

H2128S

OpenMail Technical Training

Instructor Guide



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Notes to the Instructor

Product Overview

OpenMail provides an open, standards-based mail service over a network of Unix servers. Users of a variety of clients - such as PCs, terminals, Unix workstations - directly connected to server machines can communicate via this mail service.

Openmail uses X.400 standard addressing and messaging features, allowing it to be used as an integral part of X.400 networks. Message distribution between Unix servers running OpenMail can be via the Unix Sendmail delivery service, and to external mailing systems either by means of the integral X.400 facilities, or via gateways to Unix mail, to HP 3000 systems running HP Desk, and out to the international fax network.

Unix mailing systems were traditionally difficult to configure and administer. By contrast, OpenMail administration is straightforward; simple tools for configuration and maintenance are provided to give a high level of reliability to the delivery service. OpenMail server functions are transparent to users.

OpenMail is built on an open client/server model, and a variety of different clients can be used with OpenMail, such as NewWave Mail, AdvanceMail, and the Graphical User Interface (GUI) for Motif. This course aims to teach the implementation and operation of an OpenMail network and, in particular, the configuration and maintenance of OpenMail servers. Separate training is available in the use of the various user clients.

Course Structure

The course is divided into 21 Modules so that you can use the materials flexibly. Courses can be easily tailored to the needs of the audience; for example, if your students will not be involved in implementing external mail gateways, you need not use those modules.

Each module divides into a number of topics, and an overhead slide is usually provided as the focal point. In some instances you may prefer to substitute diagrams of your own, or write up subject headings as you deal with them for added emphasis. At the end of each module is a summary slide that recaps the topics covered in that module; this slide can also be used as an introductory slide for the module if required.

The student workbook contains a copy of each slide and notes or procedures for each topic. The notes are intended to be a reminder of the course coverage. There are also references to fuller explanations of topics in the manuals; unless otherwise stated these refer to the *OpenMail Technical Guide*.

Practical exercises (labs) provide hands-on experience. Lab instructions for students are provided in their Workbook. Suggested answers or procedures for the Labs are provided to you in this Guide, but not to the students. Such exercises may be added to as you feel your own particular course demands.

Notes to the Instructor

Instructor Pre-Requisites

Ideally you are a professional trainer employed by your company to provide technical training in information systems software. Alternatively, you are an engineer supporting OpenMail (and probably other information systems software) who has some experience of training.

OpenMail Knowledge

You must have a good working knowledge of OpenMail, both as a user and as a System Administrator, gained over at least one month, including experience of troubleshooting and supporting the system.

Your formal knowledge of OpenMail may have been obtained from working through the self-paced training material provided in the OpenMail technical documentation. However preferably, if *OpenMail Technical Training* is available at your local Hewlett-Packard Education Center, you have attended the course there before you attempt to give it yourself. This will give you the opportunity to see the course taught by an expert who is experienced both as a trainer and in the support of OpenMail. You will also have the opportunity to have all your questions answered before you are in the position of having to answer questions yourself.

Formal knowledge of some HP client interfaces for OpenMail can also be obtained by attending the following training:

- *AdvanceMail User Training (HP product number H2127)*
- *HP NewWave: Supporting Users (HP product number D1721)*

Background Knowledge

You must be proficient in Unix to System Administrator level. There are a large number of courses available that can provide knowledge to this level; HP's include:

- *HP-UX System Administration/Series 300 (HP product number 51436)*
- *HP-UX System Administration/Series 800 (HP product number 51482)*
- *HP-UX Fundamentals for Programmers (HP product number 51434)*
- *SCO UNIX System V/386 System Administration (HP product number D2054)*

Electronic mail is a network service, so you must also have a basic knowledge of the local and wide area networking that can be associated with OpenMail. Some of this will vary between networks, but basic familiarity with Unix networking, especially Sendmail, Unix mail, and TCP/IP is essential. Again courses are widely available, but suitable HP courses are:

- *ARPA/Berkeley Services for the HP 9000 (HP product number 22861)*
- *HP LAN Manager/X (HP product number 22865)*

Familiarity with X.400 concepts and operations is necessary, though in-depth experience of X.400 is not required to teach the course. A number of courses are available that will provide the necessary introduction to X.400 — available from HP, and suppliers such as Omnicom and Retix — for example the following self-paced video course:

- *Message Handling Systems - X.400 (HP product number B1797)*

Notes to the Instructor

If you will be teaching the Modules covering the OfficeFax and HP DeskManager gateways, you will need to have at least a basic familiarity with those products.

Student Pre-Requisites

The course is designed to provide a general technical overview for anyone with responsibility for an OpenMail system, whether as a System Administrator directly responsible for one or more systems, or in a more general support role.

OpenMail is basically a Unix networking service, and therefore although the student does not require any prior knowledge of electronic mail, they must be Unix systems professionals with knowledge of Unix to system administration level, such as could have been provided by any of the following HP courses:

- *HP-UX System Administration/Series 300 (HP product number 51436)*
- *HP-UX System Administration/Series 800 (HP product number 51482)*
- *SCO UNIX System V/386 System Administration (HP product number D2054)*

Knowledge of networking, particularly Unix networking is desirable but not essential. Suitable courses are widely available, HP's include:

- *ARPA/Berkeley Services for the HP 9000 (HP product number 22861)*

The course will accommodate up to 12 students, working in pairs.

Course Timetable

A recommended timetable for the three days of the course is given on the following pages, along with typical durations for each module.

Not all gateways are available with all versions of OpenMail, so if your class will be targeted at a specific version, check the data sheet for that version for the supported gateway options. Indeed, since most gateways — with the possible exception of the Unix Gateway — will only be applicable to large, enterprise-wide installations, you could choose to run a two-day course by omitting the gateway modules from the course altogether.

Notes to the Instructor

Day 1 — Concepts and Configuration

1 — Class Introductions 20 minutes

2 — Introduction to OpenMail 1 hour

Break

3 — How OpenMail Works 1 hour

4 — Planning a System 1 hour

Lunch

5 — Configuring a System 1 hour

Break

6 — Planning a Network 1 hour

7 — Configuring a Network 1 hour

6 hours 20 minutes

Notes to the Instructor

Day 2 — Installation and Support

8 — Installing OpenMail 1 hour 30 minutes

Break

9 — Operating the Server 40 minutes

10 — Supporting Users 20 minutes

Lunch

11 — Maintaining the Mail Service 1 hour 30 minutes

Break

12 — Managing the Network 1 hour

13 — Customizing OpenMail 1 hour 30 minutes

6 hours 30 minutes

Notes to the Instructor

Day 3 — External Connections

14 — Introduction to X.400

1 hour

Break

15 — Planning an X.400 Interface

1 hour

16 — Configuring an X.400 Interface

20 minutes

Lunch

17 — Planning a Unix mail Gateway

40 minutes

18 — Configuring a Unix mail Gateway

1 hour

Break

19 — Planning and Configuring a Fax Gateway

40 minutes

20 — Planning an HP Desk Gateway

40 minutes

21 — Configuring an HP Desk Gateway

40 minutes

6 hours

Facilities Requirements

Facilities requirements are divided into classroom, training aids, course materials, manuals, and suggested handouts.

Classroom

The ideal environment is a purpose-designed classroom. However, if you do not have such a facility available, you can use any room that fulfills the following criteria:

- Sufficient accommodation to comfortably seat all students and their equipment.
- Sufficient power and cabling for all the equipment.
- Sufficient ventilation, quietness, etc, to ensure a relaxed environment in which students can fully concentrate on learning.

Training Aids

The classroom should have the following training aids:

- Overhead slide projector, and a screen or white wall onto which slides can be projected.
- Whiteboard or flipchart, and suitable marker pens.

Course Materials

The course comprises the following materials for the Instructor:

- This Instructor Guide (HP part number H2128-60005)
- Overhead Slide Set (HP part number H2128-60006)
- Lab Multi-System Emulation Software, available for the following platforms and media:
 - HP-UX Magnetic Tape (HP part number H2128-11002)
 - HP-UX Cartridge Tape (HP part number H2128-19002)
 - HP-UX DAT Tape (HP part number H2128-19003)

The student materials comprise copies of the:

- Student Workbook (HP part number H2128-60004)

Manuals

Copies of only one manual are required in class (for the installation Lab in Module 8), for which you will need the current installation instructions for the relevant platform:

- *OpenMail for DEC ULTRIX Installation Instructions* (HP part number 5960-2369)
- *OpenMail for HP-UX Installation Instructions* (HP part number 5960-2371)
- *OpenMail for IBM AIX Installation Instructions* (HP part number 5960-2387)
- *OpenMail for SCO UNIX Installation Instructions*(HP part number B1603-90001)
- *OpenMail for Sequent Dynix/ptx Installation Instructions* (HP part number 5960-2374)

Notes to the Instructor

While it is not necessary to give any other manuals to students in class, you should ensure that the following are available for your own reference:

OpenMail Server

- *OpenMail Technical Guide* (HP part number B2280-90001)

User Clients

- *AdvanceMail User Guide* (HP part number D2102-90022)
- *AdvanceMail Trainer's Pack* (HP product number H2126)
- *AdvanceMail Technical Guide* (HP part number D2102-90023) or *AdvanceMail/PC Administration* (HP part number 5959-9685)
- *NewWave Mail Technical Guide* (HP part number D2103-90010)

Gateway Products

- *HP OfficeFax Installation* (HP part number 5959-9669)
- *HP OfficeFax Administration* (HP part number 5959-9670)
- *OpenMail/HP DeskManager Connection Technical Guide* (HP part number B2280-90002)
- *HP DeskManager Administration* (HP part number 36570-90134)

Suggested Handouts

Distributing the following literature as handouts at appropriate points during the class will provide useful information on specific current supported connections and configurations:

- *Raising the Electronic Mail Standard* OpenMail brochure (HP part number 5091-0404)
- *Electronic Mail: Delivering a First Class Solution* case studies (HP part number 5091-3004)
- *HP OpenMail: Information Distribution Services for HP 9000 Systems* data sheet (HP part number 5952-3578)
- *HP OpenMail for SCO UNIX: Information Distribution Services for PC Multiuser Systems* data sheet (HP part number 5091-2344)
- *HP NewWave Office: Information Distribution Services for the PC* data sheet for NewWave Mail and AdvanceMail (HP part number 5091-1106)
- *HP AdvanceLink* data sheet (HP part number 5091-2129)
- *HP OfficeFax* data sheet (HP part number 5952-9687)
- *AdvanceMail User Training* course data sheet (HP product number H2127B)
- *HP NewWave: Supporting Users* course data sheet (HP product number D1721B)

Notes to the Instructor

Equipment Requirements

There are two ways to run the course:

- One server per student pair

Give each pair of students access to their own server running OpenMail; this is preferable.

- One server per class

Use one multi-user system for the whole class, with the course Lab Multi-System Emulation Software being used to allow you to run multiple OpenMail systems on the same machine.

This course is designed for the A.01.00 release of OpenMail, therefore check that your servers and their operating systems currently support the software.

Also make sure that you have acquired the correct User Licence for OpenMail.

One Server per Student

The ideal set-up is to give each pair of students their own system. The servers should all be connected to a LAN running TCP/IP. OpenMail must be installed on each server; as should the Berkeley Services Sendmail program so that the servers can exchange mail in a network. Sendmail is variously supplied with the operating system (DEC ULTRIX), ARPA Services (HP-UX), or TCP/IP products (SCO UNIX).

Typically the servers will be Unix workstations: such as HP 9000 (Series 300, 400 or 700) or IBM Risc System/6000.

Each workstation must have at least 16 Mb memory and 40 Mb of dedicated disk space. X Windows (version 11) is supported with OpenMail.

One Server per Class

The course Lab Software allows you to run multiple versions of OpenMail on the same server. In this way, by installing one version of OpenMail and the Lab Software, a number of students can all effectively use their own OpenMail system in class and communicate with the other students.

This facility can only be used where the Lab Software is available for the platform concerned. Up to 6 concurrent OpenMail sessions can be run.

Be aware that - while this provides a good training environment - you must follow the configuration guidelines given in these Notes carefully, to ensure adequate performance. The Lab Software puts a very heavy load on the system, and should only be used where you can guarantee that no processes other than OpenMail (and those required by OpenMail) will be running.

The Lab Software is a supported feature of this course but not of the OpenMail product itself. It has been tested on the following systems, where the stated number of simultaneous sessions could be run with acceptable response times - slower than normal but reasonable for a classroom situation. On other systems, some trial and error will be necessary to establish how many sessions will run at an acceptable level of performance.

Notes to the Instructor

HP 9000, Series 360 with 16 Mb memory	3 sessions
HP 9000, Series 815 with 8 Mb memory	2 sessions
HP 9000, Series 825 with 16 Mb memory	3 sessions
HP 9000, Series 832 with 48 Mb memory	6 sessions
HP 9000, Series 835 with 32 Mb memory	6 sessions
HP 9000, Series 837 with 32 Mb memory	6 sessions
HP 9000, Series 840 with 16 Mb memory	4 sessions

OpenMail

For details of the current version for your platform, refer to the appropriate OpenMail data sheet.

Do not attempt to install OpenMail without following the system configuration recommendations and installation procedure given in the *Installation Instructions* for the appropriate platform.

Terminals

To run the OpenMail Administration Interface (`omadmin`) and the AdvanceMail terminal user interface (`advmail`), the following terminal types are supported:

- aixterm
- ANSI
- HP 239x
- HP 262x
- hpterm
- VT100
- VT220
- Wyse60
- xterm

Alternatively, you can use PCs running a terminal emulator, such as HP AdvanceLink.

Clients

Additional clients are not required, but if your students will be implementing systems with clients other than AdvanceMail/TI, these can be used for the user interface Lab.

Refer to the relevant manuals for instructions on configuring and connecting clients to OpenMail over serial or LAN links.

Additional Software

To run the Unix Gateway Lab in Module 18 you will need Sendmail to be running on the training system(s).

Notes to the Instructor

Class Set-Up Using the Multi-System Emulation Software

Configuring the Server

In place of the system configuration normally recommended for OpenMail, a system running the Lab Software must be set-up with the following configuration parameters which, in order of importance, are:

Memory	At least 16 Mb real memory plus 1 Mb per OpenMail session.
Swap space	At least 12 Mb plus 5 Mb per OpenMail session.
Disk space	30 Mb for OpenMail plus about 0.5Mb per OpenMail session - in addition to space to be used as swap space.
Processor	The power of processor is not the single key determinant of performance, but the faster the processor the better.

For details on system sizing and performance see the *OpenMail Technical Guide*.

Using the Lab Software

To enable each pair of students to run an OpenMail session on the same server, *playpens* need to be created, which each contain a copy of the OpenMail software. The facility to create playpens is provided in the OpenMail software, but scripts from the course Lab Software are required to set the playpens up.

OpenMail must already be installed. You will need Root capability to set up the playpens (and to delete them after the class), but not to use the playpens during the class. Each playpen requires around 3 Mb disk space.

Each playpen will be created as follows:

- A Unix user (without password) is configured for each playpen.
- A copy of OpenMail is put in each playpen.

All OpenMail services appear to be installed in each playpen, but only the following work: Local Client Interface, Service Router, Local Delivery, Sendmail Interface, and the Test Server. No other service can be started.

The Trace Mailnode is configured, and the Unix user is configured as an OpenMail user with Administrator capability. These are named as follows (this example assumes 6 playpens are set up):

Class Users	Playpen System	Unix Login	OpenMail User	Trace Mailnode
Students 1/2	system0	/users/omac0	omac0	ny0,admin,systems
Students 3/4	system1	/users/omac1	omac1	ny1,admin,systems
Students 5/6	system2	/users/omac2	omac2	ny2,admin,systems
Students 7/8	system3	/users/omac3	omac3	ny3,admin,systems
Students 9/10	system4	/users/omac4	omac4	ny4,admin,systems
Students 11/12	system5	/users/omac5	omac5	ny5,admin,systems

Notes to the Instructor

Setting Up the Playpens

1. Log in as root.
2. Ensure OpenMail is running by typing `/etc/omrc`
3. Load the appropriate media version of the Lab Software into the drive.
4. Make a directory to contain the Lab files: we suggest `/usr/openmail/class`
5. From that directory, extract the Lab files (which will go into a directory `class`) by typing:

```
tcio -i <device> | tar xpf -
```

Check that all the following files have been extracted with the correct permissions:

```
-r-xr-xr-x 1 root  other      241 Aug 23 1992  AddUser
-r-xr-xr-x 1 root  other      723 Aug 23 1992  InitPP
-r-xr-xr-x 1 root  other     1016 Aug 23 1992  Install1
-r-xr-xr-x 1 root  other    13036 Aug 23 1992  Playpens
-r-xr-xr-x 1 root  other      506 Aug 23 1992  Profile
-r-xr-xr-x 1 root  other      196 Aug 23 1992  StartDaemons
-r-xr-xr-x 1 root  other      266 Aug 23 1992  XPORT
-r-xr-xr-x 1 root  other     7915 Aug 23 1992  in-play
-r-xr-xr-x 1 root  other      640 Aug 23 1992  play.xpo
-r-xr-xr-x 1 root  other       46 Aug 23 1992  playpen
```

6. From within the directory, type `./Playpens`
7. From the menu displayed, select the option to install playpens and follow the prompts to create the number of playpens you require.

Remember that playpens are numbered from zero and the maximum number that will run is six.

Note that if you later want to add extra playpens, you will have to first delete all existing playpens and then start over creating the number of playpens you require.

The creation of each playpen takes a few minutes.

8. Then, from the same directory, type `./StartDaemons`

Check that the licence and database monitors are running for each playpen by looking for `omlicmon` and `omdmon` using the listing from:

```
ps -ef
```

9. To secure your system, use the `passwd` command to assign passwords to each Unix login created by the Playpens script (`omac0 - omacn`). Write these down so that you will be able to give them to students in class.

Important Notes on Using Playpens

- The Playpens script will let you configure as many playpens as you have disk space for, but you can only start up 6 at any one time. (If you attempt to start up OpenMail services in a seventh playpen, you will probably get the error message `OM_6032`)

Notes to the Instructor

- The “real” OpenMail system, outside of the playpens you set up, does not need to be running for the playpen versions of OpenMail to work. In fact, if it is running, it will only tie up valuable system resources.
- Each playpen system is associated with an `omac` login - from which ALL activity must take place in class. Any activity from any other Unix login than the `omac` login will attempt to access the “real” OpenMail system, not the appropriate playpen.

Therefore, all administrative activity in the Labs must be carried out by the `omac` OpenMail user. Once other OpenMail users have been configured, AdvanceMail can be run from this login for them (providing the user is configured with an OpenMail password), as follows:

```
omac2> advmail "Jasmin Lee"
```

- Since the playpens use copies of the same OpenMail binaries, there may be occasional contentions reported when two students try to use the same command at exactly the same instant. In these cases, simply re-trying the operation usually overcomes the problem.
- Playpens can exchange messages (for example in the Labs in Modules 2 and 7). This appears to students as if they are separate servers communicating in a network via Sendmail - but the playpens actually use scripts rather than Sendmail to achieve this. Sendmail is thus not required to be running for the playpens to exchange mail.
- For communication between the playpen systems, the Trace Mailnode in each must remain as set-up by the script. If communication fails, check first whether a student has re-assigned their Trace Mailnode.

Deleting the Playpens

Before deleting playpens you must ensure that any OpenMail services that have been started within them are stopped.

Note that all Unix users in `/etc/passwd` with login names beginning with `omac` will be deleted.

Run the Playpens script and select the option to delete playpens.

Preparation for the Labs

Before the Course

1. If using separate servers rather than the playpen systems that are set up by the Lab Software, you must first perform the following set-up on each server. (For playpen systems, these steps are performed automatically by the Lab Software.)

- i. Log in as `root`. Remember the PATH for OpenMail commands is `/usr/openmail/bin`
- ii. Create a Unix login for class use. We suggest logins of the form `omac0-omacn`

Add a password to each login.

- iii. Ensure OpenMail is running by typing:

```
/etc/omrc
```


Notes to the Instructor

- iv. Configure one OpenMail mailnode on each system:

```
on system 0      omaddmn -m "ny0,admin,systems"  
on system 1      omaddmn -m "ny1,admin,systems"  
etc
```

- v. Configure one administrative user on each system:

```
on system 0      omaddu -n "omac0/ny0,admin,systems" -u omac0 -c yyy  
on system 1      omaddu -n "omac1/ny1,admin,systems" -u omac1 -c yyy  
etc
```

- vi. Make a note of the node name of each system:

```
hostname
```

2. On all configurations (separate servers and playpen systems), setup OpenMail as follows:

- i. Login as the appropriate user (for example omac0)
- ii. Start the following OpenMail services and check they have started:

```
omon -s local l-client router sendmail test  
  
omstat -s
```

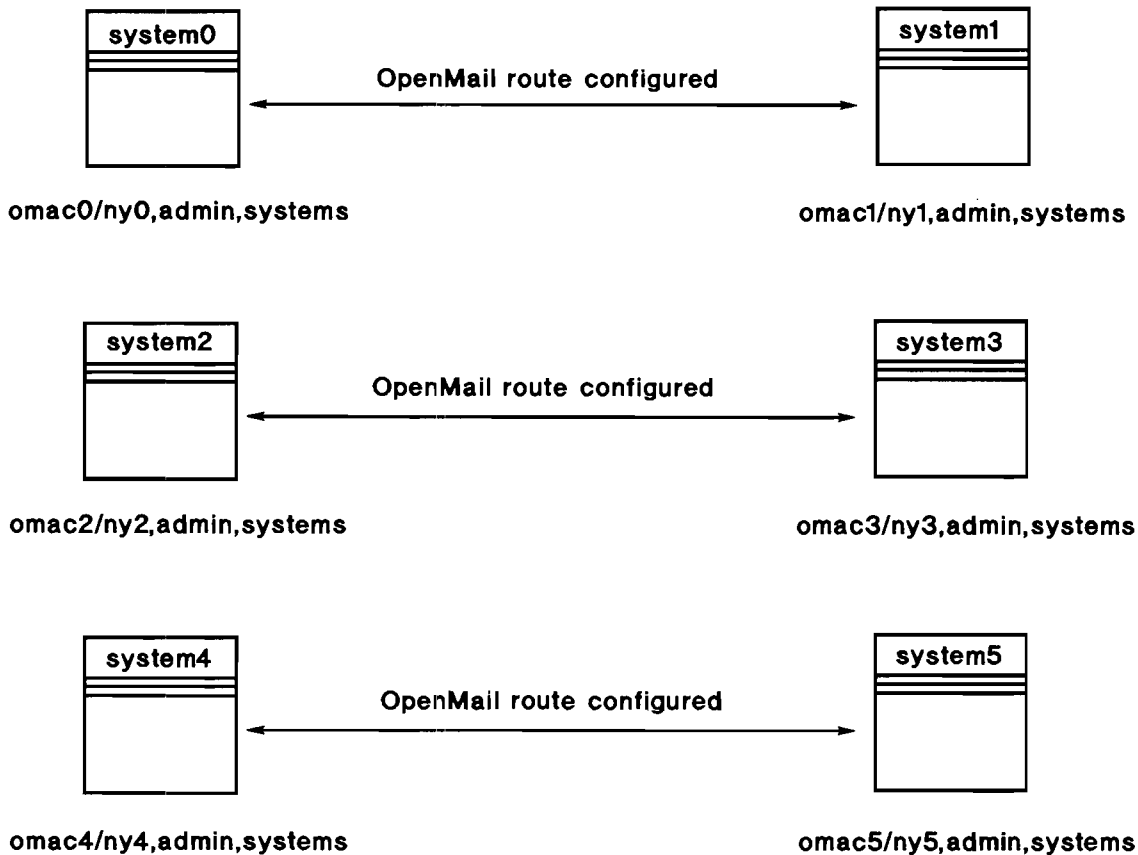
- iii. Set up one route from each OpenMail system to one other, as follows:

```
on system 0      omaddrt -m "ny1,admin,systems" -q SMINTFC -u openmail@system1  
on system 1      omaddrt -m "ny0,admin,systems" -q SMINTFC -u openmail@system0  
on system 2      omaddrt -m "ny3,admin,systems" -q SMINTFC -u openmail@system3  
on system 3      omaddrt -m "ny2,admin,systems" -q SMINTFC -u openmail@system2  
on system 4      omaddrt -m "ny5,admin,systems" -q SMINTFC -u openmail@system5  
on system 5      omaddrt -m "ny4,admin,systems" -q SMINTFC -u openmail@system4  
etc
```

On separate servers (non-playpen systems), substitute the appropriate nodename in the Sendmail address.

The following diagram shows the connectivity you have established for the first Lab in Module 2. (You'll extend this network during the Lab in Module 7.)

Notes to the Instructor



Module 2

This Lab consists of a set of typical mailing tasks which students work out how to do using the user interface. It can thus be used with any user client, and so can be tailored to the user client that most students sites' will be using. The default should be to use the AdvanceMail terminal interface, since this is easiest to set up and use in class.

If you'll be using a terminal emulation that doesn't fully support function keys, such as VT100, provide students with a table of the key mappings from the *AdvanceMail User Guide*.

Module 5

To configure the four OpenMail users in the Planning Sheet from Module 4, Unix logins will be required. If students have their own systems you could give them root capability to do this themselves; otherwise, we recommend you preconfigure a set of logins for use in this Lab (perhaps based on the sample answers in the Planning Sheets).

If using playpens, students cannot then start AdvanceMail sessions from these logins - they must remain in their omac login and signon to the mailbox of the user they have configured using:

```
advmail "User Name"
```

Notes to the Instructor

Module 8

Get copies of the OpenMail Installation Instructions for your platform, to hand out to students before the Lab so they can follow the specific installation procedure. Specific instructions are not given in the Workbook or these Notes.

If students will install on their own systems, ensure sufficient copies of the software media are available.

If you don't have a spare server to install OpenMail on in the Lab, and particularly if you are using the playpen systems, you may be concerned about running this Module at the start of Day 2. In this case, move the Module to the end of Day 2; which will give you time after class to re-set-up the playpens and fix any problems (if they occur).

Module 12

The second Lab in Module 12 - using `omqdump` to track a message - is an advanced Lab and can be omitted if the skill level of students appears inadequate or time short.

Module 13

To be able to use the Request Server in the Lab, make sure that the `usr/openmail/req` directory allows everyone write access. Also the directory `usr/openmail/examples/req` need to allow everyone read access.

To configure the two OpenMail users in the second Lab, Unix logins will be required. If students have their own systems you could give them root capability to do this themselves; otherwise, we recommend you preconfigure a set of logins for use in this Lab. As with the Lab in Module 5, if using playpens, students cannot then start AdvanceMail sessions from these logins - they must remain in their `omac` login and `signon` to the mailbox of the user they have configured using:

```
advmail "User Name"
```

Module 18

The Unix Gateway configuration Lab requires Sendmail to be operational on the class system(s).

This Lab cannot be performed using the Lab Software, since the Unix Gateway service isn't operational in the playpen systems. However, it can be performed using the "real" OpenMail system, as a demo, with the class gathered round to watch.

Module 1 — Class Introductions

Objectives

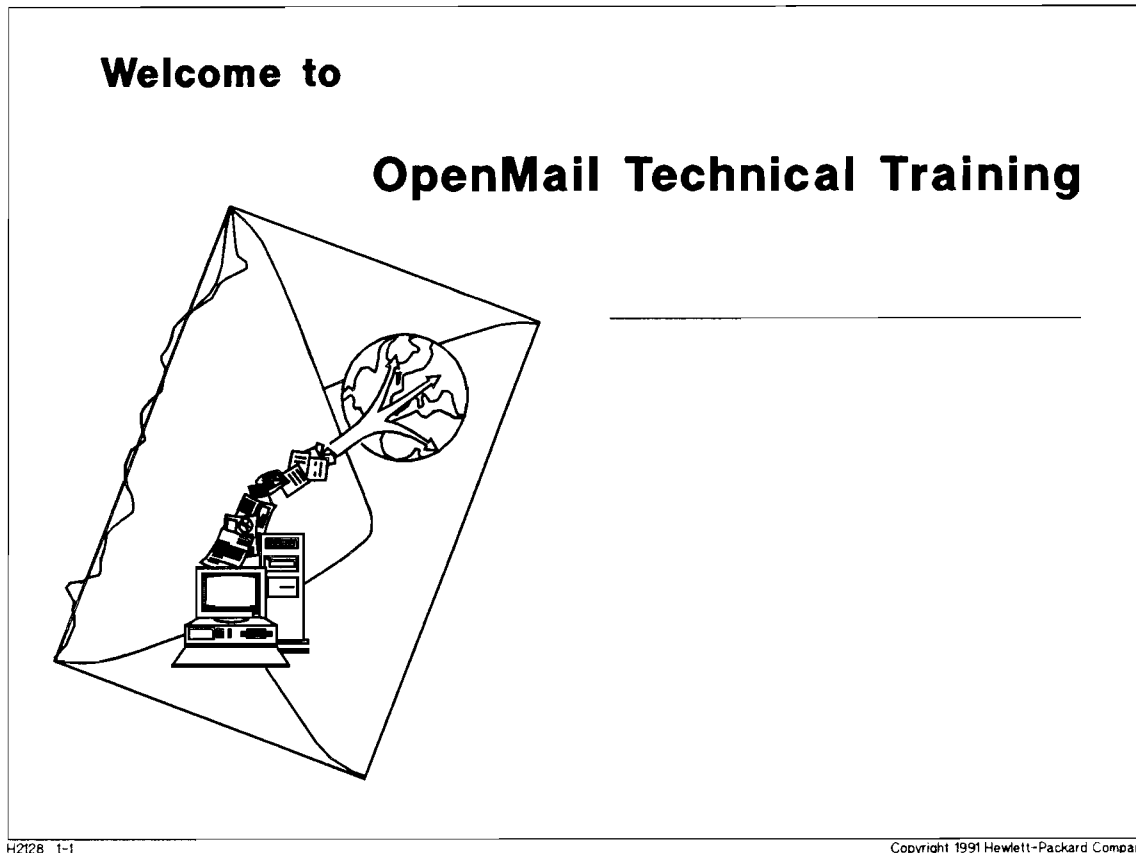
After spending 20 minutes completing this Module, you will:

- Get to know your fellow students
- Understand the overall course objectives
- Be able to describe what will be covered on each day of the course



Module 1 — Class Introductions

1-1. Welcome



Welcome to the OpenMail Technical Training class.

The student workbook contains a copy of the slides used and notes on each of the topics covered. It is intended for use in class, and as a source of information to supplement the OpenMail documentation for when you leave this course.

Please take a few moments to familiarize yourself with the instructor, other students, and site amenities.

1-1. Welcome

Instructor Notes

Purpose

Introduce yourself, the class set-up, amenities, and get students to introduce themselves.

Key Points

Introduce Yourself

- Name
- Background/experience of OpenMail

Class Set-Up

- The course is divided into 21 modules, over 3 days. Each module is divided into individual topics.
- There are practical LABS or WRITTEN EXERCISES at the end of most modules.

Amenities

- Rest rooms/refreshments
- Dining arrangements
- Messages/phones
- Security/fire escape procedures, etc.

Student Introductions

- Name and company
- Current role
- Electronic mail experience
- Unix experience
- What you want from the course

Transition

Look at the course objectives ...

1-2. Course Objectives



Course Objectives

By the end of the course be able to:

- Design and implement OpenMail networks
- Install and configure an OpenMail server
- Carry out daily operations and maintenance
- Diagnose and resolve most system problems
- Provide effective service and support to users

H2126 1-2

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By the end of this course students will be able to:

- Design and implement a mail network that meets your company needs now, and is both maintainable and expandable in future.
- Install and configure OpenMail systems and modify them as necessary.
- Carry out standard operations, reliability tests, and maintenance actions to ensure a smooth-running system.
- Diagnose and resolve first-level system errors, such as those you will encounter supporting a system.
- Provide users with a reliable, secure, and effective mail service which meets their needs.

Module 1 — Class Introductions

1-2. Course Objectives

Instructor Notes

Purpose

Specify the course objectives.

The Course Doesn't Cover . . .

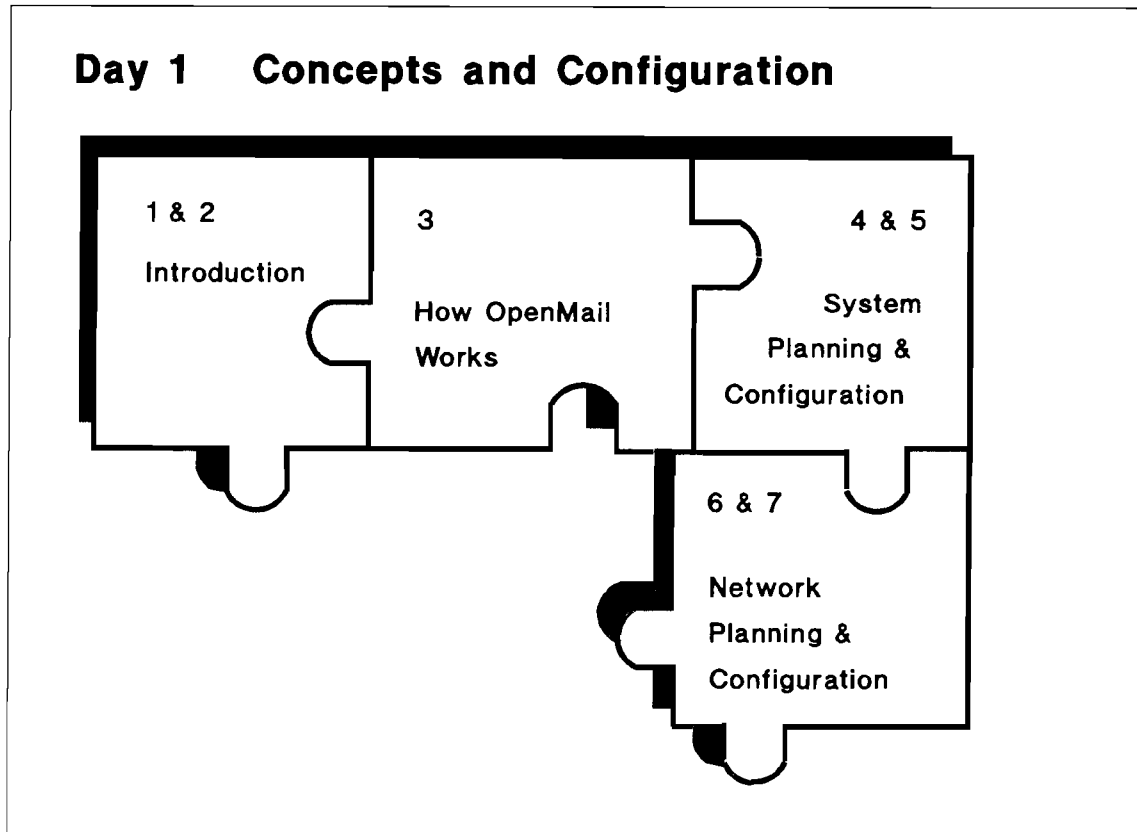
- Unix system: Configuration, operation, and maintenance of the Unix server.
- Networking: Establishing local or wide area datacomm links between servers.
- X.400: Configuration, operation, and maintenance of an X.400 Message Transfer Agent.
- Gateway products: Configuration, operation, and maintenance of the other electronic communication products that can be accessed through OpenMail gateways, such as OfficeFax and HP DeskManager.
- Clients: Connection, configuration, and use of clients, such as AdvanceMail, NewWave Mail, and the Graphical User Interfaces for Motif and MS-Windows - though they are overviewed.
- APIs: Programmatic integration via the Application Program Interfaces - though the capabilities provided by the APIs are overviewed.

Transition

Look at the content of Day 1 . . .

Module 1 — Class Introductions

1-3. Day 1 - Concepts and Configuration



H2128 1-3

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Module 1	Class Introductions
Module 2	Introduction to OpenMail
Module 3	How OpenMail Works
Module 4	Planning a System
Module 5	Configuring a System
Module 6	Planning a Network
Module 7	Configuring a Network

Module 1 — Class Introductions

1-3. Day 1 - Concepts and Configuration

Instructor Notes

Purpose

Explain the theory and practice covered during Day 1.

Key Points

Theme

- Concepts and configuration: the initial implementation of OpenMail - planning, configuring, running - for both a system and a network.

Modules

- 2 Provides an overview of OpenMail: the mail services it provides, the environments required for both server and clients, and the interfaces for Administrator and users.

Includes a Lab using one of the user interfaces.
- 3 Explains how mail is stored, and how the main services distribute mail.
- 4-5 Cover setting up a single OpenMail system.

Includes a written planning exercise in devising a mail addressing scheme and a Lab in which you configure a system.
- 6-7 Cover setting up links between several systems to make an OpenMail network.

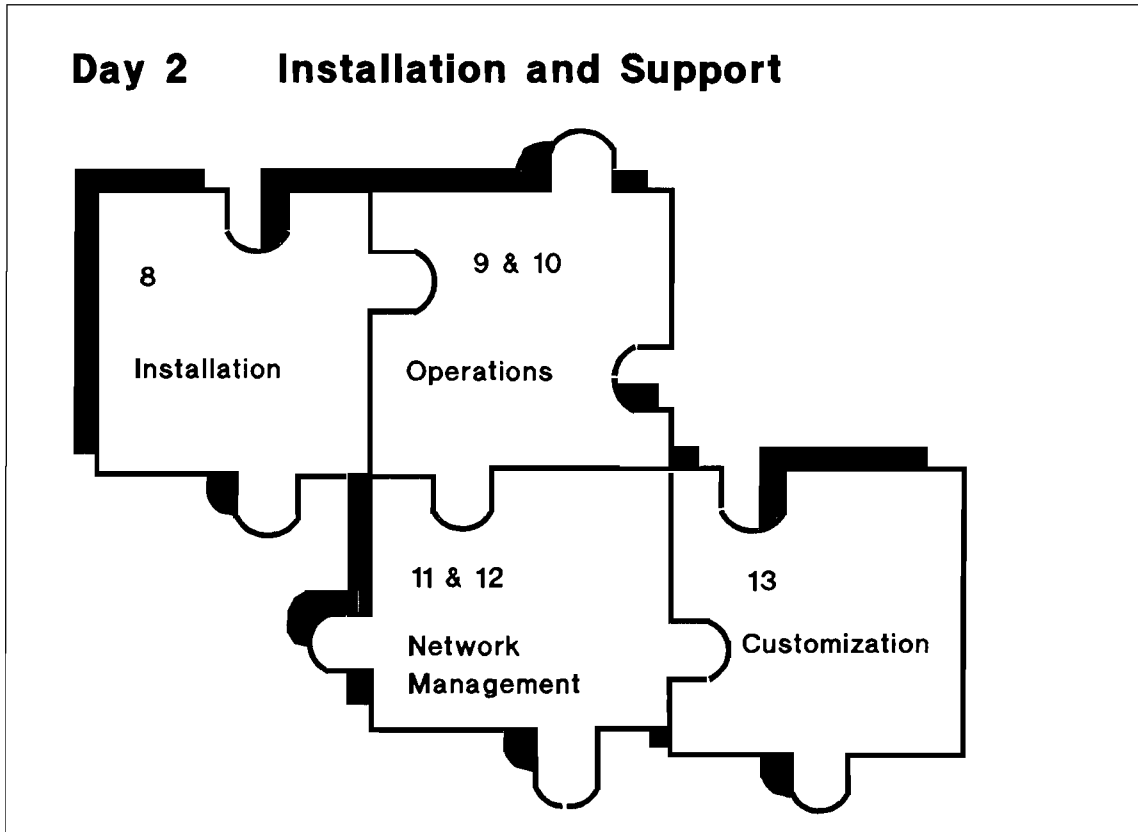
Includes a written planning exercise in routing mail to remote systems, and a Lab in which you configure a network. By the end of this module, you will have linked your system to others in the class.

Transition

Look at the content of Day 2 ...

Module 1 — Class Introductions

1-4. Day 2 - Installation and Support



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Module 8	Installing OpenMail
Module 9	Operating the Server
Module 10	Supporting Users
Module 11	Maintaining the Mail Service
Module 12	Managing the Network
Module 13	Customizing OpenMail

Module 1 — Class Introductions

1-4. Day 2 - Installation and Support

Instructor Notes

Purpose

Explain the theory and practice covered during Day 2.

Key Points

Theme

- Installation and support: the regular operation and support of an OpenMail system.

Modules

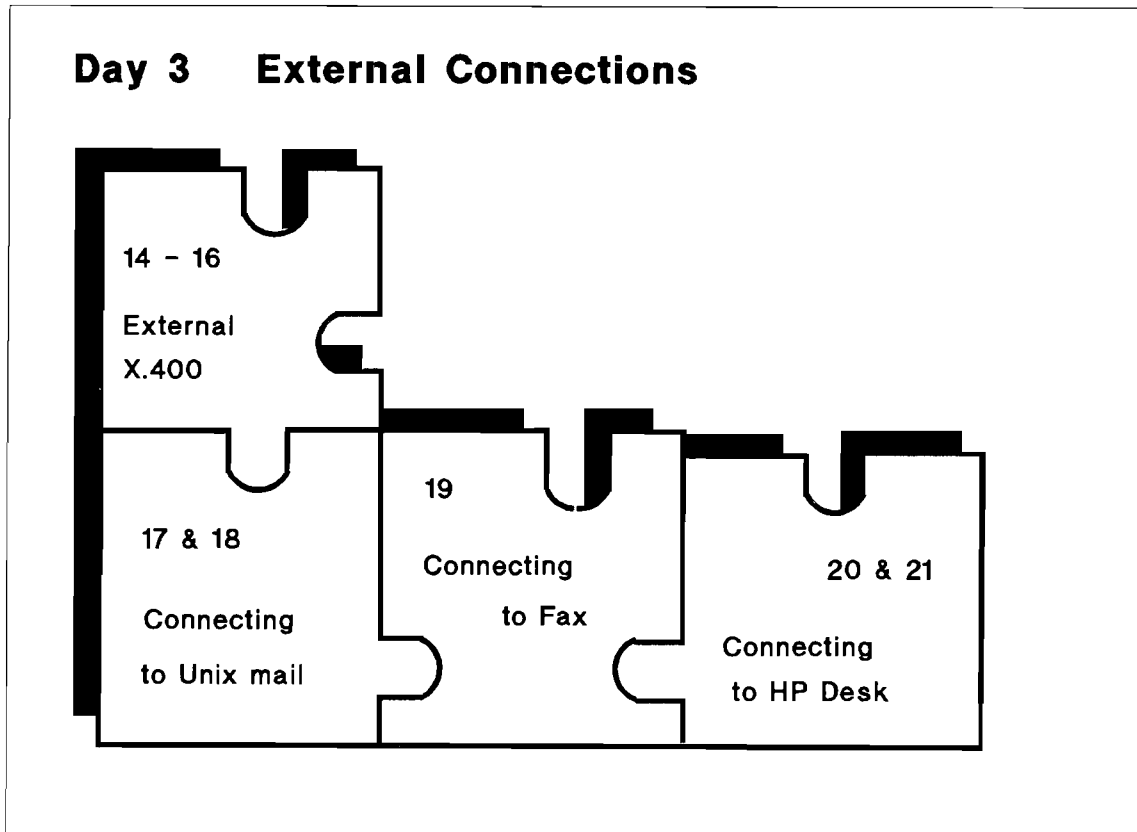
- 8 Explains the installation procedure and related system considerations, such as directory structure, security and performance, before a Lab in which OpenMail is installed.
- 9-10 Cover operating the system: looking at the system status, starting services, getting service status reports, updating the Directory, and how to train and support users.
- 11-12 Cover maintaining and managing the system: handling day-to-day errors like failed messages, and using commands rather than the Administration Interface.
- 13 Looks at customizing OpenMail via the script interface, the Request Server, file converter interface, and the Application Program Interfaces.

Transition

Look at the content of Day 3 . . .

Module 1 — Class Introductions

1-5. Day 3 - External Connections



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Module 14	Introduction to X.400
Module 15	Planning an X.400 Interface
Module 16	Configuring an X.400 Interface
Module 17	Planning a Unix mail Gateway
Module 18	Configuring a Unix mail Gateway
Module 19	Planning and Configuring a Fax Gateway
Module 20	Planning an HP Desk Gateway
Module 21	Configuring an HP Desk Gateway

Module 1 — Class Introductions

1-5. Day 3 - External Connections

Instructor Notes

Purpose

Explain the theory and practice covered during Day 3.

Key Points

Theme

- External connections: the connection of OpenMail to other electronic communication systems:
 - X.400
 - Unix mail
 - Fax
 - HP DeskManager

The course only covers enough of these other systems to provide an understanding OpenMail's links to them.

Modules

14-16 Introduce X.400 concepts and explain how to plan/configure an external link to X.400.

17-18 Explain how to set up a link to the Unix mail Internet, which you try in the Lab.

19 Explains how to link the electronic mail network to the fax network, via an OfficeFax server.

20-21 Explain how to set up a gateway to HP's proprietary HP DeskManager mail system.

Transition

The next Module introduces the OpenMail server and its various user clients.

Module 1 — Class Introductions

Module 2 — Introduction to OpenMail

Objectives

After spending 1 hour completing this Module, you will be able to:

- Understand the mail services provided by OpenMail
- Understand the administration facilities provided by OpenMail
- Describe the hardware and software environments in which OpenMail works
- Describe the connectivity of OpenMail to other electronic communication systems
- Understand what tools are provided for the OpenMail System Administrator
- Describe what user clients can connect to the OpenMail server
- Appreciate the features of some OpenMail clients
- Use one of the user interfaces to read and send messages via OpenMail

2-1. Mail Services Provided by OpenMail

Mail Services Provided by OpenMail

- Storage, creation, and deletion of messages
- Distribution of mail
- Acknowledgement of delivery/non-delivery and notification of arrival
- Creation of manual or auto forward and reply messages
- Directory services and address resolution
- Inclusion and conversion of files
- Importance, priority, and sensitivity status settings

H2126 2-1

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OpenMail is a mail server based on the ISO X.400 electronic mail standard. It provides a message store on the server, where messages can be held, created, and deleted. It distributes mail from that message store to recipients on the local system or to other systems, and provides senders with acknowledgement of delivery (at various levels) and, if necessary, notification of non-delivery. It will also notify users of the arrival of new mail. Forward routing and replies to messages using the original addresses are supported, either initiated by user action or configured for automatic generation.

OpenMail's directory allows users to lookup names and extract addresses for names they supply. Users can interrogate the directory in various ways, according to the fields within it (which can include a wide variety of attributes such as job title, mailstop, etc). Access to multiple directories is also supported.

Messages can be of an unlimited size, and consist of an unlimited number of parts; each part can contain a Distribution List, text, or a file. Files can be included into messages from the local filesystem, and converted to text or another format as desired. Message text can be marked with varying levels of sensitivity, including *private* to prevent unauthorized access in the event of not reaching the intended recipient; different levels of importance and priority, including *urgent* for priority delivery; and the mailing of messages can be deferred until a specified earliest delivery date.

2-1. Mail Services Provided by OpenMail

Instructor Notes

Purpose

Explain the mail services provided by the OpenMail mail server to clients from the user's perspective.

Key points

- OpenMail provides for a message store—which the X.400 '84 recommendations do not have—although the '88 recommendations do.
- Distribution of mail can be over a single server or over a network—OpenMail is a scalable solution.
- Many of the features that users see are dependant upon the client.
- Must think of OpenMail as being a “mail engine” rather than an integrated office system.

Additional Services

In addition to the key mailing services, OpenMail provides the following facilities in their support:

- Password protection of each user's mailbox.
- Conversion of files and upload/download of messages to/from the Message Stores of remote clients.
- Browsing of files for reading and printing with local clients.
- Conversion of address formats, file formats, and character sets at gateways.
- Generation and tracking of acknowledgements, which can be either:
 - Transmitted
 - Received
 - Delivered
 - Read
 - Reply
- Storage of messages in nested, hierarchical folders.

Transition

Look at the administrative facilities provided by OpenMail . . .

2-2. Administrative Facilities Provided by OpenMail

Administrative Facilities Provided by OpenMail

- Central management of the Message Store
- Directory propagation across enterprise-wide networks
- Easy-to-use administration shell
- Remote administration of network nodes
- Automated administration integrated with Unix server
- Diagnostic facilities to resolve routing/delivery problems

H2128 2-2

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Storing mail in a central Message Store on the server enables OpenMail to make use to standard Unix system administration, security, and backup procedures, provided by the DP department.

OpenMail's design — based around standard X.400 addressing — allows the implementation of thousands-of-user, enterprise-wide mail networks, across the many different Unix platforms typically found in large organizations. With OpenMail as the standard mail server, the propagation of local directories across the network to establish and maintain network-wide directories is easily achievable.

All daily administration can be performed from a menu-driven administration shell, protecting local Administrators from system complexity, validating their entries, and providing on-line help.

Remote network nodes can be administered from a central location, and much administration can be automated through standard Unix scripting/scheduling facilities to allow out-of-hours maintenance and reporting.

Diagnostic facilities are provided to test routes, detect message looping, and identify causes of message non-delivery - transparent to users.

2-2. Administrative Facilities Provided by OpenMail

Instructor Notes

Purpose

Explain the administrative facilities that enable OpenMail to operate enterprise-wide mail networks.

Key Points

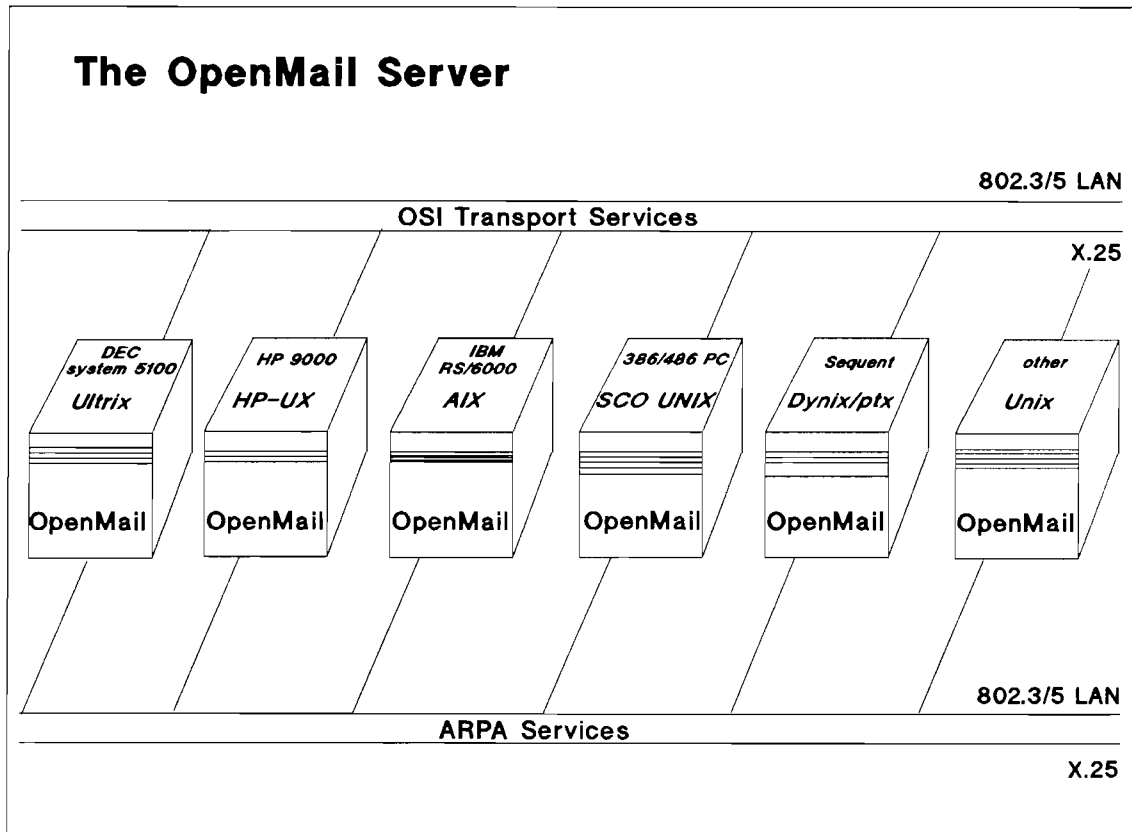
- Other facilities:
 - Event logging to record system operation/failures
 - Audit logging of system operation for statistics/billing purposes
 - Central batch printing of users' mail on a per-mailbox basis
- Advantages over Unix mail:
 - Central directory services enable users to easily address recipients without understanding network topology.
 - Non-delivery of mail is treated as Administrator rather than user problem.
 - Reliable network, compared with Internet links which aren't guaranteed available and depend primarily on spare bandwidth in University networks.
- Advantages over LAN mail:
 - Central message store frees users from backup/maintenance overhead
 - Use of Unix server provides technology matched to task

Transition

Look at the OpenMail server, and its environment . . .

Module 2 — Introduction to OpenMail

2-3. The OpenMail Server



H2128 2-3

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OpenMail is a mail server for Unix systems; the platforms currently supported include:

- DECsystem 5100 running ULTRIX
- HP 9000 running HP-UX
- IBM RISC System/6000 running AIX
- 386/486 systems running SCO UNIX
- Sequent systems running Dynix/ptx

Communication to other OpenMail systems is via either:

- X.400 and OSI Transport Services

for a fully X.400-conformant mail network.

- ARPA/Berkeley Services Sendmail program using either:

- SMTP (Simple Mail Transfer Protocol) over TCP/IP on either IEEE 802.3/5 LANs or X.25 links
- UUCP (Unix-Unix Copy) over dial-up wide area links

to make use of standard Unix networking in an internal mail network.

Purpose

Overview the hardware, software, and networking environments in which the OpenMail server works.

Multiple Platforms and Vendors

- Future ports may include Data General, NCR and Sun. See the latest datasheet for details.
- OpenMail is sold by many major computer vendors as their Unix-based X.400 mail server, either standalone or integrated into their Unix office products. Vendors currently include:
 - Hewlett-Packard 'In today's world, information networks that include equipment from many vendors are becoming the rule. Our network includes thousands of processors ... yet we can all exchange messages with each other.

If we have the impulse to communicate we can do it, without regard to technological barriers or boundaries.'

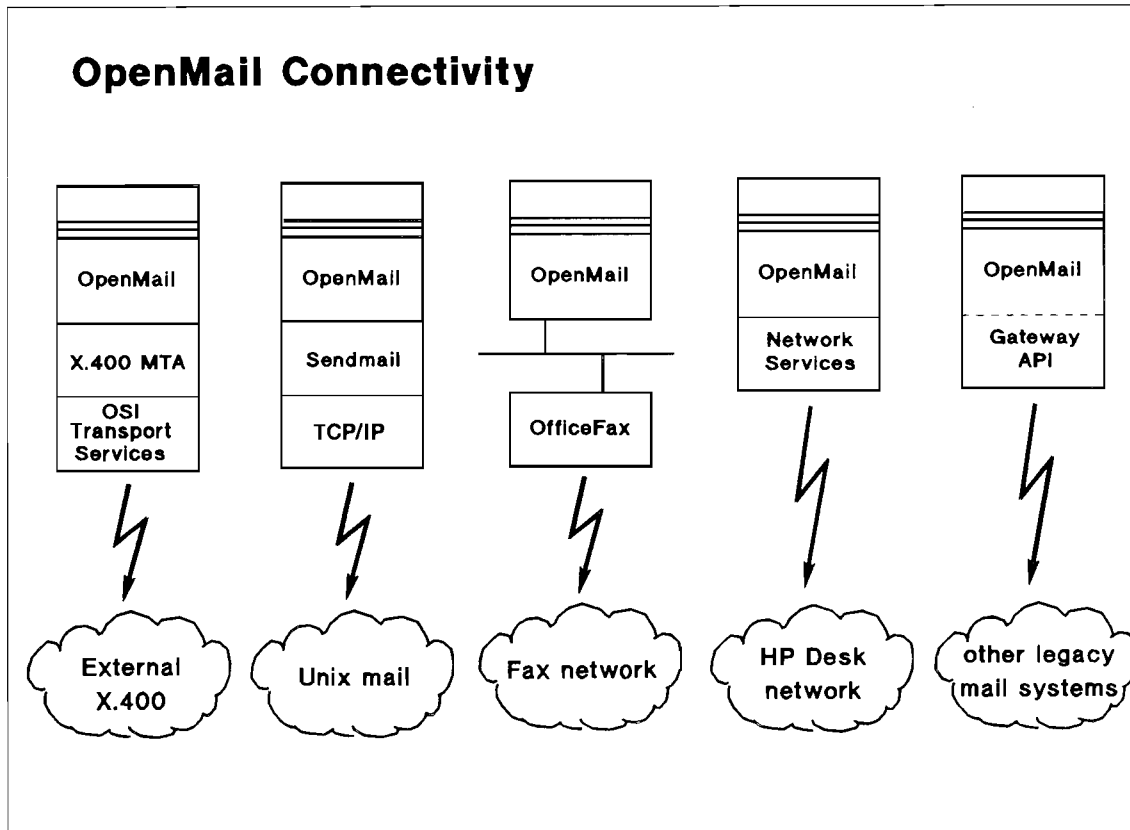
John Young, President of HP, on the impact of electronic mail at HP, Oct 1990.
 - Sequent 'We chose OpenMail because of its leadership position in providing open, standards-based email in the Unix environment.'
 - Uniplex 'When we needed an open, standards-based mailing product for our next generation office system, we chose OpenMail - the clear leader.'
- OpenMail A.01.00 will be ported to the following platforms towards the end of 1992:
 - DECsystem 5100 running ULTRIX
 - IBM RISC System/6000 running AIX
 - 386/486 systems running SCO UNIX
 - Sequent systems running Dynix/ptx

Transition

Look at the connectivity to external electronic communication services supported by OpenMail ...

Module 2 — Introduction to OpenMail

2-4. OpenMail Connectivity



H2128 2-4

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OpenMail has built-in facilities to enable communication with other electronic communication systems:

- External X.400** Since OpenMail is a native X.400 User Agent/Message Store, only a simple interface is required to pass mail out over X.400, via an X.400 MTA and OSI Transport Services, enabling OpenMail users to communicate with users on any system based on the X.400 mail standard.
- Unix mail** A gateway is provided to convert mail into the accepted Unix mail format (based on RFC-987 and RFC-1148), enabling OpenMail users to communicate with the Unix Internet and users of Unix mail systems, such as Elm, Mail, Mailx, Uniplex, etc.
- Fax** A gateway enables OpenMail to send mail out to an OfficeFax PC server which acts as a link to the telephone network, enabling OpenMail users to mail to any fax number worldwide.
- HP DeskManager** A gateway, on HP 9000 systems only, enables OpenMail users to communicate with users of Hewlett-Packard's proprietary mail system.
- other legacy mail systems** A Gateway API provides the capability to connect OpenMail mail services to those of other mail systems, such as legacy systems like IBM PROFS and DEC All-in-1.

Purpose

Overview the external connectivity options supported by OpenMail.

Implementation Example

British Telecom (BT) - one of the world's largest phone companies - chose OpenMail for its corporate electronic mail and office automation project.

The project is a strategic initiative for BT, aimed at further improving BT's customer responsiveness by speeding up internal communications. BT's program manager described it as:

“An extremely important project for enabling BT to be more responsive to our customers.”

It is Europe's largest office automation project (\$135 million), and is establishing a messaging system for 53,000 management staff worldwide.

Based around OpenMail on a mix of Unix platforms - Digital DECsystem, HP 9000 Series 800, IBM RS/6000 - BT selected OpenMail because it offers a consistent, manageable, enterprise-wide communications infrastructure, across all their server operating environments.

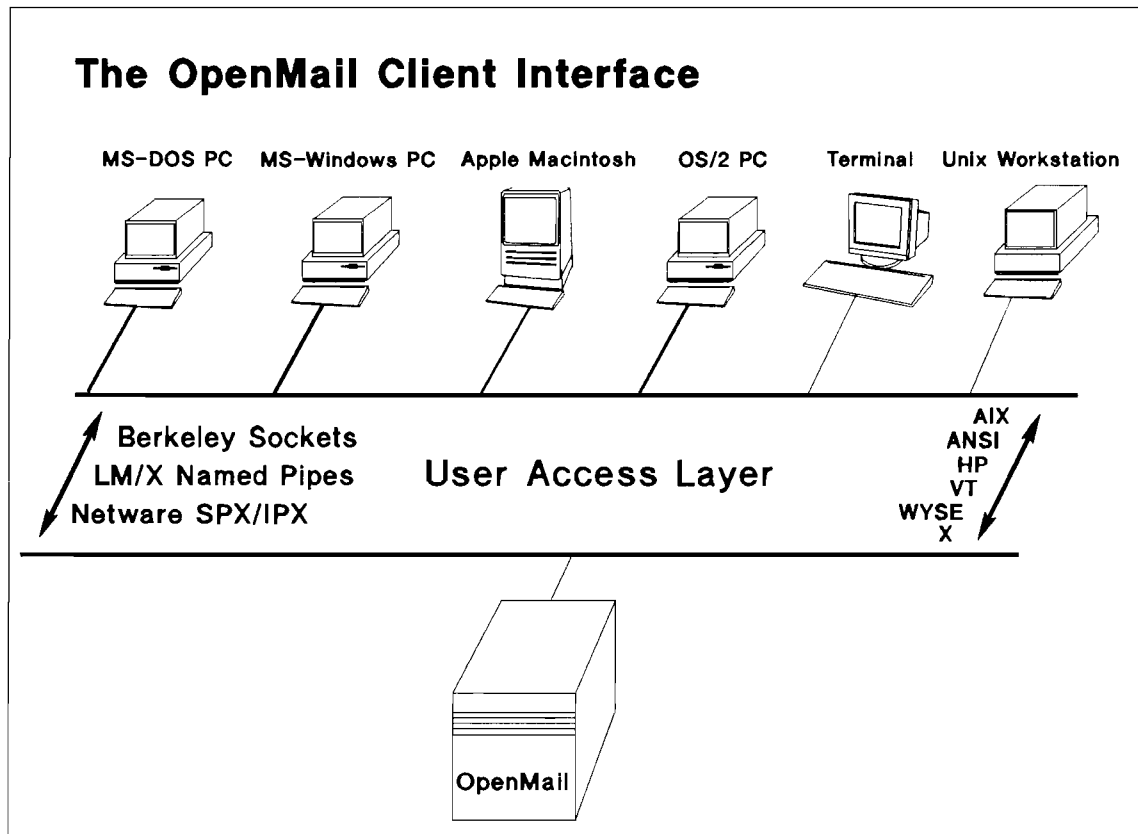
Other products involved are AdvanceMail and NewWave Mail on PCs, and Uniplex on servers. Nodes are connected with a Virtual Private Network based on BT's Gold 400 service.

Transition

Look at the clients that can connect to an OpenMail server . . .

Module 2 — Introduction to OpenMail

2-5. The OpenMail Client Interface



H2128 2-5

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OpenMail provides an electronic mail service for local or remote client systems connected to the server, via the User Access Layer (UAL) Application Program Interface (API).

Supported terminal types are:

- ANSI standard
- aixterm or IBM hft
- HP 239x, HP 262x, or HP 700s emulating those
- hpterm
- VT100, VT220, VT320
- Wyse60
- xterm

Clients can be connected via RS-232 serial, X.25, or LAN links, currently running either:

- Berkeley Sockets (Unix or MS-DOS clients)
- LAN Manager/X Named Pipes (MS-DOS clients)
- Netware SPX/IPX (MS-DOS clients)

Module 2 — Introduction to OpenMail

2-5. The OpenMail Client Interface

Instructor Notes

Purpose

Explain the client hardware and communications connections that are supported by the OpenMail server.

Client Connectivity

Client connectivity is dependant upon the porting of OpenMail A.01.00, which will be ported to the following platforms (which will otherwise only support version A.00.02 of OpenMail) towards the end of 1992:

- DECsystem 5100 running ULTRIX
- IBM RISC System/6000 running AIX
- 386/486 systems running SCO UNIX
- Sequent systems running Dynix/ptx

OpenMail Platform :	DEC ULTRIX	HP-UX	IBM AIX	SCO UNIX	Sequent Dynix/ptx
Client Connection					
Berkeley Sockets LAN	yes	yes	yes	yes	yes
LM/X Named Pipes LAN	no	yes	yes	yes	no
Netware SPX/IPX	no	yes	no	no	no
HP OfficeShare NetIPC LAN	no	yes	no	no	no
RS-232 Serial	no	yes	yes	yes	no

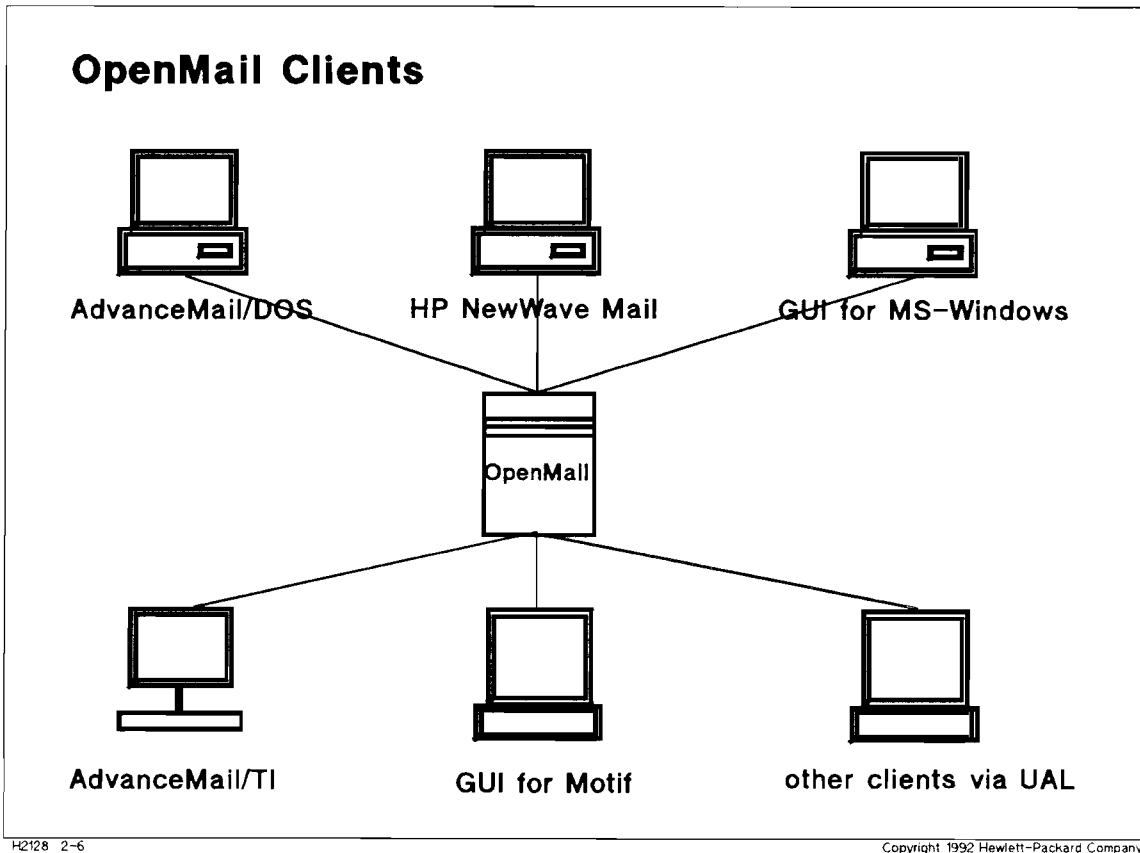
Refer to data sheets for details of the supported client and server LAN products that provide this connectivity, and current connectivity supported by the UAL.

Transition

Look at the client software available for OpenMail . . .

Module 2 — Introduction to OpenMail

2-6. OpenMail Clients



A number of user clients are available for OpenMail from Hewlett-Packard, and others written to conform to the OpenMail UAL API are available from other vendors. Currently available clients from Hewlett-Packard include:

- **AdvanceMail** running on MS-DOS PCs
- **OpenMail Graphical User Interface for MS-Windows** on MS-Windows PCs
- **NewWave Mail** running on HP NewWave PCs
- **AdvanceMail** running on terminals
- **OpenMail Graphical User Interface for Motif** on Unix workstations

If OpenMail is installed on a single server, all of the users connected to that system can exchange mail. If OpenMail is installed on a number of computers in your organization you have an OpenMail network; users connected to any of the computers in the network can then exchange mail.

The user can get help from on-screen help facilities and user guides. However new starters or users trying out new things, will need support and will tend to turn to the OpenMail System Administrator.

2-6. OpenMail Clients

Instructor Notes

Purpose

Overview the user clients to OpenMail.

Key Points

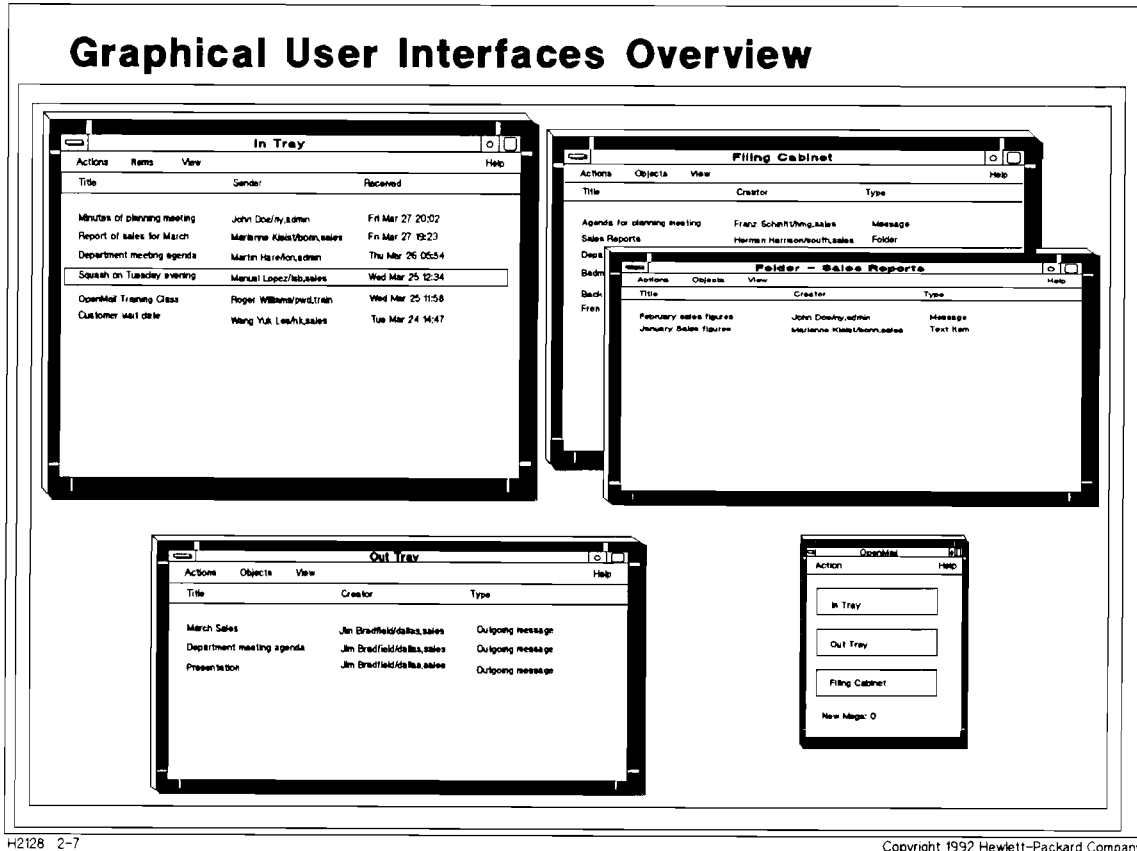
- When OpenMail is installed on a server, this is called a single OpenMail system.
 - Users can exchange mail: they have an In Tray, Out Tray, filing area, and the resources to create, send, receive, file, print, and delete messages.
- When OpenMail is installed on several connecting servers, this is called an OpenMail Network.
 - Users can exchange mail with users configured on any computer in the same network.
- In addition, if the Interfaces/Gateways are configured, users can communicate with systems based on the X.400 standard, Unix mail, HP DeskManager, and also send faxes.
- User support is covered in Module 10.

Transition

Look at the OpenMail Graphical User Interfaces ...

Module 2 — Introduction to OpenMail

2-7. Graphical User Interfaces Overview



H2128 2-7

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The OpenMail GUI provides a windowed user interface to an OpenMail server, allowing you to create, send, receive and store messages.

Messages consist of a Distribution List and one or more content items. These can be text or other files copied in from your Windows environment. Message text can be created using the text editor provided or with any application that is linked in by the System Administrator. All the messages you need to work on can be displayed at the same time, in different windows.

The GUI's main menu is the Control Panel, which you should leave displayed on your screen. From there you can display the three main windows—the In Tray, the Out Tray and the Filing Cabinet. A new mail counter on the Control Panel indicates the arrival of messages whenever the In Tray is not displayed. A message can be sent from any of these windows or from the Control Panel.

In addition to using commands from the drop-down menus, you can perform many actions by “dragging and dropping” items between windows within the OpenMail GUI.

Purpose

Give an overview of the Graphical User Interface clients for Motif and MS-Windows.

Key Points

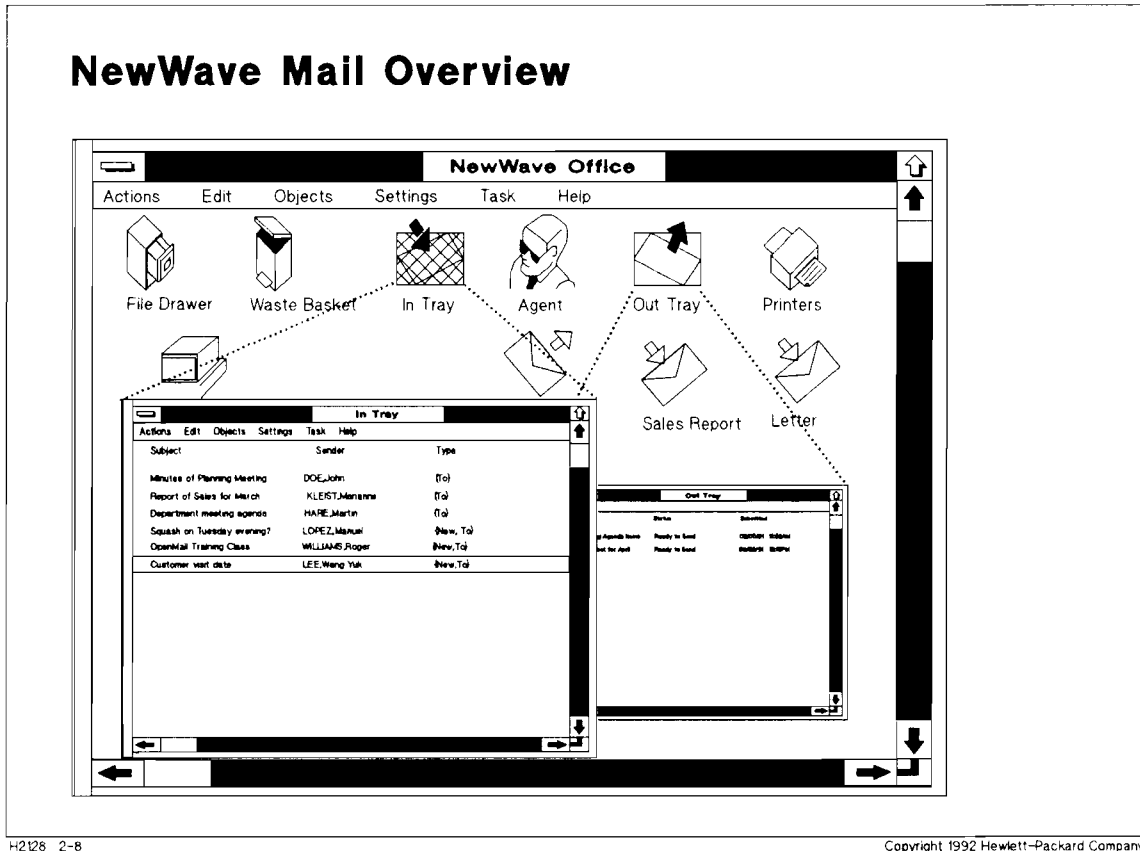
- The Motif and MS-Windows clients have a common interface.
- GUIs will be available in late 1992
- Motif client can run on the same or a different server from OpenMail, and display on any X-display.
- Motif client will initially only be available on HP-UX.
- These clients keep mail in the OpenMail Message Store, not locally.

Transition

Look at the NewWave Mail graphical user client . . .

Module 2 — Introduction to OpenMail

2-8. NewWave Mail Overview



NewWave Mail provides OpenMail users with all the benefits of the intuitive, easy to use NewWave environment for their mailing tasks.

HP NewWave is an advanced graphical interface for MS Windows-based PCs, which provides task automation across applications and active object linking, through an object-oriented environment. Object management and task automation (via the Agent Facility) allows mailing tasks to be seamlessly integrated with other office tasks (much more so than, say, with a traditional character-based interface like AdvanceMail).

All normal mailing functionality is available, including automatic background transfer of messages between the PC and OpenMail, and new mail notification.

As a native NewWave application, users can send a message simply by dragging the icon for their report onto the Out Tray, and can file received messages simply by dragging them out of the In Tray and dropping them on their file drawer or on to the NewWave Desktop.

2-8. NewWave Mail Overview

Instructor Notes

Purpose

Give an overview of the NewWave Mail graphical user client.

Key Points

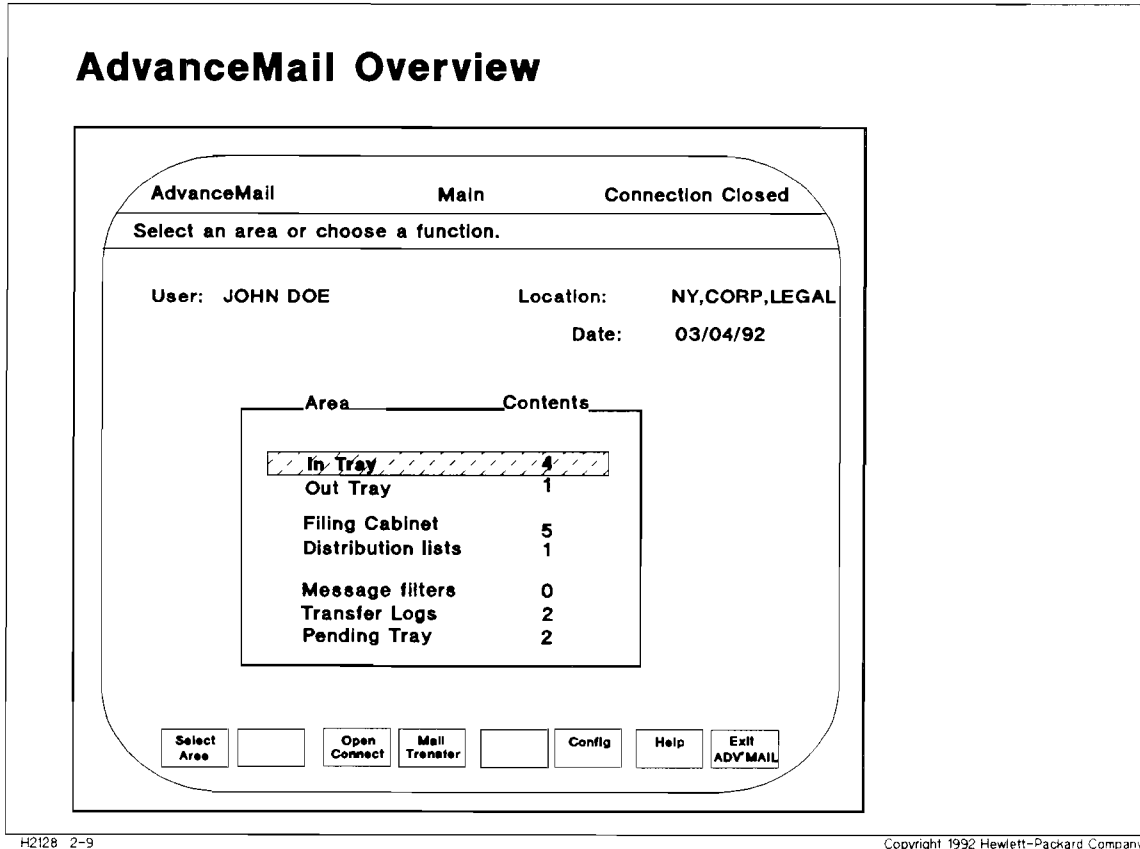
- NewWave Mail is the user client for PCs running the HP NewWave environment.
- NewWave Mail requires:
 - 80286 PC with 2Mb extended memory (minimum)
 - 80386 PC with 3Mb expanded memory (typical)
 - MS-Windows 3.0a to 3.1
 - NewWave A.03.00 to C.01.00
- NewWave is an intuitive, easy-to-use environment — users will not need extra training to be able to use NewWave Mail.
- Slide shows both In Tray and Out Tray windows displayed within the NewWave Desktop:
 1. The envelopes in the main desktop window are messages that have been dragged onto the Desktop.
 2. Those with arrows pointing out are unsent messages; those pointing in are received messages.

Transition

Look at the AdvanceMail character-based user client . . .

Module 2 — Introduction to OpenMail

2-9. AdvanceMail Overview



H2128 2-9

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AdvanceMail is the user client for basic MS-DOS PCs. It is an easy-to-use, menu and function key driven program for PCs, using the same interface as the AdvanceMail/TL.

In addition to access to the core OpenMail mail facilities, AdvanceMail/PC provides:

- Filing of messages on the PC.
- Personal Distribution Lists and nicknames.
- Text editor or linked word processor of choice.
- Filtering of messages downloaded from OpenMail by subject, urgency, etc.
- Local configuration of file conversions, printers, screen colors, etc.
- Mouse support for many actions.

2-9. AdvanceMail Overview

Instructor Notes

Purpose

Give an overview of the AdvanceMail character-based user client.

Key Points

- AdvanceMail requires:
 - 8088, 8086, 80286, 80386, 80486 PC
 - Hard disk or 1.4 Mb flexible disk drive
 - 450 Kb base memory for serial, 410-435 Kb for LAN connections
 - MS-DOS 3.1 or later
- AdvanceMail is the “low cost-per-user” solution compared with NewWave Mail.
- AdvanceMail can operate in any of these modes:

Client Mode	PC connects to server just to perform batch transfers of mail.
Open Connection Mode	Constant connection to server for immediate address resolution and message transfer to/from PC
Deferred Actions Mode	Snapshot of mailbox with local actions stored and actioned at next connection (designed for portable PCs)

Transition

A Lab in which you use the user interface to send and read mail . . .

2-10. LAB: User Interface

Start the User Interface

Start up the user client that the instructor has provided for this Lab.

- Login, start the user interface, and supply any passwords as necessary.

2-10. LAB: User Interface

Instructor Notes

Purpose

Start the User Interface

Learn how to start the appropriate user interface to OpenMail.

Preparation

- The Lab consists of a scenario of some typical mailing tasks, which students should work out how to perform using the appropriate user client.
- For reference, procedures are given in your notes on the following pages for performing these tasks using AdvanceMail/TI. If you are using another user client in the Lab, be sure you know how to perform the tasks using that client. Not all facilities may be available with all clients. Highlight any that are not available with the client you are using.
- Remember users of remote clients - such as AdvanceMail/PC or NewWave Mail - will also have to transfer their messages to and from the server after mailing them.
- There is screen help available by selecting **Help**.
- Give students any login details and passwords.
- Tell students who they'll be mailing to: system0 with system1, system2 with system3, system4 with system5, etc.
- Remind students that not all of the users are in the Directory, therefore they will have to use the full addresses of each of the users that they're mailing to, for example: *omac1/ny1,admin,systems*
- Give each pair of students the OpenMail name and address of their neighbors.

AdvanceMail/TI Procedure

1. Log into the terminal using the assigned Unix login.
2. To start AdvanceMail, type in lower case:

```
advmail
```
3. Your user name is displayed. Press any key to continue.
4. The AdvanceMail main screen is displayed.

Transition

Create a new message ...

2-10. LAB: User Interface (Continued)

Create a New Message

Create a message from scratch that you will later send to your neighbor.

- Create an outgoing message and give it a subject or title.
- Type your neighbor's name and address as the person the message is being sent TO.
- Include yourself as the FROM name (this sends a copy of the message to the back to you to keep).
- Compose some text for the message, telling the other students something about yourself, and save it.
- Don't mail the message immediately but save it to mail later.

2-10. LAB: User Interface (Continued)

Instructor Notes

Purpose

Create a New Message

Learn how to create a new message, addressed to your neighbor, and hold the message (unmailed) in the Out Tray or on the Desktop.

AdvanceMail/TI Procedure

1. From the main screen, highlight Out Tray and press **Select Area**.
2. Press **Create** to display the Create screen.
3. Type a subject for the message and press **(Return)**.
4. Type a name for the person who the message is being sent to, pressing **(Tab)** to move down a line for the next name. For example:

TO: *Joe Neighbor*

5. Press **TO/CC/BCC/FROM** until FROM is displayed, and type your own name.

This sends a copy of the message to you. Without it, you are still listed as the sender on the message but won't receive a copy yourself.

6. Press **Main Keys** and then **Compose**.
7. Type the text of your message and end by pressing **Save Text**.
8. You could now **Mail** the message, but instead press **Other Keys** and **Hold Message**.

The message is held in the Out Tray, with the status of HELD

Transition

Edit the message to mark it as urgent, ask for an acknowledgement, and then mail the message ...

2-10. LAB: User Interface (Continued)

Specify Message Settings and Mail Messages

Go back to the message you created previously, and edit it. Before mailing it off:

- Go to the Configuration screen and set Auto-Reply for urgent messages only.
- Find the message you created previously and open it.
- If your client allows, mark the message as urgent, of high importance, company confidential, and ask for a “read” acknowledgement
- Mail the message.
- Create another message to the same user, but mark it as non-urgent, and then mail it.
- If using a client without a continuous connection to the OpenMail server, also transfer the message from the client to the server.

2-10. LAB: User Interface (Continued)

Instructor Notes

Purpose

Specify Message Settings and Mail Messages

Learn how to edit the Distribution List of the message created previously, specify that it's urgent, set a read acknowledgement (if possible), mail it (and if necessary transfer it to the server).

AdvanceMail/TI Procedure

1. Go to the Main Menu and press **Config**
2. Press **User Config**
3. Press **Auto Reply**
4. Change the settings and press **Perform Changes**
5. Enter the text of the reply, and end by pressing **Save Text**
6. Set Auto-Reply for urgent messages only in the Configuration screen.
7. Return to the Out Tray, highlight the message.
8. Press **Other Keys** and **Open**
9. Press **Message Settings**
10. Change the message settings.
11. Press **Save Keys** and **Done** to return to the Out Tray
12. Press **Other Keys** and **Mail Message** to mail the message.
13. Follow similar procedures to create another message to the same user, except mark it as non-urgent.

Transition

Read a received message in the In Tray and reply to it, including a file in the reply ...

2-10. LAB: User Interface (Continued)

Read a New Message and Reply to It

As soon as you receive the non-urgent message from your neighbors read it, and then send them a file in reply.

- Display the contents of the In Tray.
- Look for a message from your neighbor.
- Reply back to the sender, typing a short note for them telling them that you are going to send them the file they had asked you for earlier. Save the text.
- Include a file from your Unix account if you are using a Unix client or from DOS if you are using a PC client. Make sure the file's *type* is correctly recorded in your message.
- Mail your reply.

2-10. LAB: User Interface (Continued)

Instructor Notes

Purpose

Read a New Message and Reply to It

Learn how to read a received message, how to reply to messages, and how to send local files in messages.

Key Points

A file is required for this part of the lab; we recommend you include either of the following text files:

Unix The OpenMail Release Notes in `/users/openmail/newconfig/OpenMailNotes`

DOS The `config.sys` file (usually in the root directory).

AdvanceMail/TI Procedure

1. From the main screen, highlight **In Tray** and press **Select Area** to display the In Tray screen.

If a message has arrived, asterisks in **NEW** and **URGENT** fields show the message is new and urgent.

2. Highlight the message and press **Read** to display the message.
3. Read the message.
4. Press **Reply** and **Compose Reply**.
5. A screen appears for you to type your message; type a short reply, for example:

Here is the copy of the OpenMail Release Notes you requested earlier.

6. Press **Save Text**.
7. Press **Include File/Doc**.
8. Press **Next Type** until the type displayed is **TEXT**.

Then type the name of the document, for example: `/users/openmail/newconfig/OpenMailNotes`

9. Press **Perform Include** and **Done**.
10. Press **Mail Message** to send your reply.

Transition

Delete a message from the In Tray and then recover and file it ...

2-10. LAB: User Interface (Continued)

Delete a Message, Retrieve it, and Exit

Here you delete the message you replied to previously, and later change your mind and decide you want to keep a copy of it after all. If the facility is available, you also want to check on the progress of the first message you sent earlier, before exiting the user interface.

- Delete the message that you replied to from your In Tray.
- On reflection, you decide you'd rather keep the message, so open up the Waste Basket folder and copy the message to a new folder "Class Messages" which you'll need to create. Then look in the new folder to check the message has been put there.
- Check on the progress of the message you mailed earlier on which you asked for an acknowledgement.
- Finally you'll need to close down any open windows and leave the user interface application.

2-10. LAB: User Interface (Continued)

Instructor Notes

Purpose

Delete a Message, Retrieve it, and Exit

Learn how to delete messages, recover them from the Waste Basket, how to create folders in which to store messages, read folders, and finally leave the user interface.

AdvanceMail/TI Procedure

1. From the In Tray screen, highlight a message you choose to delete.
2. Press **Delete** to place the message in the Waste Basket.
3. Press **Done** to return to the main screen
4. Press F and **(Return)** to move to the Filing Cabinet.
5. Highlight the Waste Basket folder (if it is not already) and press **Open**

6. Highlight the message name, press **Other Keys** and then **File**

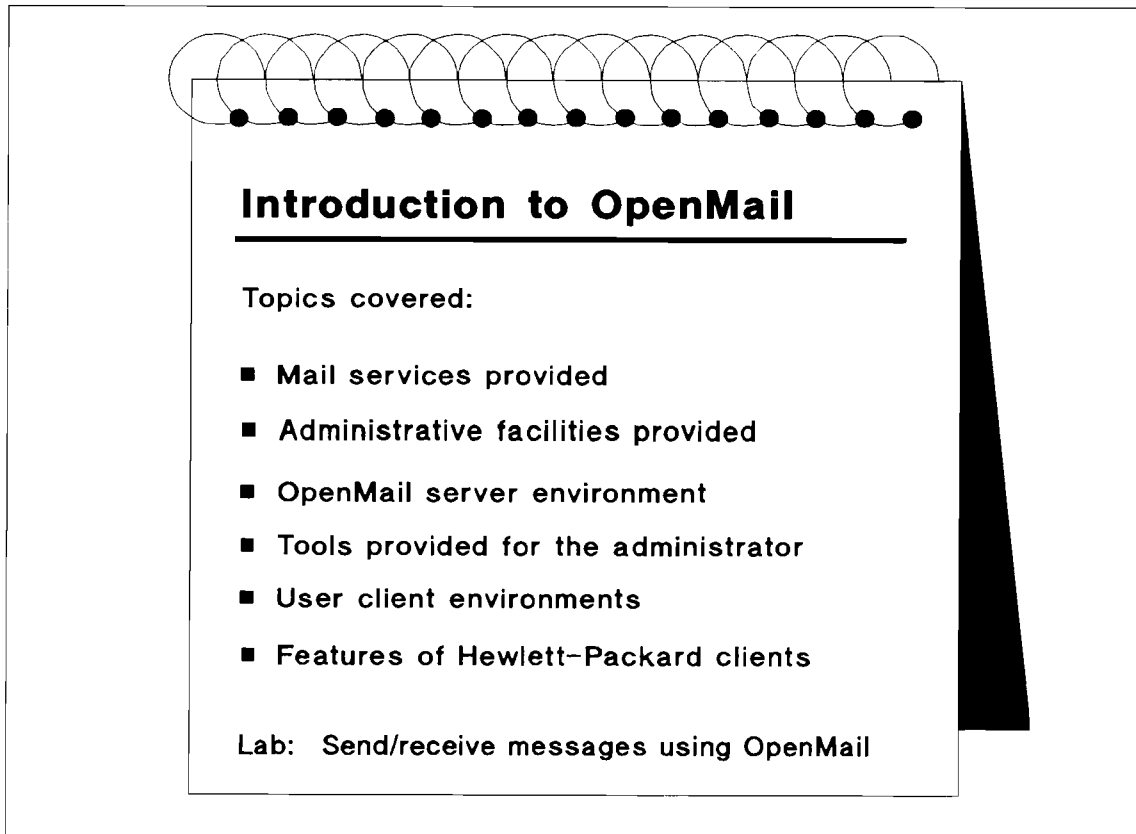
The only folder displayed is Waste Basket. You don't want the message filed there so . . .

7. Press **Create Folder** and provide a name for the folder, for example *Class Messages*
8. Press **Move To Folder** to move the message to the new folder.
9. Press **Done** to exit the Waste Basket and return to the Filing Cabinet.
10. Highlight the new folder (*Class Messages*) and press **Open Folder** to read its contents.
11. From the main screen, highlight Pending Tray and press **Select Area**
12. Any messages on which you have asked for acknowledgements are listed.
13. Press **Track Message**
14. From the main screen, press **Exit ADV'MAIL**
15. Confirm you want to leave by pressing **Confirm Exit**

Transition

To summarize . . .

2-11. Summary



Introduction to OpenMail

Topics covered:

- Mail services provided
- Administrative facilities provided
- OpenMail server environment
- Tools provided for the administrator
- User client environments
- Features of Hewlett-Packard clients

Lab: Send/receive messages using OpenMail

H2128 2-11

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Notes

Purpose

Review what has been covered in Module 2.

Key Points

- This module gave an overview of OpenMail - particularly the environments, tools available to the System Administrator, and user interfaces.

The OpenMail Server

- The hardware OpenMail requires was discussed.
- The flexibility of communication enabled by the Interfaces and Gateways was mentioned.

The OpenMail System Administrator

- The facilities OpenMail provides were briefly discussed:
 - Administration Interface
 - Command Interface
 - User Interfaces
- The System Administrator's references were mentioned:
 - OpenMail manuals
 - OpenMail Problem Solving System
 - OpenMail man pages

The OpenMail User

- Various clients are available — we looked at the GUIs, NewWave Mail, and AdvanceMail.
- For standard activities the user will not be aware of OpenMail's existence.
- The System Administrator's job is to ensure that the mail service is as trouble-free as possible.
- User needs are discussed in greater depth in Module 10.

Transition

The next Module introduces basic terminology and the way mail is distributed and held in OpenMail.

Module 2 — Introduction to OpenMail

Module 3 — How OpenMail Works

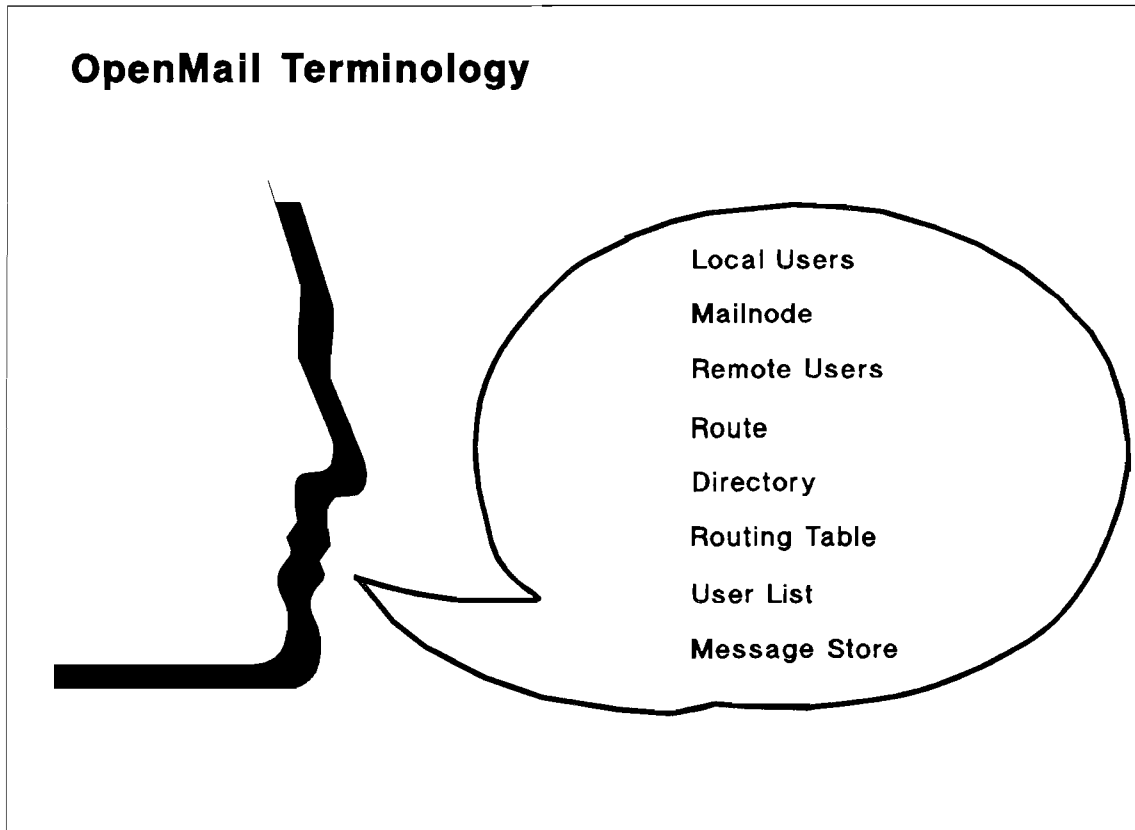
Objectives

After spending 1 hour completing this Module, you will be able to:

- Use basic OpenMail terms
- Understand the services that make up the OpenMail software
- Describe how mail is distributed by an OpenMail system
- Describe how mail is distributed between OpenMail systems
- Describe how mail is distributed from OpenMail to other systems
- Understand how service queues are used in mail distribution
- Understand how messages are held within OpenMail

Module 3 — How OpenMail Works

3-1. OpenMail Terminology



H2126 3-1

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Local Users: Users who can log in to the computer you are configuring, from any client.

Mailnode: the user's location. The recipient's name and mailnode make up the address of the message. It is usual for several users to share the same mailnode, for example all users in an office department.

Remote Users: Users logged into systems other than the one you are configuring. Remote users may be other OpenMail users or non-OpenMail users.

Route: The path a message takes through the network to reach its destination mailnode.

Directory: a store of user names and mailnodes, used to check and complete user entries. For example, when a user enters a name in a Distribution List, OpenMail retrieves the mailnode from the Directory to complete the recipient's address. Error messages are displayed for incorrect addresses entered by users.

Routing Table: a list of mailnodes and the local or remote routes to them.

User List: a lookup table of local users, used to route messages into their mailboxes.

Message Store: an area where OpenMail holds messages in the Unix file system.

3-1. OpenMail Terminology

Instructor Notes

Purpose

Cover basic OpenMail concepts and terms.

Key Points

- Go through the definitions of the key basic concepts embodied by the terms.
- Directory is implemented using a dbVista™ database, which is kept in `/users/openmail/sys/db`

Each system's Directory contains details of local users, and of any other users on other systems in a network that you choose to add (to make addressing remote users as easy as addressing local users).

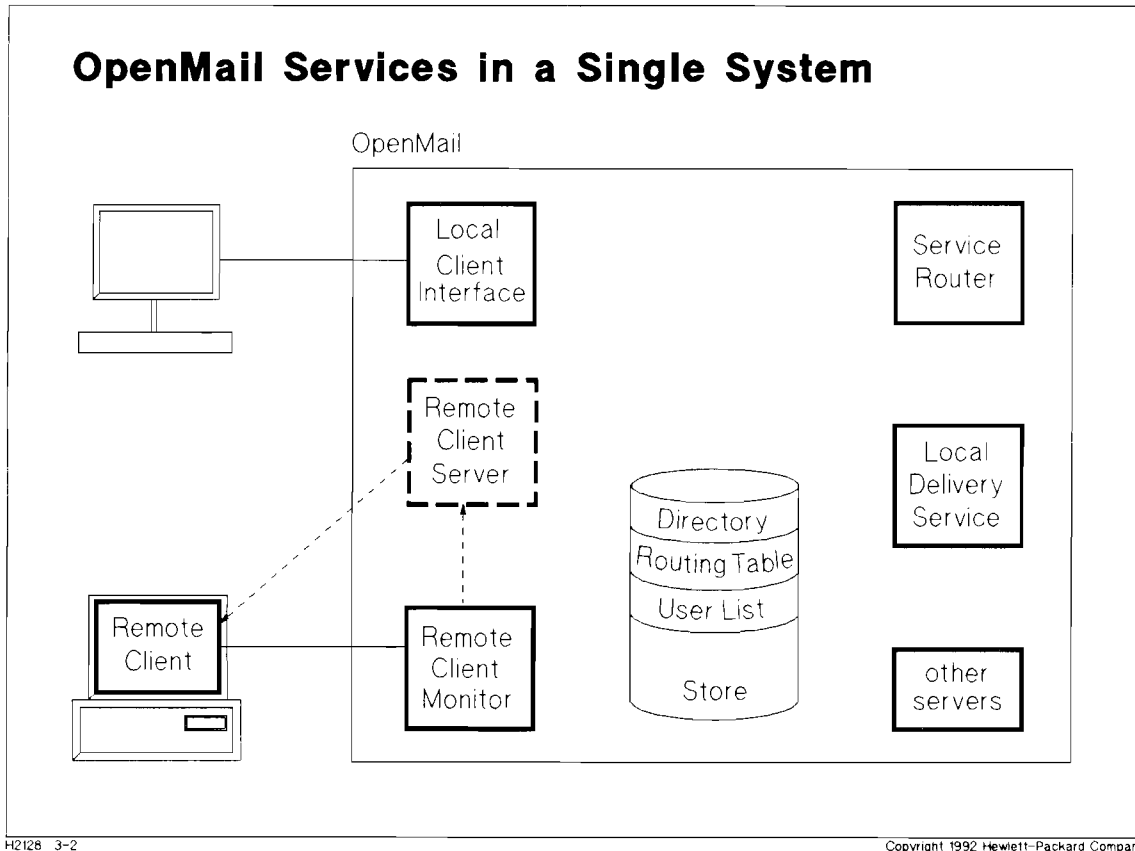
- Routing Table is stored in `/users/openmail/sys/router`
- Message store is not a database. It's just a term for many directories under `/users/openmail/data` that are created dynamically to hold message data.

Transition

Look at how mail is distributed in a single OpenMail system . . .

Module 3 — How OpenMail Works

3-2. OpenMail Services in a Single System



Local Client Interface: provides mail services to each permanently connected local client user.

Remote Client Interface: has three components:

- **Remote Client Monitor:** daemon that handles connections by spawning a Remote Client Server.
- **Remote Client Server:** process that provides mail services to each connecting Remote Client.
- **Remote Client:** provides mail user interface to remote users (eg AdvanceMail or NewWave Mail).

Service Router: responsible for routing incoming and outgoing messages on the local OpenMail machine. It accesses the Routing Table to decide which delivery service should deliver the message.

Local Delivery Service: responsible for delivery of all local mail regardless of its source. The Local Delivery Server accesses the User List to identify the recipient's In Tray and places the message there.

Other Servers:

- **Error Manager Server:** used to send messages to Error Managers on other systems.
- **Test Server:** used to send test messages to remote systems, and produce trace records for diagnosis.
- **Request Server:** used to accept and action mailed requests from (local or remote) systems.
- **Print Server:** prints messages as specified by clients.

3-2. OpenMail Services in a Single System

Instructor Notes

Purpose

Define the elements of a single OpenMail system.

Key Points

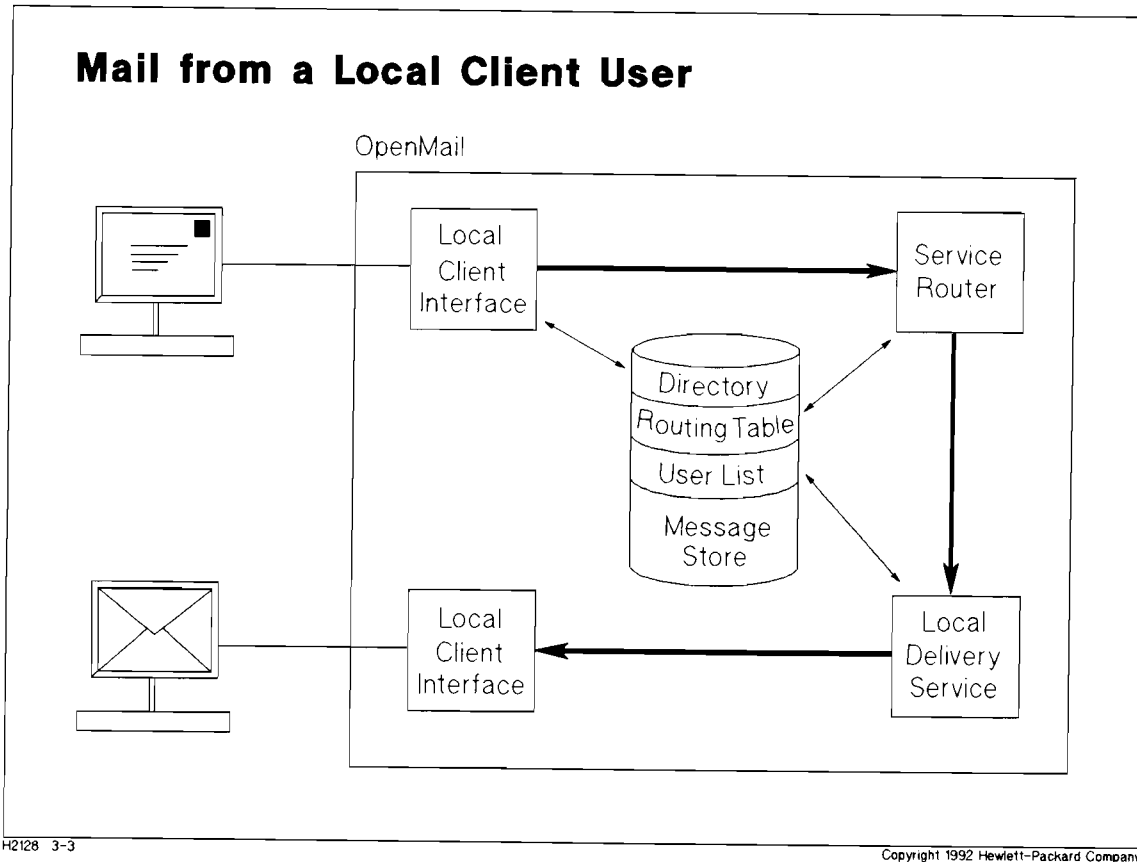
- Local/Remote Client Interfaces provide mail services to users via a mailbox, which contains:
 - **In Tray:** where incoming messages are placed. The user goes here to read new messages.
 - **Out Tray:** where outgoing messages are created. The user goes here to send messages.
 - **Filing Cabinet:** where messages are stored.
- Remote Client Monitor — listens for remote client attempting to connect, and when they do, spawns a transient (shown dotted) Remote Client Server child process for each established session.
- A typical local client is the AdvanceMail terminal interface.
- A typical remote client is the NewWave Mail PC application.
- Service Router — passes mail to the appropriate delivery service - in this case the Local Delivery Service - but can be to services for external delivery (covered later).

Transition

Look at how a message travels through a single OpenMail system . . .

Module 3 — How OpenMail Works

3-3. Mail from a Local Client User



1. A terminal user creates a message in their Out Tray.
2. The user enters the recipient's name at the TO prompt.
3. The Local Client Interface finds the mailnode in the Directory and adds it at the TO prompt.
4. The user mails the message. It goes to the Service Router.
5. The Service Router accesses the Routing Table to decide which delivery service should deliver the message; this message is for local delivery.
6. Local messages are passed to the Local Delivery Service.
7. The Local Delivery Service searches the User List to find the location for the user's In Tray.
8. The Local Delivery Service puts the message in the recipient's In Tray, ready to be accessed.

3-3. Mail from a Local Client User

Instructor Notes

Purpose

Explain how messages are distributed in a single OpenMail system.

Key Points

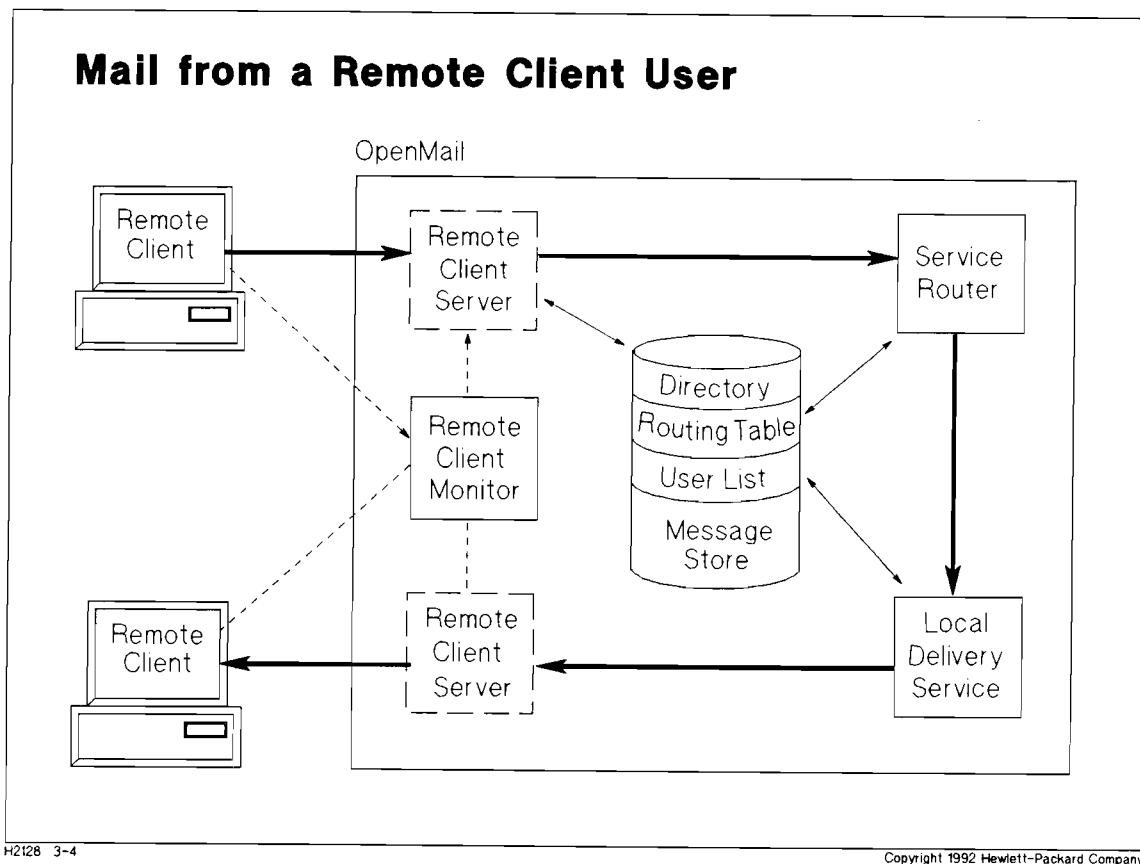
- Talk through a message being sent from one terminal user to another, highlighting the role of the different services and their use of lookup information held on disk (shown by light arrows).
- The message does not actually move around the system. It is placed in the Message Store when mailed, and subsequent process interactions simply change pointers attached to the message (not shown on slide).
- A Local Client Interface service is created for each logged in user.

Transition

Look at message distribution when the remote client user creates and mails a message . . .

Module 3 — How OpenMail Works

3-4. Mail from a Remote Client User



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1. The remote client user performs an action in the client application that signals the need to open a connection to the Remote Client Monitor. The Monitor then supplies a copy of the Remote Client Server for that user's session.
2. The user enters the recipient's name at the TO prompt.
3. The Remote Client Server finds the mailnode in the Directory and returns it to the remote client.
4. The user mails the message. It goes via the Remote Client Server to the Service Router.
5. The Service Router accesses the Routing Table to see which delivery service should deliver the message; this message is for local delivery.
6. Local messages are passed to the Local Delivery Service.
7. The Local Delivery Service searches the User List to find the location for the user's In Tray.
8. The Local Delivery Service puts the message in the recipient's In Tray, ready to be accessed.

Module 3 — How OpenMail Works

3-4. Mail from a Remote Client User

Instructor Notes

Purpose

Explain how messages from remote clients are distributed in a single OpenMail system.

Key Points

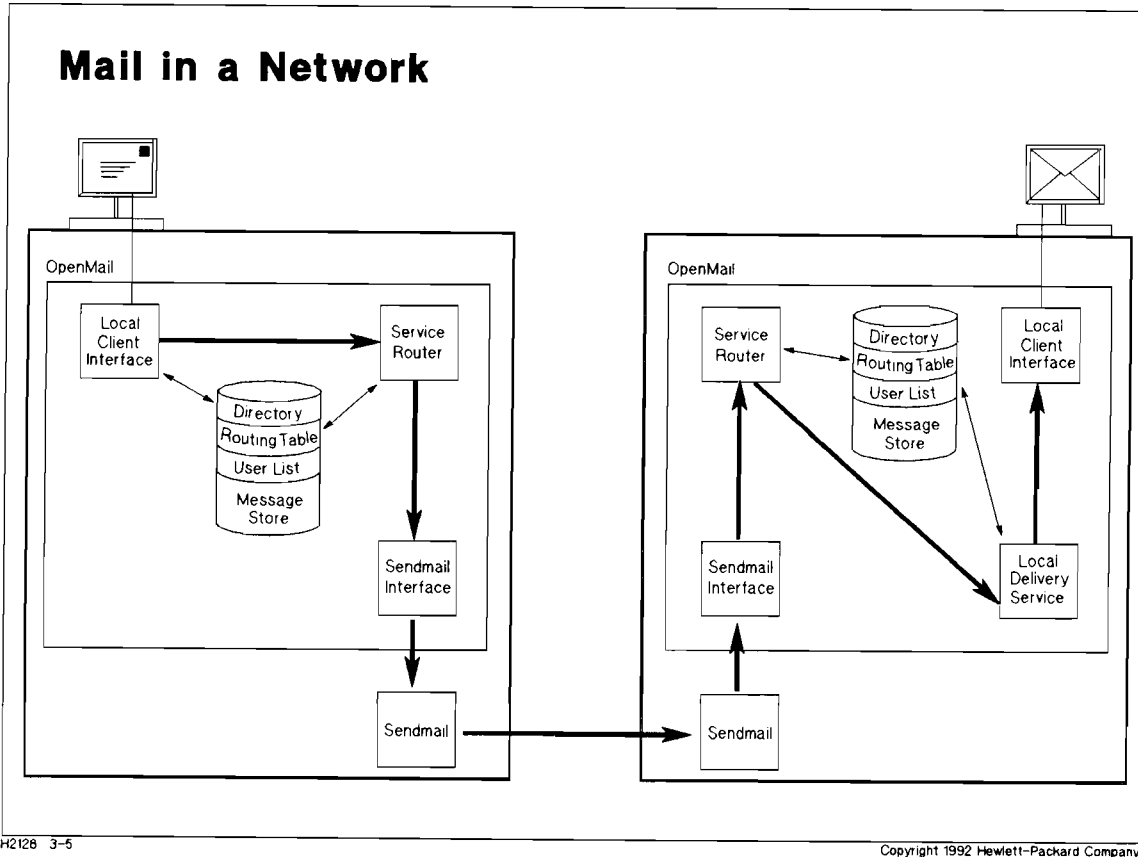
- Talk through a message being sent between remote client users, highlighting the role of the Remote Client Monitor in spawning Remote Client Server sessions for each connecting client.
- Remote client users set up to do batch transfers of mail to/from the server will:
 - Also when mailing, have to transfer the message from the client to the server.
 - Will not get on-line verification of addresses from the Directory. Addresses are checked after transfer by the Remote Client Server and, if valid, the message is passed to the Service Router; if invalid, the message is returned to the client application with error notification.
 - Similarly remote client recipients may not immediately see new messages in their In Tray; they may have to transfer the message from the server to their client.

Transition

Look at how mail is delivered between users on different OpenMail systems . . .

Module 3 — How OpenMail Works

3-5. Mail in a Network



In an OpenMail network there is an extra component — Sendmail. Sendmail is the transport system/delivery service which links Unix systems. If a message is passed from one computer to another in an OpenMail network, Sendmail handles the transfer.

1. A message is handled as before, until the Service Router accesses the Routing Table to decide which delivery service should deliver the message.
2. Messages for a different OpenMail system are passed, through the Sendmail Interface, to Sendmail for delivery to the receiving computer.
3. The routing information includes the Sendmail address of the receiving computer, and this is what Sendmail uses to identify the receiving computer.
4. On the receiving computer, the Service Router accesses the Routing Table. The mailnode is found to be local and so the message is passed to the Local Delivery Service and delivered as in the previous example.

3-5. Mail in a Network

Instructor Notes

Purpose

Explain how mail is delivered in an OpenMail network.

Key Points

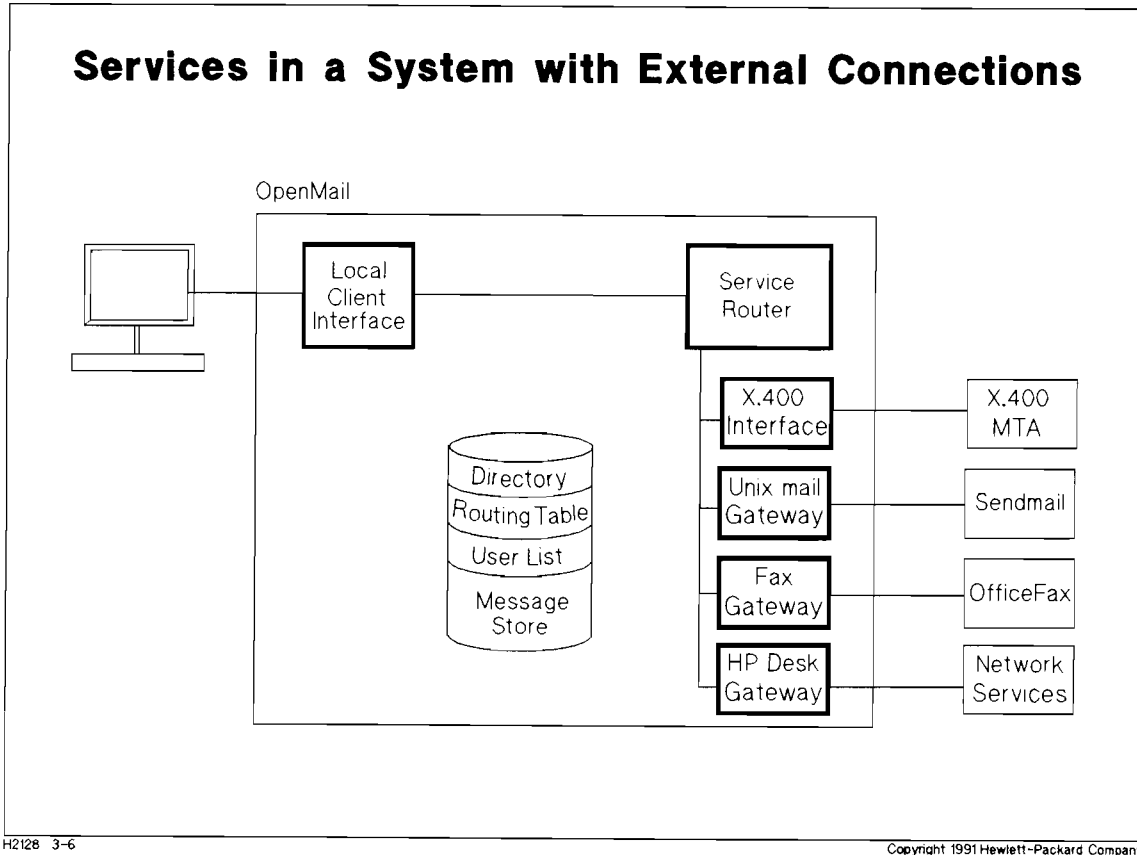
- Example assumes OpenMail systems are connecting in a private network via Sendmail rather than X.400. This is the more common scenario, due to the overhead of implementing X.400 transport on each system within a private network.
- Here, the Service Router on the originating system doesn't route the message to the Local Delivery Service but to an external delivery service, in this case, the Sendmail Interface, for delivery by Sendmail.
- The Sendmail address contains the node name of the receiving Unix system where the destination OpenMail server resides (this is covered in detail in Module 6).

Transition

Look at mail travelling to non-OpenMail systems . . .

Module 3 — How OpenMail Works

3-6. Services in a System with External Connections



X.400 Interface/External Gateways: are parts of OpenMail that enable communication to non-OpenMail systems, principally by converting OpenMail addressing to meet the requirements of the other system. These are:

- X.400 Interface, for other mail systems using X.400 standards.
- Unix mail Gateway, for Unix mail on the local or another Unix computer.
- Fax Gateway, for faxes.
- HP Desk Gateway, for HP DeskManager on an HP 3000.

External Delivery Services: the links out of the OpenMail system on the originating computer to the transports that take the message from OpenMail to the corresponding service on the receiving computer.

The External Delivery Services and their associated transports are:

- X.400 Interface: the X.400 Message Transfer Agent (MTA)
- Unix mail Gateway: Sendmail
- Fax Gateway: HP OfficeFax
- HP Desk Gateway: Network Services (NS)

3-6. Services in a System with External Connections

Instructor Notes

Purpose

Define the elements of an OpenMail system linking to other electronic communication systems.

Key Points

- A gateway passes the message between systems and contains all the addressing data to do this. It also provides any conversion of message formats so that the receiving system can cope with incoming messages, or the sending system can cope with outgoing messages.
- X.400 has an *interface* rather than a *gateway* because OpenMail is already an X.400 mail system, although OpenMail uses a shortened form of X.400 addressing internally.

The X.400 Interface adds external addressing attributes to outgoing messages, and strips the extra details off incoming messages because these details match with the OpenMail system.

- The X.400 Interface and Unix Gateway are supplied with all versions of OpenMail, the Fax Gateway with most (check relevant datasheet), and the HP Desk Gateway only with HP-UX.

Transport Services

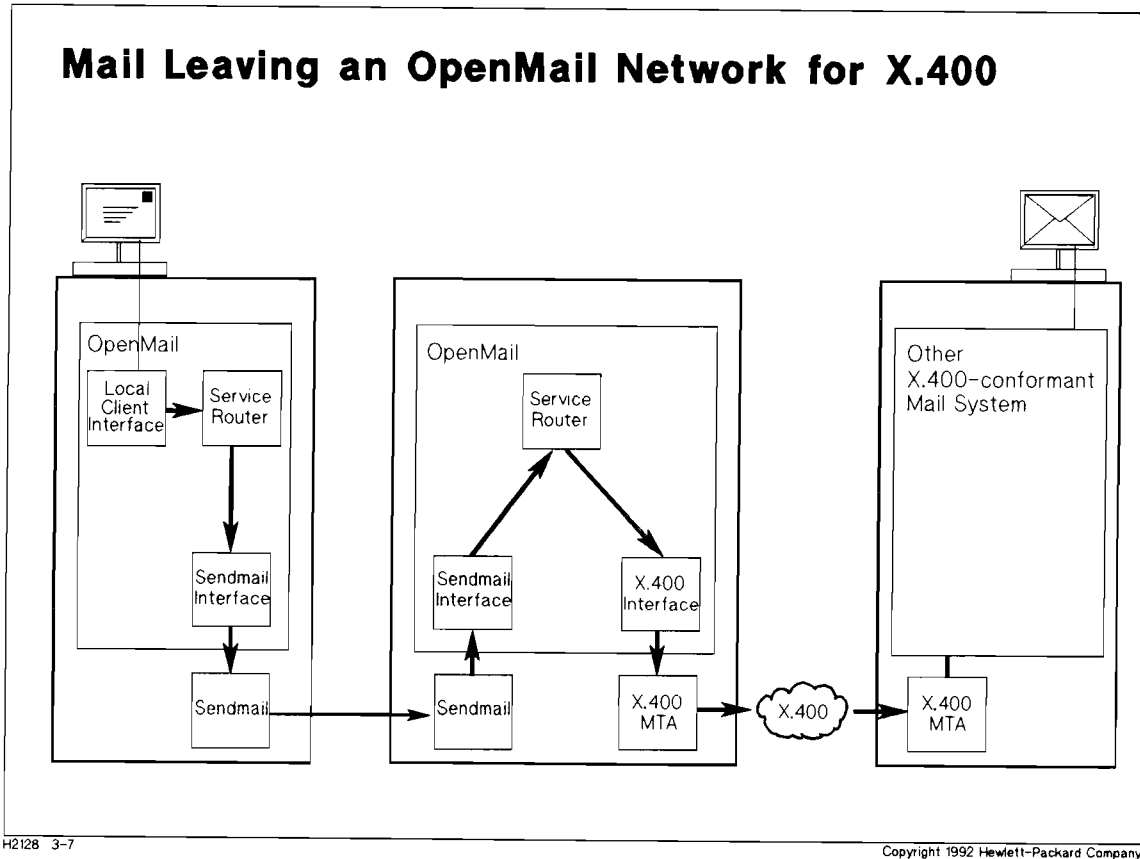
- We've already seen Sendmail used as the transport between OpenMail systems; it is also used to deliver messages to other Unix mail systems.
- The transport service used by the X.400 Interface to send messages to an X.400 system is called the **X.400 Message Transfer Agent (MTA)**.
- HP OfficeFax enables messages to pass from OpenMail as faxes to the PTT network.
- **Network Services (NS)** is the transport service for HP DeskManager.

Transition

Look at mail travelling through an X.400 Interface ...

Module 3 — How OpenMail Works

3-7. Mail Leaving an OpenMail Network for X.400



An OpenMail user on a system without an X.400 Interface, sends a message to an X.400 user, via an OpenMail system with an X.400 Interface.

1. The user creates and mails their message.
2. The process is as explained earlier until the Service Router accesses the Routing Table to find out which service should deliver the message. The mailnode is a remote one, routed via the OpenMail system with the X.400 Interface.
3. The Service Router of this second OpenMail system accesses its Routing Table which has the mailnode listed as being routed through the X.400 Interface, so the message is passed to the X.400 Interface.
4. The Interface converts the mailnode from OpenMail format to its full X.400 form and passes the message to the X.400 MTA.
5. The X.400 MTA passes the message through the X.400 network until it is delivered to the X.400 conformant-system, and processed by that system in the normal way.
6. A reply follows the reverse path.

3-7. Mail Leaving an OpenMail Network for X.400

Instructor Notes

Purpose

Explain how mail is delivered between OpenMail and another X.400-based system.

Key Points

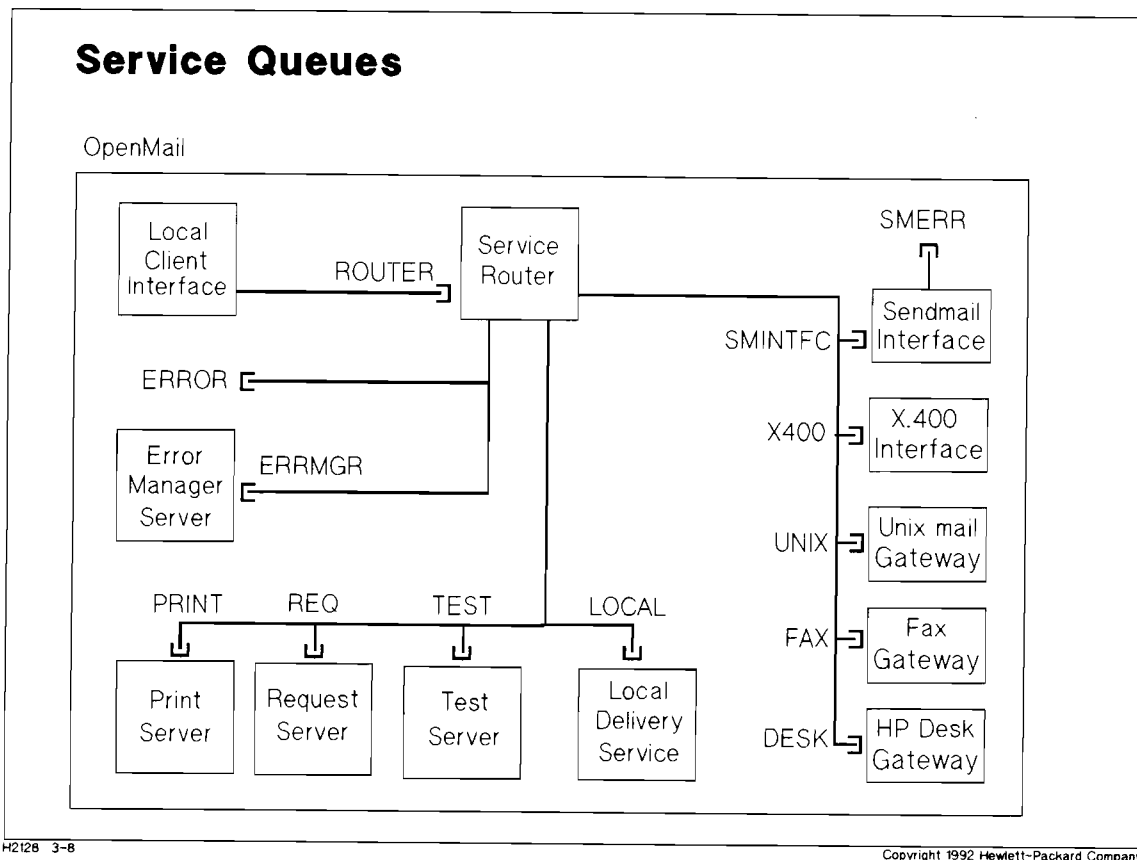
- Talk through a message being sent from OpenMail to a non-OpenMail system via an external delivery service, in this case, X.400.
- The process is similar for the other external connections.
- Highlight the intermediate role of the OpenMail system with the X.400 Interface in connecting an OpenMail system with an X.400 system in this network.

Transition

Look at the remaining aspect of message delivery - service queues . . .

Module 3 — How OpenMail Works

3-8. Service Queues



OpenMail services communicate with each other via queues:

ROUTER	Input queue for the Service Router
LOCAL	Input queue for the Local Delivery Service
SMINTFC	(SendMail INTerFaCe) Input queue for the Sendmail Interface
X400	Input queue for the X.400 Interface
UNIX	Input queue for the Unix mail Gateway
FAX	Input queue for the Fax Gateway
DESK	Input queue for the HP Desk Gateway

In addition, the following queues perform special functions:

SMERR	(SendMail ERRor) Holds messages that Sendmail has had problems delivering
ERROR	Holds corrupt messages that any part of OpenMail discovers
ERRMGR	Input queue for the Error Manager Server (used to communicate with the Error Manager)
PRINT	Input queue for the Print Server (provides print services to clients)
REQ	Input queue for the Request Server (used to action scripts)
TEST	Input queue for the Test Server (used to test routing)

Purpose

Explain the remaining necessary aspect of message delivery — service queues.

Key Points

■ Message delivery with reference to queues:

1. The user sends a message to *local_user/openmail*, *remote_user/openmail*, *unix_user/unix*, etc.
2. When the message is mailed from the Terminal User Interface, it is placed in the Message Store.
3. The Service Router consults the Routing Table to put the message on the correct queue for delivery: LOCAL, SMINTFC, X400, UNIX, FAX, or DESK.

It's actually a *Transaction File*, not the whole message that is put on the queue - as we shall see in a minute.

■ A major part of the background knowledge you need is about the queues, for example:

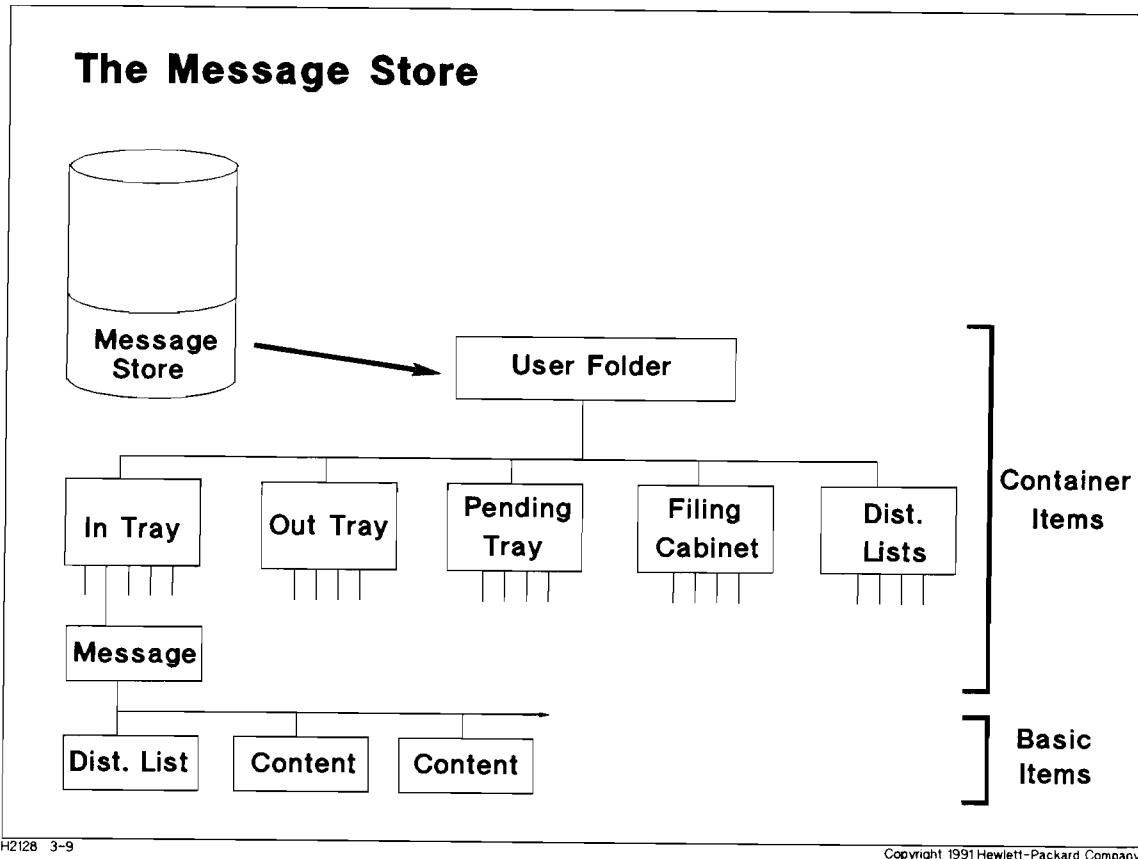
- If you want to look at Sendmail delivery problems, look at the SMERR queue.
- If you want to look at corrupt messages in the system, look at the ERROR queue, which holds messages with corrupt Distribution Lists or data.

Transition

Look at the OpenMail Message Store ...

Module 3 — How OpenMail Works

3-9. The Message Store



The Message Store is held in the filesystem `/users/openmail/data` and is only readable by Root.

OpenMail is based around *containers*. A user's mailbox, known as their *User Folder* is a container.

Items in the Message Store are either *container items* or *basic items*. Container items are trays, folders, and messages; these can contain other container items or basic items. Basic items are Distribution Lists, text items, files, etc.

3-9. The Message Store

Instructor Notes

Purpose

Explain the concept of the Message Store.

Key Points

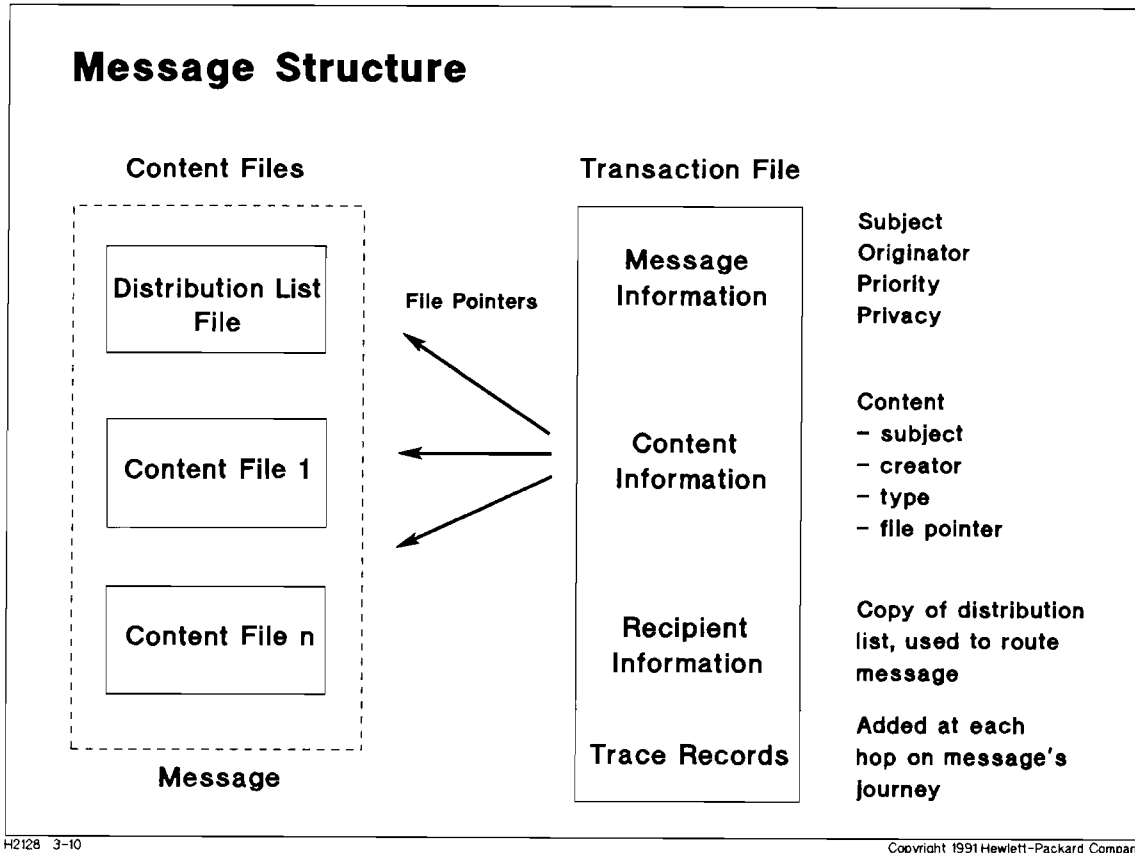
- The internal structure of the Message Store is not visible to users, and is only apparent to the Administrator when using certain diagnostic tools [such as `omqdump` and `omcontain` covered in Module 12].

Transition

Look at the structure of messages . . .

Module 3 — How OpenMail Works

3-10. Message Structure



As we saw, a message is a *container item* when at rest in the Message Store. However when it is moving around the system, it is transformed into a *Transaction File* and *Content Files*.

The Transaction File is the control file or “envelope” for the message, and this is what is put in a message queue - such as ROUTER - when a message is awaiting delivery.

Content Files contain the data for each individual part of the message.

3-10. Message Structure

Instructor Notes

Purpose

Explain how messages are transported within OpenMail.

Key Points

- Format of Transaction Files is equivalent to the message envelope defined by the X.400 P1 protocol, but is simpler to manipulate.
- Format of Content Files is equivalent to the content format defined by the X.400 P2 protocol but richer.
- The Transaction File contains a copy of the message's Distribution List, which is used to route the message through the network. The actual Distribution List file is just for display to the recipient.

Transition

A written exercise to apply message distribution concepts . . .

Module 3 — How OpenMail Works

3-11. WRITTEN EXERCISE: Mail Destined for Unix mail

Draw a diagram similar to those used in this Module to show the services and queues that would be used to distribute a message sent by a remote client user out to Unix mail, via a local Unix Gateway.

Also show the interactions between services and with lookup data such as the Routing Table.

Finally, show the movements that happen to the message itself, as opposed to those made by its references in the Transaction File.

Module 3 — How OpenMail Works

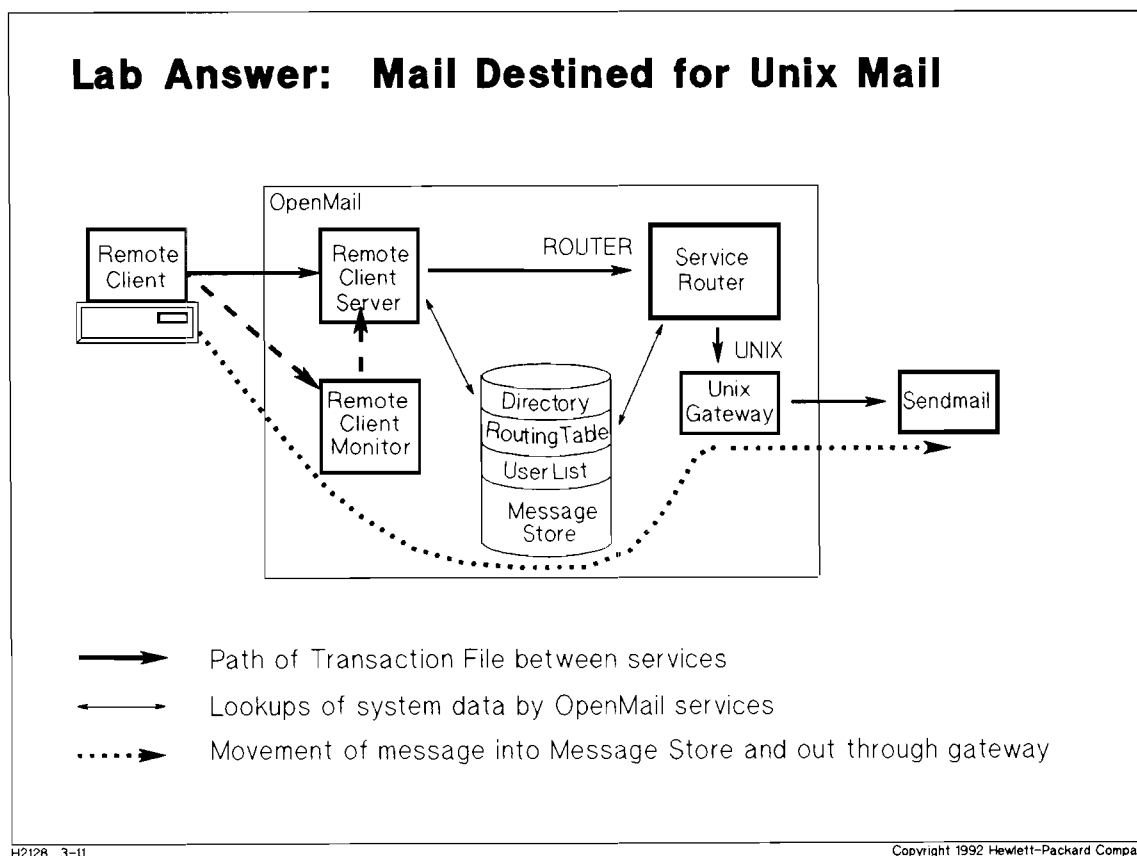
3-11. WRITTEN EXERCISE: Mail Destined for Unix mail

Instructor Notes

Purpose

Practise and apply concepts of message distribution covered in this Module to mail being delivered out to Unix mail.

Suggested Answer

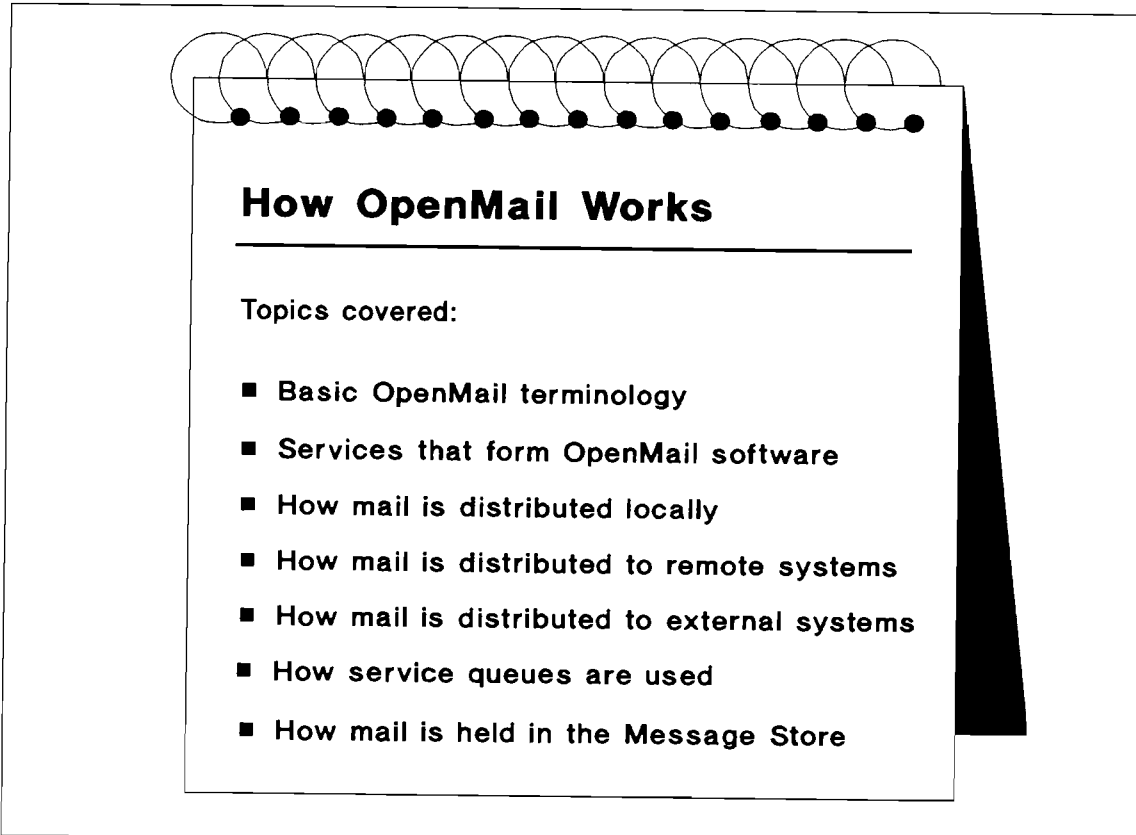


Draw up on a whiteboard or get students to draw their own answers up.

Transition

To summarize ...

3-12. Summary



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Notes

Module 3 — How OpenMail Works

3-12. Summary

Instructor Notes

Purpose

Review what has been covered in Module 3.

Key Points

- This session built up OpenMail terminology and concepts. It started with basic terms applicable to message addressing. It ended with OpenMail concepts of message distribution.
- Local, remote, and external (non-OpenMail) message distribution has been covered:
 - Concepts of local message distribution will be useful in planning and configuring a local system (Modules 4 and 5).
 - Concepts of OpenMail mail distribution to remote OpenMail systems will be useful in planning and configuring an OpenMail Network (Modules 6 and 7).
 - Concepts of mailing between OpenMail and foreign systems will be useful in planning an X.400 Interface or Gateways (Modules 14 to 21).
 - Knowledge of the OpenMail services will be useful in operating the system (Module 9).
 - Understanding of the structure of the Message Store will be useful in troubleshooting and understanding the programmatic interfaces (Modules 12 and 13).

Transition

The next Module covers the planning of a single OpenMail system.

Module 3 — How OpenMail Works

Module 4 — Planning a System

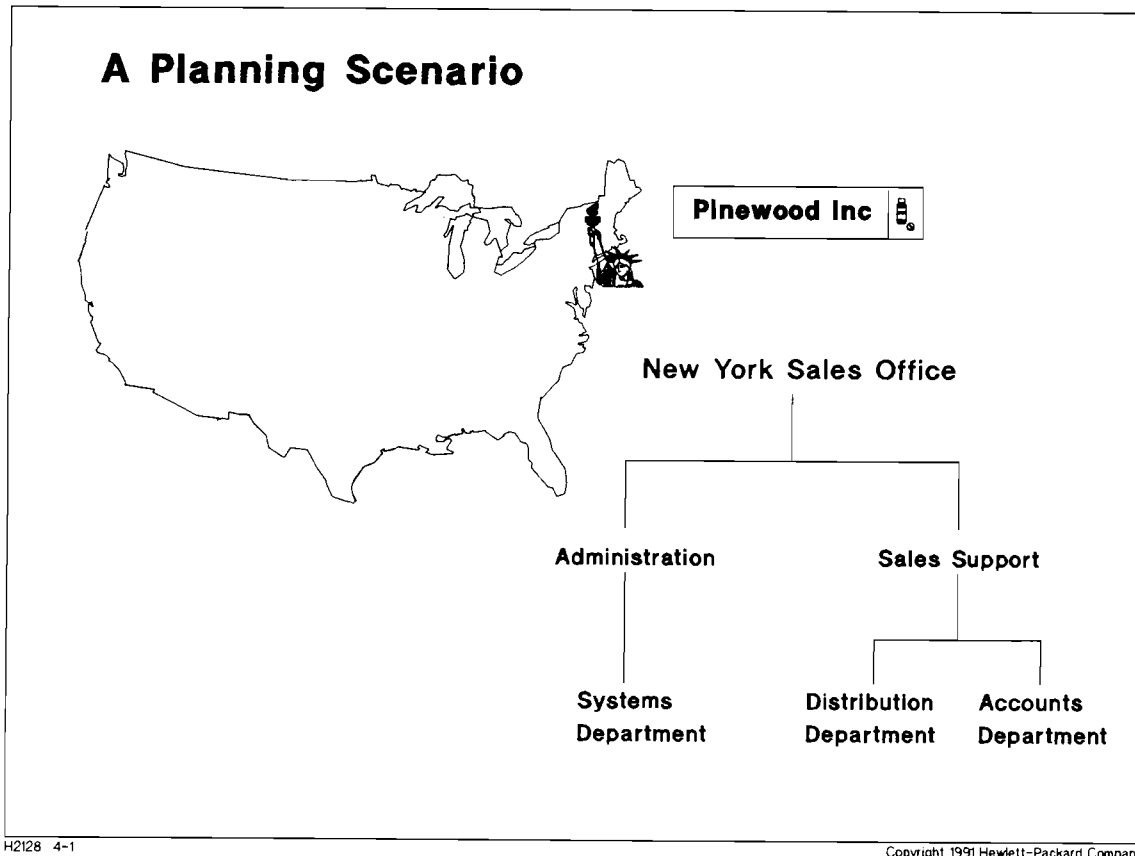
Objectives

After spending 1 hour completing this Module, you will be able to:

- Understand the importance of planning a mail system
- Understand the main items that need planning:
 - Personal names and mailnodes
 - Local user details
 - Error notification user
 - Public Distribution Lists
- Obtain the required number of user licences
- Devise a suitable plan for a single OpenMail system

Module 4 — Planning a System

4-1. A Planning Scenario



You are given the role of OpenMail System Administrator for Pinewood Inc..

At a preliminary meeting you attended, you have gained the following facts about your new job:

- You have been asked to plan a single OpenMail system at one of Pinewood Inc.'s New York sites. This will be a pilot site and you are to plan the pilot system with a view to configuring it.
- Later, each major site will have an OpenMail system linked, to provide a network.
- Pinewood Inc. have set up a committee to ensure the OpenMail project makes good progress. The committee consists of top management, your Unix Mail Administrator, the Unix System Manager, and now yourself.

Module 4 — Planning a System

4-1. A Planning Scenario

Instructor Notes

Purpose

Introduce the scenario to be used in class exercises.

Key Points

- A mail system requires careful planning - right from the start - to ensure the network is expandable and maintainable.
- The larger the network or potential network, the more important planning becomes.
- Pinewood Inc. is a fictitious company.
- You are planning the OpenMail system for Pinewood Inc., New York, and as such are part of the OpenMail Project Committee.

This will be the pilot system. After planning it, you will be responsible for configuring it.

- The same scenario is used in the OpenMail manuals.

Transition

Look at what information you need and how to get it . . .

4-2. Gathering Information

Gathering Information

- **Company organization**
 - geographical locations
 - organizational structure

- **Company growth**
 - new locations
 - changes of location
 - changes in organization

- **User population**
 - target number of users
 - local or remote client users

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List out what you need to know:

- Company organization and growth
- User information
- Error notifications

Identify sources of information:

- A company staff list/telephone list
- Office plan showing departments/divisions
- Your course notes and manuals

Use meetings to confirm plans:

- In the meeting, establish who you are, and talk about your role as OpenMail Administrator.
- Reports can be outdated; use meetings to test the knowledge you have gained from reading.
- Use open-ended questions; make notes during the meeting and keep them for reference.

4-2. Gathering Information

Instructor Notes

Purpose

Explain how to decide what information you need to gather.

Key Points

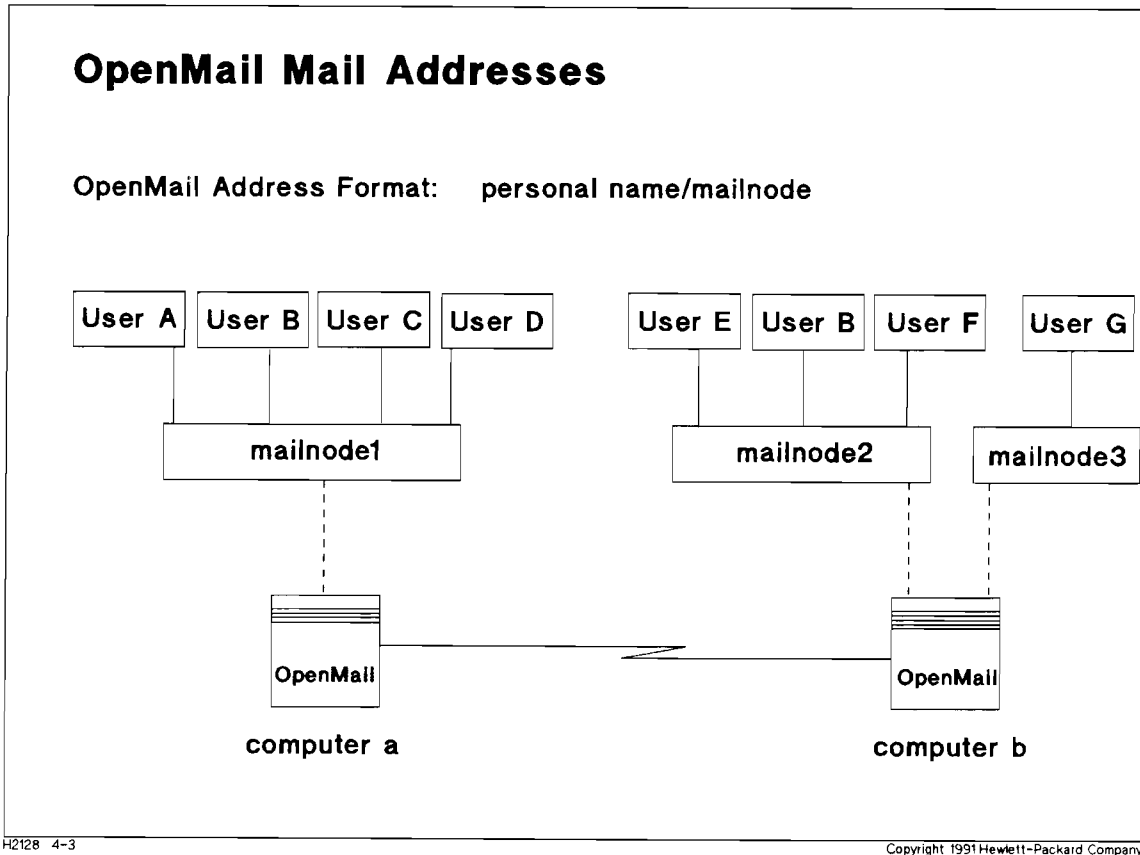
- Company growth patterns, for example:
 - Who in the company will know about expected growth? Try your manager, Personnel department, System Manager.
 - How many servers the company intends to have in five years time?
 - How many of those computers are going to have OpenMail installed on them?
 - Whether they are to link with other computers which have OpenMail on them?
- User information, for example:
 - What are the target number of users?
 - How many will have their own PCs and terminals?
- Decide who should receive error notifications of undelivered mail.

Transition

Look at how OpenMail mail addresses identify users ...

Module 4 — Planning a System

4-3. OpenMail Mail Addresses



- OpenMail mail addresses follow the X.400 standard.
- Personal names are descriptive, enabling each mail user to be addressed just as they are normally.
- Personal names uniquely identify every user associated with a particular mailnode.
- Mailnodes locate users into logical groupings.
- Mailnodes are unique within the mail network.

4-3. OpenMail Mail Addresses

Instructor Notes

Purpose

Explain how OpenMail addresses identify users.

Key Points

- Note there can be users with the same name, providing they are on different mailnodes.
- The addressing scheme is not directly linked to any particular computer.
- OpenMail only uses internal attributes of X.400 addressing within an OpenMail network, as the mailnodes are all within the same private network. External attributes are added only when the messages leave the OpenMail network (covered in Module 14).

Transition

Look at the format of personal names . . .

4-4. Personal Names

Personal Names

Format: Given-name Initials Surname Generation

Valid Examples: Fletcher
 Jim Fletcher
 jim ft. fletcher
 Jim F.T. Fletcher jnr.

Character limits: 16 5 40 3

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- Names can comprise up to four elements (as allowed for by the X.400 standard):
 given-name initials surname generation
- Names must contain at least a unique surname - typically you'd specify a given-name and a surname.
- Names must be unique within the same mailnode.
- If used, the generation and initials must be terminated with periods.

4-4. Personal Names

Instructor Notes

Purpose

Explain the valid formats of OpenMail personal or user names.

Key Points

- Case is not significant to OpenMail, but the case used to configure the name will be retained subsequently when the name is displayed.
- Multi-part surnames - such as de la Rue - must have the spaces within them filled with underscores (de_la_Rue), or else be concatenated (deLaRue).
- Periods following initials and generation do not count in the character limits set out on the slide.

Transition

Look at planning mailnodes . . .

4-5. Mailnodes

Mailnodes

- Decide number of Organizational Units in your mailnodes (up to 4)

Mailnode format: unit1,unit2,unit3,unit4

- Decide naming convention for your mailnodes

Example convention: city,office,workgroup

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Mailnode Size

- A mailnode comprises between 1 and 4 *organizational units*, in the form: unit1,unit2,unit3,unit4
- A mailnode should be long enough to contain meaningful information about a user's location; short enough to minimize entry time when you have many of them.

Mailnode Content

- Work out a naming convention that can be applied throughout the network: across differing and changing organizations and geography, as well as allowing for future expansion.
- Mailnode names should be meaningful to users. You might decide that organizational unit 1 should always be a *computer*, unit 2 a *division*, and unit 3 a *department*. Another alternative could be *city,office,workgroup*.
- You can have more than one mailnode per OpenMail system - but each mailnode must be unique in the network.

Purpose

Explain the decisions involved in planning mailnode content and size.

Key Points

- The 4 Organizational Units (as specified by the X.400 standard) allow for flexibility in a large system.
- Each organizational unit can be up to 32 characters in length.
- Decide on the number of Organizational Units in your mailnodes.
- We recommend you use 3 Organizational Units - these will be sufficient for most requirements.
- The most significant unit comes first, and units are separated by commas, for example:

`city,office,workgroup`

- Your mailnode naming system should apply both to the pilot system and the subsequent network.
- Using a common unit 1 for all mailnodes on a particular computer will simplify routing in a network (covered in Module 6).
- Define mailnode names ready for entry on configuration screens.

Transition

Look at the information you will need to specify about users . . .

4-6. Local User Details

Local User Details

- Personal Name
- Mailnode they will be associated with
- Server Unix login
- Capabilities: local/remote access, administrator
- Mailbox password
- Message catalog language
- Aliases for personal name
- Whether they have a Directory entry

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Prepare a list with details for each user:

- Name: given-name and surname, and optionally initials and generation
- Mailnode: local mailnode that the user is associated with.
- Unix Login: every user must have a Unix login of their own on the server.
- Capabilities: whether the user will use a local or remote client, or have Administrator capabilities.
- OpenMail Password for their mailbox; this can be changed by the user later if they wish.
- Language: if that user will use a message catalog other than the system default (US English).
- Aliases: typically used for the user's job title, and useful when a user's role in the organization may be more well known or more permanent than the person. For example, you could have an alias of *OpenMail Administrator*.
- Directory entry: whether the user's name and mailnode should be added to the default Directory.

4-6. Local User Details

Instructor Notes

Purpose

Explain what information you will need to specify about each user.

Key Points

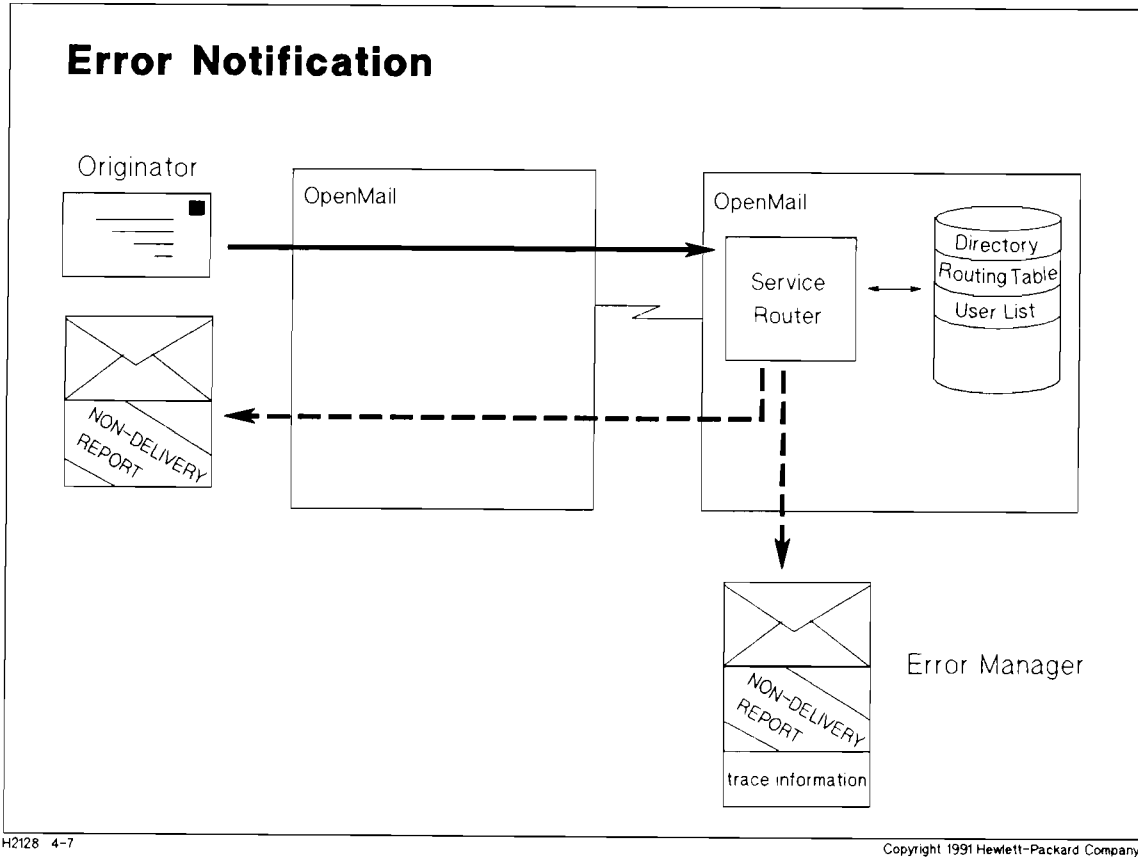
- You should prepare a list with details of each user.
- Remote Client is one that accesses OpenMail through the UAL via an IPC mechanism, such as Sockets, for example the Motif GUI or NewWave Mail.
- Local Client is one that accesses OpenMail through the UAL via stdin/stdout, for example AdvanceMail/TI.
- Local AND remote client users must be configured - every user who will have a mailbox on the server.
- Every user must have their own Unix login. This is used in a number of ways:
 - Terminal users can run AdvanceMail without having to specify their user name.
 - Remote client users' logins are used to run their Remote Client Server daemon sessions.
 - OpenMail Admin capability - for example the use of commands - is associated with a Unix login not a user name
- A user can have up to 16 aliases.
- This information is used to construct the User List.

Transition

Consider which user will receive error notifications . . .

Module 4 — Planning a System

4-7. Error Notification



Decide which user will receive error notifications:

- Error Notification happens in a number of cases when there is an error detected in the address of a message that prevents its delivery. An example would be when the Local Delivery Service cannot find a user who is specified in the address listed in the User List.
- The resulting non-delivery notification is returned to the sender's In Tray along with the message.
- It can also be sent to one other person - the Error Notification User - on the system where the message failed. This person should be responsible for checking their In Tray for these messages at least once a day and correcting them.
- You can specify another real user (such as yourself) or set up a special user name like *Error Manager*. In the later case, you must also give a mailnode, and add the special user to the User List.
- You should configure an Error Notification User on each system, as if one does not exist error notifications are only returned to the originator, and there are instances when the originator will not receive them.

4-7. Error Notification

Instructor Notes

Purpose

Explain how to decide who will receive error notifications.

Key Points

- Decide which user will receive error notifications (apart from the originator).
- You can configure the system to send these error messages to you, but could find it inconvenient to have error notifications mixed in with your personal mail.
- Alternatively configure the system to send error notifications to a fictional user that you can login as, for example *Error Manager*. Give your own mailnode.
- You would have to add the fictional user to the User List - that is configure them as a local user.
- Check the specified In Tray at least once a day, and correct any problems you can - for example mis-spelled names - and resubmit the messages; if the addressing is invalid, the user must correct it themselves.
- You can communicate with the Error Manager on a remote system, if one is configured, by addressing a message to:

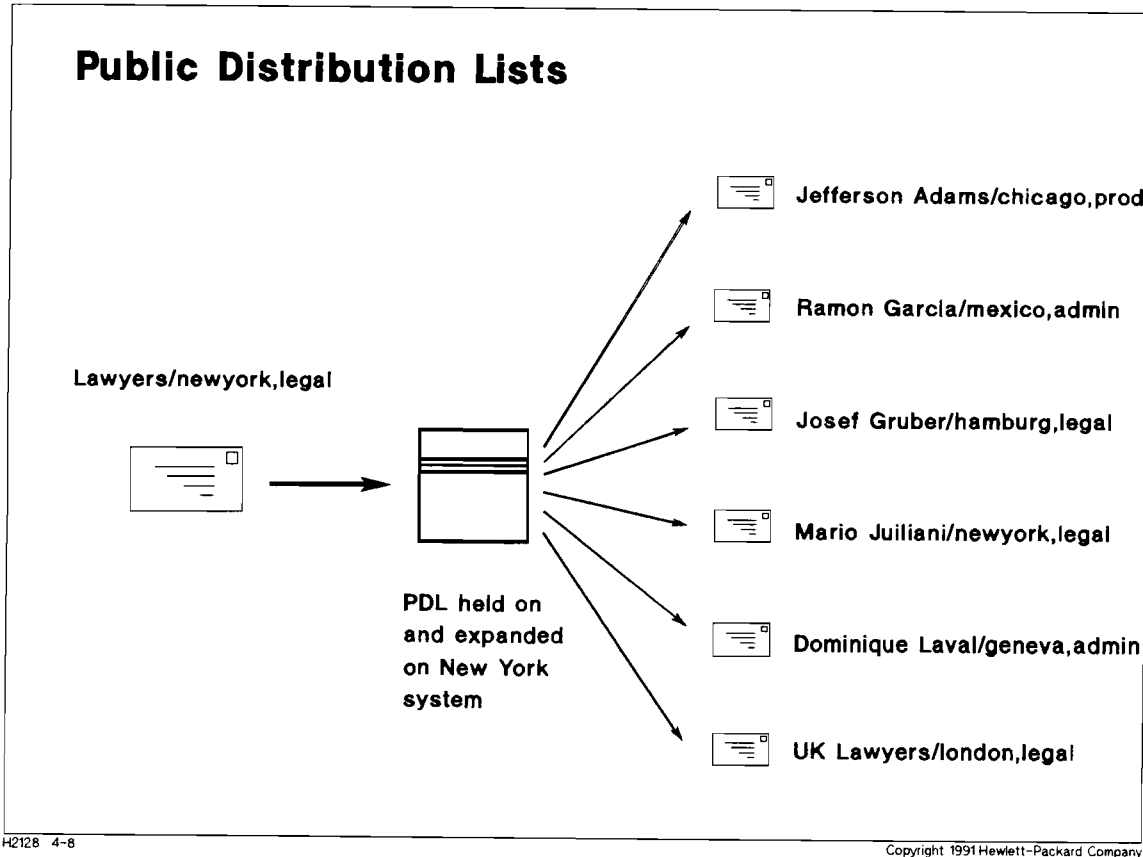
`+errmgr/mailnode`

Transition

Look at the capability to set up Public Distribution Lists ...

Module 4 — Planning a System

4-8. Public Distribution Lists



You could create a Public Distribution List (PDL) of all the users in a department, or all members of a committee, or - as in the slide - of all lawyers in the company. If the list was called `lawyers` and had the mailnode `newyork,legal` any user on the local system - or any remote system in a network - could send a message to all the lawyers in the company simply by addressing messages to:

```
lawyers/newyork,legal
```

When the message arrives at the mailnode `lawyers,legal` in New York where the PDL is held, the list is read and the message delivered on to all the addresses in the list. These can be local users, users on remote systems, or even another Distribution List (as is `UK Lawyers/london,legal` on the slide).

4-8. Public Distribution Lists

Instructor Notes

Purpose

Explain how Public Distribution Lists for system-wide use can be set up by the Administrator.

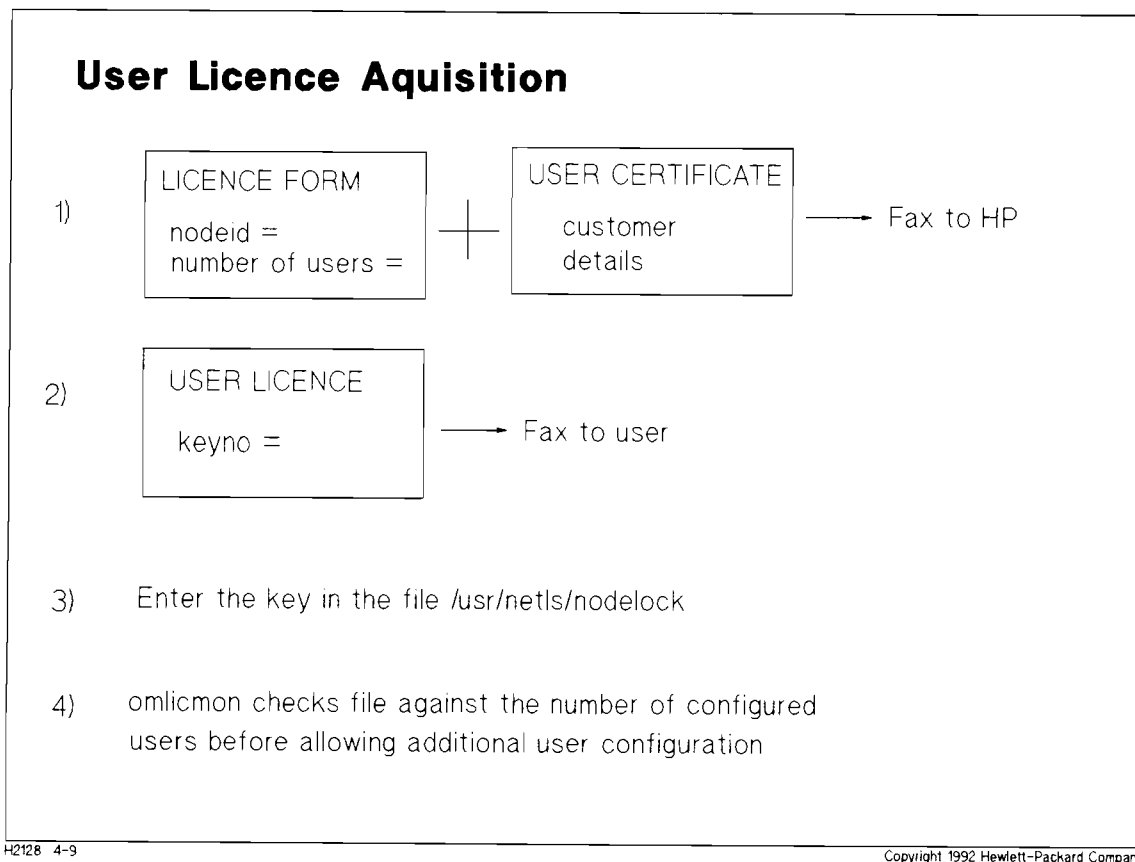
Key Points

- There are two steps in making a Public Distribution List (PDL) for a group of users:
 1. Giving the list a PDL name and mailnode.
 2. Putting user names and mailnodes in the list.
- The mailnode can be any local mailnode. The users that you later enter into the PDL do not have to be on the mailnode you specify here. This mailnode is simply the location where the PDL resides and from which the Distribution List takes effect.

Transition

Look at acquiring user licences via NetLS ...

4-9. User Licence Acquisition



NetLS is supplied with HP-UX and must be installed prior to installing OpenMail.

The OpenMail licence must be purchased from your supplier with the product. Once received, the procedure for obtaining the licence is as follows:

1. Fax the completed licence form and User Certificate to the specified HP distribution entity.
2. HP will then use the Network Licence System (NetLS) creation tools to generate a node-specific licence key for up to 100 users, enabling the requisite number of users, for each node ID specified. HP will then return the licence key. Each machine is supplied with information specific for that machine alone, that will enable the specified number of users (mailboxes) to be configured.
3. You should then enter the licence key into the file `/usr/netls/nodelock`.
4. OpenMail checks the licence key during configuration, to check that the number of users does not exceed the number of user licences.

Before running OpenMail, you must start the Licence Monitor with the `omlicmon` command.

4-9. User Licence Acquisition

Instructor Notes

Purpose

Explain how to ensure you have sufficient user licences via NetLS.

Key Points

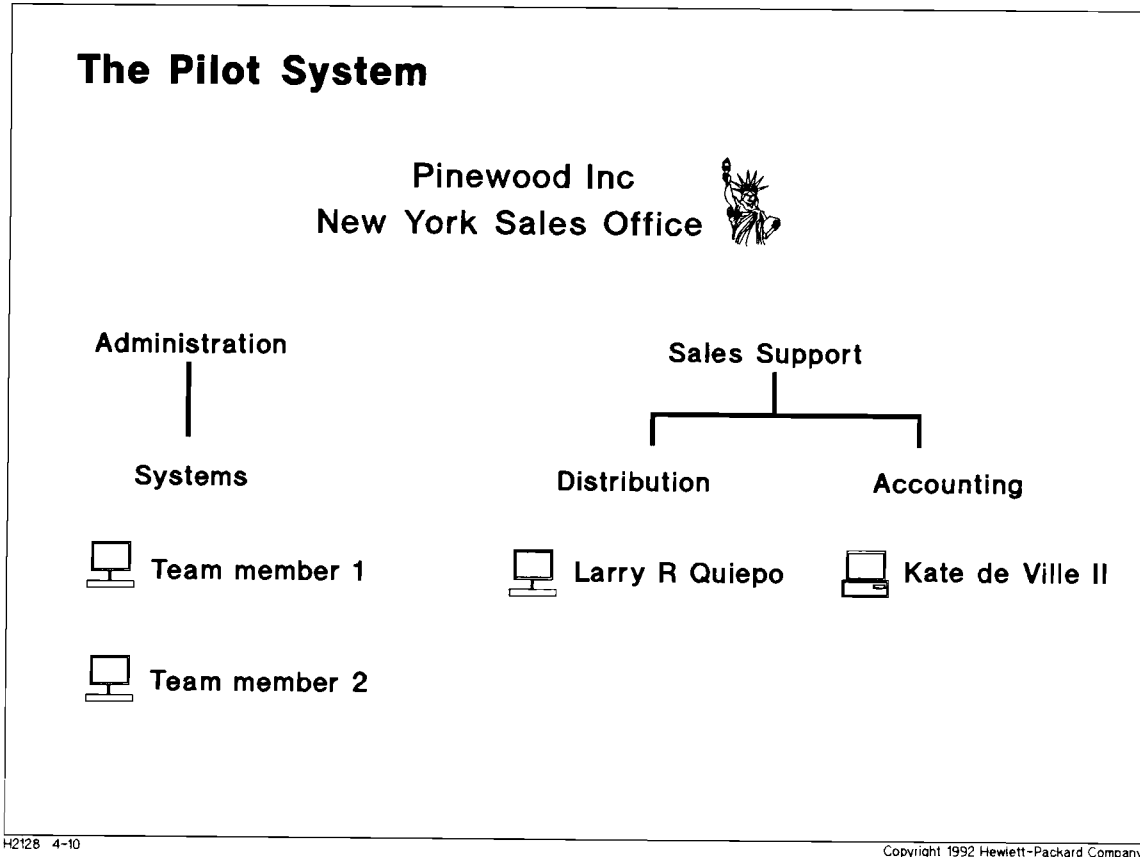
- Non-HP-UX systems - the licences are obtained from the suppliers.
- The OpenMail User Licence product from HP contains:
 - User Certificate
 - Declaration Form for credits
 - Instructions for obtaining licence keys
 - Licence key installation instructions
- NetLS used for the HP direct channel
- Special licences are available for demonstration, evaluation and pilot programs.
- It is possible for the licence control mechanism to include other applications and systems that utilize OpenMail, such as User Agents. This will be of benefit to PC-based application suppliers.
- An overrun of 10% is allowed before no more configuration additions or modifications are allowed.
- An electronic copy of the document “Obtaining and Installing OpenMail Licenses” is present in `/users/openmail/newconfig/OMLicenseNotes`

Transition

Now you’ve seen what needs planning, let’s do it as a written exercise . . .

Module 4 — Planning a System

4-10. DISCUSSION: The Pilot System



Ask your instructor relevant questions about planning an OpenMail system for this Sales Office as if you were the Administrator.

For completing the Planning Sheets, enter your own names as the members of the Systems team. There are a number of sales offices acting as pilot sites in New York, and the slide shows users in the first office (system0 in the class network). If you are planning one of the other sales offices use the following names in your Planning Sheets:

System	Distribution Dept	Accounting Dept
system1	Gary R Weske	Shelley van der Kamp II
system2	Jeff R Duarte	Celeste O'Shea II
system3	Mark R Holzman	Marianne de Winter II
system4	Enzo R Perego	Dieter von Berg II
system5	Lance R Noguchi	Linda McLeod II

4-10. DISCUSSION: The Pilot System

Instructor Notes

Purpose

This task practices information gathering and planning skills.

Discussion

- Encourage questions from students, assuming that they are the Administrator for the pilot system.
- The major decision here are the mailnodes, their size and format.
- Consider what you want the mailnode to identify: department, building, town, area, company?
- In this example you have been given departments and divisions, so you could try:

Format: division,department

Example: sales,distribution or sales,accounts

The problem here is that if you have similar divisions and departments elsewhere (as we have) you could end up with the same mailnodes in another part of the network and this is not allowed.

The city name could help to differentiate mailnodes, like this:

ny,sales,distribution ny,sales,accounts

Using the Planning Sheets

Work through the sheets as a class. Complete all the details as this is the basis for the next exercise.

- Mailnodes will vary as they are dependent on location (New York), function (administration or sales support), and department (systems, distribution, or accounting).
- In class, each team will plan and configure a sales office in New York, so we'll add a number to differentiate them as follows:

```
ny0,admin,systems
ny1,admin,systems
etc
```

- Language will be the default (US English), so leave the entry space blank.
- The slide differentiates remote client (Accounting) and local client (Systems and Distribution) users.
- All users currently share the same server.
- Each New York sales office is a pilot site. Pinewood is a large company and future expansion is likely.

Transition

Complete the Planning Sheets . . .

Module 4 — Planning a System

4-11. WRITTEN EXERCISE: System Planning Sheets

Enter the details for the Pinewood Inc. pilot site, as they were discussed in class, into the planning sheet here and on the next page.

Number of Organizational Units to be used:

Mailnode naming convention:

Planning Sheet 1

	User 1	User 2
Org. Unit 1		
Org. Unit 2		
Org. Unit 3		
Org. Unit 4		
Given Name		;
Initials		
Surname		
Generation		;
Unix Login		
Remote Client User (y/n)		
Local Client User (y/n)		
Admin capability (y/n)		
OpenMail Password		
Language		
Alias		
Entry in Directory (y/n)		
Error Notification		

Module 4 — Planning a System

4-11. WRITTEN EXERCISE: System Planning Sheets

Instructor Notes

Planning Sheet 1

Suggested Answer (Sales Office 0)

Number of Organizational Units to be used:	3
--	---

Mailnode naming convention:	<i>city,function,department</i>
-----------------------------	---------------------------------

	User 1	User 2
Org. Unit 1	ny0	ny0
Org. Unit 2	admin	admin
Org. Unit 3	systems	systems
Org. Unit 4		
Given Name	<i>your firstname</i>	<i>your firstname</i>
Initials		
Surname	<i>your surname</i>	<i>your surname</i>
Generation		
Unix Login	<i>your login</i>	<i>your login</i>
Remote Client User (y/n)	Y	Y
Local Client User (y/n)	Y	Y
Admin capability (y/n)	Y	Y
OpenMail Password	user1	user2
Language	American	American
Alias	Administrator	Error Manager
Entry in Directory (y/n)	Y	N
Error Notification	N	Y

Module 4 — Planning a System

4-11. WRITTEN EXERCISE: System Planning Sheets (Continued)

Planning Sheet 2

	User 3	User 4
Org. Unit 1		
Org. Unit 2		
Org. Unit 3		
Org. Unit 4		
Given Name		
Initials		
Surname		
Generation		
Unix Login		
Remote Client User (y/n)		
Local Client User (y/n)		
Admin capability (y/n)		
OpenMail Password		
Language		
Alias		
Entry in Directory (y/n)		
Error Notification		

Module 4 — Planning a System

4-11. WRITTEN EXERCISE: System Planning Sheets (Continued)

Instructor Notes

Planning Sheet 2

Suggested Answer (Sales Office 0)

	User 3	User 4
Org. Unit 1	ny0	ny0
Org. Unit 2	sales	sales
Org. Unit 3	dist	accounts
Org. Unit 4		
Given Name	Larry	Kate
Initials	R.	
Surname	Quiapo	de_Ville
Generation		II.
Unix Login	larryq	katev
Remote Client User (y/n)	N	Y
Local Client User (y/n)	Y	N
Admin capability(y/n)	N	N
OpenMail Password	user3	user4
Language	American	American
Alias		
Entry in Directory (y/n)	Y	Y
Error Notification	N	N

Transition

To summarize . . .

4-12. Summary



Planning a System

Topics covered:

- Company organization/plans for growth
- Personal name and mailnode requirements
- Local user details
- Error notification receiver
- Uses of public distribution lists
- Obtaining user licences

Lab: Plan an OpenMail system

Notes

Purpose

Review what has been covered in Module 4.

Key Points

- At the start of the module good reasons for planning were given.
- A step-by-step approach to gathering information was presented. Use methods that suit your situation and the level of responsibility you have been given.
- The areas of information that needed research were discussed:
 - Company background and plans for growth
 - Mailnode size and format
 - User details
 - Who should receive error notifications

Written Exercise

- We will configure these users at the end of the next Module.
- You can photocopy the Planning Sheets if you want to document your information prior to entering it at your terminal.

Transition

The next Module covers the configuration of a single system.

Module 4 — Planning a System

Module 5 — Configuring a System

Objectives

After spending 1 hour completing this Module, you will be able to:

- Use the Administration Interface to configure a single OpenMail system:
 - Configure a system printer
 - Configure mailnodes
 - Configure information about each user
 - Configure a user to receive error notifications
 - Configure a Public Distribution List

Module 5 — Configuring a System

5-1. The Administration Main Menu

The Administration Main Menu

To get there:
\$ omadmin

SERVICES	Service administration
MAINTENANCE	General maintenance
DIRECTORIES	Shared directory administration
USERS	Local user, mailnode, PDL admin
ROUTES	Route, service ACL, gateway admin
PRINT COMMAND	Specify the omadmin print command

Select Help Exit

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To use the Administration Interface:

- On menus, use arrow keys to highlight the option you want and press **Select** to action it.

Alternatively, just type the first letter of the option.

Press **Exit** when you've finished, and then type **y** to confirm you want to leave Administration Interface and return to the Shell.

- On all data entry screens, **Action Menu** displays a pop-up menu, which provides additional locally-relevant actions, plus always the following:

Shell
Main Menu

Shell exits you back to the Command Interface (to return to the Administration Interface - at the screen at which you left it - type **exit**)

5-1. The Administration Main Menu

Instructor Notes

Purpose

Explain the options available from the Administration Interface Main Menu.

Key Points

- The Main Menu presents these options:

SERVICES	to monitor and control OpenMail services
MAINTENANCE	to set logging and perform error recovery
DIRECTORIES	to configure directories
USERS	to configure the local system
ROUTES	to configure routes to, and information about, other systems in a network
PRINT COMMAND	to set a printer for configuration printouts



- Directory Update File shown at the top of the screen keeps a copy of any configuration entries you make. This file can be used to update the configuration of other systems in a network (covered in Module 7).
- To select an option you can just type the initial letters of the option (that is, s, m, d, u, r or p).

Oadmin

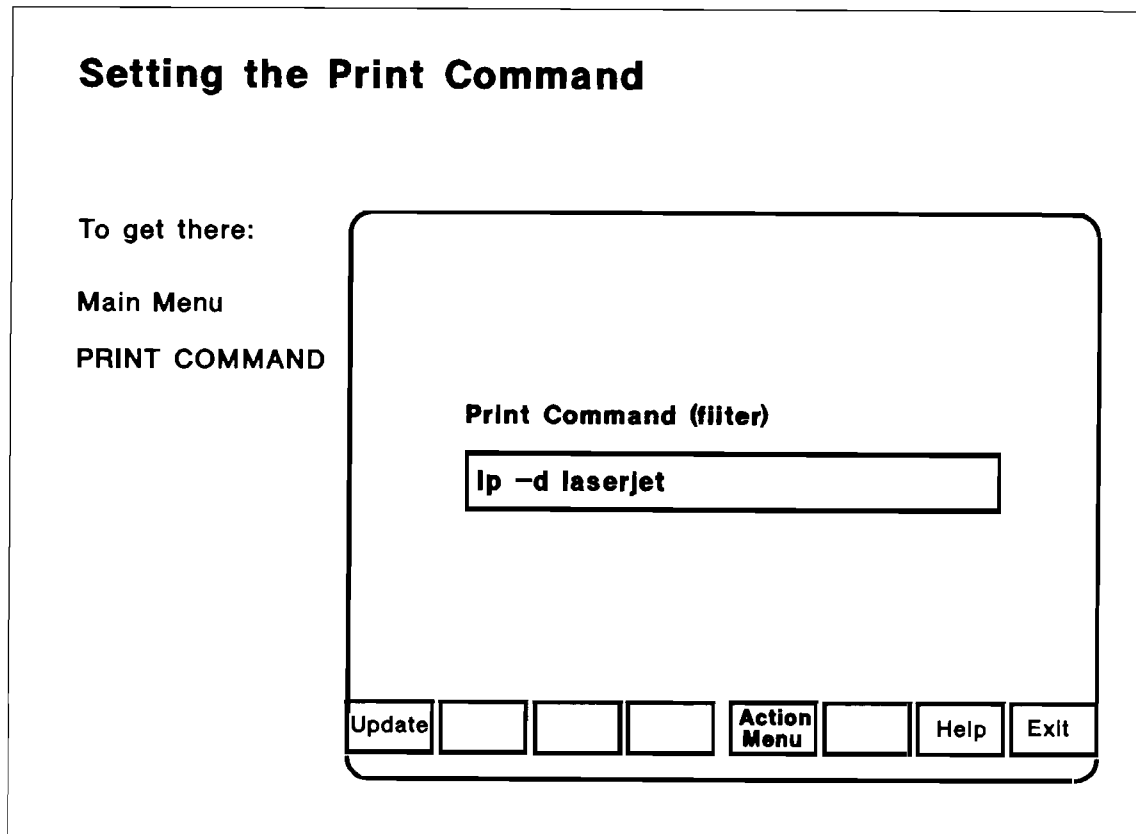
- 8 function keys shown at the bottom of the screen relate to the function keys on the keyboard.
- The use of these function keys changes depending on the screen you are at.
- Help (F7) explains what to enter in each field.
- Action Menu (F5) is available on all data entry screens. It has some standard options whenever you use it, plus options appropriate to the screen you are at.

Transition

Look at setting the Print command . . .

Module 5 — Configuring a System

5-2. Setting the Print Command



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Set the printer to be used during configuration to print any configuration information to.

1. From the Main Menu, highlight PRINT COMMAND and press Select

The Specify the omadmin print command screen appears.

2. Specify the printer you want to use, together with any formatting information, for example:

```
lp -d <printrname>
```

3. Press **Update**

You are returned to Main Menu.

5-2. Setting the Print Command

Instructor Notes

Purpose

Explain how to set a printer and print format for configuration information.

Key Points

- Select **PRINTER** at the Main Menu and the Set Print Command screen appears.
- Type the Unix command for your printer (formatting information optional).
- An alternative print command might be:

```
pr -h <hostname> | lp
```

- Now, when you choose the print option in the Action Menu, the current screen is printed out.
- If you don't specify a printer, the system default printer is used.

Transition

Look at adding a mailnode . . .

Module 5 — Configuring a System

5-3. Adding a Mailnode

Adding a Mailnode

To get there:

- Main Menu
- USERS
- MAILNODES
- Action Menu
- Add Mnode

Mailnode

ny,admin,systems

Add				Action Menu		Help	Exit
-----	--	--	--	-------------	--	------	------

H2128 5-3

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1. From the Main Menu, select **USERS**
2. Select **MAILNODES**

The Mailnode administration screen appears.

3. Press **Action Menu** and then select **Add Mnode**
4. In the relevant field, type the first mailnode name. Press **Add** to end entry.

A message appears briefly at the bottom of the screen telling you if the action was successful.

5. Repeat for the second mailnode.
6. By default, the first mailnode specified becomes the Trace Mailnode; used to run tracing information.
7. Select **Exit**
8. To print a list of the configured mailnodes, from the Action Menu press **Print Mnodes**

5-3. Adding a Mailnode

Instructor Notes

Purpose

Explain how to configure mailnodes for users on the local system.

Key Points

- There is no longer any need to define the number of mailnode units to be used with A.01.00.
- Use **Help** for information on details, such as the limits to mailnode length.

The Trace Mailnode

- Tracing information consists of a record of the systems that a message has passed through. Every message that passes through a system, goes through the Trace Mailnode, and picks up tracing information as it does so.
 - If a message is delivered successfully, the tracing information is removed.
 - If a message is not delivered, it is returned to the sender with a Non-Delivery Report attached, and a copy is sent to the user designated as the Error Manager, with trace information attached.
- This is the default. To specify a different Trace Mailnode, highlight the one to be the new Trace Mailnode, and then select **Trace** in the Action Menu.

Transition

Look at configuring local users . . .

Module 5 — Configuring a System

5-4. Adding a Local User

Adding a Local User

To get there:

Main Menu
USERS
USERS
Action Menu
Add User

Name	Mark Lauder		
Mailnode	ny,admin,systems		
Unix Login	Remote Access	Local Access	Admin Caps
markl	n	y	y
OpenMail password	Language		
user2	American		
Aliases	In Directory		
administrator	y		
Add		Action Menu	Help Exit

H2128 5-4

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1. From the Local user, mailnode, and PDL administration screen, select **USERS**
The Local user administration screen appears.
2. Press **Action Menu** and then select **Add User**
The Add a user screen appears.
3. Enter the information planned for each user in the appropriate fields, pressing **Add** to end each entry.
4. Press **Exit**
5. To print a list of configured users, from the Action Menu press **Print Users**
6. Press **Exit**

5-4. Adding a Local User

Instructor Notes

Purpose

Explain how to configure users on the local system.

Key Points

- User names will appear in the Directory exactly as you type them here.
- Mailnode must be already configured in order to associate a user with it.
- Unix logins are required for each user configured. The Shell option from the Action Menu is a good exit if you have forgotten to configure these beforehand.
- OpenMail passwords aren't mandatory but in practise you should always use them.
- Password is not displayed on the screen as you type it, for reasons of security.

A set password is indicated by asterisks in the password field when you return to the Modify a Local User screen. To modify the password in the future, simply type over the asterisks displayed in the password field.

The password can be any combination of up to 8 characters, providing the first character is a letter. Case is significant.

- Aliases have the same requirements as user names, and of course, will be on the same mailnode.
- Full details of requirements for each field are given by **Help**

Transition

Look at configuring a user to receive error notifications . . .

Module 5 — Configuring a System

5-5. Specifying an Error Manager User

Specifying an Error Manager User

To get there:

Main Menu
USERS
ERROR MGR

User to receive error notifications:

Name
Error Manager

Mailnode
ny,admin,systems

Update Action Menu Help Exit

H212B 5-5

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Set up a user to receive notifications of errors:

1. From the Local user, mailnode, and PDL administration screen, select ERROR MGR
2. Enter the details. The name and mailnode you enter here must also be configured as a valid user with a mailnode.
3. Press Update

5-5. Specifying an Error Manager User

Instructor Notes

Purpose

Explain how to configure a user to receive notification of undelivered messages.

Key Points

- The Error Manager user must be configured onto an existing mailnode.
- They must be configured on the Local User screen as a user.

Transition

Look at configuring Public Distribution Lists . . .

Module 5 — Configuring a System

5-6. Adding a Public Distribution List

Adding a Public Distribution List

To get there:

- Main Menu
- USERS
- PDL
- Action Menu
- Add PDL

List Name

Mailnode

Aliases (name only – one per line)

H2128 5-6

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1. Give the list a name and mailnode:
 - a. From the Local user, mailnode, and PDL administration screen, select PDL
 - b. Press **Action Menu** and select **Add PDL**
 - c. The **Add a PDL** screen is displayed: you are asked for the list name and mailnode.
 - d. Press **Add** and then **Exit**
2. Put user names and mailnodes in the list:
 - a. From the **Add a PDL** screen, highlight the list and press **Select**
 - b. Press **Action Menu** and select **Open PDL**
 - c. Press **Action Menu** again and select **Add Name**
 - d. Enter the name and mailnode of each user, press **Select** and then **Exit**
 - e. To print the configured Distribution List, from the **Action Menu** press **Print Names**
 - f. From the **Action Menu**, select **Main Menu**

Module 5 — Configuring a System

5-6. Adding a Public Distribution List

Instructor Notes

Purpose

Explain how to configure Public Distribution Lists for use by users on the local system.

Key Points

- If the PDL is local, all you need to enter is the name and mailnode of each user you want in the list.
- The PDL is treated like a special local user.
- The contents of PDLs are not listed anywhere for users to view, though PDLs themselves are listed in the Directory.

Transition

A Lab to configure a single system . . .

Module 5 — Configuring a System

5-7. LAB: Configure an OpenMail System

Refer to your Planning Sheets from Module 4 for details of what you need to configure for the New York pilot system, and refer back in this Module for procedures for each task. Remember that Help (F7) is available to assist you.

1. Enter the Administration Interface.
2. Configure a printer for printing screens, if one is available.
3. Configure each mailnode.
4. Enter details of each local user.
5. Specify a user to receive error notifications.
6. Create a PDL of the four users in the New York sales office.
7. Send a test message to the PDL to welcome users.

Sign on to the user interface as the newly-configured team member with the alias "Administrator", and send a welcome message to the NY Sales Office PDL.

8. Sign on as one of the Sales Office users and read the message.

Module 5 — Configuring a System

5-7. LAB: Configure an OpenMail System

Instructor Notes

Purpose

Perform all necessary configuration to set-up an operational OpenMail system.

Preview

1. **Enter the Administration Interface.**

2. **Configure a printer for printing screens.**

Let students know if a printer is available to the class.

3. **Configure each mailnode.**

One mailnode is already configured on the class system (as the Trace Mailnode). If using the Lab Software, tell students not to change this; it must stay as it is.

4. **Enter details of each local user.**

One user is already configured on the class system. Give the class a set of Unix logins they can use on their systems - or else they will need root capability to configure their own.

5. **Specify a user to receive error notifications.**

6. **Create a PDL of the four users in the New York sales office.**

You carry out the two stages of creating a PDL.

7. **Send a test message to the PDL to welcome users.**

If using the playpens, all AdvanceMail sessions must be started from the omac login, as follows:

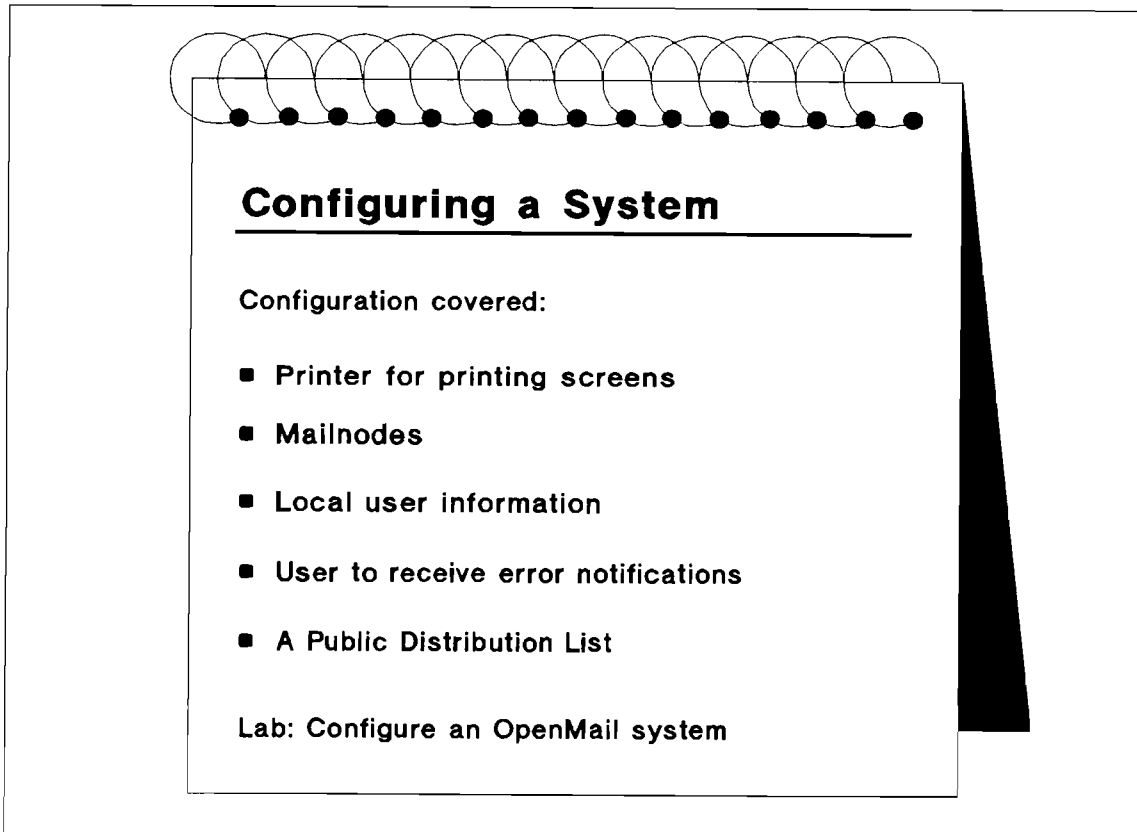
```
advmail "Administrator" or advmail "Jasmin Lee"
```

8. **Sign on as one of the Sales Office users and read the message.**

Procedures

1. Topic 5-2: `omadmin`
2. Topic 5-3: `omadmin`, select PRINT COMMAND
3. Topic 5-4: `omadmin`, select USERS, select MAILNODES
4. Topic 5-5: `omadmin`, select USERS, select USERS
5. Topic 5-6: `omadmin`, select USERS, select ERROR MGR
6. Topic 5-7: `omadmin`, select USERS, select PDL
7. Module 2 Lab: `advmail`

5-8. Summary



Configuring a System

Configuration covered:

- Printer for printing screens
- Mailnodes
- Local user information
- User to receive error notifications
- A Public Distribution List

Lab: Configure an OpenMail system

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Notes

Module 5 — Configuring a System

5-8. Summary

Instructor Notes

Purpose

Review what has been covered in Module 5.

Key Points

- Which steps are absolutely essential in configuring a system?
 - 1 — Starting the Administration Interface
 - 3 — Entering mailnodes
 - 4 — Entering details of each local user
- Which steps are particularly useful and why?
 - 2 — Printing configuration details for paper references and records
 - 5 — Error notification is vital for spotting operational problems and, if configured under a user name such as Error Manager, need not clog up the Administrator's own In Tray.
 - 6 — PDLs can be a time-saver for users

Transition

The next Module covers the planning of an OpenMail network.

Module 5 — Configuring a System

Module 6 — Planning a Network

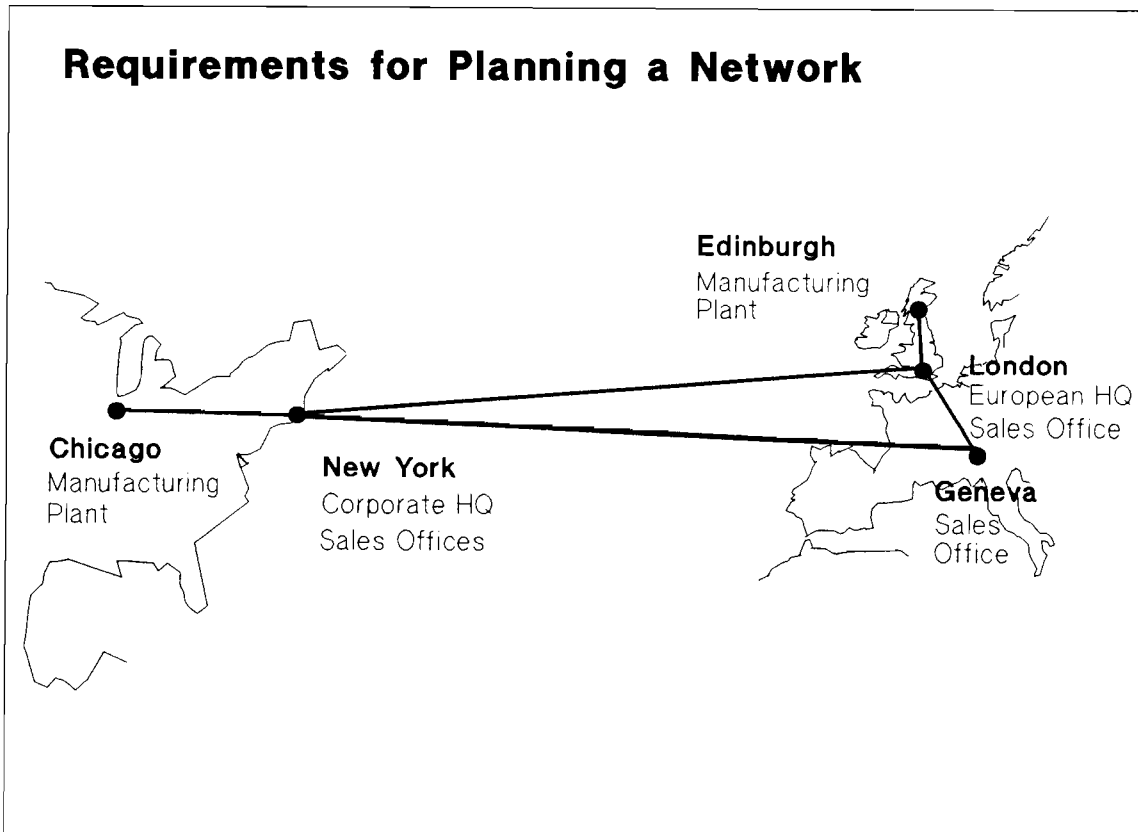
Objectives

After spending 1 hour completing this Module, you will be able to:

- Extend your planning from a single system to an OpenMail network
- Appreciate network-wide planning considerations
- Decide who should plan different parts of the network
- Understand how routing works
- Decide routing strategies
- Understand Sendmail address formats
- Plan routes
- Plan network-wide directories

Module 6 — Planning a Network

6-1. Requirements for Planning a Network



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In addition to planning each local system, network planning involves, for each system:

- Specifying remote mailnodes that need to be accessed.
- Specifying the route to be taken to each remote mailnode that needs to be accessed.
- Adding remote users to the local Directory, for easy addressing.

Module 6 — Planning a Network

6-1. Requirements for Planning a Network

Instructor Notes

Purpose

Consider the main network planning and configuration tasks.

Key Points

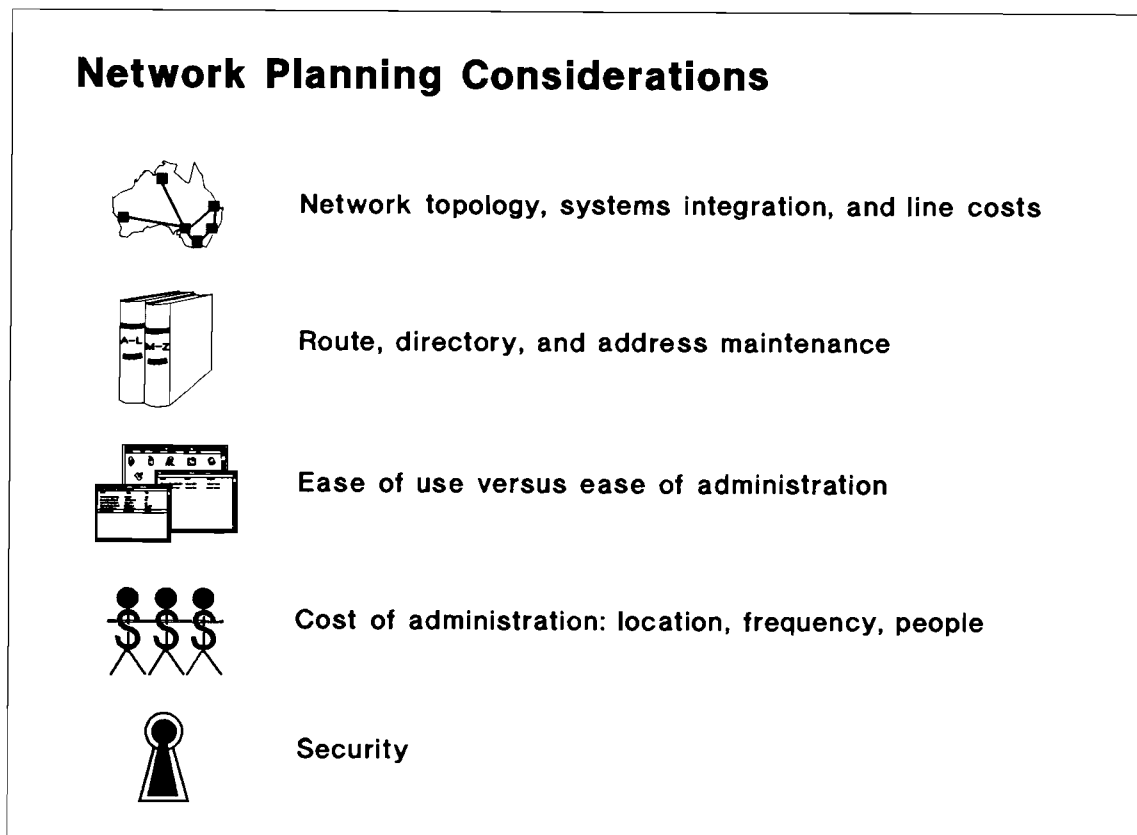
- When you move on to planning a whole network of OpenMail systems, the local considerations on each system in the network will be the same as those we considered when planning the single pilot systems at Pinewood's New York sites, that is considering:
 - Mailnodes
 - Users
 - Error Notifications
- Network planning additionally involves, for each system:
 - Specifying remote mailnodes that need to be accessed.
 - Specifying the route to be taken to each remote mailnode needs to be accessed.
 - Adding remote users to the local Directory, for easy addressing.
- Slide shows Pinewood Inc's network, which is used as the example throughout this Module.

Transition

Look at overall design considerations in planning your mail network . . .

Module 6 — Planning a Network

6-2. Network Planning Considerations



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At this planning stage there are a number of factors that need to be considered:

- Designing the network topology so that connections to legacy systems, or to standards-based networks, such as Unix and X.400 are accessible where necessary. This will also mean trying to keep network traffic costs to a minimum.
- You should consider how much you can minimize maintenance, by the use of hub machines, as well as deciding on how much centralization will be needed to ease the administration overhead. However, the cost of administration must be balanced against the ease of use for the user population—for example Directories that are transparent to users make addressing messages much easier for users, but can be difficult to maintain.
- The implementation of security features should also be thought through carefully during the network planning phase.

6-2. Network Planning Considerations

Instructor Notes

Purpose

Explain the overall design considerations in planning your network.

Our Assumptions

- X.400 is used for backbone connections, and Sendmail for internal site/network connections.
- Hubs are used to minimize route/directory administration.
- Most users are entered in directories (to allow open transparent communication)
- Remote, automated administration is performed wherever possible.
- Selective access through gateways, and to some special directories, is allowed.

Transition

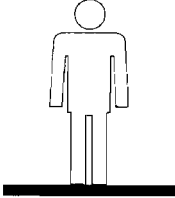
Look at who should be involved in planning an OpenMail network ...

6-3. Who Should Plan an OpenMail Network?

Who Should Plan an OpenMail Network?

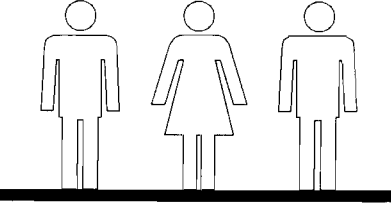
Network Administrator
Planning that affects the whole network:

- Choosing mailnode addressing scheme
- Planning routing policy
- Deciding how to use Directories



OpenMail Administrators
Planning for their system:

- Users
- Error notification



H2128 6-3

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The Network Administrator will know about the existing computer network, and should take responsibility for all decisions affecting the OpenMail network, from the start of the pilot.

Areas of responsibility for the Network Administrator will include planning:

- A mailnode structure for the whole network.
- A policy for message routing between computers.
- A strategy for how system Directories will be used and updated.

There should be an OpenMail Administrator for each computer (even if one person looks after several machines). Each OpenMail Administrator should plan those things that are local to their system, particularly:

- How users are represented on the system (use of aliases, password, etc).
- How delivery errors will be notified.

Module 6 — Planning a Network

6-3. Who Should Plan an OpenMail Network?

Instructor Notes

Purpose

Explore how planning responsibilities can be shared between the people responsible for a network.

Key Points

- In a company the size of Pinewood Inc, there will be a person responsible for making all networking decisions, such as deciding the communication links between computers.

Referred to as the Network Administrator here, but perhaps using a different job title in your organization, this person should be on your contact list from the start — whether planning a local system or a network.

- You could mix systems using different numbers of mailnode units and naming conventions in the same network, but we don't recommend this as it will confuse both Administrators trying to keep Routing Tables up-to-date and users.

Transition

Looks at how mail is routed to a single remote user ...

6-4. Routing Mail — to a Single Remote User

Instructor Notes

Purpose

Explain how the Routing Table is used to route a message to a single remote user.

Key Points

- At this planning stage you plan the routes to other computers ready to enter this information on the Routing Table for your system. Each system has its own Routing Table.
- Local addresses are automatically entered into the Routing Table; you only need to provide remote addresses and routes to them on other computers in the network.
- The Routing Table needs two types of information:
 - Remote mailnodes
 - Remote computer's Sendmail Address for each of these mailnodes

How Routing Works

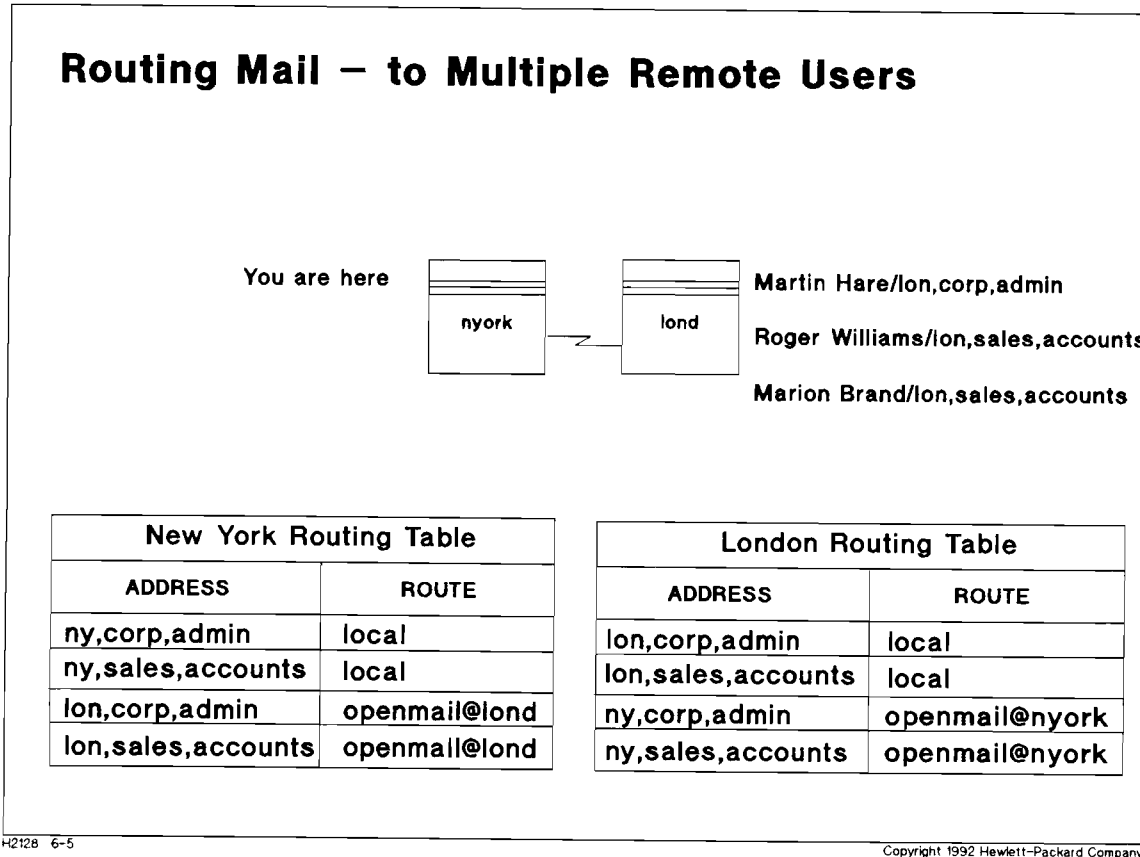
- The example shows how the New York site routes remote mail to the London system, whose Sendmail address is `openmail@lond`
- Remote mail from London is routed to the New York system with the Sendmail address of `openmail@nyork`
- Every mailnode on the same server must have the same Sendmail Address.
- Routing a reply from Martin Hare in London back to New York, is a straight reversal of the process.

Transition

Look at sending a message to a distribution list of several remote users . . .

Module 6 — Planning a Network

6-5. Routing Mail — to Multiple Remote Users



The slide shows how a message addressed to several users at Pinewood's London site is handled, and demonstrates how message traffic is kept to a minimum.

1. You send a message from New York to London, addressed to Martin Hare at `lon,corp,admin`, and Roger Williams and Marion Brand at `lon,sales,accounts`
2. The Service Router at New York identifies that each recipient is at the same Sendmail Address in London, and so sends one copy of the message to the computer `lond`
3. On the London system, the Service Router sends on the message to the Local Delivery Service, which delivers it to the three local mailboxes.

There is still only one copy of the message in the London Message Store - even though the recipients have different mailnodes, because they are still on the same computer. There are pointers to the one message from each user's mailbox.

6-5. Routing Mail — to Multiple Remote Users

Instructor Notes

Purpose

Explain how OpenMail keeps network traffic to a minimum by sending one copy of a message for multiple recipients at the same remote site.

Key Points

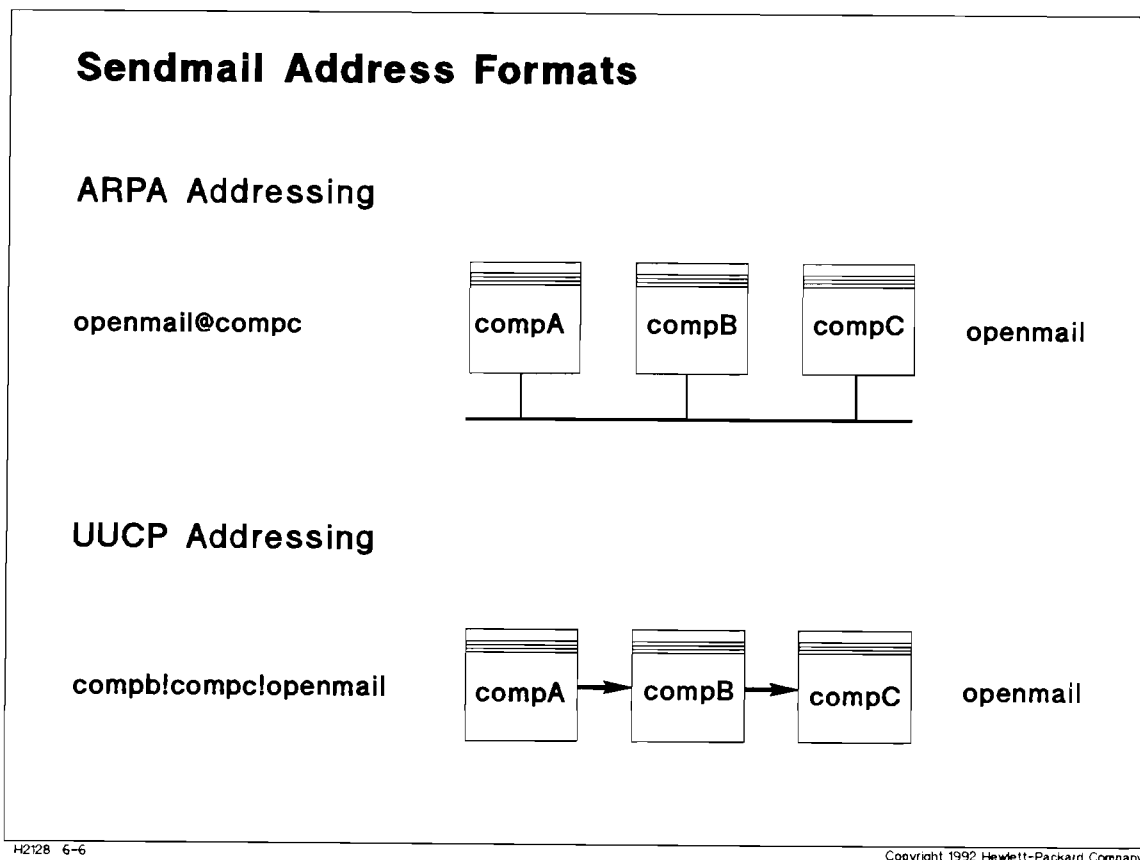
- OpenMail sends one copy of a message for each addressee in the distribution list with a different Sendmail Address.
- Every mailnode on the same system shares the same Sendmail Address. So, as in this case, only one copy of the message is sent to that system even if it is addressed to multiple recipients at that Sendmail Address. This keeps down the amount of traffic on the line.
- The message isn't even duplicated if one of the recipients files their copy of the message in their Filing Cabinet - copies are only made of parts of the message that are subsequently edited, forwarded, etc. This keeps down the amount of disk space required for messages.

Transition

Look at Sendmail Address formats ...

Module 6 — Planning a Network

6-6. Sendmail Address Formats



Sendmail understands two address formats:

- ARPA — typically used on hardwired connections such as LANs and X.25, by SMTP.
- UUCP — typically used over the public switched network, by UUCP.

Addressing will probably be configured for you on the system. Ask the person responsible for your Sendmail facility, typically the Network Administrator, which of these two addressing types to use.

ARPA addressing has the following format:

Format *user@host*
Example: openmail@compc

UUCP addressing routes a message to the destination computer via a series of hops. Each hop is specified in the address, with the user name being the OpenMail system on the final computer. For example:

Format *hostb!hostc!hostd!user*
Example: compb!compc!compc!openmail

Purpose

Explain the different Sendmail address formats that can be used in a Unix network.

ARPA Addressing

- When the distance between computers is not very great, the link is likely to be hardwired, using connections like LAN or X.25. In this case ARPA addressing is used.
- ARPA addressing routes a message directly to the destination computer.
- The user name is the OpenMail system on the specified computer (actually the user `openmail`).

UUCP Addressing

- When the computers are farther apart, and communication is over the public switched network, using PTT (telephone company) lines, UUCP addressing can be used.

Mixed Addressing

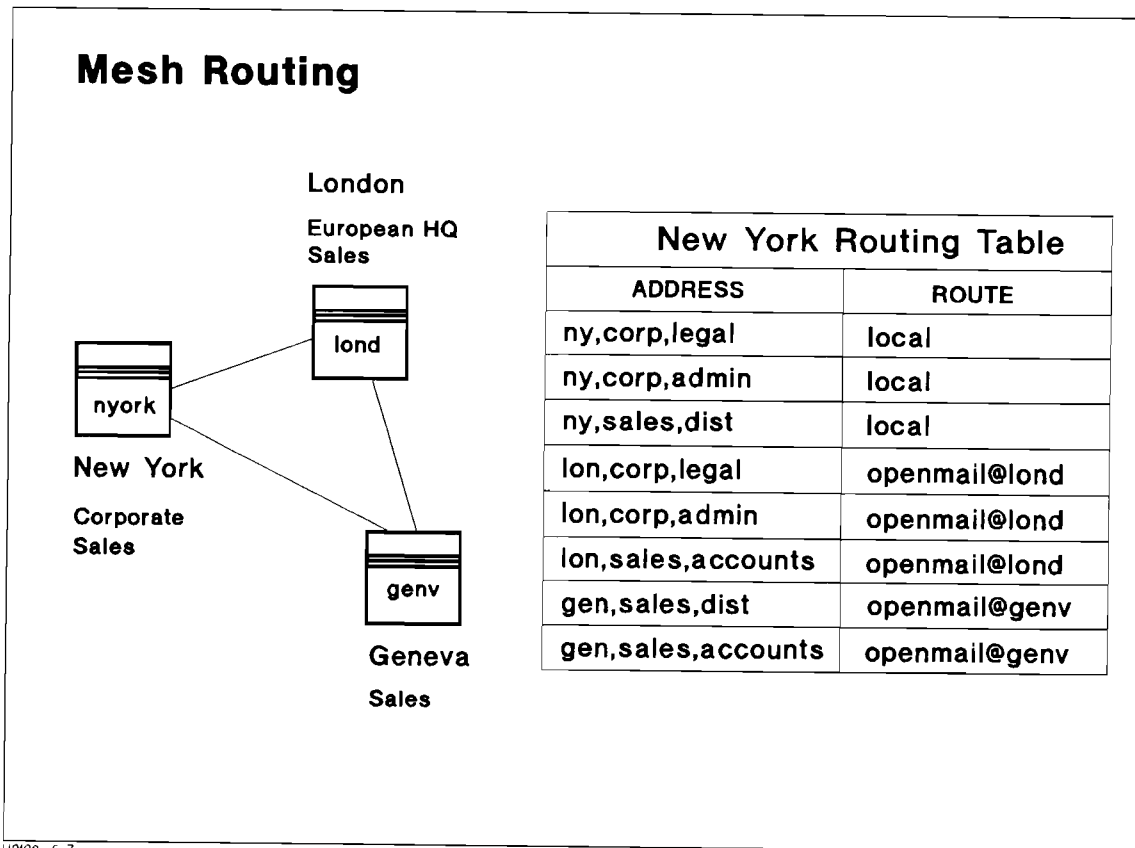
- You may have to use a mix of both ARPA and UUCP addressing depending on your communication lines, though this is not recommended.

Transition

Look at routing strategies that can be used with OpenMail . . .

Module 6 — Planning a Network

6-7. Mesh Routing



- Using Mesh (or “straight-to-destination”) Routing, each system has a list of every mailnode in the network.
- In the scenario, New York, London, and Geneva are all directly connected by X.25 links.
- Mesh enables all of these systems to route messages directly to each other.

6-7. Mesh Routing

Instructor Notes

Purpose

Explain the advantages and disadvantages of Mesh (straight-to-destination) Routing.

Key Points

Routing Strategies

- There are 3 types of routing you can use in the OpenMail network:
 - Mesh Routing (this topic)
 - Hub Routing (next topic)
 - A mix of both within the same network

Mesh Routing

- Advantage: easy to use
- Disadvantage: since OpenMail requires the recipient's mailnode to be present in the Routing Table of the receiving computer — changing or adding a mailnode creates a major updating task throughout the network. Every system requiring access to that mailnode must alter its Routing Table.
- You can partly overcome the disadvantage by using wildcards to make the routes to mailnodes less specific; you can then add departments or divisions without having to update Routing Tables.

Transition

Look at using wildcards in Routing Tables . . .

Module 6 — Planning a Network

6-8. Using Wildcards

Using Wildcards

Without Wildcards

New York Routing Table	
ADDRESS	ROUTE
ny,corp,legal	local
ny,corp,admin	local
ny,sales,dist	local
lon,corp,legal	openmail@lond
lon,corp,admin	openmail@lond
lon,sales,accounts	openmail@lond
gen,sales,dist	openmail@genv
gen,sales,accounts	openmail@genv

Using Wildcards

New York Routing Table	
ADDRESS	ROUTE
ny,corp,legal	local
ny,corp,admin	local
ny,sales,dist	local
lon,*,*,*	openmail@lond
gen,sales,*,*	openmail@genv

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A wildcard is an asterisk, used to replace:

- Whole mailnodes (*,*,*,*)
- Part of a mailnode (lon,sales,*,* or lon,*,*,*)
- Part of a mailnode unit (lo*,*,*,*)

The first unit of a mailnode is the most significant; the last is the least significant. If you wildcard one unit, any less significant units must also be wildcarded. For example:

lon,*,*,* is valid

,,*,admin is invalid

Setting up a wildcarded route for *,*,*,* routes mail addressed to all mailnodes for which you haven't explicitly configured a route to the system specified. For example:

,,*,* openmail@lond

sends mail addressed to any mailnode that doesn't have a route configured for it, to London.

6-8. Using Wildcards

Instructor Notes

Purpose

Explain how wildcards can be used to reduce the Routing Table maintenance overhead.

Key Points

- The New York Routing Table on the left carries all mailnodes for the London and Geneva system.

Wildcards can reduce the maintenance overhead, as shown in the Routing Table on the right.

- For example: `lon,corp,*,* openmail@lond`

would cover:

`lon,corp,legal` and `lon,corp,admin`

- For example: `lon,*,*,* openmail@lond`

does cover:

`lon,corp,legal` and `lon,corp,admin` and `lon,sales,accounts`

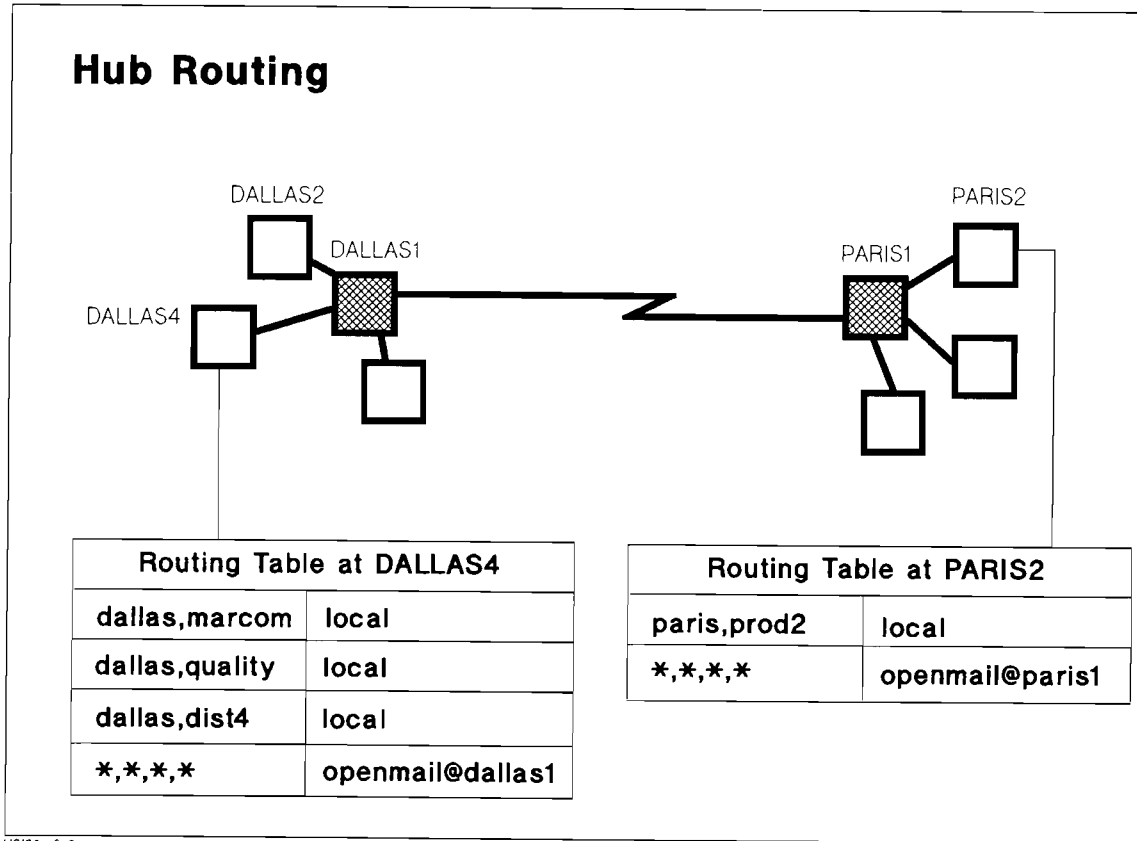
- Advantage: with wildcards, the London site could add new mailnodes without the New York site having to update its Routing Table.
- In the slide, local mailnodes are not shown wildcarded as they don't have to be entered in the Routing Table.

Transition

Look at an alternative routing strategy - hub routing ...

Module 6 — Planning a Network

6-9. Hub Routing



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The slide shows another example company which uses hub routing, with one site in Dallas, Texas (with 4 computers) and another site in Paris, France (with 4 computers), which uses hub routing. Users at both sites communicate with each other regularly using OpenMail.

Hub Systems (DALLAS1 and PARIS1 on the slide) hold all the routes for all the mailnodes at the same site and the route to the hub system of the other site.

Leaf Nodes (for example, DALLAS4 and PARIS 2) only hold a route to the nearest hub system.

The Routing Table at DALLAS4 shows all remote mailnodes are wildcarded - including those at DALLAS2, DALLAS1, and all PARIS computers - and are accessed via the hub system, DALLAS1.

Similarly, all remote mailnodes to the PARIS2 system are accessed via the PARIS1 hub.

6-9. Hub Routing

Instructor Notes

Purpose

Explain the advantages and disadvantages of hub routing.

Key Points

- A network can be built completely on the hub routing principle as this example shows.

Here two sites, both with four computers, are linked so that users on all computers can communicate through one computer, the hub, at each site.

- The shaded areas are **hub systems** for each site. They hold all the routes for all mailnodes at the same site and the route to the hub system at the other site.

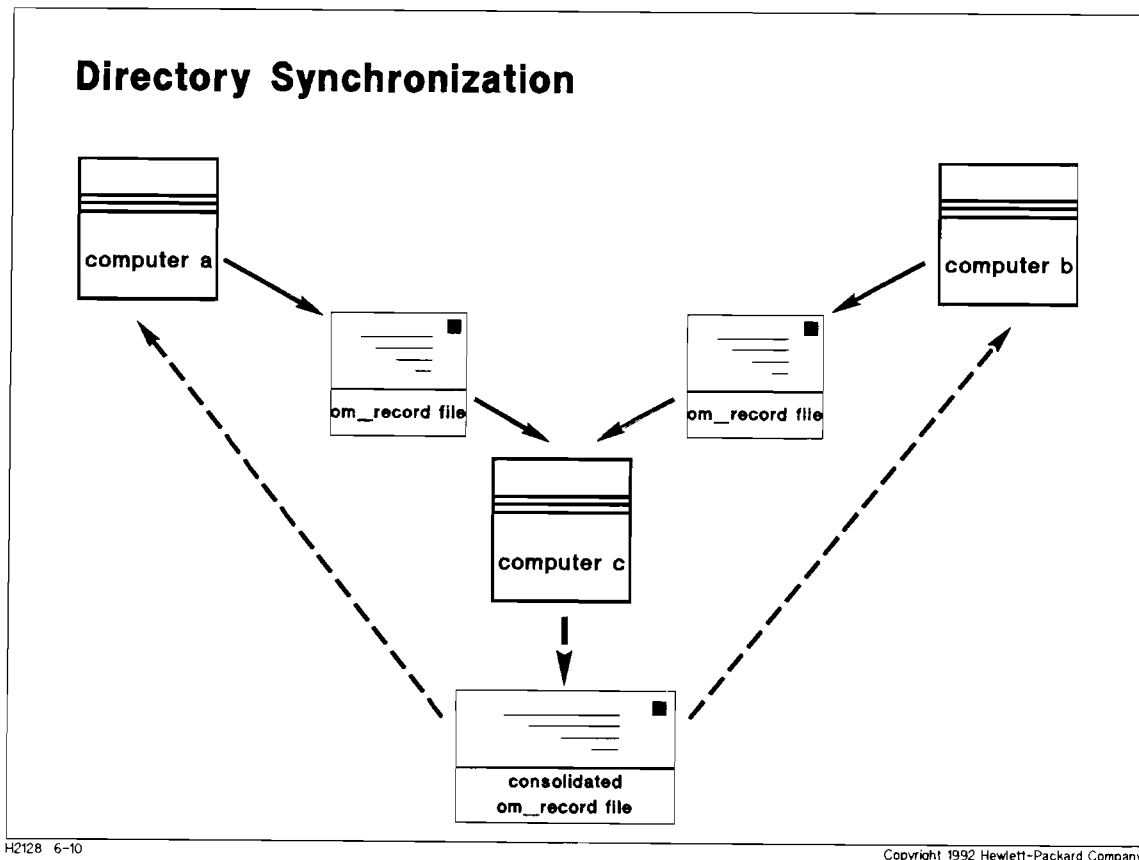
The other computers at each site, known as **leaf nodes** only hold a route to the nearest hub system.

- Advantage: using Hub Routing, only two computers out of the eight hold large Routing Tables. This makes updating the Routing Tables easy.
- Advantage: you don't need direct connections between every system in the network.
- Notice this example uses a mailnode naming convention utilizing just 2 organizational units.

Transition

Look at building a network-wide Directory ...

6-10. Directory Synchronization



Local users entered during configuration of local system

Remote users entered using the Directory update file `om_record`

Updating each local Directory, to contain the names and mailnodes of users on the remote OpenMail systems, enables users to:

- Address remote users by name only (instead of having to know the full address, including mailnode).
- Enter as much of a name as they know (for example, a last name), and let OpenMail list similar names to choose from.
- Enter a full name and mailnode, and let OpenMail supply instant feedback whether it is incorrect.

For the Administrator, it also reduces the likelihood of users sending out messages to incorrect addresses, that cannot be delivered and so require manual intervention to redirect them.

Deciding how many - if any - remote users to add to each Directory in the network is basically a judgement of ease-of-use against administrative overhead.

6-10. Directory Synchronization

Instructor Notes

Purpose

Explain the value of keeping up-to-date Directories of remote users.

Key Points

- Remote users — users configured on other systems in the network — need to be configured manually into your system's Directory, if you choose to do this.
- Your planning activity should include:
 - Getting to know the Administrators of other OpenMail systems
 - Developing procedures for exchanging update information, covering such issues as:
 - will these be collected centrally for distribution?
 - how often will updates be sent out — daily, once a week, every other week?
 - Liaising with the Network Administrator so OpenMail Directory updates can be coordinated with the distribution of network directories.
- Local configuration information is put in the `om_record` file, which can be sent to other systems to enable the Administrator there to easily add remote users to their Directory.
- Here's an update routine you might set up: once you have configured your system, mail the `om_record` file to the person responsible for coordinating network updates.

If all OpenMail Administrators do this you should periodically receive consolidated updates from the coordinator. Of particular value to you will be the user name and mailnode details for updating your Directory.

This should be done every two weeks.

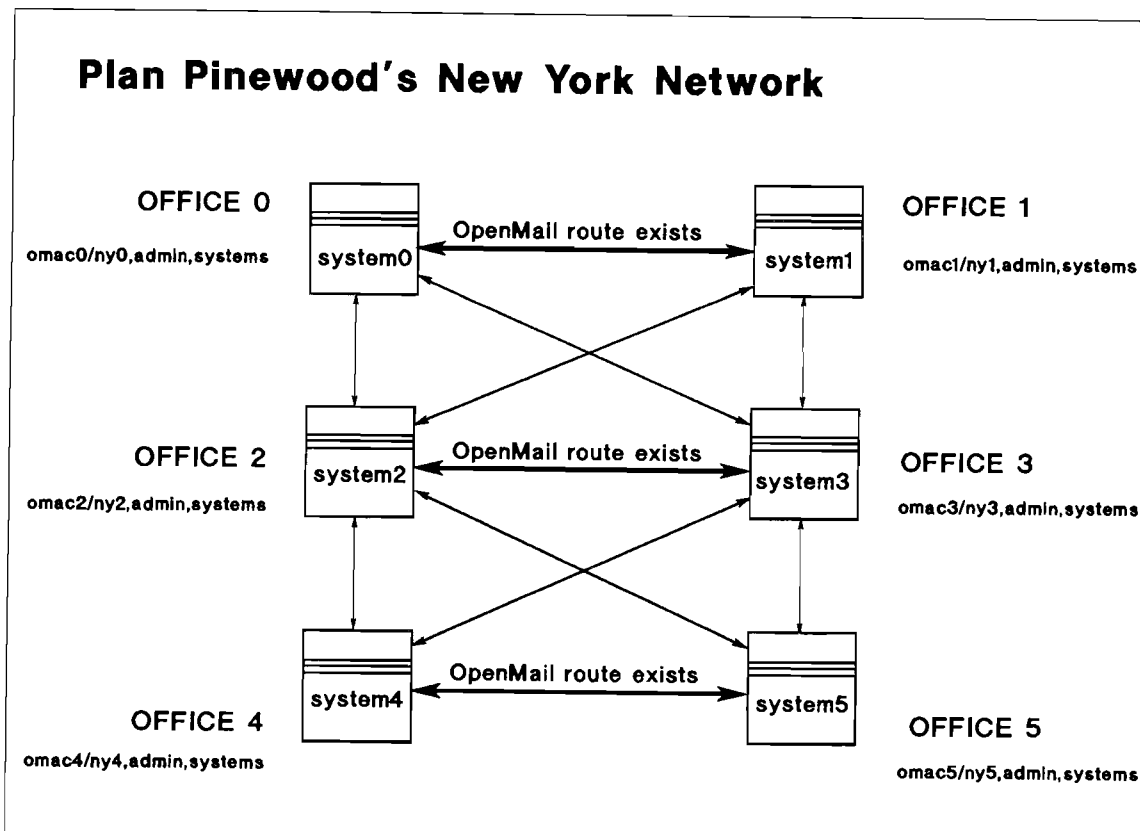
- You can use the Request Server to automate this task.

Transition

The introductions to a written exercise to complete Planning Sheets for network configuration . . .

Module 6 — Planning a Network

6-11. WRITTEN EXERCISE: Plan Pinewood's New York Network



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The slide shows Pinewood Inc's pilot systems at each of its New York sales offices. Each office has a system with OpenMail installed (the slide shows the node names). All links are X.25 lines, which typically use ARPA format Sendmail addressing. One route already exists from each system (shown on the slide).

In Module 4, you planned a single system pilot site. Here, you plan the network communications for your site by completing Planning Sheets for accessible remote mailnodes and the Routing Table.

This network is to be connected by almost total straight-to-destination routing, with most systems linking to most others directly. This means the following routes need to be set up on each system:

Sales Office	Routes mail to:
system0	systems 1, 2, and 3
system1	systems 0, 2, and 3
system2	systems 0, 1, 3, 4, and 5
system3	systems 0, 1, 2, 4, and 5
system4	systems 2, 3, and 5
system5	systems 2, 3, and 4

Not all systems may be operational in the class network; the instructor will let you know.

Module 6 — Planning a Network

6-11. WRITTEN EXERCISE: Plan Pinewood's New York Network

Instructor Notes

Purpose

Introduce the network scenario prior to completing the mailnode Planning Sheet.

Key Points

- The slide shows the existing network and additional links required between computers.
- Use this information to first complete the Mailnode Planning Sheet, and then use that to help you complete the Routing Table Planning Sheet.
- The planning sheets will be used for reference when you configure the network in the next Lab, in the same way as you did when configuring a single system.
- If you have less than 6 systems in class, tell students how much of the network you will be implementing, detailing any necessary adjustments.
- If node names are other than shown on the slide, tell students what they are.
- Systems 0,1,4, and 5 each set up three routes; systems 2 and 3 need to set up five routes.
- Leave the slide displayed during the exercise.
- Go through answers to this Lab (6-10) before proceeding to the next Lab (6-11).

Transition

Complete the network's Mailnode Planning Sheet . . .

Module 6 — Planning a Network

6-11. WRITTEN EXERCISE: (Continued)

Enter the mailnodes for the New York system that you configured in Module 5, in the Planning Sheet, and then - after getting lists of mailnodes from your neighbors - enter mailnodes for the other systems that your system will route directly to.

Mailnode Planning Sheet

NY Sales Office	Function	Department	Mailnode
Office Number:	Administration	Systems	
Office Number:	Sales Support	Distribution	
Office Number:	Sales Support	Accounting	
Office Number:	Administration	Systems	
Office Number:	Sales Support	Distribution	
Office Number:	Sales Support	Accounting	
Office Number:	Administration	Systems	
Office Number:	Sales Support	Distribution	
Office Number:	Sales Support	Accounting	

Module 6 — Planning a Network

6-11. WRITTEN EXERCISE: (Continued)

Instructor Notes

Mailnode Planning Sheet

Suggested Answer (Sales Office 0)

NY Sales Office	Function	Department	Mailnode
Office Number: 1	Administration	Systems	ny1,admin,systems
Office Number: 1	Sales Support	Distribution	ny1,sales,dist
Office Number: 1	Sales Support	Accounting	ny1,sales,accounts
Office Number: 2	Administration	Systems	ny2,admin,systems
Office Number: 2	Sales Support	Distribution	ny2,sales,dist
Office Number: 2	Sales Support	Accounting	ny2,sales,accounts
Office Number: 3	Administration	Systems	ny3,admin,systems
Office Number: 3	Sales Support	Distribution	ny3,sales,dist
Office Number: 3	Sales Support	Accounting	ny3,sales,accounts

Transition

Complete the network's Routing Table Planning Sheet . . .

Module 6 — Planning a Network

6-11. WRITTEN EXERCISE: (Continued)

Instructor Notes

Routing Table Planning Sheet

Suggested Answer (Sales Office 0)

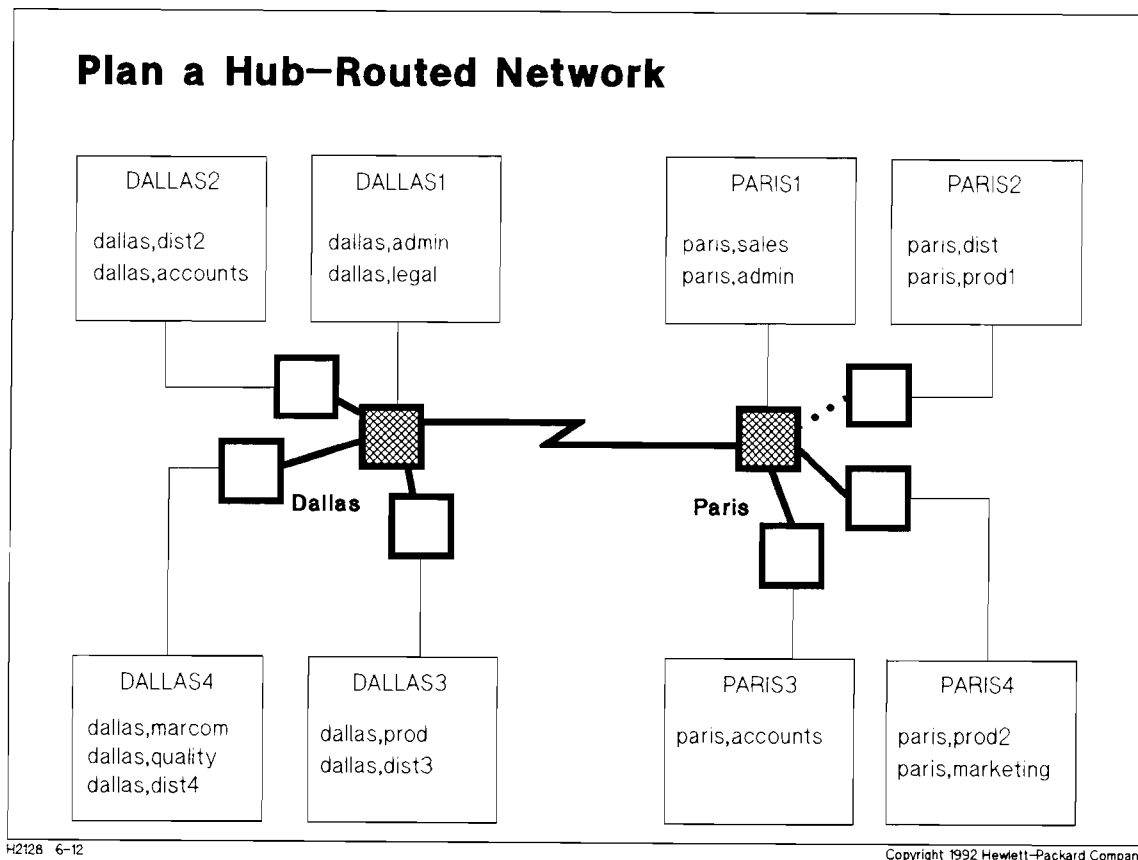
Address	Route
ny0,admin,systems	local
ny0,sales,dist	local
ny0,sales,accounts	local
ny1,*,*	openmail@system1
ny2,*,*	openmail@system2
ny3,*,*	openmail@system3

Transition

An introduction to another exercise to complete Routing Table Planning Sheets for a Hub Network ...

Module 6 — Planning a Network

6-12. WRITTEN EXERCISE: Plan a Hub-Routed Network



Treat the dial-up link for PARIS2 (dotted line) as a UUCP address, and the X.25 links (solid lines) as ARPA addresses. The Sendmail address format will vary according to the type of link. For this exercise, follow the format that has been used in the course so far.

ARPA format: *user@host*

UUCP format: *host[!host]!user*

6-12. WRITTEN EXERCISE: Plan a Hub-Routed Network

Instructor Notes

Purpose

Review network planning by completing Planning Sheets for a network based on hub routing.

Key Points

- This exercise builds on the example introduced earlier with two hub systems: Dallas and Paris.
- Local mailnodes are automatically stored in the routing table. You do not enter them.
- Remember *,*,*,* wildcards every route not otherwise explicitly routed.
- This is a good example of the implications of hub routing:
 - Little administration at Leaf Nodes in terms of updating mailnode information.
 - Essential to keep the central hub mailnode entries up-to-date.

Routing Table for PARIS1

- The example shows the restrictions of wildcarding. It would seem sensible to replace the full `paris,dist` and `paris,prod1` with the wildcarded version `paris,*`. However, you have to consider that `paris,*` would also relate to `paris,prod2` which has a completely different Sendmail Address. `paris,*` would confuse the system. Therefore, all the mailnodes beginning with `paris` must be entered into the Routing Table in full.

Routing Tables for PARIS2 and DALLAS2

- These are Routing Tables for Leaf Nodes.
- Wildcarding can be beneficial: all mail that is not local will go to the Hub System, and so the mailnode entry for all addresses that are not local to the leaf node can be completely wildcarded (*,*,*,*). When new mailnodes are added elsewhere in the network, Leaf Nodes will not need to configure these details.

Transition

Complete the Planning Sheets for the four systems: PARIS1, PARIS2, DALLAS1, DALLAS2 ...

Module 6 — Planning a Network

6-12. WRITTEN EXERCISE: (Continued)

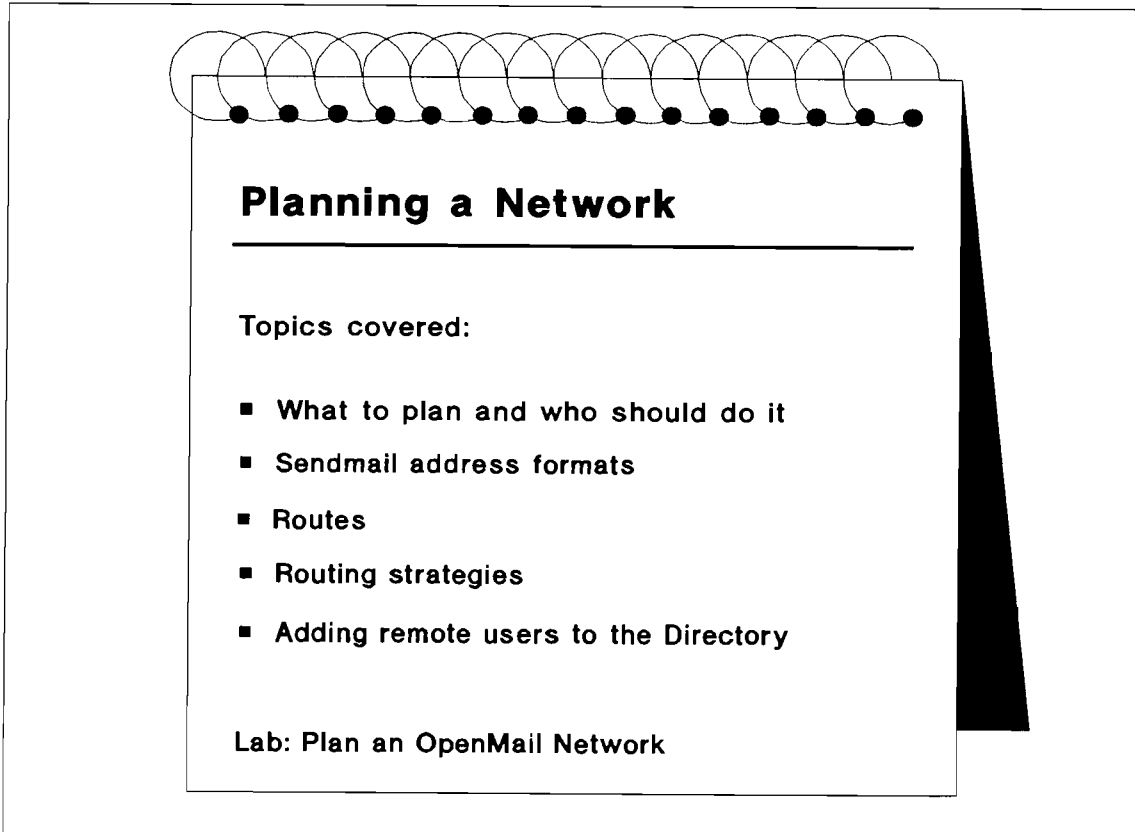
Instructor Notes

Suggested Answer

Routing Table for PARIS2		Routing Table for PARIS1	
Address	Route	Address	Route
paris,dist	local	paris,sales	local
paris,prod1	local	paris,admin	local
,,*,*	paris1!openmail	paris,dist	paris2!openmail
		paris,prod1	paris2!openmail
		paris,accounts	openmail@paris3
		paris,*,*,*	openmail@paris4
		dallas,*,*,*	openmail@dallas1

Routing Table for DALLAS1		Routing Table for DALLAS2	
Address	Route	Address	Route
dallas,admin	local	dallas,dist2	local
dallas,legal	local	dallas,accounts	local
dallas,dist2	openmail@dallas2	*,*,*,*	openmail@dallas1
dallas,accounts	openmail@dallas2		
dallas,dist3	openmail@dallas3		
dallas,prod	openmail@dallas3		
dallas,dist4	openmail@dallas4		
dallas,marcom	openmail@dallas4		
dallas,quality	openmail@dallas4		
paris,*,*,*	openmail@paris1		

6-13. Summary



Planning a Network

Topics covered:

- What to plan and who should do it
- Sendmail address formats
- Routes
- Routing strategies
- Adding remote users to the Directory

Lab: Plan an OpenMail Network

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Notes

Purpose

Review what has been covered in Module 6.

Key Points

- Liaison is required with other OpenMail Administrators and the Network Administrator.
- Sendmail Address is used to route mail to single and multiple remote users.
- There are different ARPA and UUCP Sendmail Address formats you may find in your network.
- There are 2 different routing strategies you can use in your network: mesh and hub.
- Wildcarding can reduce the routing overhead.
- Remote users should be added to the local Directory.

Transition

The next Module covers the configuration of an OpenMail network.

Module 6 — Planning a Network

Module 7 — Configuring a Network

Objectives

After spending 1 hour completing this Module, you will be able to:

- Use the Administration Interface to configure an OpenMail network
- Configure routes to other systems
- Test routes to other systems
- Configure remote users in your directory
- Keep other systems up to date with your directory

Module 7 — Configuring a Network

7-1. Adding Routes to Remote Mailnodes

Adding Routes to Remote Mailnodes

To get there:

- Main Menu
- ROUTES
- OPENMAIL ROUTES
- Action Menu
- Add Route

Remote Mailnode

[ignore X.400 parts of address]

Sendmail address of computer

Add **Action Menu** Help Exit

H2128 7-1

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- At the Main Menu select ROUTES
- From the Routes, service ACL, and gateway administration menu select OPENMAIL ROUTES

The Routing Table list is displayed.

- Press Action Menu and select the Add Route option.

The Add a route screen is displayed

- Complete two fields — the Remote Mailnode and the Sendmail address of the other system.

Ignore the part of the screen that asks for the external parts of the X.400 address, that is, do not make entries in the Organization, Country, Admin Domain, Private Domain, and X121 Address fields.

- Press Add to configure the route on your system.
- Repeat the process until all the routes for your system are entered.
- Press Exit three times to return to the Main Menu.

7-1. Adding Routes to Remote Mailnodes

Instructor Notes

Purpose

Explain how to add a route to a mailnode on a remote OpenMail system.

Key Points

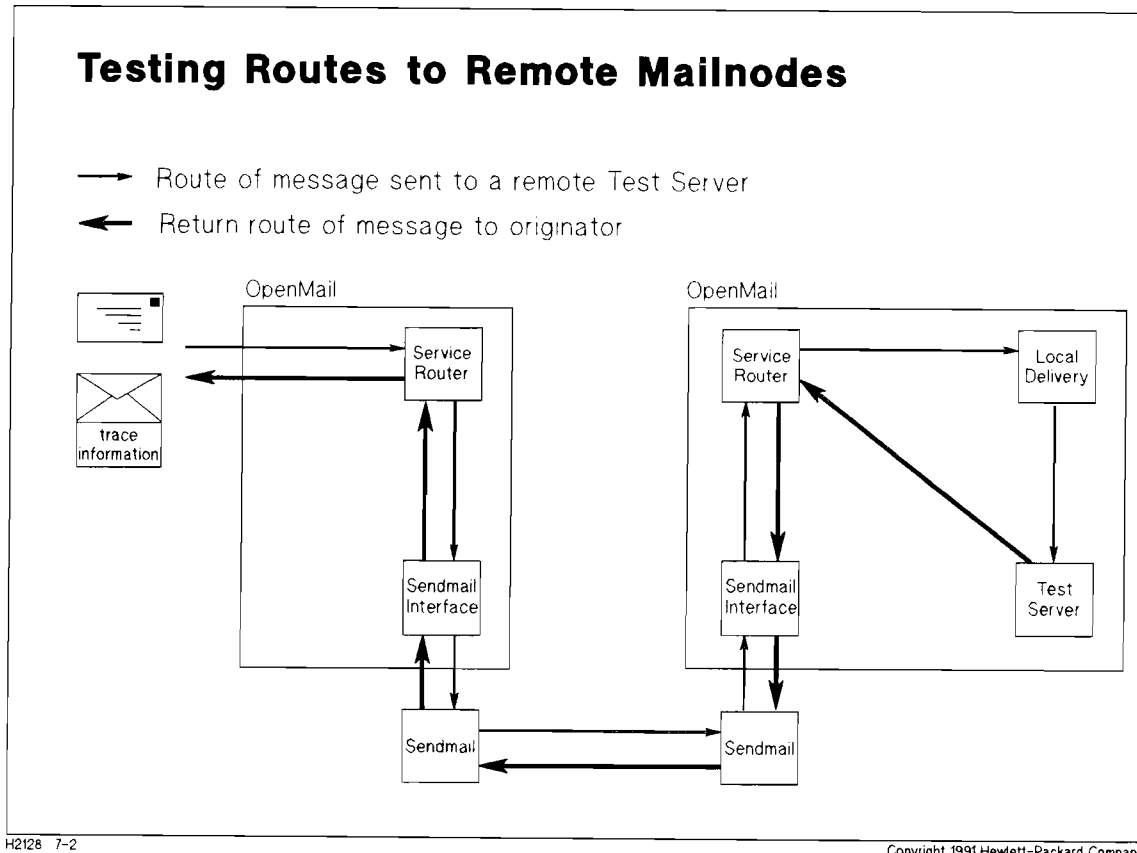
- This configuration step creates the Routing Table entries discussed in the previous Module.
- Go through this procedure for every remote mailnode in the network that you want to be able to mail to from your system.
- X.400 parts of address are only required when adding a route through an X.400 Interface (Module 16).

Transition

Look at ways of testing routes to remote mailnodes . . .

Module 7 — Configuring a Network

7-2. Testing Routes to Remote Mailnodes



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The Test Server enables the Administrator to send "loopback" messages to remote mailnodes to verify the routing you have set up, without having to involve anyone at the remote site.

To send a test message to a remote mailnode, address it to the user `+test` at that mailnode; for example:

```
T0: +test/lon,corp,admin
```

The message will be returned to the originator and, if that person has administrative capability, additional trace information will be attached to record the steps it took on its journey.

Each system the message has passed through will be indicated by the presence in the trace records of that system's Trace Mailnode, the name of the computer, the version of OpenMail and Unix on that system, and the time it passed through.

7-2. Testing Routes to Remote Mailnodes

Instructor Notes

Purpose

Explain how to test routes to remote systems.

Key Points

1. Ensure that datacomm links to remote systems are operational before trying to test whether a route exists between OpenMail on both systems.

Various commands let you do this: you can ping to the remote system, or else try to login to the remote system via ftp or rlogin. For example:

```
/etc/ping remotehostname
```

2. Use the Test Server to check the OpenMail route to the remote mailnode is operational.
3. Then, you are set to send messages to remote users.

Transition

Look at updating the Directory ...

7-3. Adding Remote Users to the Directory

Adding Remote Users to the Directory

To get there:

Main Menu
DIRECTORIES
ADD ENTRY

Name	Directory
Martin Hare	
Mailnode	
lon,corp,admin	

[ignore X.400 parts of address]

Attribute	Attribute Value

Add [] [] [] Action Menu [] Help Exit

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This screen is for interactively adding remote users to the Directory. However local configuration details, stored in the file `om_record`, can be sent to other systems for batch updating of their Directories.

How to mail out Directory updates and incorporate updates from another system:

1. Log into AdvanceMail on your terminal, and create a message from the Out Tray.
 2. Press **Include File/Doc** to include the directory update file in the message.
 3. Type the name of the file, `om_record`, which is in the Administrator's home directory.
 4. Press **Next Type** until **TEXT** is shown as file type, and press **Perform Include**
 5. Press **Done** to return to the Message screen, and mail the message in the usual way.
1. From the terminal user interface, highlight the message containing the directory updates.
 2. To read the directory updates, highlight the part containing the `om_record` file and press **Read**
 3. To save the file to Unix, open the message, highlight the part containing the file, and press **Save Item**
 4. Type a name for the file (*filename*), and press **Perform Save**. Exit AdvanceMail.
 5. To incorporate the updates in your Directory, type: `sh filename`

Module 7 — Configuring a Network

7-3. Adding Remote Users to the Directory

Instructor Notes

Purpose

Explain how to mail out and incorporate Directory update files.

Key Points

- You could add each remote user into your Directory using the Administration Interface (as shown on the slide) but it will be much easier to exchange Directory update files with other Administrators.

Transition

A Lab in which you configure a network ...

Module 7 — Configuring a Network

7-4. LAB: Configure an OpenMail Network

As OpenMail Administrator at a New York site, you have already configured your local system. Now that you are part of a network you must also enter the routes to mailnodes on other computers in the network, into your local system's configuration.

Refer to your Planning Sheets completed in Module 6 (6-10) in order to carry out this task. Refer back to the notes earlier in this Module for the procedures.

1. Configure routes

Configure a route to each remote mailnode listed on your Planning Sheet. One route is already configured!

2. Validate the route

Use the Test Server to check the routes to each remote mailnode on a neighboring system.

3. Send your directory updates to your neighbor

Create another message addressed to the Administrators of your neighboring systems.

Include your `om_record` file, which contains details of all the configuration changes made on your system, in the message.

Mail the message.

4. Save the directory update files received from your neighbors

When you receive a message from your neighbor, open it, and read the `om_record` file they sent you.

Save the file into your home directory.

5. Edit and apply the directory updates

Edit the Directory update file so it contains just details of remote users, and then apply the updates to your Directory.

7-4. LAB: Configure an OpenMail Network

Instructor Notes

Purpose

Configure the routes to other systems that were planned in Module 6.

Preview

1. Configure routes

Configure routes to all the remote mailnodes listed in the Planning Sheets completed in Module 6. A route is already configured on the class system to one mailnode on a neighboring system: this needs to be extended or modified to cover all mailnodes on that system.

2. Validate the route

Verify the route configured in Task 2. Use AdvanceMail to send a message to `+test` at the mailnodes on the neighboring systems and await the replies back into the In Tray. If the test fails, first check the destination mailnode is correct.

3. Send your directory updates to your neighbors

Use AdvanceMail to send details of local users to the neighbor. Send the whole file.

4. Save the directory update files received from your neighbors

Receive the file in AdvanceMail and save the `om_record` file received as a Unix file.

5. Edit and apply the directory updates

Edit the file (using a Unix editor such as `vi`) so it just contains commands to add users (eg `omaddu`), and then update the local Directory to cover all users in their network.

Notice the configuration commands in the files, which we look at in detail in Module 12.

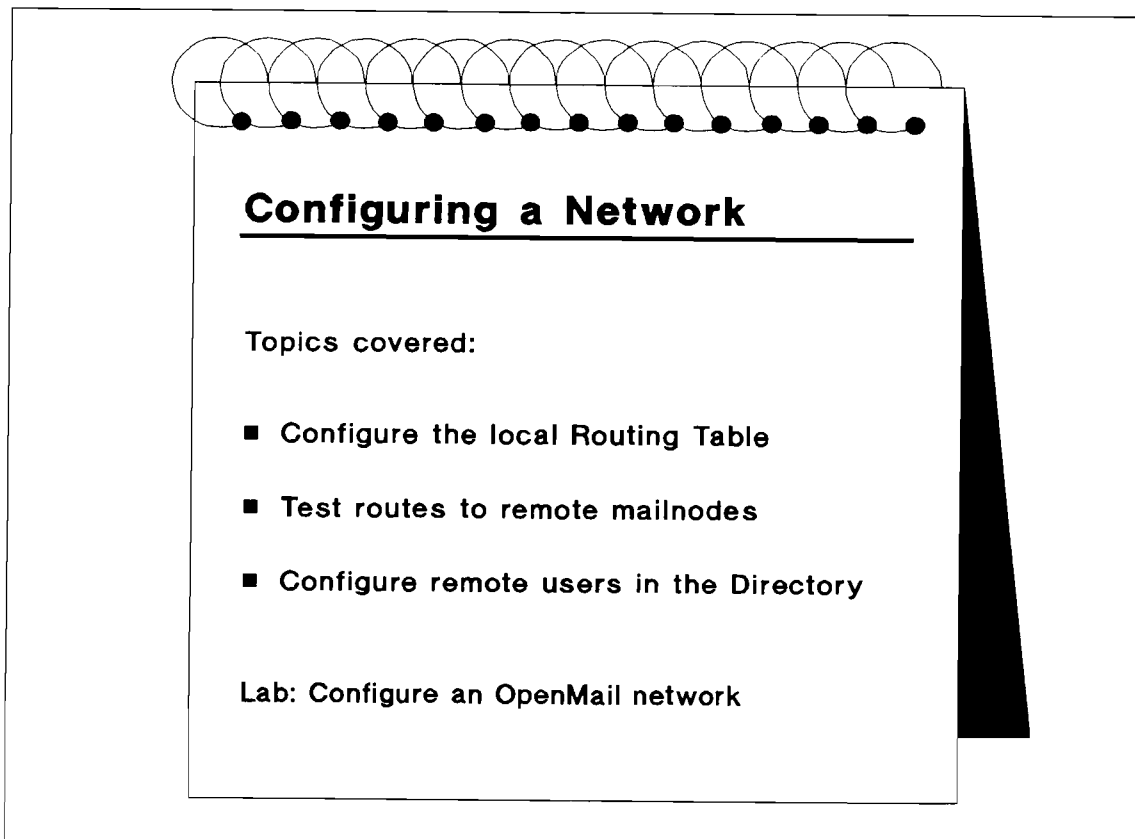
Procedures

1. Topic 7-1: `omadmin`, select `ROUTES`, select `OPENMAIL ROUTES`
2. Topic 7-1: `omadmin`, select `ROUTES`, select `OPENMAIL ROUTES`
3. Topic 7-2: `advmail`, send to `+test/mailnode`, `Mail`
4. Topic 7-3: `advmail`, `Include File`, `Mail`
5. Module 2 Lab: `advmail`, save file to Unix
6. Topic 7-3: `vi filename`, `sh filename`

Transition

To summarize ...

7-5. Summary



Configuring a Network

Topics covered:

- Configure the local Routing Table
- Test routes to remote mailnodes
- Configure remote users in the Directory

Lab: Configure an OpenMail network

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Notes

Module 7 — Configuring a Network

7-5. Summary

Instructor Notes

Purpose

Review what has been covered in Module 7.

Key Points

- This Module has given an overview of what is involved in the configuration of one system in an OpenMail network. Each system in the network would have to go through similar steps to fully configure the network.

Transition

The next Module looks at installing OpenMail.

Module 7 — Configuring a Network

Module 8 — Installing OpenMail

Objectives

After spending 1 hour 30 minutes completing this Module, you will be able to:

- Plan for a successful installation
- Install OpenMail
- Add modules to your installation, upgrade it, or re-install
- Understand the directory structure set up by installation
- Understand the security checks in place
- Optimize the performance of an installed system
- Understand the release history of OpenMail

Manual Reference

OpenMail Installation Instructions for the appropriate platform

Module 8 — Installing OpenMail

8-1. OpenMail Components

OpenMail Components

Mandatory Components:

OM-CORE OM-***CAT

Optional Software Components:

OM-LC OM-RC OM-X400 OM-UNIX OM-FAX OM-DESK

Optional Language Components:

OM-***PSS OM-***DOC OM-MAN

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OpenMail has these components:

OM-CORE	Core System	
OM-***CAT	Message catalogs	
OM-LC	Local Client Interface	To connect local user clients
OM-RC	Remote Client Interface	To connect remote user clients
OM-X400	X.400 Interface	To exchange mail with other X.400 mail systems
OM-UNIX	Unix Gateway	To exchange mail with other Unix mail systems
OM-FAX	Fax Gateway	To send faxes from OpenMail
OM-DESK	HP Desk Gateway	To exchange mail with HP Desk; only on HP-UX
OM-MAN	man pages	
OM-***DOC	Electronic copy of manuals	Provides print files for the manuals
OM-***PSS	Problem Solving System	

On the product media, the prefix *** is replaced by an abbreviation for the appropriate language (for example: OM-ENGCAT).

8-1. OpenMail Components

Instructor Notes

Purpose

Explain the modular component structure of OpenMail.

Key Points

- Decide on software components applicable to your installation. The list shows all the components available. You can install all, or single out particular components to install at this time.
- You can install multiple languages on the same system, in which case you can install as many *** components as you need, but only one set of man pages (in English).
- You need an HP LaserJet (or compatible) printer to print manuals from the files. This facility is not supplied with all versions.

Transition

Check how much disk space is required . . .

Module 8 — Installing OpenMail

8-2. Checking Disk Space Requirements

Checking Disk Space Requirements

Static Space Required:

Dynamic Space Required:

Component	<u>/usr/openmail</u>	<u>/users</u>
OM-CORE	12.7 Mb	0.5 Mb per user (minimum)
OM-RC	4.9 Mb	
OM-LC	2.6 Mb	
OM-DESK	3.3 Mb	
OM-X400	1.6 Mb	
OM-UNIX	0.7 Mb	
OM-FAX	0.6 Mb	
OM-***CAT	0.8 Mb	
OM-***PSS	0.7 Mb	
OM-MAN	0.3 Mb	

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Work out the total space required for your system and then make sure you have sufficient free disk space to install OpenMail:

1. Add up the static space required by the OpenMail components you will be using, to reach the requirement for **/usr**

You'll also need some space for the language components.

2. Add up the dynamic space required (for mail messages) in **/users**

Allow a minimum of 0.5 Mb for each configured user's mailbox.

3. Add up the total required by OpenMail.

Refer to the *Installation Instructions* for your platform for precise current requirements.

Purpose

Explain how to work out how much disk space is required by and available for OpenMail.

Key Points

- Make sure you have enough free disk space to install the OpenMail components you require.
- Log on to Unix and type `df`

The screen shows six columns, with information about the different filesystems in terms of:

- Kilobytes total
- Kilobytes used
- Kilobytes available
- Percentage of capacity currently in use
- Mounted on (names specific directories these figures relate to)

Check `avail` and `mounted on` columns to see how much space exists under the mounted directories.

- The range of static space requirements is indicated by these examples:
 - 26 Mbytes is maximum needed for an installation with all components and one language installed.
 - 15 Mbytes will be required for a minimum installation, with one language and no gateways.
- Size of each component can vary by up to 15% between platforms.

Transition

Check the various system requirements . . .

8-3. Checking System Requirements

Checking System Requirements

- Check operating system version is supported by OpenMail
- Calculate maximum number of users:
 - to be configured
 - likely to access OpenMail concurrently
- Ensure server/server and client/server transports are running
- Check sufficient memory is available

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Number of Users

You need to know the total number of users to be configured, and to estimate the likely number of *concurrent* users (that is, simultaneously active at any time).

The number of concurrent users provides the basis for the calculation of memory sizing and performance enhancement. Typically, the number of concurrent terminal users is 25% of configured users. If all users are PC users, the number of concurrent users can be set at 15% of configured users.

Transports

During installation OpenMail looks for server-server and server-client transport software, and installs itself to make use of what it finds. So, if appropriate, before you install OpenMail:

- Sendmail, the Berkeley service used to transport mail between servers, must be installed and initialized.
- LAN software, such as TCP/IP, used to connect PC clients or OfficeFax PC servers, must be installed and running.

8-3. Checking System Requirements

Instructor Notes

Purpose

Explain how to check the various system requirements of OpenMail.

Key Points

- Check operating system version number. Refer to appropriate *Installation Instructions*.
- System requirements - including memory - are covered under *Optimizing Performance* later in this Module. These can be considered before or immediately after installation.
- Check Sendmail is installed.

You require Sendmail if you're planning to implement an OpenMail network or Unix Gateway.

Transition

Review the installation procedure . . .

8-4. Installation Procedure

Installation Procedure

- 1 Check your system
- 2 Add the user "openmail"
- 3 Load the OpenMail software
- 4 Run the ominstall script
- 5 Verify the installation
- 6 Perform any component-dependent tasks
- 7 Start OpenMail

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The way in which installation is performed varies between platforms, but always follows these 7 steps:

1. Check the system: disk space and system requirements - as described in topics 8-2 and 8-3.
2. Add the user openmail: configure a login for user openmail and group hpoffice
3. Load OpenMail software: load the components you need from the appropriate media.
4. Install OpenMail software: run the ominstall script to customize OpenMail for your system.
5. Verify the installation: check the log file from ominstall and run an installation check.
6. Optionally, perform other tasks, such as configuring X.400 for OpenMail.
7. Start OpenMail daemons and check the latest Release Notes.

Module 8 — Installing OpenMail

8-4. Installation Procedure

Instructor Notes

Purpose

Explain the 7-Step Installation Procedure and describe what is involved in each step.

Key Points

- There are 7 main steps to installing OpenMail on any platform; even though the way steps are implemented often takes advantage of available local utilities.

For example, loading OpenMail software is always Step 3, but on HP-UX it is accomplished using `update`, on IBM AIX using `tar`, and on SCO UNIX using `custom`.

- The 3 main tasks carried out by installation are: Sendmail initialization, `openmail` user configuration, and OpenMail installation activities.
- You need to have root capability to carry out installation.
- Installation takes about 40 minutes.
- Requirements to reconfigure the Unix kernel, and to have a fixed UID of 28 for the user “`openmail`” and GID of 28 for group “`hpooffice`” are removed at release A.01.00.

Transition

Look at the extra steps required before adding, upgrading, or re-installing the installation . . .

8-5. Adding, Upgrading, or Re-Installing

Adding, Upgrading, or Re-Installing

- Check which components are installed
- Check the version of installed components
- Shut down OpenMail
- Back up data files
- Update the installation

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The installation may need to be amended in order to: upgrade to a later version, re-install after a file corruption, or add a component to those originally installed.

1. Check which components are already installed on your system by logging in as Root and typing:

```
ls -ld /system/OM*
```

2. Check the version number of each component and compare with the version number on the media you are going to use, by typing:

```
more /users/openmail/sys/version
```

3. Shut down OpenMail using the `omoff` command, and kill any daemons that are still running.

4. Only when upgrading - to safeguard users' data - back up existing data files using the `omstore` command.

5. Load component(s) to be re-installed, added or upgraded, following the Steps 3 through 7 of the initial installation procedure.

Purpose

Explain what is involved in amending the initial installation.

Version Numbers

- When checking version of installed components, compare version number displayed to version number on media. For example:

on screen: A.01.00

on media: A.01.00.a1

The first 5 alphanumeric characters must be the same. If not, you must re-install your existing components together with those you want to add, so they are all the same version level.

If version number comprises 7 alphanumeric characters, the last two characters indicate a patch level. Different patch levels can be mixed.

Removing OpenMail

Removing OpenMail from the system may be necessary in some instances, for instance, to start over with a clean installation. To do this:

1. Stop any OpenMail services that are running:

```
omoff -s all
```

2. List the OpenMail daemons running:

```
ps -ef | grep openmail
```

Then kill them, using “kill -15” to kill any remaining daemons.

3. Remove all OpenMail files, including users’ data, from the system:

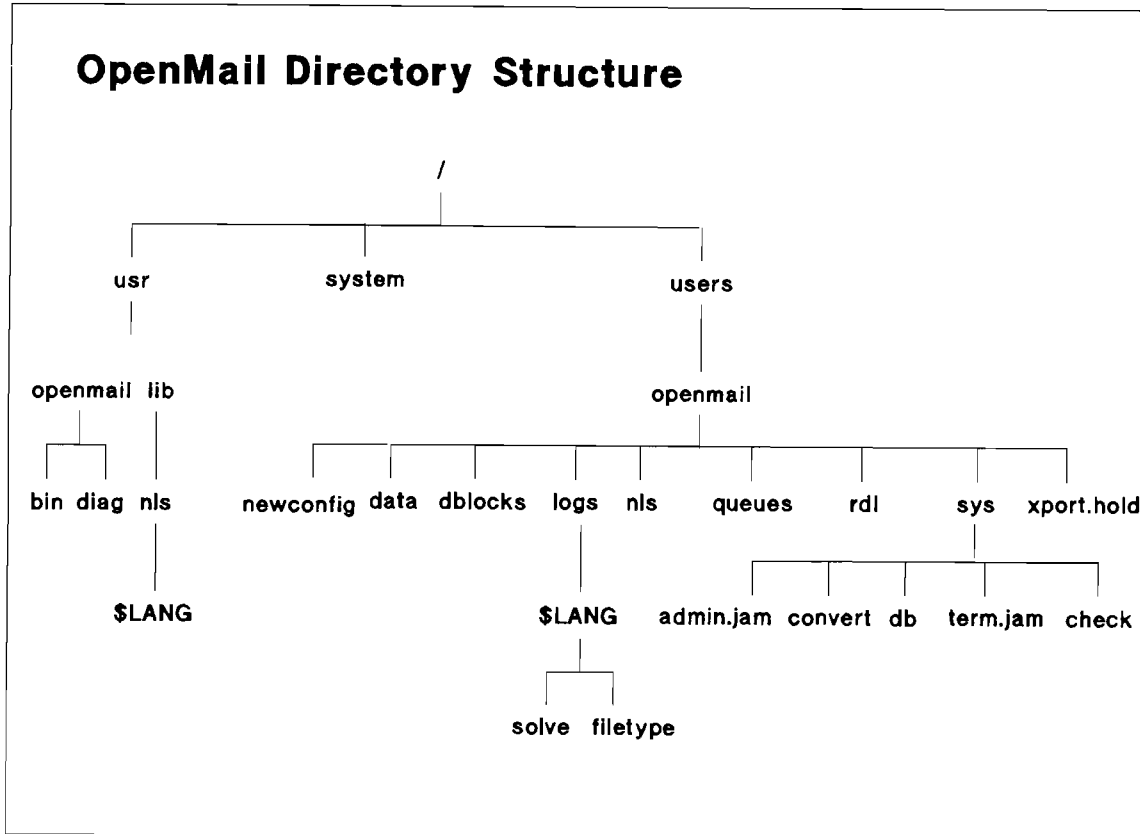
```
omreset -i
```

Transition

Look at the directories set up for OpenMail during installation . . .

Module 8 — Installing OpenMail

8-6. OpenMail Directory Structure



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<code>/usr/openmail/bin</code>	All OpenMail programs and commands.
<code>/usr/openmail/diag</code>	OpenMail diagnostic programs.
<code>/usr/lib/nls</code>	Language dependent data, such as message catalogs.
<code>/users/openmail</code>	Default root directory for OpenMail data, including:
<code>./data</code>	Messages in the system (only accessible by Root)
<code>./logs</code>	Log files for all parts of OpenMail
<code>./nls/\$LANG/filetype</code>	The list of supported filetypes and their codes
<code>./queues</code>	The message queues
<code>./sys/convert</code>	Definition of file conversions to be performed on mail
<code>./sys/db</code>	The db_vista database holding the Directory
<code>./sys/check</code>	The file lists checked during a Consistency Check.
<code>./newconfig</code>	The Release Notes for each version.

8-6. OpenMail Directory Structure

Instructor Notes

Purpose

Explain the location and function of the main OpenMail directories set up as part of installation.

Key Points

- Main directories are:

<code>/usr/openmail/bin</code>	holding OpenMail
<code>/users/openmail</code>	holding all data: messages, user data, queues, etc

- Other subdirectories in `/users/openmail` not listed in the Student Workbook are:

<code>./dblocks</code>	where <code>db_vista</code> holds database lock files
<code>./nls</code>	contains subdirectory for each set of language-dependent configuration files
<code>./rdl</code>	contains information for PDLs
<code>./sys/admin.jam</code>	holds terminal screen/keyboard configuration
<code>./sys/term.jam</code>	holds screen/keyboard configuration data for the terminal user interface
<code>./xport.hold</code>	holds messages that arrive through the Sendmail Interface when the Service Router is disabled

- A number of system files, mainly in `/etc` are modified during installation, including:

<code>/etc/passwd</code>	openmail user added
<code>/etc/group</code>	hpooffice group added
<code>/etc/shutdown</code>	Shutdown script added
<code>/etc/rc</code>	Startup script added
<code>/usr/lib/sendmail.cf</code>	Sendmail configuration file amended

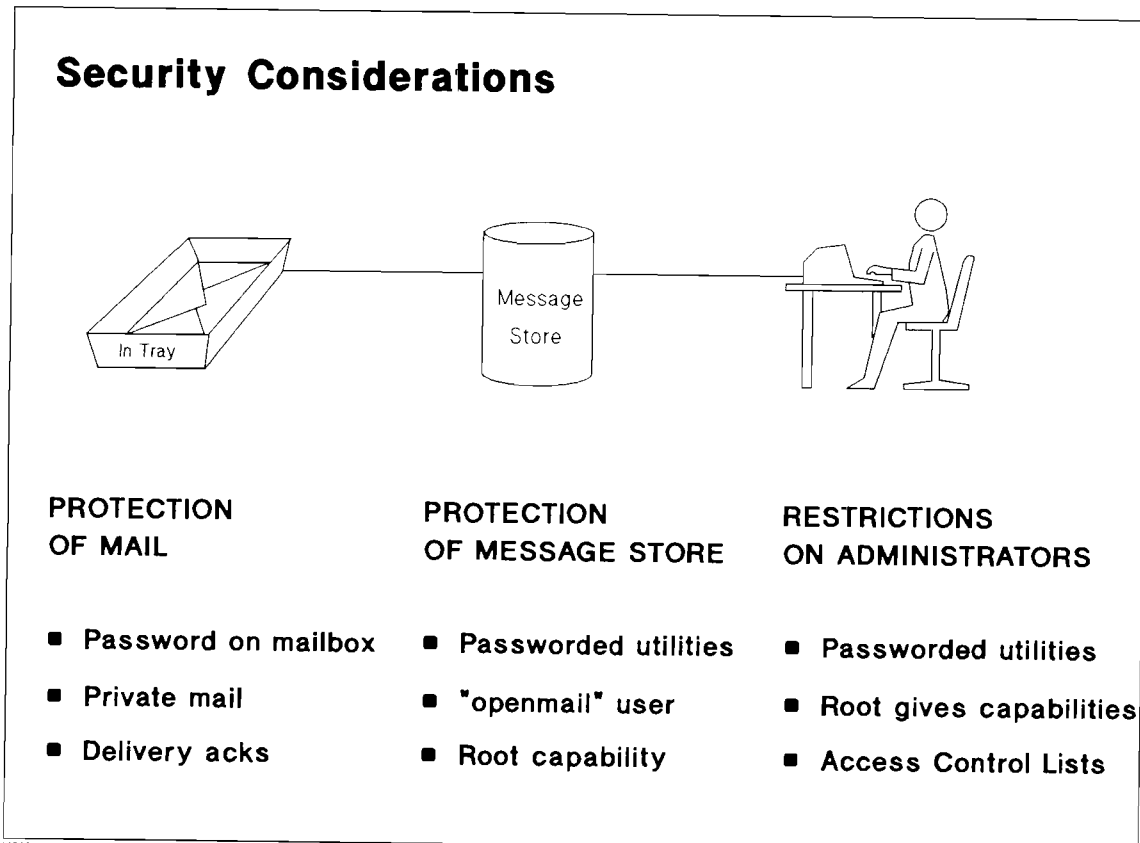
- Full file lists are supplied in the manual.

Transition

Look at the security features of OpenMail ...

Module 8 — Installing OpenMail

8-7. Security Considerations



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In general terms OpenMail is as secure as the Unix server. It can be run under Unix systems with up to the C2 class of trust (as defined by the US Department of Defense).

Protection of Users' Mail

Unauthorized access: password control on users' mailboxes (passwords held/transmitted encoded)
Sensitive mail: private mail only ever readable by addressee
Guarantee of delivery: acknowledgements prevent repudiation of delivery

Access to the Message Store

Access to message files: ownership restricted to the openmail user (who can't login interactively)
Location of message files: passworded utility required to locate constituent message files
Reading of message files: only readable by root

Restrictions on Administrators

Capabilities restricted:

- root assigns standard administration capabilities
- passwords needed to use utilities that access the Message Store
- Access Control Lists limit capabilities to delegated users

Purpose

Explain the security features that prevent unauthorized access to potentially sensitive mail.

Key Points

- Passworded utilities giving access to Message Store are `omqdump` and `omcontain` (covered in Module 12).

These are provided for advanced system maintenance, and should be restricted to competent and trusted individuals (for example, root).

- Access Control Lists (ACLs) allow administration and use of Openmail services to be restricted to specified individuals or groups (covered in Module 12).
- OpenMail is only as secure as your Unix system!

To retain maximum security:

- Restrict users with access to root capability
- Don't configure root as an OpenMail user
- Don't allow any users other than the `openmail` user to belong to the `hpooffice` group
- Don't change the status of the `openmail` user so that it can create a shell.

Transition

Look at optimizing the performance of your OpenMail system ...

8-8. Optimizing Performance

Optimizing Performance

Disk Partitioning	/users/openmail/data on separate drive(s)
Memory	6 Mb + 0.5 Mb per concurrent terminal 0.25 Mb per continuously-connected client 0.45 Mb per batch-connecting client
Swap Space	5 Mb + 0.8 Mb per concurrent terminal + 0.6 Mb per remote client
Usage	<ul style="list-style-type: none">■ Use batch not continuous client connection■ Schedule batch mail transfers out of peak hours■ Stagger batch transfers across peak hours■ Only perform batch transfers once/twice day

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A large number of considerations can affect the performance of OpenMail, including:

- Disk space and number of disks
- File placement and disk partitioning
- Memory resource
- Percentage of users logged on concurrently
- Each user's workload
- Message size and number of messages sent/received
- Use of gateways

The signs of non-optimal performance are likely to be detected from:

Disk Access:	Much higher accessing of one disk
Memory:	Frequent swapping
Swap Space:	Run out of user sessions
Kernel:	Kernel error messages

Purpose

Explain ways to tune the system to optimize the performance of OpenMail.

Key Points

- These considerations are for the performance of OpenMail alone - interaction with other applications and network software on a system may make these more or less effective.
- Performance measurement is a science - figures given here should be taken as guides only.
- Disk partitioning is particularly useful on systems with a large number of concurrent users (say, 20+).

It is accomplished by allocating the directory `/users/openmail/data`, which contains the frequently accessed message store, to a less-used drive. You can do this by creating a partition on the separate drive and then mounting this partition onto `/users/openmail/data`

Partitioning can be done before installation, or after providing `/users/openmail/data` is still empty.

- Disk splitting is useful on systems with large Message Stores and/or large numbers of users.

It is accomplished by splitting `/users/openmail/data` over multiple disks, using symbolic linking. This can be done before or after installation.

- Increasing base memory provision above 5 Mb - up to about 12 Mb - can benefit performance.
- PC clients can improve their mail transfer performance by:
 - Only downloading files they can read (i.e. not Lotus 1-2-3 files if they don't have 1-2-3)
 - Only converting files they are likely to need to edit
 - Not downloading large distribution lists
 - Not leaving (via filters) a large number of messages in the server In Tray

Transition

Look at the release history of OpenMail versions . . .

Module 8 — Installing OpenMail

8-9. Version History

Version History

A.00.00	Original release	HP-UX 3.1, 7.0 SCO 3.2.1, 3.2.2
A.00.01	First enhancement release	HP-UX 7.0
A.00.02	Bug fix release	DEC ULTRIX V4.1 HP-UX 7.0, 8.0 IBM AIX 3.01.0003 SCO UNIX 3.2.2
A.00.03	Bug fix release	Sequent Dynix/ptx V.1.2.4
A.01.00	Second enhancement release	HP-UX 8.0 9.0 IBM AIX 3.2.0000

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A.00.00 Original release

A.00.01 First enhancement release:

- X.400: enhanced GOSIP 84 conformance
- Integration: file converter integration (e.g. KEYpak)
- Mail services: fax gateway
- Clients: NewWave Mail, LM/X and Sockets connections

A.00.02 Bug fix release

A.00.03 Bug fix release

A.01.00 Second enhancement release:

- X.400: full GOSIP 84 conformance
- Administration: audit logging, batch mail printing
- Integration: UAL application program interface and Request Server
- Directories: support for multiple, attributes, and search algorithms
- Mail services: deferred mailing and auto-actions
- Security: Access Control Lists

Purpose

Explain the current version history, highlighting enhancements released and platforms supported.

Release Dates

- A.00.00
 - HP-UX in October 1989 (codename “Genesis”)
 - SCO UNIX in July 1990

- A.00.01
 - HP-UX in October 1990 (codename “1.1”)

- A.00.02
 - HP-UX (A.00.02.00) in February 1991
 - SCO UNIX (A.00.02.a0) in July 1991
 - Base version ported to other platforms, such as:
 - DEC ULTRIX (A.00.02.b0) in July 1991
 - IBM AIX (A.00.02.c0) in May 1992

- A.00.03
 - Sequent Dynix/ptx only, in January 1992

- A.01.00
 - HP-UX (A.01.00.00) in August 1992 (codename “Atlantic”)
 - IBM AIX (A.01.00.c0) in August 1992

For details of other ports see the current datasheet.

Transition

A Lab in which you install OpenMail . . .

Module 8 — Installing OpenMail

8-10. LAB: Install OpenMail

As directed by your Instructor, either install OpenMail yourself or watch it being installed, following the specific procedure for your platform in the appropriate *Installation Instructions* that the Instructor will hand out.

Module 8 — Installing OpenMail

8-10. LAB: Install OpenMail

Instructor Notes

Purpose

Install OpenMail on a version of Unix appropriate to the class.

Preparation

- This Lab will take about 40 minutes - longer if there are any problems to resolve. However it is a very valuable experience, as is any necessary problem-resolution!
- Provide a copy of the *Installation Instructions* for each student, or photocopy the relevant pages.
- If the installation instructions direct you to re-configure X.400, we suggest you omit this step since it will require you to explain an amount of X.400 terminology which isn't covered until Module 14. You can return to this step after covering that material, if you wish.

Each Student Installs

- If each pair of students has their own system in class, let them all install OpenMail, following the instructions in the appropriate manual.

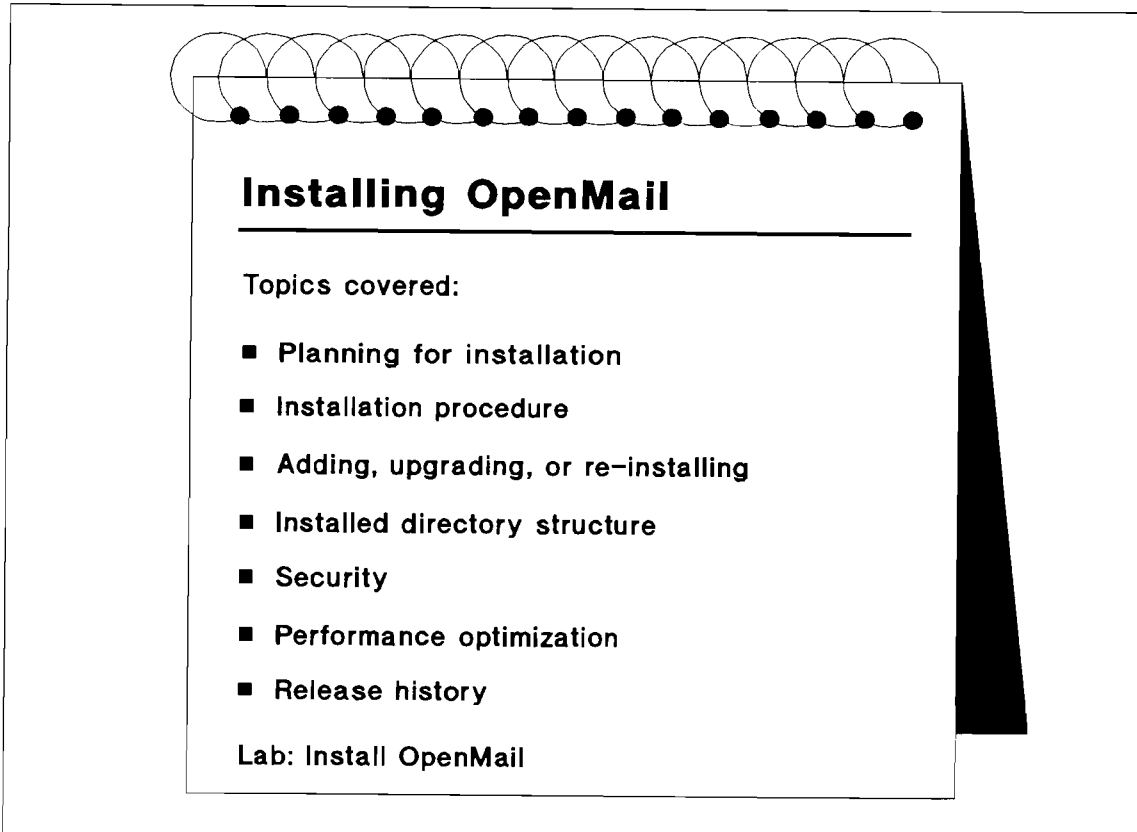
One Person Installs

- If using one server for the class (with the Lab Set-Up Software), it's advisable to install on another system, in case there are any problems with the re-installation that would hold-up the rest of the course.
- Use a Unix workstation or 80386 system. If possible, connect an overhead viewer or large screen to the system so it can be seen easily.
- Gather students in a group and, following the procedure in the manual, either get a volunteer to install OpenMail while everyone watches and you talk through what is happening.

Transition

To summarize . . .

8-11. Summary



Installing OpenMail

Topics covered:

- Planning for installation
- Installation procedure
- Adding, upgrading, or re-installing
- Installed directory structure
- Security
- Performance optimization
- Release history

Lab: Install OpenMail

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Notes

Module 8 — Installing OpenMail

8-11. Summary

Instructor Notes

Purpose

Review what has been covered in Module 8.

Key Points

- This module has shown clearly what is involved in the installation process.
- Specific installation procedures are described fully in the OpenMail *Installation Instructions*.

Transition

The next Module covers running the different services that make mail distribution possible in OpenMail.

Module 8 — Installing OpenMail

Module 9 — Operating the Server

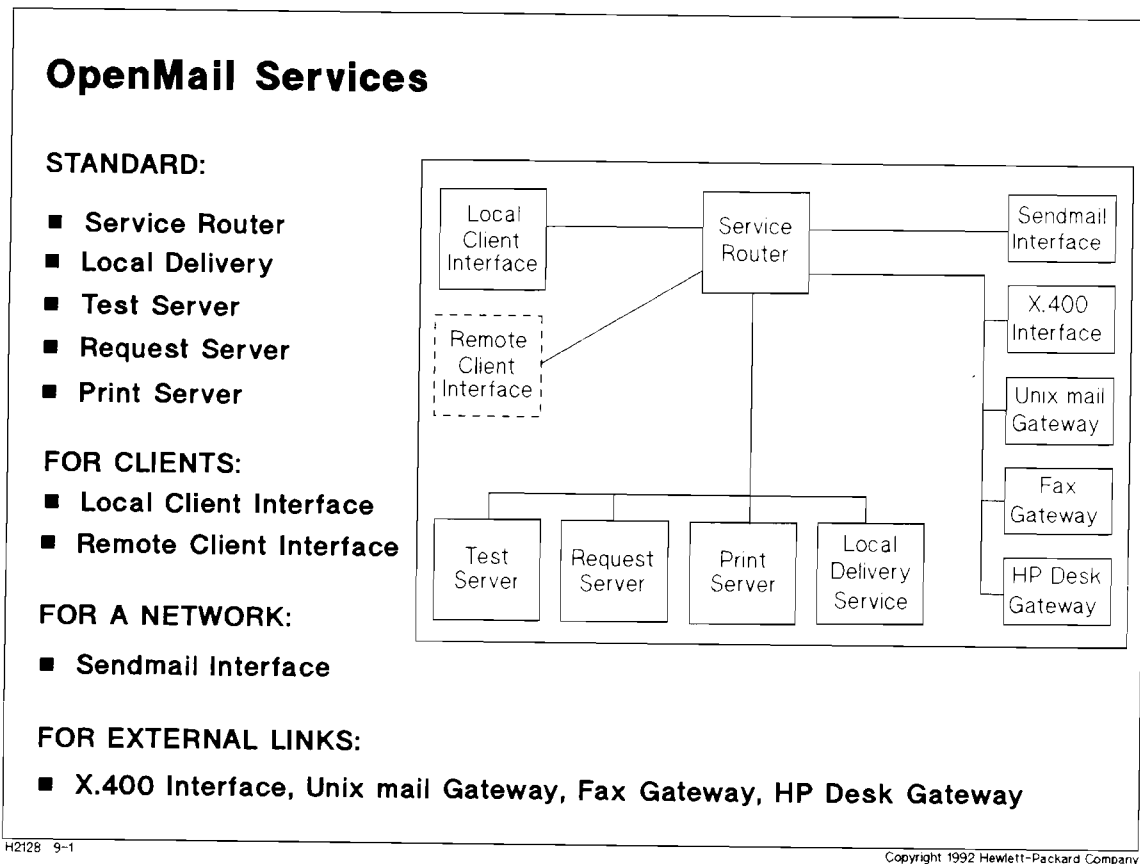
Objectives

After spending 40 minutes completing this Module, you will be able to:

- Describe what services and daemons are involved in OpenMail operations
- Start OpenMail services
- Stop OpenMail services
- Display a Detailed Status Report
- Use the OpenMail command interface to perform operations and configuration tasks

Module 9 — Operating the Server

9-1. OpenMail Services



- **Service Router:** examines Routing Table to find how message should be distributed. For local user, passes to Local Delivery; for remote users, to Sendmail Interface with route from Routing Table.
- **Local Delivery:** delivers mail to local users' In Trays and resolves user naming problems.
- **Test Server:** used to send test messages to other OpenMail systems, trace the message and produce records for problem diagnosis.
- **Request Server:** accepts and actions mailed requests.
- **Print Server:** prints messages for clients.
- **Local Clients:** interface to local clients, allowing them to connect, send, receive messages.
- **Remote Clients:** interface to remote clients, allowing them to connect, send, receive messages.
- **Sendmail Interface:** passes messages to/from Sendmail.
- **X.400 Interface, Unix mail, Fax, and HP Desk Gateways:** convert the format of messages so they can be understood by other systems.

9-1. OpenMail Services

Instructor Notes

Purpose

List the services that run in OpenMail to distribute mail and describe them.

Key Points

- Relate the Services to the way mail delivery occurs (as covered in Module 3).
- Only the services for the components that were installed will be listed as available.

Transition

Look at the daemons associated with each service ...



Module 9 — Operating the Server

9-2. Service Daemons

Service Daemons

Service Router	service.router	xport.in			
Local Delivery	local.delivery	error.manager			
Sendmail Interface	xport.out	xport.in			
X.400 Interface	x400.in	x400.out	xport.out	xport.in	
Unix Mail Gateway	unix.in	unix.out			
HP Desk Gateway	desk.in	desk.out	desk.mon	desklnk.out	mon3000
Fax Gateway	fax.connect	faxnetd			
Print Server	print.server				
Request Server	req.server				
Test Server	test.server				
OpenMail startup	advmail.mon	advmail.nmpd	advmail.ntwd	advmail.sckd	
	omlicmon	omdbmon			

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- The daemons associated with each service are created when the service is started up.
- No daemons are created when the Local or Remote Client Interfaces are started.
- If the Remote Client Interface is installed, some Monitor daemons will also be running: **advmail.sckd** for Berkeley Sockets connections, **advmail.nmpd** for LM/X Named Pipes connections, **advmail.ntwd** for Netware SPX/IPX, and **advmail.mon** for NetIPC connections.
- The Database Monitor (**omdbmon**) and the Licence Monitor (**omlicmon**) are started at system boot time and killed when the system is shutdown.
- The following processes only run if invoked by Sendmail or X.400: **xport.in** and **unix.in**
- The **faxnetd** process only runs if the Fax Gateway is installed for LAN connections, and the **fax.connect** process is only started if the Fax Gateway is installed for serial connections.

9-2. Service Daemons

Instructor Notes

Purpose

Explain the daemons that are started by OpenMail services.

Key Points

- `omdbmon`, `omlicmon` and the Remote Client Monitors (`advmail.mon`, `advmail.nmpd`, `advmail.ntwd`, `advmail.sckd`) are started from `/etc/omrc` which is in turn called by `/etc/rc` when the system is booted.
- All programs reside in `/usr/openmail/bin`

Transition

Look at starting and stopping services ...

Module 9 — Operating the Server

9-3. Starting and Stopping Services

Starting and Stopping Services

To get there:

- Main Menu
- SERVICES
- Action Menu
- Start Service(s)

Service	State	Time/Date	Usrs/Msgs
Service Router	Started	09.09.92	0
Local Delivery	Started	09.09.92	1
Unix Mail Gateway	Stopped	09.09.92	0
X400 Interface	Started	09.09.92	0
HPDesk Gateway	Stopped	09.09.92	0
Sendmail Interface	Started	09.09.92	0
Local Client Interface	Enabled	08:53	12
Remote Client Interface	Enabled	08:54	6
Test Server	Stopped	09.09.92	0
Fax Gateway	Disabled	09.09.92	0

Select One Select All/None Refresh Screen Action Menu Exit

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1. From the Main Menu, select SERVICES

The Service administration screen appears, listing each service installed on the system.

2. Highlight and select a service, or a group of services, to start.
3. Press Action Menu and select Start Service(s)
4. Press Select

The screen is updated to show the new status of the service.

5. After starting services the first time, send a test message to users to ensure system is working.
6. Services are stopped in a similar way (you can specify a delay).

9-3. Starting and Stopping Services

Instructor Notes

Purpose

Describe what is involved in starting and stopping services.

Key Points

- Services need to be started to enable mail distribution
- They might need stopping:
 - If you want to restrict mail distribution to cheaper or less busy periods, such as at night
 - To stop messages being put on a queue for a particular service that isn't working.
 - To close down the User Interface and log users off the system prior to a system backup.

The Operate Services Screen

- Displays the date or time when each service started. For the current day, the time is shown eg 08:30. For a previous day, the date is shown eg: 09.09.92.
- Far right column shows the number of messages waiting to be handled by each OpenMail service, except **Terminal Users** and **PC Users** when the number of users is shown.
- When you stop a service, users are warned every 5 minutes that the service is about to be withdrawn (the default delay is 10 minutes). You can specify the number of minutes delay by using the **Set Stop Delay** option from the Action Menu.

Transition

Look at displaying a detailed report of the status of services ...

Module 9 — Operating the Server

9-4. Displaying a Detailed Service Status Report

Displaying a Detailed Service Status Report

To get there:

- Main Menu
- SERVICES
- Action Menu
- Detailed Status

Msg Ref	Sender	Type	Subject	Sent
1139	Mark Lauder/ny,	MSG	New staff	13:54
1141	Mark Lauder/ny,	MSG	Report	08:32

Refresh Screen Action Menu Page --> Exit

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View the status of OpenMail services, which can be any one of:

Stopped	Service is completely shut down.
Stopping	Service has been stopped but is not completely shut down yet.
Started	Service is running.
Starting	Service has just been started and is initializing.
Enabled	Service is starting but not yet running.
Aborted	Service has been forced to shut down due to error.
Part Aborted	Part of a service has been shut down due to error.

To display a detailed status report of the services:

1. From the Service administration screen, select the service you want more information on.
2. From the Action Menu, select Detailed Status and press Select
3. Status report lists messages waiting on that service's queue, giving: Msg Ref (Message Reference), Sender (sender's name/mailnode), and Msg Type (message type).
4. To display Subject and Sent date for each Msg Id, press Page -->

9-4. Displaying a Detailed Service Status Report

Instructor Notes

Purpose

Describe what a detailed Status Report is and how to access one.

Key Points

- The status report for any service contains the:
 - **Msg Id** (message identity)
 - **Sender** (sender's name and OpenMail address)
 - **Msg Type** (message type, which can be:
 - **msg** (ordinary message)
 - **ack** (acknowledgement for a previously sent message)
 - **ret** (message could not be delivered, being returned to sender)
 - **rep** (reply to a previously sent message)
 - **ndn** (non-delivery notification: message that could not be delivered)
- If you ask for Detailed Status on the Client Interfaces, the following information is supplied:
 - **User** (name of user)
 - **UxLogin** (user's Unix login)
 - **PID** (user's process identification)
 - **Login Time** (the time the user started using OpenMail).

Transition

Look at using commands to perform these operations tasks . . .

Module 9 — Operating the Server

9-5. Operations Commands

Operations Commands

<code>omon -s <service></code>	Start specified service(s)
<code>omoff -s <service></code>	Stop specified service(s)
<code>omstat -s</code>	Show system status
<code>omstat -q SMERR</code>	List rejected messages in SMERR queue
<code>omstat -u <service></code>	List current users of client interface(s)
<code>omsetsvc -e</code>	Display details of all services
<code>onsetsvc -r <service></code>	Display specified service details

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When specifying services in commands, such as `omon`, `omoff`, `omstat`, the following service names and abbreviations are valid:

Service Router	router, rtr
Local Delivery	local, ld
Local Client Interface	l-client
Remote Client Interface	r-client
Sendmail Interface	sendmail, smint
X.400 Interface	x400
Unix Gateway	unix
Fax Gateway	fax
HP Desk Gateway	hpdesk, desk
Print Server	print, prt
Request Server	request, req
Test Server	test

9-5. Operations Commands

Instructor Notes

Purpose

Introduce the most useful commands for day-to-day system operations.

Examples

- To stop both Client Interfaces in 5 minutes, outputting a warning message to local client users:

```
omoff -d5 -s l-client r-client
```

- To abort a user's session:

1. `omstat -q l-client`
2. Check the user's `pid`
3. `ps -ef`
4. `kill pid`

- To provide more detailed service status than the normal `omstat`:

```
omsetsvc -e
```

Lists details of all services, including the Process Id Number(s) of constituent daemons, which can be matched with a `ps` listing to identify the daemons.

```
omsetsvc -r service
```

Lists details of the specified service only.

Transition

Look at some of the most useful configuration commands ...

9-6. Configuration Commands

Configuration Commands

<code>omaddmn -m <mailnode></code>	Adds a local mailnode
<code>omaddu -n <name/mailnode></code>	Adds specified local user to the system
<code>omaddrt -m <mailnode></code>	Adds a route to a remote mailnode
<code>omdelu -n <name></code>	Deletes a local user from the system
<code>omshowmn</code>	Shows mailnodes configured on the local system

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Syntax Rules

- Names must be separated from mailnodes by: /
- Spaces must be substituted by underscores: de_la_Rue
- Some characters need to be escaped by quoting, such as wildcards ("ny,*,*") and queue names ("smintfc")
- Mailnodes are specified as follows in configuration commands:

```
firstname initials surname generation/orgunit1,orgunit2,orgunit3,orgunit4
```

Examples

```
omaddmn -m "berlin,finance,auditing"  
omaddu -n "Heidi Neuberg/berlin,finance,auditing" -u heidin -c ynn -p schloss  
omaddrt -m "berlin,finance,auditing" -q SMINTFC -u "openmail@berlin1"  
omdelu -u "Neuberg"
```

9-6. Configuration Commands

Instructor Notes

Purpose

Explain the use of the most useful commands for updating the configuration.

Key Points

- Some of these commands will have been in the `om_record` file we edited in the Lab in Module 7.

Transition

Look at a summary of the available commands . . .

Module 9 — Operating the Server

9-7. Command Interface Summary

These are all the OpenMail commands, grouped by function.

Mailnode configuration	omaddmn omdelmn ommodmn omshowmn	Add a local mailnode Delete a local mailnode Modify a local mailnode Show local mailnode(s)
Local User configuration	omaddu omdelu ommodu omshowu	Add a local user Delete a local user Modify a local user Show local user(s)
Directory configuration	omaddent omdelent omdiropt omlistdirs ommoddir ommodent omnewdir omremdir omsearch omshowatt omshowdir	Add an entry to Directory Delete an entry from Directory Optimize Directory access List available Directories Modify Directory details Modify Directory entry Create Directory Removes a Directory Search Directory Show supported Directory attributes Show Directory entries
Routing Table configuration	omaddrt omdelrt ommodrt omshowrt	Add a route to remote mailnode Delete route to remote mailnode Modify route to remote mailnode Show route(s) to remote mailnode(s)
PDL configuration	omaddpdl omdelpdl ommodpdl omshowpdl omaddpdl omdelpdl omshowpdl	Add a public dist list Delete a public dist list Modify a public dist list Show public dist list(s) Add a name to a PDL Delete a name from a PDL Show name(s) on a pdl
Unix Gateway configuration	omconfux omshowux	Configure a unix mail gateway Show unix mail gateway configuration
Fax Gateway configuration	omconfax omshowfax	Configure a fax gateway Show fax gateway configuration

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HP Desk Gateway configuration	omaddmnt omconfdsk omdelmnt ommakedirs omshowmnt omshowddsk	Add mail address translation Configure an HP Desk gateway Delete mail address translation Create user list from HP Desk dbase Show mail address translation(s) Show HP Desk gateway configuration
General configuration	omadmin omconfenu omconvinst omshowenu	Administration interface Configure error notification user Install a converter program Show error notification user
Access Control Lists	omaddacl omaddacln omcheckacln omdelacl omdelacln ommodacln omshowacl	Add an ACL Add user/group to ACL Check capabilities of user/group Delete an ACL Delete user/group from ACL Modify capabilities of user/group Show capabilities of user/group/ACL
Operations	ombprint omconfaud omdiskspread omisoff omoff omon omrc omrestore omshowaud omshut omshutint omstat omstore	Print mail in batch mode Configure audit logging level Spread Message Store over disks Check services are fully off Turn service(s) off Turn service(s) on Start all services and daemons Restore mail backup Show audit logging level Stop all services and daemons Shutdown Client Interfaces Show status of service(s) Generate list of data files
Maintenance	omcheck omconflvl ommon omreset omresub omscan omshowlog omshowlvl omvers	Check installation of OpenMail Configure logging level Monitor operation of OpenMail Delete OpenMail Resubmit messages in error Check consistency of message store Show log file Show logging level Show version of components

Module 9 — Operating the Server

Problem Solving

omsolve
omprsolve
omcontain
omqdump
omsetsvc
omx4trace
tf.browse

Problem Solving System
Print PSS
Browse/manipulate containers
Manipulate queues
Display detailed status
Turn on/off X.400 Interface tracing
Browse a transaction file

Mailbox access

omdelete
omlist
omlogoff
omlogon
omnew
omread
omsend

Delete a message from the In Tray
List messages in the In Tray
Log off from OpenMail
Log in to OpenMail
List new messages in the In Tray
Read a message in the In Tray
Send a message

Purpose

Explain the use of OpenMail commands.

Key Points

- With repetitive tasks, such as entering names in the Directory, commands are faster than the Administration Interface—and they are more flexible.
- From the Administration Interface, you can usually exit to the Command Interface by choosing the Shell option from the Action Menu.
- Administration Interface (`omadmin`) executes a set of binaries for each action, which you can execute yourself directly from the Shell.
- To access OpenMail commands without typing the path name, include `/usr/openmail/bin` in the `$PATH` variable of the profile of the user with admin capability.
- All commands require you to be configured in OpenMail with Administrator status in order to execute.

Transition

Look at the use of `man` pages to view command syntax ...

Module 9 — Operating the Server

9-8. Using Man Pages to View Command Syntax

Using man Pages to View Command Syntax

<code>man openmail</code>	Display the on-line OpenMail command manual
<code>man openmail lp</code>	Print details to system printer
<code>man 4 openmail</code>	Display details of data structures and files
<code>man 5 openmail</code>	Display details of OpenMail commands
<code>man <command></code>	Display use and syntax of specified command

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The manual contains a list of all the commands, in the form of the command name, a synopsis of its use, a description, some examples and further references to files and other commands.

(1m) is the standard Unix categorization of these commands as part of the system maintenance and administration section of the on-line manual. The (1m) suffix can be omitted in most cases when using the commands.

To print the complete OpenMail manual, type:

```
nroff -man /usr/man/man*/om* | lp
nroff -man /usr/man/man*/openmail* | lp
```

Module 9 — Operating the Server

9-8. Using Man Pages to View Command Syntax Instructor Notes

Purpose

Show how to get information about commands by using the Unix `man` facility.

Key Points

`man 4 openmail` displays information about OpenMail data structures and files:

- Conversion files
- Directory
- General configuration and status
- Fax gateway configuration file
- Local users
- Logs
- Mailing data
- Queues
- Message Lists
- Routes
- Sendmail Interface configuration files

`man 5 openmail` displays information about concepts behind administration commands:

- Command list
- OpenMail names
- Mailnodes
- Full X.400 mailnodes
- Character mappings
- Foreign addresses
- Queues and services
- Services and abbreviations
- Services and their processes
- Logging levels

Transition

Labs in which you practice operations and using OpenMail commands ...

Module 9 — Operating the Server

9-9. LAB: Operations

Use the Administration Interface, and refer to the procedures earlier in your Workbook if you need to.

1. Check the status of the services on your system.
2. Start all the services needed for message distribution in a network.
3. Set the Local Delivery Service to stop immediately, and check changed status of that service.
4. Send a message to a non-existent local user.
5. Go back and look again at the status of the Local Delivery Service.
6. Now ask for a Detailed Status report on Local Delivery.
7. Start the Local Delivery service and check its changed status.
8. Now all the services are running, ask for a ps listing of them. What are they called?
9. Log in to the User Interface as the Error Manager.
10. Look at the error notification received as a result of mailing to the non-existent user.

Module 9 — Operating the Server

9-9. LAB: Operations

Instructor Notes

Purpose

Practice basic operational tasks required by OpenMail, and track a mis-addressed message.

Preview

1. Check the status of the services on your system.

Some services will be already running, but in real life they would have needed to be started earlier.

2. Start all the services needed for message distribution in a network.

These are: Local Client Interface, Service Router, Local Delivery, Sendmail Interface, Test Server.

If using the Playpens, no other services than those listed opposite can be started.

3. Set the Local Delivery Service to stop immediately, and check changed status of that service.

Remind students to set a 0 minute Stop Delay because otherwise the 1 minute default will apply.

4. Send a message to a non-existent local user.

By doing this we can see a mis-addressed message being sent to the Error Manager. Be sure that the recipient is a non-existent user on a valid *local* mailnode, such as a mailnode you configured in Module 5. If the sender is an Administrator they'll see the trace records as well as the Error Manager.

5. Go back and look again at the status of the Local Delivery Service.

You should see a message in its input queue (shown on the right of the screen).

6. Now ask for a Detailed Status report on Local Delivery.

7. Start the Local Delivery service and check its changed status.

This enables the OpenMail to try to deliver the message.

8. Now all the services are running, ask for a ps listing of them.

The ps listing must be done from the shell. OpenMail services are owned by the user `openmail`

9. Log in to the User Interface as the Error Manager.

Refer to Planning Sheet 2 (in Module 4) for the name and password you specified. If you configured this user with a password, you can login even though you're logged in to Unix as a different user; if you didn't, you'll have to first login to their Unix account.

10. Look at the error notification received as a result of mailing to the non-existent user.

You should see as non-delivery report of the message you - in this case - deliberately mis-addressed.

Module 9 — Operating the Server

Procedures

1. omadmin, select SERVICES
2. Select service(s), Action Menu , Start Services
3. Action Menu , Set Stop Delay, Update

Select Local Delivery, Action Menu , Stop Service

4. advmail
5. omadmin, select SERVICES
6. Action Menu , Detailed Status
7. Select, Local Delivery, Action Menu , Start Service
8. ps -ef | grep openmail

```
root      131      1  0  Oct 26  ?      0:01 /usr/openmail/bin/omlicmon
root      140      1  0  Oct 26  ?      0:00 /usr/openmail/bin/advmail.sckd
root      138      1  0  Oct 26  ?      0:00 /usr/openmail/bin/advmail.mon
openmail  179      1  1  Oct 26  ?      2:07 service.router
openmail  176      1  1  Oct 26  ?      2:02 error.manager
openmail  180      1  1  Oct 26  ?      2:02 local.delivery
openmail  175      1  1  Oct 26  ?      2:03 test.server
rogerw   7618 7599  4 17:25:54 ttyu0 0:00 grep openmail
```

9. advmail "Error Manager"
10. The Non-Delivery Notification (marked E) in the Error Manager's In Tray shows something like:

```
NON-DELIVERY REPORT                                Dated: 11/11/92 at 15:53
Subject: Test Message                               Contents: 5
Sender: MAIL-SYSTEM
```

Part 1

TO: Error Manager / ny,corp,admin

Part 2

----- ERROR REPORT -----

Message in error from:

Mark Lauder / ny,corp,admin

Peter Pan / ny,corp,admin
because: 'Recipient name not found at destination' [DM 9300]

..

----- TRACE REPORT -----

11/11/92 15:49:45 Passive Operation Record: **Message Submission
11/11/92 15:49:51 Passive Routing Record: **Message Relayed
Node: nyork Address: ny,corp,admin

11/11/92 15:53:37 Active Operation Record: **Message Submission
11/11/92 15:53:39 Active Routing Record: **Message Relayed
Node: nyork Address: ny,corp,admin

Module 9 — Operating the Server

Module 9 — Operating the Server

9-10. LAB: Use OpenMail Commands

Instructor Notes

Answers

1. Add a local user and then display his Directory entry

```
omaddu -n "Emilio Marquez/ finance,auditing" -u emilio

omshowu -n "Emilio Marquez"
User Name: emilio marquez
MailNode: finance,auditing
Unix Logon: emilio
Password: set
Capabilities: Remote, Local
Language: Spanish
Aliases: controller
```

2. Find out if any services are not running

```
omstat -s

Service Router           Started    09.07.92    0
Local Delivery Service   Started    09.07.92    0
Sendmail Interface       Started    09.07.92    0
Local Client Interface   Enabled    09.07.92    0
Remote Client Interface  Enabled    09.07.92    0
Test Server              Started    09.07.92    0
..
```

3. Find out the status of the Service Router input queue

```
omstat -q ROUTER
```

4. Find out PIDs of Local Delivery daemons local.delivery and error.manager

```
omsetsvc -r local
```

```
Details for subsystem Local Delivery:
Number of components      = 2
Logging level             = 7
Has an input queue?       - YES
Queue name                 = LOCAL
..
PIDs of subsystem processes: 177 174 0 0 0 0 0 0 0 0 0
```

```
ps -fp 177,174
```

UID	PID	PPID	C	STIME	TTY	TIME	COMMAND
openmail	174	1	1	Oct 26	?	3:27	error.manager
openmail	177	1	1	Oct 26	?	3:28	local.delivery

Module 9 — Operating the Server

9-11. Summary



Operating the Server

Topics covered:

- What the services are
- What the service daemons are
- How to start and stop services
- How to display a detailed status report
- Command Interface

Lab: Control services/get a status report
Use OpenMail commands

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Notes

Purpose

Review what has been covered in Module 9.

Key Points

Operations

- You have seen that OpenMail operations involves starting and stopping the services.
- You have learnt how to access status reports on the different services.

System Backups

- Operations in OpenMail does not refer to backup. This is a Unix system function and therefore the responsibility of the Unix System Manager (or equivalent in your organization).
- Arrange with the System Manager to let you know when a backup will occur so that you can close the OpenMail services down. In some organizations this may happen at the end of each day, in others backup may occur less frequently. If you require more back-ups arrange them with your System Manager.

Transition

The next Module looks at helping and advising users.

Module 9 — Operating the Server

Module 10 — Supporting Users

Objectives

After spending 20 minutes completing this Module, you will be able to:

- Undertake a successful, phased implementation
- Understand the importance of making users motivated and aware
- Understand how to educate and train users
- Understand the importance of providing continuing user support

References

AdvanceMail User Training (HP product number H2127)

AdvanceMail Trainer's Pack (HP product number H2126)

HP NewWave: Supporting Users (HP product number D1721)

Module 10 — Supporting Users

10-1. Motivating Users

Motivating Users



"Now with electronic mail, we can send one announcement out and know it's getting to the people we need to reach."



"I can't even imagine trying to get back to the way we used to do things."



"Tell someone you're going to take the system away and the reaction will be "No way!"



"It's completely changed the way business is conducted"

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Investment in OpenMail will be wasted unless users are going to use it. They will only use it if they are confident in their ability to master it, and believe that it is a useful tool.

Many of the slides for this module consist of quotes. These quotes are from members of a team of 21 people who, in 1982, were given full responsibility for implementing electronic mail throughout Hewlett-Packard. Implementation has been highly successful, and by 1988 it was the seventh largest private network in the US.

The company now has over 80,000 electronic mail users, on a world-wide network of over 485 different systems, in 31 countries from Penang to Palo Alto. An estimated 6 million pages of information are sent through electronic mail every month in HP.

Module 10 — Supporting Users

10-1. Motivating Users

Instructor Notes

Purpose

Discuss users' needs and planning for those needs.

Key Points

- When prospective users are informed about this new electronic tool that will be available for their use, how might they feel?

Ask students for suggestions:

FLIPCHART

-
- | | |
|------------------------|---------------|
| — hesitant | -- threatened |
| — enthusiastic | — challenged |
| — antagonistic | — intrigued |
| — willing to have a go | — scared |
| — knowledgeable | |
-

- You may need to look at ways of countering any initial resistance or fear from users.

Transition

Look planning user awareness education ...

10-2. Awareness Education

Awareness Education

- **Define the target user group**
 - Make a list of the future users
 - Find out their needs

- **Provide an awareness program to explain about electronic mail**
 - Run a workshop
 - Send out memos
 - Put up posters
 - Organize group meetings
 - Involve staff representatives

Making users aware of the potential benefits of electronic mail will go a long way towards a successful implementation. This is often best achieved by targeting specific groups of users.

10-2. Awareness Education

Instructor Notes

Purpose

Discuss ideas to prepare users to incorporate electronic mail into their work patterns.

Key Points

- Run a workshop to explain why your organization has chosen to implement electronic mail.
- Discuss with potential users what the benefits of using electronic mail will be, for example:
 - Messages wait even if you are not there
 - Messages can be read at a convenient time
 - You are not interrupted, unlike the telephone
 - You can think about messages before replying
 - Communication over long distances and across time zones is as easy as local communication
- Emphasize that electronic mail takes its place alongside the telephone and paper based-communication methods; it does not replace them.

Transition

Look at how you can build users' skills in using electronic mail . . .

10-3. Skills Training

Skills Training

"We wanted to make sure that everyone was fully trained on the use of the hardware and software so that they could take full advantage of the benefits offered by the new technology."

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Some users may need typing and keyboard skills training.

For training users to use AdvanceMail effectively, classroom training is available in two forms:

- *AdvanceMail User Training*

A training class, taught by an experienced instructor, either at your site or at an Education Center. This is a one-day class covering all the basic functions of AdvanceMail.

- *AdvanceMail Trainer's Pack*

A fully customizable package of all the materials required to run the class yourself at your site. The pack provides ready-to-use notes for the trainer, overhead slides, and student exercise/reference sheets. This course is ideal for training large numbers of users.

Graphical user interfaces, such as NewWave Mail, are much easier to learn and require little incremental learning if, for instance, users are already familiar with NewWave. For this reason, training is provided for user support staff rather than end-users:

- *HP NewWave: Supporting Users*

Module 10 — Supporting Users

10-3. Skills Training

Instructor Notes

Purpose

Review resources available to train users in the use of the various user clients.

Key Points

- Distribute course datasheets during class.
- Show the AdvanceMail Trainer's Pack so students appreciate how it can solve their training needs.
- Invite students to discuss with you, after class, how you can help them train users in their company.

Transition

Look at the need to continue to support users after initial training . . .

10-4. Continuing User Support

Continuing User Support

"The final elements of the company-wide implementation project – training employees and providing them with ongoing support – were key to the success of the program."

Existing staff:

- Support

"If somebody runs into a problem, we don't want their workday to come to a standstill. We want them to be able to call a support person and get immediate attention."

New staff:

- Awareness training
- Demonstration
- Course/Self-teach/manual
- Department contact

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Existing Staff

- Your core of existing users will need support.
- As new staff arrive or existing staff start to use OpenMail, an education facility needs to exist.
- Users need a telephone number they can call when they have problems.
- One person per department could take on the role of teacher/adviser.

New Staff

- Ask Personnel to include the awareness program in New Employee or Induction courses.
- Provide newcomers with a demonstration of the system.
- Back the demonstration up with self-teach material or ensure a manual is to hand.

10-4. Continuing User Support

Instructor Notes

Purpose

Emphasize the need to set up User Support facilities for users.

Monitor Usage

- Keep a (monthly/quarterly) spot-check record of the number of users and number of messages. Watch for trends in these results of a decrease of usage. If less usage becomes apparent, check the problem by sending out a questionnaire about electronic mail usage, or remind people with memos or posters.
- Maintain the system on a regular basis to ensure minimum complaints.
- Keep a record of complaints and what areas they are in. The trends here will tell you what to watch out for on the system.

Transition

Complete a questionnaire to assess how prepared your organization is to successfully implement electronic mail . . .

Module 10 — Supporting Users

10-5. QUESTIONNAIRE: Assess User Preparedness

Read each question and circle the answer that you think is most appropriate for your organization.

1. Do all of your users have keyboard skills?
 - a. They can all type
 - b. They may not be the fastest typists in the world, but they know what they're doing
 - c. Before this, they'd have left all their typing to typists

2. Have all/most of your users been using terminals or PCs for anything else?
 - a. No
 - b. Some have
 - c. Yes

3. Has there been a positive response from your users or people talking on their behalf?
 - a. Yes, most people/all are looking forward to using electronic mail
 - b. I haven't heard what people think
 - c. Some people are worried about the prospect

4. Do users know about the advantages of electronic mail?
 - a. Everyone has been given information about the advantages of electronic mail
 - b. I haven't heard what people think
 - c. Some people are worried about the prospect

5. Do users know why your organization has decided to use electronic mail?
 - a. Yes
 - b. No, nothing formal has gone out
 - c. I don't know

6. Is your company going to encourage prospective users with courses, seminars, or information bulletins?
 - a. No
 - b. Yes
 - c. Nothing final/I don't know

7. Do you have or plan to set up a Help desk or group to support users?
 - a. We are planning to make some provision
 - b. Yes, we already have an experienced User Support function
 - c. Nothing has been planned so far

Module 10 — Supporting Users

10-5. QUESTIONNAIRE: Assess User Preparedness

Instructor Notes

Purpose

Complete the questionnaire to assess preparedness for user implementation.

Score

1	2	3	4	5	6	7
a - 10	a - 0	a - 10	a - 10	a - 10	a - 0	a - 5
b - 5	b - 5	b - 0	b - 5	b - 0	b - 10	b - 10
c - 0	c - 10	c - 5	c - 0	c - 0	c - 0	c - 0

60 +

Your company has everything under control. Your prospective OpenMail users have the necessary skills, knowledge and confidence to use electronic mail to. Having ensured user enthusiasm, training them in electronic mail skills will be made all the easier.

30 - 60

Your company is well on the way to successful use of OpenMail. Before users are trained to use it, they need to understand why it is necessary and how it will help them. They need to be enthusiastic about it too, otherwise they will not use it.

0 - 30

It is worth organizing an awareness program to introduce electronic mail to your users. This should:

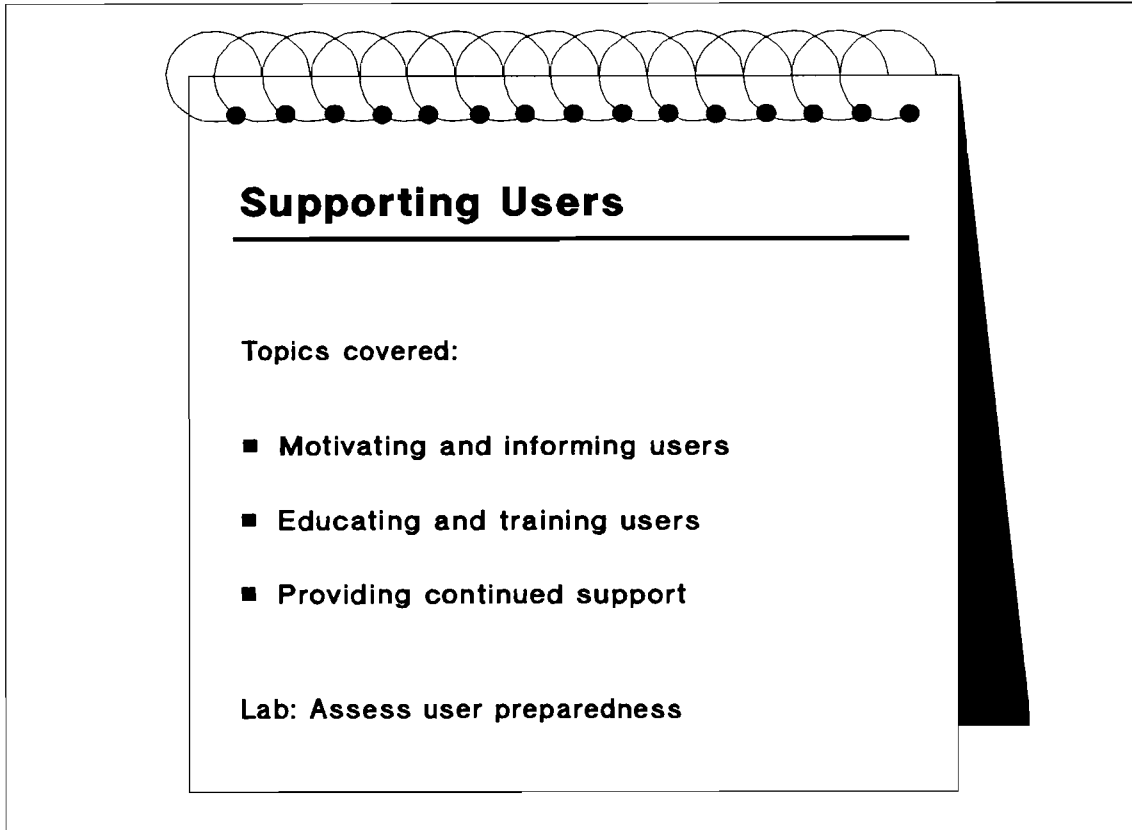
- Give them confidence in the system and their ability to learn how to use it.
- Enable them to appreciate the potential of electronic mail.
- Inform them why the company is investing in electronic mail.

Transition

To summarize ...

Module 10 — Supporting Users

10-6. Summary



Supporting Users

Topics covered:

- Motivating and informing users
- Educating and training users
- Providing continued support

Lab: Assess user preparedness

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Notes

Module 10 — Supporting Users

10-6. Summary

Instructor Notes

Purpose

Review what has been covered in Module 10.

Key Points

- This module has discussed some ideas on how to introduce electronic mail into the organization.
- Once most users start using electronic mail, they won't be able to work without it!

Transition

The next Module covers maintaining a regular mail service, including locating and resubmitting failed messages.

Module 10 — Supporting Users

Module 11 — Maintaining the Mail Service

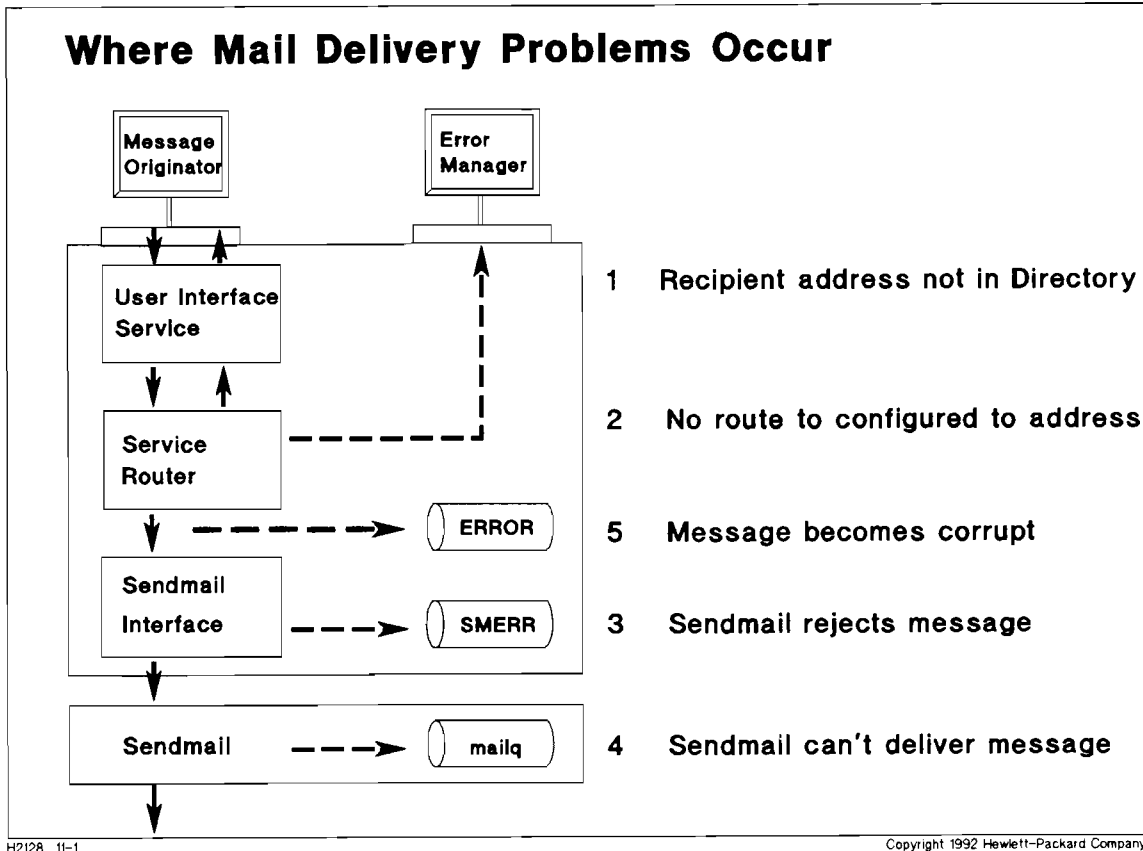
Objectives

After spending 1 hour completing this Module, you will be able to:

- Understand what regular maintenance the mail service requires
- Check for and correct mis-addressed messages
- Monitor for and resubmit mail that could not be delivered
- Check for mail stuck in Sendmail
- Trace system failures using the Event Log
- Perform a consistency check of the Message Store
- Diagnose errors using the Problem Solving System
- Use the available diagnostic commands

Module 11 — Maintaining the Mail Service

11-1. Where Mail Delivery Problems Occur



Non-delivery of mail going between OpenMail systems via Sendmail can occur at any of the following stages:

1. The relevant User Interface Service looks up the Directory to validate the recipient names/addresses in the message Distribution List. Any non-unique names, and unknown or invalidly-specified addresses, are rejected and the message not mailed.
2. The Service Router looks up the Routing Table to find routes for each valid recipient address. Any addresses without routes cause a copy of the message to be sent to the Error Manager and a Non-Delivery Report to be returned to the originator.
3. The Sendmail Interface passes mail routed to other OpenMail systems to Sendmail. Any messages with invalid routes are rejected by Sendmail, and passed back to the Sendmail Interface, which puts them on the SMERR queue.
4. Sendmail attempts to connect to the remote node and deliver the message. Any messages that cannot be delivered at first attempt (e.g. because Sendmail wasn't running on the remote node) are put on the mailq, waiting to be retried.
5. Any message that becomes corrupt while in OpenMail, for whatever reason, is put on the ERROR queue.

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11-1. Where Mail Delivery Problems Occur

Instructor Notes

Purpose

Overview the main points at which a message can fail to get delivered.

Key Points

- 1 is managed by the client user interface.
- 2, 3 and 4 are covered in the next topics of this Module.
- 5 is dealt with in Module 12.

Transition

Look at checking for mis-addressed messages in the Error Manager's In Tray ...

11-2. Checking for Mis-Addressed Messages

Checking for Mis-Addressed Messages

Error Manager receives messages that were mis-addressed because:

- Recipient is not known on destination mailnode
- Destination mailnode does not exist
- No route configured from originator's system to remote mailnode

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Mail that cannot be delivered because a recipient address specified by the originator is not known to OpenMail's Routing Table, is returned to the originator, marked with an E status, and with a Non-Delivery Report attached. In some circumstances, they will recognize the error - for example, a mis-spelt recipient name - and be able to correct it themselves and re-send their message.

To cover situations when the user cannot resolve the error, a copy of the message is also sent to the Error Manager on the system where the message failed, along with trace information showing the route the message took up to the point of failure.

The Error Manager should check their In Tray at least once a day, and correct any problems within their domain - such as a non-existent route - and then re-send the message. If they cannot resolve the error, they should inform the originator.

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11-2. Checking for Mis-Addressed Messages

Instructor Notes

Purpose

Explain how to check for messages that have been incorrectly addressed by the originator.

Key Points

- We checked the Error Manager's In Tray in the Lab in Module 9.
- Each Non-Delivery Report contains an error message which includes an error number [OM number] that can be looked up in the Problem Solving System.
- There should be an Error Manager configured and checked regularly on each system in a network.
- If a user complains of an undelivered message that hasn't been returned to them, be sure to check the In Trays of all Error Managers on systems between them and the destination.

Transition

Look at how to check for undeliverable mail and then resubmit those messages . . .

11-3. Checking for Undeliverable Mail

Checking for Undeliverable Mail

To get there:

- Main Menu
- MAINTENANCE
- NON TRANSMIT
- Action Menu
- Error Detail

Reference Number:	2362338
Message Id:	H000006a00001b68
Sender:	Mark Lauder/ny,corp,admin
Subject:	Details of new network
Message type:	Message
Sent:	06.09.91
Error text:	
--- Transcript of session follows ---	
554 openmail@lond.pinewood.com	
Network node not known	

				Action Menu			Exit
--	--	--	--	-------------	--	--	------

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Check the **List the non-transmitted messages** screen of the Administration Interface for messages that couldn't be delivered.

1. From the Main Menu, select **MAINTENANCE**
2. From the Maintenance Menu, select **NON TRANSMIT** to view the SMERR queue.
3. From the **List the non-transmitted messages** screen, select the undelivered message.
4. From the Action Menu, select **Error Detail**

The screen shows message details and a numbered error message, for example:

554 openmail@lond. Network node not known.

5. If necessary, use the Problem Solving System to look up error message number and instructions on corrective action.
6. Resubmit the message by selecting **Resubmit All** from the Action Menu.

11-3. Checking for Undeliverable Mail

Instructor Notes

Purpose

Explain how to check for messages that could not be delivered because of a system or routing error.

Key Points

- Mail can be undeliverable for a number of reasons:
 - Routing error (e.g. incorrect Sendmail address for destination system)
 - Faulty line set-up or line failure
 - Looping Distribution List
 - Sendmail problem
- Mail that is rejected by Sendmail is returned to OpenMail and put on the Sendmail Error Queue (SMERR); the user is not informed. This queue can be viewed by using the Resubmit All option from the Action Menu.
- You will need to deal with these messages periodically, say once a day.
- For reasons of security, the original message text is not viewable from this screen.

Transition

Look at checking in Sendmail for a message if there is no sign of it stuck anywhere in OpenMail ...

11-4. Checking for Mail Stuck in Sendmail

Checking for Mail Stuck in Sendmail

Example message from qf file in Sendmail's mail queue:

```
P1167
T620639269
DdfAA01298
MDeferred: Connection refused ----- reason for
                                     deferral
message received by Sendmail on
systema from OpenMail {
  Sopenmail
  Ropenmail@systemb
  Hreceived: by systema; Fri, 1 Sep 91 08:47:49 bst
  Hdate: Fri, 1 Sep 91 08:47:49 bst
  H?F?from: openmail
  H?F?full-name:
  H?P?return-path: <openmail>
  Hsubject: Encoded OpenMail Transport Message
  Hx-openmail-creator: lauder/mark///ny/corp/admin
  Hx-openmail-suj: This is the subject - time is 8:44
  destination ----- Happarently-to: openmail@systemb
} message
details
```

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If you can't locate a message in OpenMail, it is probably stuck in the Sendmail transport system, where you should look for it on each system the message was routed through.

- Check Sendmail's Log File: `more /usr/spool/mqueue/syslog`

Look for a message going from user `openmail` to user `openmail@computer`, where `computer` is the name of the next server on the message's route.

- Check Sendmail's Mail Queue. If Sendmail can't send a message first attempt, continues retrying for a specified period, during which the message waits on Sendmail's mail queue (`/usr/spool/mqueue`).
 1. To view the queue type: `mailq`
 2. Entries marked `deferred` are awaiting retry. Note down the message IDs for deferred mail.
 3. Log in as root, `cd` to the directory `/usr/spool/mqueue` and list it. You will see `qfmessageid` files (message headers) and `dfmessageid` files (data).
 4. View `qf` files till you find the right one (message creator, subject, and route are listed). The reason for deferral is given by the `MDeferred` parameter.

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11-4. Checking for Mail Stuck in Sendmail

Instructor Notes

Purpose

Explain how to look in the Sendmail transport system for undelivered messages that can't be found in OpenMail.

Key Points

- In the example:
 - Message was going from system `systema` to `systemb`
 - Sender was `lauder/mark` and subject was `This is the subject - time is 8:44`
 - Reason for deferral was Sendmail daemon (`/usr/lib/sendmail`) was not running on `systemb`
- If there are several messages for the same destination in the Log File, since no subject is given, you may need to increase Sendmail's logging level:
 1. Login as root
 2. Kill the Sendmail daemon (usually `/usr/lib/sendmail -bk`)
 3. Restart Sendmail as `/usr/lib/sendmail -v` (verbose) which logs to the standard output

Transition

Look at checking the OpenMail Event Log ...

11-5. Event Logging

Event Logging

LEVEL 1	Serious errors in the OpenMail system only
LEVEL 3	Level 1, plus system errors not causing service failures
LEVEL 5	Levels 1-3, plus warnings of service status changes
LEVEL 7	Levels 1-5, plus reports of normal service events (default)
LEVEL 9	Levels 1-7, plus reports of normal message handling events

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Information can be logged at any one of 5 levels, of increasing comprehensiveness:

- Level 1** Serious system problems that have occurred on your OpenMail system such as a complete failure of a service, or total system failure. Causes can be various: for example, OpenMail files missing, or power failure.
- Level 3** Level 1 problems plus less serious OpenMail system errors which do not cause a service to abort e.g. a message is corrupt and cannot be delivered.
- Level 5** Levels 1 and 3 plus log warnings, for example, a change in the status of a service when it is started.
- Level 7** Levels 1, 3 and 5 and log information about successful execution of "backend programs" (daemons).
- Level 9** Levels 1, 3, 5, and 7, and reports on the mailing processes showing each stage of message delivery.

11-5. Event Logging

Instructor Notes

Purpose

Explain the different levels of logging information OpenMail can provide.

Key Points

- OpenMail automatically logs information about events, errors, and the times they occur on the system, to the Event Log.
- The Event Log is contained in 3 compressed files (`/users/openmail/logs/log.[0-2]`), which are not readable directly.
- Default level is 7 - increase to 9 to trace specific, hard-to-locate problems.

Other Log Files

- `/users/openmail/logs/daemon.stderr` logs the stderr/stdout for OpenMail daemons (normally contains only dbVista errors).
- `/users/openmail/logs/ftlvis.log` logs errors from the OpenMail Lock Manager, errors related to message queues, semaphores if they become unavailable, etc..
- `/users/openmail/logs/fatal` logs fatal errors (which are also recorded in the main Event Log).
- `/users/openmail/logs/desklink` logs HP Desk Gateway problems.
- `/users/openmail/logs/audit` contains the output from audit logging (explained in Module 12).

Transition

Look at how to view the Event Log ...

Module 11 — Maintaining the Mail Service

11-6. Viewing the Event Log

Viewing the Event Log

To get there:

Main Menu
MAINTENANCE
EVENT LOG

From date	From time	To date	To time
06.09.91	17:05		
Service			
Local Delivery			
Level			
7			
Local User name			
Mailnode			
View		Action Menu	Help Exit

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1. From the Main Menu, select **MAINTENANCE**
2. From the General Maintenance menu, select **EVENT LOG**
3. Provide details of the logging information you want to see:
 - Period for report to cover
 - Service to check on, for example Local Delivery
 - Log Level: 1 (failures), 3 (corruptions), 5 (warnings), 7 (events) or 9 (mail handling)
 - Optionally, a specific user and mailnode to report on.
4. Press **View**
5. Repeat steps 3 and 4 for each service you want to view.

11-6. Viewing the Event Log

Instructor Notes

Purpose

Explain how to view the Event Log.

Key Points

- You specify the Log report that you want using the **View Log Files** option:
 - Period** Default is for the current date, starting from midnight last, ending at the current time.
 - Service** Default is all services.
 - Level** Default is 7.
- In addition, you can specify a particular user and mailnode that you want information about.

You might use this if you have a complaint from a user about a problem with a service, or a difficulty sending messages. The log will record any errors that occurred when that user sent or received messages.

If this is the case, the service will be either **PC User Interface** or **Terminal User Interface**
- You can print the log to a screen or printer (from the **Action Menu**)
- If you choose not to view all services, you must select one service at a time.
- You can view at a lower level than has been logged: for example, view at level 3 even if level 7 was logged.

Transition

Look at an example Log Report ...

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11-7. Viewing Log Reports

Viewing Log Reports

```
REPORT      Sendmail Interface (Incoming)    07.09.91  06:18
Message type      : 0
Message Id       : D036b44000000000
Transaction file record: 30500
From            : BERNARD TRILL/NY,CORP,ADMIN
Subject         : support cost for PCs

OpenMail Message Submitted to the Service Router

REPORT      Local Delivery (Local Delivery)  07.09.91  06:18
[OM 7603] Started delivery of message

REPORT      Local Delivery (Local Delivery)  07.09.91  06:18
[OM 7605] Current message Id: D036b44000000000

REPORT      Local Delivery (Local Delivery)  07.09.91  06:18
[OM 7607] Started delivery to recipient

REPORT      Service Router (Service Router)  07.09.91  06:18
[OM 7812] Putting message on Service Queue Local
```

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The slide shows part of an example Log Report.

You can see where the report for each message starts, because it is prefixed by details of the message:

- Message Type
- Message Id
- Transaction File
- From (name and mailnode)
- Subject

Here you can see Level 9 reporting. Each step of message delivery is accounted. Here there is only room for the events that have happened in the Local Delivery Service and an activity in the Service Router, but in the full report the message would be tracked until it is delivered locally or sent externally. The total Log Report on this one message could be made up of about 16 REPORTS.

11-7. Viewing Log Reports

Instructor Notes

Purpose

Go through an example Level 9 log report.

Key Points

- This Log report has been specified for Incoming Messages from the Sendmail Interface.
- The Log reports progress of the message. Here you can see the progress through Local Delivery. The report would continue to show logs of each activity in the Service Router, back to Local Delivery and finally to the recipient.
- Notice how all these begin with REPORT, because it has been a level 9 Log and the message delivery has been free of problems.

Transition

Look at configuring the level of logging ...

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11-8. Configuring Logging Levels

Configuring Logging Levels

To get there:

Main Menu
MAINTENANCE
LEVELS

<u>Service</u>	<u>Level</u>
Service Router	7
Local Delivery	9
Unix Mail Gateway	3
HPDesk Gateway	7
X400 Interface	7
Sendmail Interface	7
Test Server	9
Administration	3
Converters	7
PC Monitor	7
Browser	9
Fax Gateway	3
Request Server	7
Print Server	7

Update **Action Menu** Help Exit

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1. From the Main Menu, select MAINTENANCE
2. From the Maintenance Menu, select LEVELS

The Set the event logging levels screen is displayed, listing installed OpenMail services and the current logging level.

3. For the service you want to change, move the cursor to the Level number.
4. Enter the new level number (either 1, 3, 5, 7, or 9)
5. Repeat steps 3 and 4 for any other services
6. Press Update

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11-8. Configuring Logging Levels

Instructor Notes

Purpose

Explain how to change the logging level for OpenMail services.

Key Points

- If you choose to have a high level of detail in your Event Log, or are trying to pick up an irregular error, it may be useful to make the file larger; the file is circular and will overwrite itself as soon as it is full.
- Default size of 300 Kb is usually sufficient for normal needs.
- 1 Mb is probably the largest file you are likely to require.
- Log size is changed from the **Log Size** screen of the Maintenance menu.

Transition

Look at setting logging on user interface sessions . . .

11-9. Logging Client Sessions

Logging Client Sessions

advmail -r *filename* Capture keystrokes from terminal session to file

advmail -p *filename* Replay terminal user session from file

advmail -d 2 Log commands from terminal user session

advmail -d X00 Log events from terminal/PC to server log levels

host_trace = 2 *filename* Log commands from NewWave user session

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A number of logging and tracing options are provided for monitoring terminal and PC client sessions.

Keystroke recording/playback Can be used where reproducible errors are occurring, to capture the sequence of keystrokes that produce the error in a file. This can then be sent to the Support Center, where it can be replayed, hopefully reproducing the error on their system, and enabling them to analyze and correct the error.

Command logging Records information for entire user sessions in the file
/tmp/unixloginC.trc

Event level logging Records user interface events in the OpenMail log file, at the same levels as for the administration interface. (Specified here as *loglevelx100*)

By starting AdvanceMail from the PC, this logging level will be set for the associated OpenMail PC Mail Server process.

11-9. Logging Client Sessions

Instructor Notes

Purpose

Explain how logging can be set on user client sessions, from terminals or PCs.

Examples

- `advmail -r /users/roger/advlog`

Option can also be used with `omadmin`, and for automating some repetitive tasks.

- `advmail -d 2`

Logs to `/tmp/rogerC.trc`

- `advmail -d 500`

Logs normal events to the OpenMail log file.

- ```
[HPNWMTC]
host_trace = 2 roger
```

Entry in a PC MS-Windows WIN.INI file (versions prior to A.03.10) or the HPNWMAIL.INI (A.03.10 onwards) will perform database access tracing for NewWave Mail, logging to `/tmp/rogerC`

### Transition

Look at performing a consistency check of the Message Store ...

# Module 11 — Maintaining the Mail Service

## 11-10. Checking the Consistency of the Message Store

**Checking the Consistency of the Message Store**

To get there:

Main Menu  
MAINTENANCE  
CONSISTENCY

Last check performed on: 04.05.92 at: 21:05

Time and date of Message Store consistency check

2245 today

|         |  |  |  |             |  |      |      |
|---------|--|--|--|-------------|--|------|------|
| Perform |  |  |  | Action Menu |  | Help | Exit |
|---------|--|--|--|-------------|--|------|------|

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After certain system failures, there is a danger of references being lost and non-referenced messages building up in the Message Store. If not deleted, these could eventually block the delivery system. A Consistency Check identifies non-referenced messages, removes them, and reports which messages were removed.

1. Ensure the printer you want the report printed on is configured in the Administration Interface.
2. Select CONSISTENCY from the Maintenance Menu. The screen shows when the last check was performed and how long it took — which gives some indication of time for this one.
3. In the field provided, enter the time you want the check to take place. Usually lengthy and therefore done at night. Apart from this, the check is entirely automatic.
4. Shutdown messages are displayed to all OpenMail users one minute before closedown. Their sessions are killed when it closes the Client Interfaces. Unix users are not affected.
5. OpenMail checks for messages with no references and deletes them. Normal messages remain intact.
6. The result of the check is printed. Each deleted message is identified so you can inform users whose messages were not delivered.
7. When the check has finished OpenMail will automatically start the services again.

# Module 11 — Maintaining the Mail Service

## 11-10. Checking the Consistency of the Message Store

Instructor Notes

### Purpose

Explain when to perform a Consistency Check.

### Key Points

- Only perform a Consistency Check when absolutely necessary, for example when:
  - Checking the status of the services on a regular basis and finding a service suddenly closed.
  - Recognizing a system failure, a major breakdown.
  - Users complain of breakdown.
- If a reported failure might be due to problems with the services look at the status of the services, to see if any services have aborted or closed down suddenly. If so, carry out a Consistency Check.
- A Consistency Check is a lengthy process and causes OpenMail to be shutdown and then restarted. As such, it is best scheduled when it will not interrupt system availability, typically at night.
- As with other scheduled processes under Unix, you must be authorized to use the `at` command via the file `/usr/lib/cron/at.allow` to schedule a Consistency Check.

---

**Caution** Students should not start a Consistency Check, as this will disrupt the class.



---

### Transition

Look at the Problem Solving System ...

## 11-11. Using the Problem Solving System

### Using the Problem Solving System

How to get there:

\$ omsolve

- 0) EXIT
- 1) GENERAL TOPICS
- 2) DETAILED ERROR MESSAGES
- 3) SOLUTIONS

Please select one of the above:

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Access the Problem Solving System, which has three sections:

|                                |                                                                                                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General Topics</b>          | Gives an overview of the system, problem solving techniques, sources of information, and details of what to send to your support center if help is required.          |
| <b>Detailed Error Messages</b> | Lists error messages in detail, for database, system, and Sendmail errors. It provides solutions for specific error numbers you enter, for example <i>0M errnum</i> . |
| <b>Solutions</b>               | Describes likely approaches to solving generic problems, such as "lost mail" and provides general troubleshooting information on the following topics:                |

To run the Problem Solving System interactively from the Shell, type: `omsolve`

To print the Problem Solving System, type: `omprsolve | lp`

# Module 11 — Maintaining the Mail Service

## 11-11. Using the Problem Solving System

## Instructor Notes

### Purpose

Explain the use of the on-line Problem Solving System (omsolve).

### Key Points

This on-line system has 3 parts:

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General Topics</b>          | Overview of how to use the system: <ul style="list-style-type: none"><li>Problem solving techniques</li><li>Sources of information</li><li>Details of what to send to your support center if help is required</li></ul>                                                                                                                                                                                                                                                                                                                                                     |
| <b>Detailed Error Messages</b> | Lists error messages under these categories: <ul style="list-style-type: none"><li>Database errors</li><li>HP Desk Gateway errors (HP 9000 part)</li><li>HP Fax Gateway errors</li><li>Main OpenMail</li><li>NetIPC Errors</li><li>HP Desk Non-Delivery Errors</li><li>Sendmail Errors</li><li>System Errors</li><li>OpenMail User Interface Errors</li><li>Unix mail Gateway Errors</li><li>X.400 Incoming &amp; Outgoing Process errors</li></ul>                                                                                                                         |
| <b>Solutions</b>               | Approaches to generic problems: <ul style="list-style-type: none"><li>Troubleshooting omon/omoff</li><li>Sorting out serial connections</li><li>Getting PC LAN connections going</li><li>Sorting printing problems</li><li>Sorting out timezone problems</li><li>Getting mail from OpenMail to OpenMail</li><li>Exchanging mail with Unix mail</li><li>Getting mail from X.400 to OpenMail</li><li>Getting mail from OpenMail to X.400</li><li>Exchanging mail with HP Desk</li><li>Troubleshooting the HP Desk Gateway</li><li>Sorting out localization problems</li></ul> |

### Transition

Look at some of the most useful diagnostic commands . . .

## 11-12. Diagnostic Commands

### Diagnostic Commands

|                  |                                                              |
|------------------|--------------------------------------------------------------|
| <b>omcheck</b>   | <b>Checks the installation of OpenMail</b>                   |
| <b>omscan</b>    | <b>Checks the consistency of data storage</b>                |
| <b>omshowlog</b> | <b>Displays the log file</b>                                 |
| <b>omsolve</b>   | <b>Problem Solving System – solutions to numbered errors</b> |
| <b>omvers</b>    | <b>Outputs version numbers of OpenMail components</b>        |

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To provide varying views of the Event Log:

|                                   |                                                                                                         |
|-----------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>omshowlog -F 07.30 -l 5</b>    | <b>Lists all errors, to level 5, that have occurred since 7.30 today.</b>                               |
| <b>omshowlog -n "Mark Lauder"</b> | <b>Lists everything done by the specified user.</b>                                                     |
| <b>omshowlog -s router</b>        | <b>Lists errors for the specified service.</b>                                                          |
| <b>omshowlog -d /tmp/omlog</b>    | <b>Lists an Event Log that has been gotten from a remote system and put in the specified directory.</b> |

# Module 11 — Maintaining the Mail Service

## 11-12. Diagnostic Commands

Instructor Notes

### Purpose

Explain the most useful commands for system problem diagnosis.

### Key Points

- Following perform same function as corresponding option on the Admin Interface Maintenance menu:

|                        |                                           |
|------------------------|-------------------------------------------|
| <code>omcheck</code>   | Installation option (covered in Module 8) |
| <code>omscan</code>    | Consistency option                        |
| <code>omshowlog</code> | View Logs option                          |
| <code>omsolve</code>   | the Problem Solving System                |
| <code>omvers</code>    | Versions option (covered in Module 8)     |

### Transition

A Lab in which you diagnose and solve messaging problems ...



## 11-13. LAB: Diagnose and Solve Messaging Problems

In order to resubmit a message there must be a problem for you to look at. In the first part of the task you create the problem, then look at the problem and finally solve it. In the second part of the task you look at the different reporting that can be achieved by changing the logging levels.

### Track down a routing error

1. Create problems. Some problems encountered may result from incorrectly configured routes. Here you set one up!

Configure a route to the following remote mailnode, at the following non-existent Sendmail Address:

Mailnode: `valid,remote,mailnode`  
Sendmail Address: `openmail@junkcomp`

2. Send messages that will highlight the problems

Send a message to Zoe Zebedee, a non-existent user at the remote mailnode you configured above.

3. Check for un-delivered mail

- i. Display the `List non-transmitted messages` screen. Your message should be listed there.
- ii. Display `Error Detail` on your message to see more detail about your error. After the prompt `Error Text:` you will see the error identity number and message displayed. Note down the number.

4. Look up the error number in the Problem Solving System

5. Check the Event Log to see what it tells you about this message's non-delivery.

### Using the Log File

1. View a Log Report

Display the log of all activity recorded by the Local Delivery Service for the previous 24 hours.

2. Change the logging level of Local Delivery

Change the logging level to level 9.

3. Stop the Local Delivery Service
4. Send a message to an existing local user.
5. Re-view the Event Log

Display the log for the Local Delivery at level 9. What does it tell you about the non-delivery of the local message?

## 11-13. LAB: Diagnose and Solve Messaging Problems

Instructor Notes

### Purpose

See the results of a routing problem and a service failure, and practise how to recover from them.

### Preview

#### Track down a routing error

##### 1. Create problems

- Create a problem to see how OpenMail reacts to it.
- Enter a new route to a valid remote mailnode but on a non-existent computer.

##### 2. Send messages that will highlight the problems

- Having set up the problem, now use the system so that the error becomes apparent, by sending a message to the new address.
- Zoe Zebedee is not known in the Directory, so you will have to supply her mailnode:

`Zoe Zebedee/valid,remote,mailnode`

- Looking in the Error Manager's In Tray won't show anything because the system will have diagnosed it as an administration error, not a user error. Only copies of errors sent back to users are kept in the Error Manager. This sort of error will not go back to the user.

##### 3. Check for un-delivered mail

- Use `Resubmit` to see the problem explained to you in detail.

##### 4. Look up the error number in the Problem Solving System

- The `omsolve` entry for error 554 (a Sendmail error) describes our problem in its first suggested cause.
- Here, you know what the problem is because you have created it. But you can see how this would be useful if you were unaware of an X.400 Interface closedown due, for example, to a faulty line.

##### 5. Check the Event Log

#### Using the Log File

##### 1. View a Log Report

This was recorded at the default level of 7.

##### 2. Change the logging level of Local Delivery

##### 3. Re-view the Event Log

- Using the `playpen` system, each student does not have their own log file - all share the one system log file, containing entries from all `playpens`.

# Module 11 — Maintaining the Mail Service

## Procedures

### Track down a routing error

1. Select OTHER SYSTEMS, OPENMAIL ROUTES, press **Action Menu**, select **Add Route**, and press **Perform Add**
2. advmail, select **In Tray**, then:  

TO: Zoe Zebedee/valid,remote,mailnode
3. Select MAINTENANCE, NON-TRANSMIT, press **Select Message**, then **Action Menu** and select **Error Detail**
4. omsolve, 2, 7, 554

### Using the Log File

1. Select MAINTENANCE, select **EVENT LOG**, enter previous day's date, current time, and specify **Local Delivery**, press **View**
2. Select MAINTENANCE, select **LEVELS**, position cursor and enter 9, press **Update**
3. Select **SERVICES**, highlight **Local Delivery**, press **Select Service**, **Action Menu**, and **Stop Service(s)**
4. advmail, select **In Tray**, then:  

TO: *Valid User*/ny,corp,admin
5. Select MAINTENANCE, **EVENT LOG**, and press **View**

## Transition

To summarize ...

# Module 11 — Maintaining the Mail Service

## 11-14. Summary

A graphic of a spiral-bound notebook with a white page and a black spiral binding on the left. The page contains the following text:

### **Maintaining the Mail Service**

Topics covered:

- Checking for mis-addressed messages
- Resubmitting undeliverable messages
- Checking for mail in Sendmail
- Reading the Event Log
- When/how to perform a consistency check
- How to use omsolve
- Diagnostic commands

Lab: Diagnose and solve messaging problems

## Notes

# Module 11 — Maintaining the Mail Service

---

## 11-14. Summary

## Instructor Notes

### Purpose

Review what has been covered in Module 11.

### Key Points

- We covered 5 important aspects of maintenance:
  - Checking for mis-addressed messages
  - Resubmitting undeliverable messages
  - Checking Sendmail errors
  - Checking the Event Log of what has happened on the system
  - Checking the consistency of the Message Store

### Transition

The next Module covers more general aspects of managing OpenMail, including the use of the Command Interface.

# Module 11 — Maintaining the Mail Service

## Module 12 — Managing the Network

---

### Objectives

After spending 1 hour completing this Module, you will be able to:

- Use the Monitor Program
- Deal with corrupt messages using `omqdump`
- Use Access Control Lists to limit access to system resources
- Create Audit Logs to produce system statistics
- Use multiple Directories to store user data
- Schedule key administration tasks
- Utilize network administration facilities
- Make use of OpenMail and related documentation
- Contact the Support Center with relevant data



## 12-1. The OpenMail Monitor Program

### The OpenMail Monitor Program

- Reports fatal errors
- Lists aborted services
- Lists queues holding more messages than specified limit
- Lists undeliverable messages on SMERR queue
- Reports if disk usage exceeds specified limit
- Checks no terminal sessions are in CPU loops

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The OpenMail Monitor program (`ommon`) monitors the operation of the system. It can be run manually or, more usually, scheduled to run twice a day from `cron`. It mails a report to a specified user over Unix mail, who can be local or on a remote system.

To run `ommon`: `ommon -u user -q queuelimit -m mountpoint -p percentage`

The default recipient of the mailed report is `root`, the default queue limit is 3, the mount point is `/users`, and the disk usage threshold is 90%.

To edit the `crontab` file, as `root`: `crontab -l > file`

The following entry in the `crontab file` would mail a report to a remote user, and is scheduled to run every day at 7am and 12am (with standard error redirected to a temporary file):

```
0 7,12 * * * /usr/openmail/bin/ommon -u adminu@nyork.pinewood.com -q5 -p80 > /tmp/ommon
```

To run the `crontab file`: `crontab file`

## 12-1. The OpenMail Monitor Program

Instructor Notes

### Purpose

Explain the usefulness of the Monitor program in performing a regular general system “health-check”.

### Things Monitored

|                         |                                                                                                                                                                                          |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fatal errors:           | contents of <code>/users/openmail/logs/fatal</code>                                                                                                                                      |
| Aborted services:       | list of any services that have aborted.                                                                                                                                                  |
| SMERR queue:            | details of each message rejected by Sendmail.                                                                                                                                            |
| Queue limits:           | list of messages in queues exceeding limit defined by <code>-q</code> option.                                                                                                            |
| Disk usage:             | if exceeds limit defined by <code>-p</code> option for disk containing the Message Store ( <code>/users/openmail</code> ), whose mount point is specified by the <code>-m</code> option. |
| CPU loops:              | any <code>omadmin</code> or <code>advmail</code> terminal sessions in loops.                                                                                                             |
| HP Desk Gateway errors: | contents of <code>/users/openmail/desk/export/TRANSFER/DSCOPY.ERRS</code>                                                                                                                |

Unix mail is used in case one of the things to report is that the OpenMail mail service is down!

### Transition

Look at tools to manipulate corrupt messages in the Message Store . . .

## 12-2. Dealing with Corrupt Messages

### Dealing with Corrupt Messages

omqdump is a support tool that:

- Manipulates messages on queues, including ERROR
- Decodes and reads message Transaction Files
- Identifies message Content Files, which can then be read
- Allows corrupt messages to be reconstructed or deleted

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Corrupt messages cannot be mended but they can be recovered from the ERROR queue, and often reconstructed using omqdump (/usr/openmail/diag/omqdump). This requires a password to run—to allow its use to be restricted to competent support staff, and for security (as it allows you to read the text of users' messages). To run omqdump:

```
$/usr/openmail/diag/omqdump
```

```
WARNING: This is a diagnostic tool for use by HP trained personnel.
Improper use can cause serious damage.
If you do not wish to continue, hit return now.
```

Here, supply the password, in the form *Adateofmonth + 10E* as follows (it is not displayed on screen), e.g.:

```
A25E
```

```
Please select an option:
```

```
q : QUIT
s : queue summary
l : list (read) queue
g : get msg from queue
Option?
r : read msg
p : put msg on queue
d : delete msg from queue
c : close msg
```

## 12-2. Dealing with Corrupt Messages

Instructor Notes

### Purpose

Explain how to use `omqdump` to manipulate messages in queues, and particularly to recover corrupt messages from the ERROR queue.

### Key Points

- This tool can create problems as well as solve them - use it with care and restrict use to trained people.
- The tool also opens the security of the Message Store, so restrict the password to only those people who need it.
- Note there is no prompt for the password - it must be supplied instead of just pressing `Return` after the WARNING message.
- Example password (A25E) is for system date of 15th of the month (i.e. A[15+10]E). The characters A..E must be in upper case.

### Transition

Look at how to use `omqdump` ...

## 12-3. Using omqdump

### Using omqdump

|                       |                                                 |
|-----------------------|-------------------------------------------------|
| queue summary         | Outputs queue listing similar to omstat         |
| list (read) queue     | Decodes TF files of messages in specified queue |
| get msg from queue    | Gets first message off specified queue          |
| read message          | Decodes message's Transaction File              |
| put msg on queue      | Puts "got" message on another queue             |
| delete msg from queue | Deletes message from a queue                    |
| close msg             | Closes message and puts back on queue           |

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### Retrieving a message from the ERROR queue

1. get the message from the ERROR queue
2. read the message

Note the creator name (in user interface style - for example *Mark Lauder/ny,corp,admin*).

Note the names of the attached files in `/users/openmail/data`

3. Copy the attached files into your home directory.
4. Create a new message, addressed to the originator, explaining that their message was corrupted.
5. Include each Content File in the message. Filetype 1167 is ASCII text; refer to `/users/openmail/nls/$LANG/filetype` for a description of other filetypes.
6. Mail the message.

Alternatively, if you can reconstruct the message, you could forward it on to the intended recipient.

## 12-3. Using omqdump

## Instructor Notes

### Purpose

Explain how to use omqdump

### omqdump Options

|                       |                                                                                                                                                                                                                                                                                                          |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| queue summary         | List similar to omstat. Same listing can be obtained from the command line (omqdump -s).                                                                                                                                                                                                                 |
| list (read) queue     | List of decoded Transaction Files of each message in the queue. You're prompted for a queue name. Same listing can be obtained from the command line (omqdump -l <i>queue</i> ).                                                                                                                         |
| get msg from queue    | Gets first message from the queue that you specify when prompted.<br><br>Once <i>got</i> , the message can be <i>read</i> , <i>put</i> on another queue, <i>deleted</i> , or <i>closed</i> .<br><br>You're also prompted for a timeout, which is time to wait for a message to arrive if queue is empty. |
| read message          | Decodes the message's Transaction File.                                                                                                                                                                                                                                                                  |
| put msg on queue      | Puts <i>got</i> message on another queue - message also stays on its original queue.                                                                                                                                                                                                                     |
| delete msg from queue | You're prompted for the queue and the message you want to delete from it.                                                                                                                                                                                                                                |
| close msg             | Closes message and puts it back on the queue.                                                                                                                                                                                                                                                            |

### Transition

Look at a decoded Transaction File listing and how to recover a corrupt message ...

## 12-4. Interpreting an omqdump Listing

### Interpreting an omqdump Listing

```
Access Count = 1
TF File = -/data/0000018/0001t7f
Priority = Normal
TF Info Flags = 7
Filter Route =
Attach File #1 = -/data/000000d/0000dg8
Attach File #2 = -/data/000000k/0000dlj

HEADER (DN) 1 0 0 0 0x2000400 3 1
CREATOR (DN) 0 107 0 0 0 0 "lauder/mark///ny/corp/admin" "" ""
CREATE_DATE (DN) 92/8/3 14:45.54+60
MSG_INT_ID (DN) 0 "H000006b000036b0" "H000006b000036b0"
ORIGINAL_EITS (DN) 0x0 0 0 0 0 1 "1.1.6.7.2"
CONTENT_FILE (DN) 1166 1166 0x2 0 0 "DISTRIBUTION" "" "" "" ""
"IA5"
CONTENT_FILE (DN) 1167 1167 0x0 0 0 "Vitaly important message text"
"" "" "IA5" "" "IA5"
RECIPIENT (DN) 0x20 0 1 "SMINTFC" "" "openmail@chigo" "jones/david///\
sfran,sales,admin"
OPERATION_TRACE (DN) 92/8/3 14:46.21+60 5
ROUTE_TRACE (DN) 92/8/3 14:46.21+60 0 "nyork/ny,corp,trace"
```

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|                    |                                                                                                                                    |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Access Count       | Several queues can access a message; this says how many are accessing this message                                                 |
| TF File            | Name of the Transaction File in /users/openmail                                                                                    |
| Attach File #1     | The displayed Distribution List (part 1 of the message). Can be read with tf.browse command                                        |
| other Attach Files | One file for each content part of the message (in /users/openmail)                                                                 |
| CREATE DATE        | In year, month, day form, with local offset from GMT. Example was created in British Summer Time, which is 60 minutes ahead of GMT |
| CREATOR            | Originator, identified in full X.400 form with null components identified by a /                                                   |
| CONTENT FILE       | Description of each Content File, with subject and filetype (e.g. 1167 is TEXT)                                                    |
| RECIPIENT          | Description of each recipient, with relevant queue, route, name and address.                                                       |
| ROUTE TRACE        | Trace record of each system message has passed through—ARPA hostname (if remote) and trace mailnode                                |

## 12-4. Interpreting an omqdump Listing

Instructor Notes

### Purpose

Explain how to interpret an omqdump listing of a Transaction File, and how to recover a corrupt message using the information it provides.

### tf.browse

This command just decodes a specified Transaction File (giving a listing similar to the slide minus the top 7 lines). It does not take a password since a passworded utility, such as omqdump, must already have been used to locate the file.

### omcontain

A similar command to omqdump that lets you browse and manipulate *containers*, such as a user's In Tray. This command is useful for dealing with a corrupt message at rest (for example, a message that has been delivered and so is no longer in a queue).

It takes a password in the same form as omqdump. See the man page for details.

### Transition

Look at controlling access to OpenMail services and Directories using Access Control Lists . . .



## 12-5. Access Control Lists

### Access Control Lists

- Enable you to restrict access to Services and Directories to specified users
- Specify users by capability (Admin, local, all) or by address

For example:

- Control user access to different Directories
- Restrict user access to gateways
- Configure a user just to maintain Directories (ie add/delete entries)

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Access Control Lists (ACLs) enable you to specify which users and groups of users you are going to allow to use particular OpenMail resources, by associating them with particular capabilities. This means that you can set up a complex structure of capabilities for different users. ACLs can either be configured in `omadmin` or from the command line.

The resources that can be limited by the ACLs are:

- Mailing services and resources such as the Request Server and Print Server
- Scripts used by the Request Server
- Printers used by the Print Server
- Directories

ACL entries refer to either a standard group of users or to a user name and address pattern:

- The standard groups of users are OpenMail Administrators, local users, and everyone (the default).
- Users are configured by their addresses. A name and address pattern is either an internal OpenMail name and address, or a full X.400 O/R Name/Address. Names can be wildcarded.

## 12-5. Access Control Lists

## Instructor Notes

### Purpose

Explain how to use Access Control Lists (ACLs) to limit user access to OpenMail services and Directories.

### Key Points

- You can set up a list of people who can access particular services. These users can exist anywhere in the network.
- Capabilities are dependant upon the type of resource, and apply to both users and groups. They are specified in the configuration file.
- The ACL configuration file is in `/users/openmail/nls/$LANG/acl.cfg`. This file contains the capabilities available for each resource and their abbreviations. The capabilities include “update”, “modifyself”, “read”, for groups; and “configure”, “use” and “execute” for users.
- ACLs can be set up in `omadmin` or from the command line interface. `omadmin` can be used to set up ACLs for the OpenMail services and directories, but the command line interface must be used to set up ACLs for anything else. Once an ACL has been created using the command line interface, then access to that particular OpenMail resource is limited to local users with Admin capability.
- An example command line to set up an ACL is:

```
omaddacl -t resource -l listname
```

and to add entries to the list:

```
omaddacln -t resource -l listname -n username -c capabilities
```

- The ACLs are held in `/users/openmail/acl/`
- There is a Lab on ACLs in Module 13.

### Transition

Look at how audit logging can be used to obtain usage statistics for analysis and billing ...

## 12-6. Audit Logging

### Audit Logging

- Over 100 elements can be logged, e.g.
  - user signon
  - duration
  - client type
  - message type
  - message attributes
  
- To activate logging on X.400 Interface at level 5:  
omconfaud X400 5
  
- Level 5 elements defined in /users/openmail/sys/audit.cfg
  
- Results logged to text file /users/openmail/logs/audit

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Audit logging is similar to event logging, but more customizable. You can specify at a very detailed level what you want logged. The output data could then be analyzed by a script file to produce detailed statistics.

Grouped under each operation within the configuration file /users/openmail/sys/audit.cfg is a list of element names showing the type of information that can be logged, and the level to which the logging is currently set for that particular element.

Therefore if you configure the audit logging to be set at level 5 for a particular service, then only those items which have numbers below 5 associated with them in the configuration file are logged.

The audit logging process is activated using omconfaud with the service that you are going to log, and the level that you are going to log.

To view the logging levels that have been set, use the omshowaud command.

## 12-6. Audit Logging

Instructor Notes

### Purpose

Explain how to create Audit Logs of system statistics.

### Key Points

- The results are logged in `/users/openmail/logs/audit` by default, but this can be changed in the configuration file `/users/openmail/sys/audit.cfg`
- It is best to create a copy of the configuration file supplied with the product, before you modify it.
- As the value of the logging level is increased, so more information is logged to the Audit Log file.
- Turn off event logging by specifying the logging level for a particular service to zero.
- The numbers are on a “more details” and “less details” basis rather than having specific meanings.
- The following services can log information to the log file:
  - Administration (all configuration commands)
  - Fax Gateway
  - Local Client Interface
  - Remote Client Interface
  - Local Delivery Service
  - Request Server
  - Service Router
  - Unix Mail Gateway
  - HP Desk Gateway
  - X.400 Interface

### Transition

Look at the output of an Audit Log file ...

## 12-7. Audit Log File Output

### Audit Log File Output

```
routing
time 707402235 Mon Jun 1 13:17:37:15 1992 + 60
type 0 message
priority 0 normal
sensitivity 0 normal
importance 0 normal
created-locally true
ua-message-id H000006a00001bf1
mta-message-id H000006a00001bf1
ack-req 0 none
message-size 389
delivered-count 1
```

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The above slide shows the output for one particular message, when audit logging at level 7, using the options specified by default in the audit configuration file (`/users/openmail/sys/audit.cfg`).

Detailed reporting could be achieved by creating a script file to go through the Audit Log file, and to output statistics for you.

## 12-7. Audit Log File Output

Instructor Notes

### Purpose

Explain how to look at the Audit Log log file and the sort of information it gives you.

### Key Points

- The output is purely dependent on what has been set in the configuration file. Only those fields that have been given a logging level of 7 or less will be seen in the final output.

### Transition

Look at using multiple Directories ...

## 12-8. Using Multiple Directories

### Using Multiple Directories

- Directories are used by:
  - Client Interfaces
  - Service Router
- Must have a default system Directory
- Can add:
  - personal Directories
  - shared Directories
- Shared Directory access is controlled by ACLs

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Each OpenMail system has a default Directory that is used to keep the information that the Service Router uses to perform name resolution.

However, extra Directories can be added to meet the needs of specific users or groups of users. These Directories may then be used for name resolution purposes by the client. The information that they contain is entirely up to you—as a number of attributes can be specified for the records in the Directory. This gives client interfaces the chance to make use of these extra flexibility that this feature offers.

Directories and their data can be added from either `omadmin` or the command line interface.

The two types of Directories that can be used are:

- Personal—which belong to individual users
- Shared—which can be accessed by a number of users

## 12-8. Using Multiple Directories

Instructor Notes

### Purpose

Explain how multiple Directories can be added to the system, and what the benefits of their use can be.

### Key Points

- Should establish procedures to keep the Directories up-to-date
- The searching mechanism can be customized. Searches can be sequential, but faster searching can be achieved using keyed (indexed) attributes and probe attributes.
- `/users/openmail/sys/dir.attrs` contains the list of Directory attributes.
- To see a listing of the supported Directory attributes, use the `omshowatt` command.
- `/users/openmail/nls/$LANG/diratt.loc` contains the description of the attributes.
- Probe attributes can be used which are automatically generated when an entry is added to the Directory. An example of a probe attribute is the Soundex algorithm supplied with OpenMail which generates a probe attribute from the surname supplied. Further algorithms can be added to OpenMail. `/users/openmail/sys/dir.probes` contains details of how probe attributes are generated.

### Transition

Look at the administration tasks you'll have to schedule on a regular basis ...



## 12-9. Scheduling Key Administration Tasks

### Scheduling Key Administration Tasks

- |                  |                                                                                                                                                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DAILY</b>     | <ul style="list-style-type: none"><li>■ Check Error Manager's In Tray</li><li>■ Check the SMERR queue</li><li>■ Check the Event Log</li><li>■ Monitor system status</li><li>■ Monitor the ERROR queue</li><li>■ Check the consistency of the Message Store</li></ul> |
| <b>PERIODIC</b>  | <ul style="list-style-type: none"><li>■ Ensure regular system back-ups</li><li>■ Monitor system usage</li></ul>                                                                                                                                                      |
| <b>AS NEEDED</b> | <ul style="list-style-type: none"><li>■ Add/remove local users in the Directory</li><li>■ Distribute/incorporate Directory update files</li></ul>                                                                                                                    |

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#### Daily

- Sign on to the Error Manager user and check the In Tray for mis-addressed messages.
- Check the SMERR queue for un-deliverable messages, correct and resubmit them.
- Monitor the ERROR queue for corrupt messages by running `ommon` every night
- Check the log files by running `omshowlog`
- Check the general system and service status by running `omstat`
- Check the consistency of the Message Store by running `omscan` every night.

#### Periodic

- Ensure system back-ups are regular and don't disrupt availability to users.
- Monitor system usage to forecast future load and identify non-using workgroups.

#### As Needed

- Add/remove local users from the Directory as they join/leave the organization.
- Distribute/incorporate `om_record` update files according to procedures agreed with other systems (typically, every two weeks).

# Module 12 -- Managing the Network

## 12-9. Scheduling Key Administration Tasks

## Instructor Notes

### Purpose

Provide a recommended daily and periodic schedule for the OpenMail administration tasks we've learnt about.

### Key Points

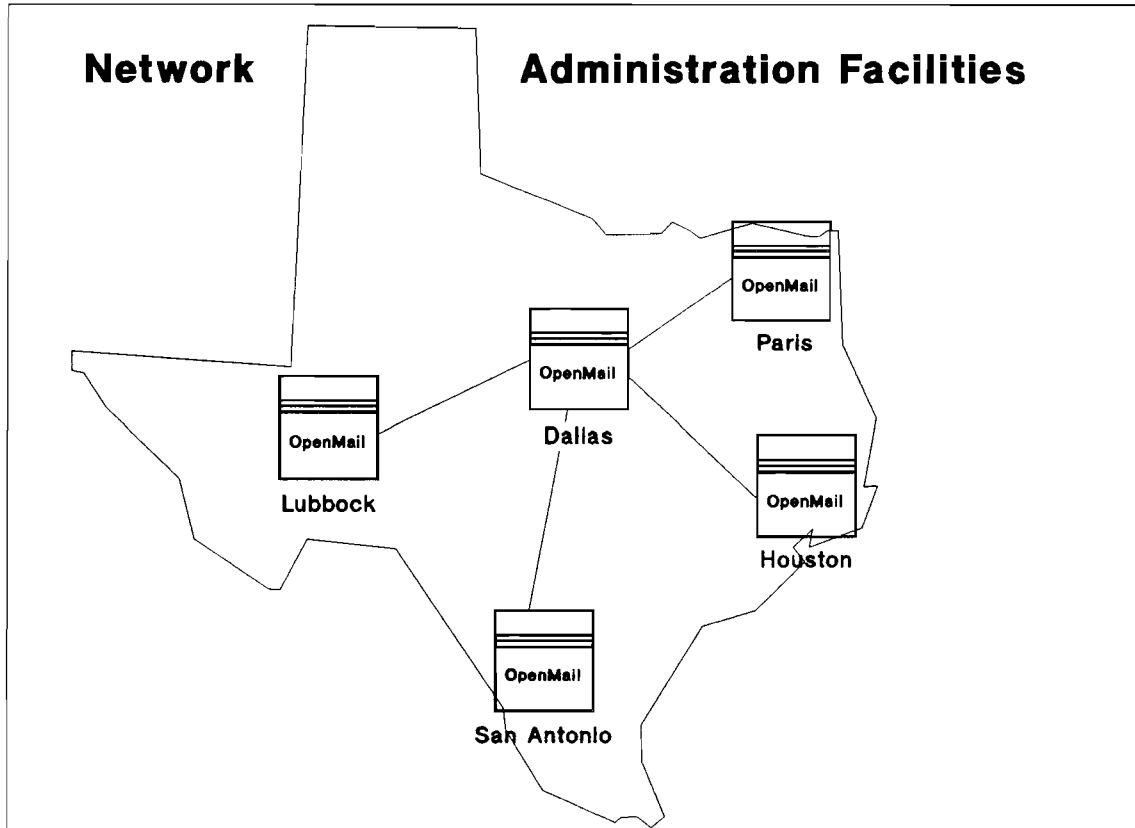
- Explain the importance of establishing a routine of system monitoring.
- Talk through each of the daily, periodic, and as needed tasks.
- All of these tasks have been covered in this course:
  - Checking the Error Manager's In Tray (Module 11)
  - Checking the SMERR queue (Module 11)
  - Checking the log files (Module 11)
  - Checking system status (Module 9)
  - Monitoring the ERROR queue (Module 12)
  - Checking Message Store consistency (Module 11)
  - Ensuring regular system backups (Unix System Admin responsibility)
  - Monitor system usage (Module 12)
  - Add/remove local users (Module 5)
  - Distribute/incorporate Directory updates (Module 7)
- Exact frequency will need to be established for your organization:
  - Daily tasks may need to be performed more often on a heavily used or mission-critical system.
  - Periodic tasks may be performed weekly or more frequently.
  - As needed tasks will require procedures established to ensure they do happen.

### Transition

Review the facilities available for administering a network ...

# Module 12 — Managing the Network

## 12-10. Network Administration Facilities



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|                           |                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Server               | Enables validation of routes to remote mailnodes on other systems in a network, by mailing to <code>+test/remote mailnode</code> .                                                                                                                                                                                                                    |
| Directory Update File     | <code>om_record</code> file enables distribution of changes to a local Directory to other systems in a network, so allowing all Directories to be easily synchronized.                                                                                                                                                                                |
| OpenMail Monitor Program  | <code>ommon</code> can be scheduled to run regularly and mail system status reports to a remote user, so allowing central monitoring of a network.                                                                                                                                                                                                    |
| Log Files                 | Can be mailed to another system to be read there using <code>omshowlog</code>                                                                                                                                                                                                                                                                         |
| Public Distribution Lists | Allow central maintenance of network-wide Distribution Lists.                                                                                                                                                                                                                                                                                         |
| Error Manager             | Can be configured on a remote OpenMail system - but shouldn't be configured through a remote gateway since trace records are trashed at gateways (which are themselves often points of failure).<br><br>Can contact the Administrators of remote systems by mailing to <code>+ERRMGR/remote mailnode</code> (mail goes into Error Manager's In Tray). |
| Request Server            | Can automate administration by actioning scripts on receipt of a message from a remote system.                                                                                                                                                                                                                                                        |

# Module 12 — Managing the Network

## 12-10. Network Administration Facilities

## Instructor Notes

### Purpose

Explain how various OpenMail facilities can be used for central administration of a network.

### Key Points

Explain how a network can be centrally administered, with reference to the network of systems in Texas shown on the slide. Here, the Administrator on the system in Dallas (the hub) can:

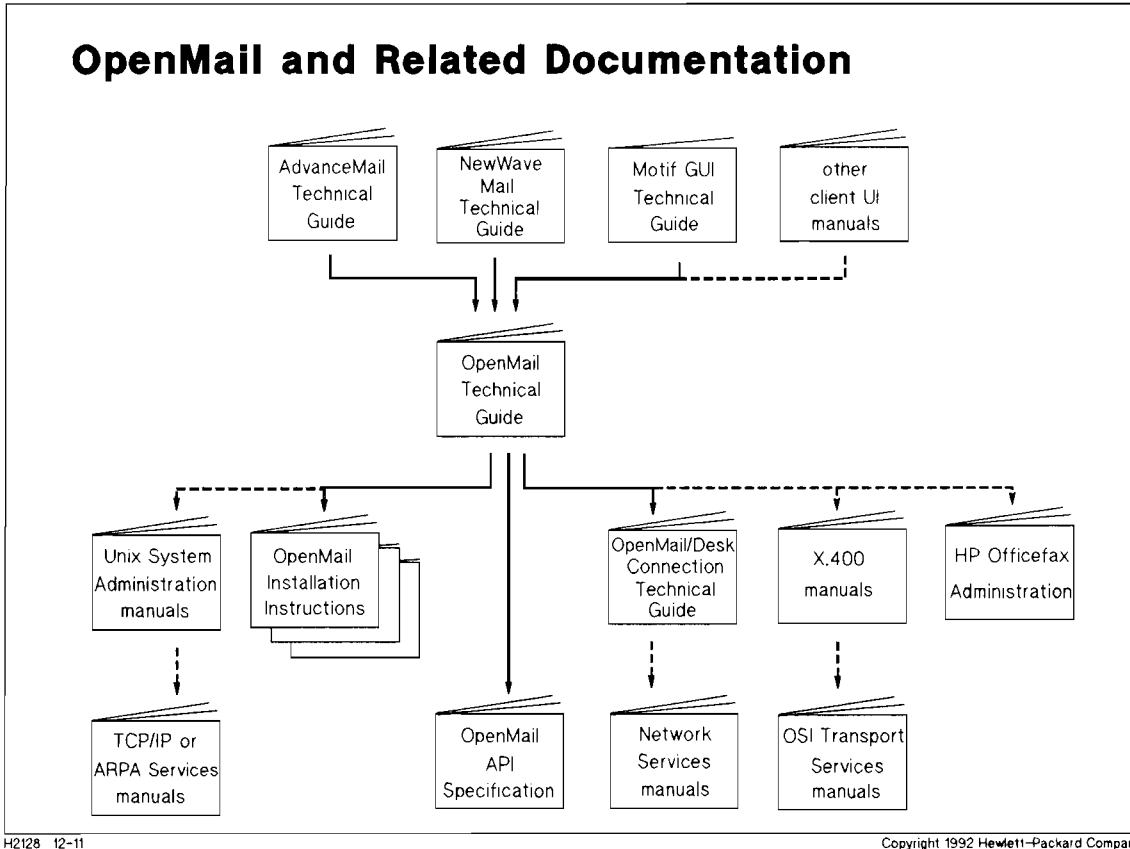
- Test routes to mailnodes at the remote sites
- Collect, integrate and distribute Directory Update Files
- Monitor each remote system by setting up `ommon` to mail its report to Dallas.
- Check the log files from remote systems (write a script to mail the log file to Dallas each day).
- Maintain Public Distribution Lists for the network.
- Act as the Error Manager for every system in the network.
- Initiate script execution on remote systems by mailing to the Request Server on those systems (Request Server is covered in Module 13).
- Problem-solve on remote systems by logging on (using `rlogin`) and performing all local admin facilities remotely.

### Transition

Look at OpenMail and related documentation that can help you . . .

# Module 12 — Managing the Network

## 12-11. OpenMail and Related Documentation



AdvanceMail Technical Guide  
NewWave Mail Technical Guide

OpenMail Technical Guide

OpenMail Installation Instructions  
OpenMail API Specification

Unix System Administration manual

TCP/IP or ARPA Services manuals

OpenMail/Desk Connection

Network Services manuals

X.400 manuals

OSI Transport Services manuals

OfficeFax Installation

OfficeFax Administration

How to send mail to OpenMail from terminals or PCs.  
How to send mail to OpenMail from NewWave PCs.

The main OpenMail manual - your key reference.

Instructions on installing on various platforms.  
How to write applications to work with the OpenMail APIs.

How to increase system parameters such as number of files per process or virtual memory, and arrange disk space.  
Explain about Sendmail, and well as networking.

How to configure an HP Desk Gateway and maintain an OpenMail-Desk link.

Explains about DSCOPY used with the HP Desk Gateway.

How to install/administer the X.400 MTA.

How to install/administer the datacomm layer below the MTA.

How to install/administer connection to the fax server.

How to administer the fax server PC.

# Module 12 — Managing the Network

## 12-11. OpenMail and Related Documentation

## Instructor Notes

### Purpose

Go over the OpenMail documentation and that of related services that will help you manage the system.

### Current Manual Titles

*AdvanceMail Technical Guide* (HP part number D2102-90023) or *AdvanceMail/PC Administration* (HP part number 5959-9685)

*NewWave Mail Technical Guide* (HP part number D2103-90010)

*OpenMail Technical Guide* (HP part number B2280-90001)

*OpenMail for DEC ULTRIX Installation Instructions* (HP part number 5960-2369)

*OpenMail for HP-UX Installation Instructions* (HP part number 5960-2371)

*OpenMail for IBM AIX Installation Instructions* (HP part number 5960-2387)

*OpenMail for SCO UNIX Installation Instructions* (HP part number B1603-90001)

*OpenMail for Sequent Dynix/ptx Installation Instructions* (HP part number 5960-2374)

*OpenMail/HP DeskManager Connection Technical Guide* (HP part number B2280-90002)

*HP OfficeFax Installation* (HP part number 5959-9669)

*HP OfficeFax Administration* (HP part number 5959-9670)

### Transition

Look at what information to send to the Support Center . . .

## 12-12. Contacting the Support Center

### Contacting the Support Center

- Obtain a version listing of OpenMail binaries
- Obtain a copy of the Event Log
- Set up an Admin user to allow access to your system

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If you need the help of your OpenMail Support Center, they may ask you to provide the following information to assist them:

- A version listing of the OpenMail binaries installed on your system. This is output by `omvers`, either to a file or a printer as follows:

```
omvers -vp | lp
```

```
omvers -vp > filename
```

- A copy of the Event Log and any other log files. As this may be quite large, select some criteria that cover the problem area and print that part only:

```
omshowlog -l 9 -s x400 -f 15:30 | lp
```

- If the support engineer needs to look at corruptions, they will need to access your system as Administrator. Set up a login for them.

# Module 12 — Managing the Network

---

## 12-12. Contacting the Support Center

## Instructor Notes

### Purpose

Explain what information will help the Support Center deal with any locally unresolved problems.

### Key Points

- If all else fails, your Support Center can help - but they'll need some basic information about your system.
- This information can be mailed over the Unix internet, X.400, or by the postal service.

### Transition

A Lab in which you use `omqdump` to track a message within OpenMail . . .



## Module 12 — Managing the Network

### 12-13. LAB: Use `omqdump` to Track a Message

In this Lab you send a message to a remote OpenMail user, use `omqdump` to track its progress within OpenMail, and then check its progress out into Sendmail.

1. Stop the Service Router and all the OpenMail *delivery* services.
2. Mail a message to a remote user.  
Address the message to a neighbor, using the remote mailnode you configured a route to in Module 7.
3. Use `omqdump` to report on the status of the message queues.
4. Start the Service Router and re-run `omqdump` to see the changed status of the queues.
5. Examine the SMINTFC queue using `omqdump` to find your message.
6. Note down the location of the files that make up your message:
7. Login as root, and change directory to `/users/openmail/data`
8. Read the Transaction File using `tf.browse`
9. Read each Content File
10. Start the Sendmail Interface, and re-run `omqdump` to see the resulting change in queue status.

## 12-13. LAB: Use omqdump to Track a Message

## Instructor Notes

### Purpose

Use omqdump to track a message leaving OpenMail and going into Sendmail. This Lab is optional, for a competent class, and can be omitted if short of time.

### Procedure

1. Stop the Service Router and all the OpenMail *delivery* services.

```
omoff -s router local sendmail
omstat -s
```

2. Mail a message to a remote user
3. Use omqdump to report on the status of each message queue.

```
/usr/openmail/diag/omqdump -s
```

4. Start the Service Router and re-run omqdump to see the changed status of the queues.

```
omon -s router
/usr/openmail/diag/omqdump -s
```

5. Examine the SMINTFC queue using omqdump to find your message.

```
/usr/openmail/diag/omqdump
Adate+10E
option? 1
queue(): smintfc
```

6. Note down the location of the files that make up your message.

```
TF File= /users/openmail/data/0000018/0001t7f
Attach File #1= /users/openmail/data/000001g/0001tf0
etc
```

7. Login as root, and change directory to /users/openmail/data

8. Read the Transaction File using tf.browse

```
/usr/openmail/diag/tf.browse -b -i 0000018/0001t7f
```

9. Read each Content File.

```
cd 000001g
more 0001tf0
etc
```

10. Start the Sendmail Interface, and re-run omqdump to see the resulting change in queue status.

```
omon -s sendmail
/usr/openmail/diag/omqdump -s
```

## 12-14. Summary



### Managing the System

---

Topics covered:

- Monitor program
- Using omqdump
- Access Control Lists
- Audit Logs
- Using multiple Directories
- Scheduled and remote administration
- Documentation and support

Lab: Tracking messages

## Notes

# Module 12 — Managing the Network

---

## 12-14. Summary

## Instructor Notes

### **Purpose**

Review what has been covered in Module 12.

### **Key Points**

- The commands can be put into scripts you can keep and use when required.

### **Transition**

The next Module covers various aspects of customization, including writing scripts containing OpenMail commands to use the Request Server.

# Module 12 — Managing the Network

# Module 13 — Customizing OpenMail

---

## Objectives

After spending 1 hour 30 minutes completing this Module, you will be able to:

- Understand the role of Unix scripts in customization
- Write and use your own scripts for simple administration tasks
- Use the OpenMail commands that are available to access the Message Store
- Understand how the Request Server can be used to automate tasks
- Understand how and when file conversions are performed
- Install file converters and change the default conversions
- Understand the open-ness of the Application Program Interfaces to OpenMail, particularly the UAL

## 13-1. Using Scripts to Manage OpenMail

### Using Scripts to Manage OpenMail

Using standard Unix scripting facilities to access OpenMail commands and files, you can:

- Schedule and customize system administration tasks
- Automate system administration on remote network nodes
- Create support tools of your own
- Set up simple integration with other applications

Using the standard Unix script features allows you to customize and automate your administration tasks, as well being able to look after the running of your system by creating your own support tools.

## 13-1. Using Scripts to Manage OpenMail

Instructor Notes

### Purpose

Explain how Unix command scripts allow you to customize OpenMail.

### Key Points

- Scripts can just be common sequences of OpenMail commands.
- By using more complex features like `if - then` modules you can write script programs to fully customize the administration procedures of your system to your needs.
- By using the Unix `cron` facility, tasks can be scheduled, say to run every night.
- Unix mail can be used to send output from scripts to the attention of local (or remote) users.

### Transition

Look at some sample scripts . . .



## 13-2. Sample OpenMail Scripts

### **fatalerrors**

This script will report serious errors periodically. This could be scheduled to be run by cron every hour or so, to produce regular reports of any serious errors occurring on the system. If the user specified was a remote user, this could be run on each system in a network to report failures back to one central Administrator.

```
user=username@mailnode #unixlogin Sets up parameters for the variable user
if [-f /users/openmail/logs/fatal] ; then Checks for existence of fatal log file
cat /users/openmail/logs/fatal | mail $user Reads fatal log and mails to specified user
rm /users/openmail/logs/fatal Delete the fatal log file
fi End
```

### **smerrors**

This script will mail the status of the SMERR queue to a user *root@computername* using Unix mail.

```
cn='omstat -q "SMERR" | wc -l' Counts lines in the SMERR queue listing
if [$cn != "0"] ; then If there are messages in the queue, then ...
omstat -q "SMERR" | mail root@computername Repeats command and mails listing to root
fi
```

### **printscan**

This script performs a consistency check of the Message Store and sends the output to a printer.

```
omoff -d2 -s all Closes down OpenMail services after a 2 minute delay
sleep 300 Waits 300 seconds
omscan -d | lp Performs an omscan and pipes the output to a printer
omon -s all | lp Starts up all OpenMail services again and outputs to printer
```

# Module 13 — Customizing OpenMail

---

## 13-2. Sample OpenMail Scripts

## Instructor Notes

### **Purpose**

Illustrate the possibilities of simple scripts in customizing OpenMail.

### **Key Points**

### **Transition**

Look at the commands which allow you to directly access a user's mailbox ...

## 13-3. Mailbox Access Commands

### Mailbox Access Commands

|                 |                                                     |
|-----------------|-----------------------------------------------------|
| <b>omsend</b>   | <b>Sends a message</b>                              |
| <b>omlist</b>   | <b>Lists the contents of the user's In Tray</b>     |
| <b>omdelete</b> | <b>Deletes a message from the In Tray</b>           |
| <b>omread</b>   | <b>Reads a message in the In Tray</b>               |
| <b>omnew</b>    | <b>Lists new items in the In Tray</b>               |
| <b>omlogon</b>  | <b>Obtains a logon to OpenMail</b>                  |
| <b>omlogoff</b> | <b>Terminates an omlogon connection to OpenMail</b> |

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The above commands provide direct access to a user's mailbox from the Unix command line. This enables simple integration with other applications and scripts. See the man pages for details.

To send a message:

```
omsend -u "Mark Lauder" -s "Report" -p "nickname" -t "Marion Brand"
-c "Kate de_Ville" -a /users/mark/work/report.txt
```

To list newly arrived mail:

```
omnew -u "Mark Lauder" -p "nickname"
```

To read and deal with the In Tray interactively:

```
omread -u "Mark Lauder" -p "nickname" -i
```

This lists the contents of the In Tray in order, prompting for Delete/Quit/Confirm after each message.

## 13-3. Mailbox Access Commands

## Instructor Notes

### Purpose

Explain the use of the commands that allow client access to a user's mailbox without using a client application.

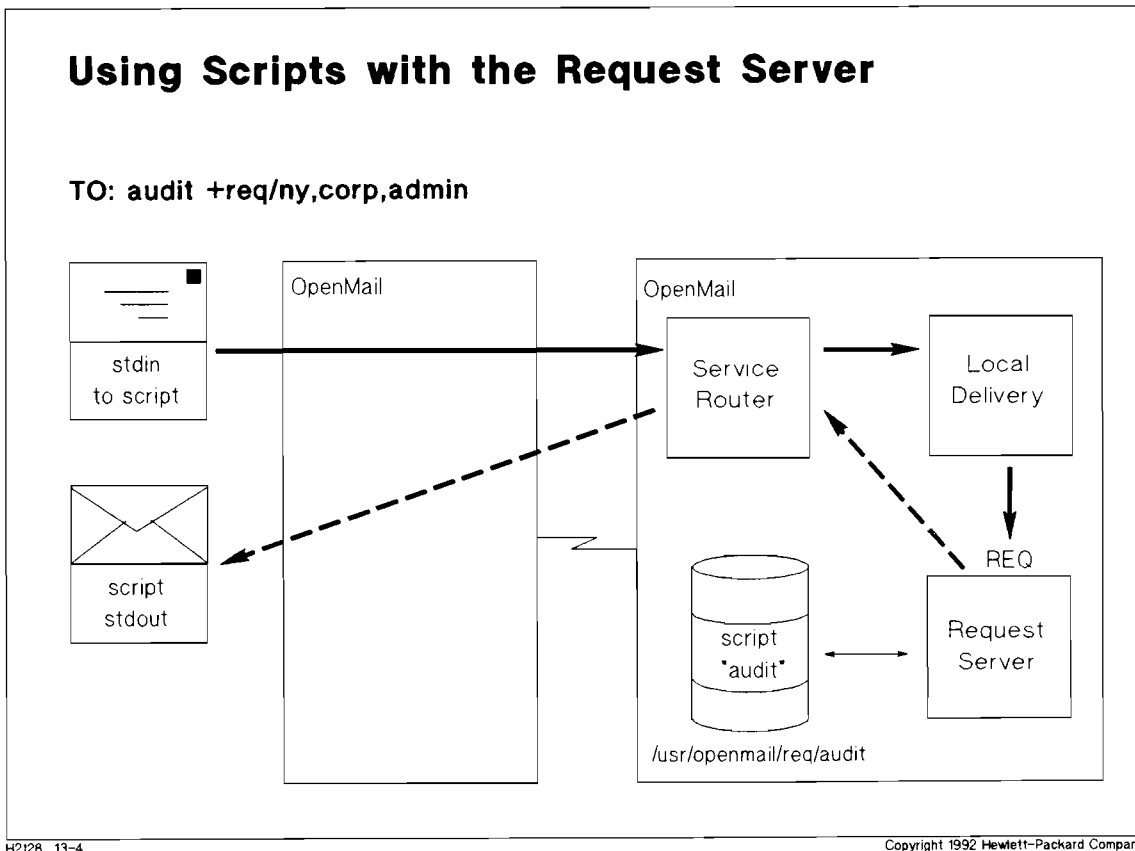
### Key Points

- Once an `omlogon` command has been issued, an `omlogoff` must be used; otherwise the user will not be able to access their OpenMail mailbox from a client, as they will already be logged on.
- However, there may be a number of performance implications if you have a number of users who use these commands regularly in scripts—each command accesses the UAL and starts a remote session on the server. The way to get around this is to do an `omlogon` before these commands are used. By doing this, a session will be established once, removing the need for a `logon` everytime one of the mailbox access commands is used.

### Transition

Look at using scripts with the Request Server ...

## 13-4. Using Scripts with the Request Server



The Request Server can be used to run special script files. For example,

1. A user sends a request to the Request Server
2. The message is addressed to *audit* +*REQ* on the target OpenMail server, where *audit* is the given-name and +*REQ* is the surname of the O/R name/address.
3. When the Request Server receives the request, it attempts to activate the script named in the given-name.
4. If the script file exists, it will be run.
5. The standard output of the script is placed in a message and returned to the originator of the request message.

All script files must put into `/usr/openmail/req` and must be executable by the user `openmail`. Example script files supplied in `/usr/openmail/examples/req` are: `audit.sum`, `audit.tidy`, `conf.dump`, `everyone`, `audit`, `dir`, and `info`

## 13-4. Using Scripts with the Request Server

Instructor Notes

### Purpose

Explain how to use the Request Server to action scripts on remote systems.

### Key Points

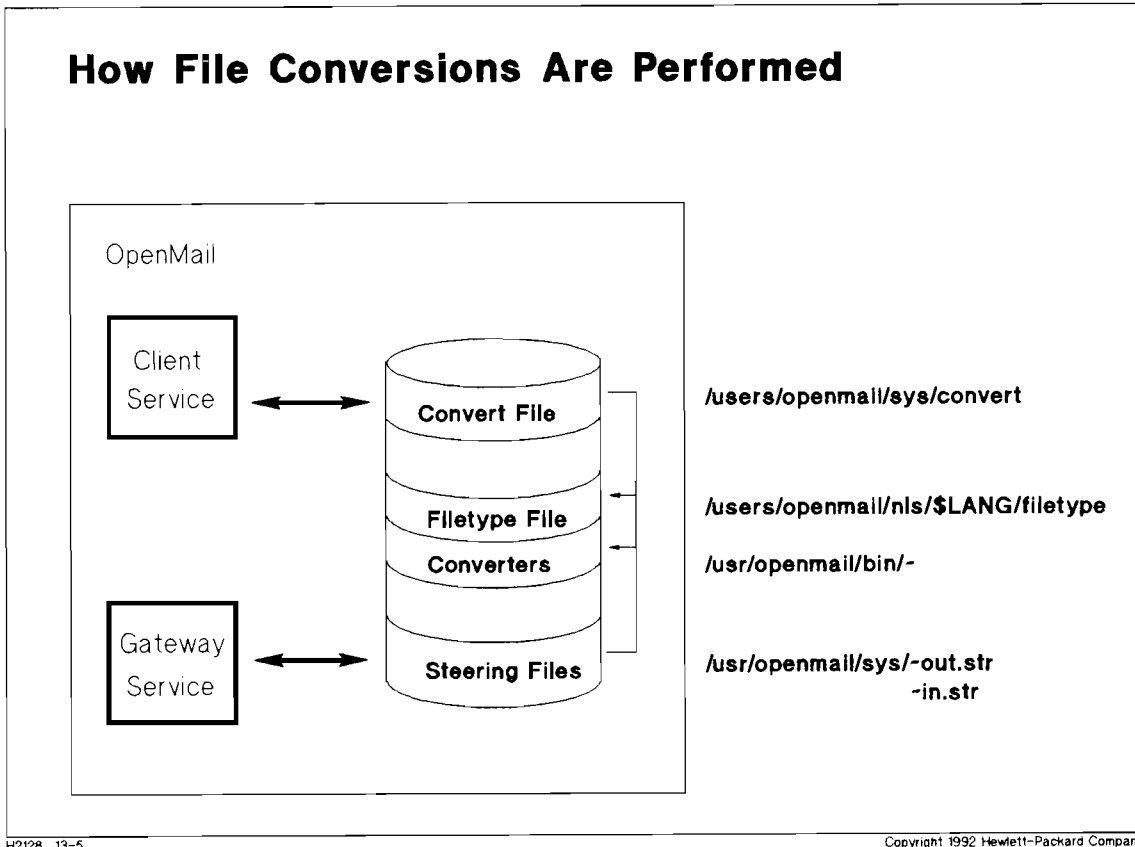
- The Request Server exists on all mailnodes in a network.
- Do not use scripts that begin with `om` as these are reserved for use by OpenMail developers.
- Be careful that there are no breaches of security. For example scripts that return any requested file to a user should be avoided.
- You can configure regularly used scripts in the Directory.
- All the scripts are executed in the Bourne shell for standardization purposes.
- The example scripts are:

|                         |                                                        |
|-------------------------|--------------------------------------------------------|
| <code>audit.sum</code>  | produces a summary from the audit file                 |
| <code>audit.tidy</code> | Cron script to create daily OpenMail audit files       |
| <code>conf.dump</code>  | Produces a listing of the OpenMail configuration       |
| <code>everyone</code>   | Produces a PDL of all local OpenMail Users             |
| <code>audit</code>      | Returns the contents of the OpenMail audit file        |
| <code>dir</code>        | Applies directory updates to a remote OpenMail system  |
| <code>info</code>       | Returns information to the sender based on the subject |

### Transition

Look at how file conversions are performed within OpenMail ...

## 13-5. How File Conversions Are Performed



File conversions can be performed at two points in OpenMail:

- When a message is displayed by/transferred to a client
- When a message passes through a gateway (out or in)

The following files control what conversions are performed:

|                |                                                                                                                                                                                     |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Convert File   | Defines conversions to be performed by clients.                                                                                                                                     |
| Filetype File  | Defines internal numeric filecodes associated with different types of files. Used in the Convert File to specify conversions, and by clients to display descriptions of file types. |
| Converters     | Converter programs perform file conversions specified in the Convert or Steering Files.                                                                                             |
| Steering Files | Define conversions to be performed on messages leaving/entering through the X.400 Interface and gateways.                                                                           |

## 13-5. How File Conversions Are Performed

Instructor Notes

### Purpose

Explain how and when file conversions are performed by OpenMail.

### Key Points

- Example gateway steering files in `/users/openmail/sys` are:

- `x400out.str`
- `unixout.str`
- `fax.str`

Details of how these are used are in the gateway Modules.

- Clients can use the `filetype` file to allow users to select the filetypes they want to be offered to them, and the order in which they are offered (ie change the default order).

For example, this can be done in AdvanceMail/TI by:

1. Selecting `Config`
2. Selecting `File Types`

- Another file `/users/openmail/nls/$LANG/pcdetail` is used and downloaded to some remote clients (such as AdvanceMail/PC and NewWave Mail).

This is similar to the `filetype` file, but allows users to select their own preferred conversions (ie change the default conversions) for files downloaded to that client.

For example, this can be done in AdvanceMail/PC by:

1. Selecting `Config`
2. Selecting `Conversions`

### Transition

Look at adding a file converter program into OpenMail ...



## 13-6. Adding a File Converter Program

### Adding a File Converter Program

- 1 Copy the program into `/usr/openmail/bin`
- 2 Obtain the filecodes for source and target file formats
- 3 Add the conversion specification to `/users/openmail/sys/convert`
- 4 Increment the version number of the `/convert` file
- 5 Restart OpenMail services

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To install a converter, such as one you have written yourself, follow this procedure:

1. Copy the converter program onto the system. Standard converter programs are located in `/usr/openmail/bin` which is a good location for additional converters.
2. Obtain the allocated filecodes for the source and target file formats used in your conversion, by reading the file `/users/openmail/nls/$LANG/filetype`
3. Edit the file `/users/openmail/sys/convert` to add a line specifying your conversion, for example:

```
1622 1167 /usr/openmail/bin/ami.browse 1622 1167
```

where 1622 is the filecode for the source format (Ami Pro), 1167 is the target format (text), and `/usr/openmail/bin/ami.browse` is the location of the converter program.

4. Increment the version number in the first line of the `convert` file.
5. Turn off and restart all OpenMail services to make the converter known to the system.

## Module 13 — Customizing OpenMail

### 13-6. Adding a File Converter Program

Instructor Notes

#### Purpose

Explain how to add a file converter program of your own into OpenMail.

#### Key Points

- You can install a file converter program of your own using the procedure given.
- OpenMail is shipped with filecodes allocated for most commonly used word processing and other file formats. Examples are:

|      |                    |
|------|--------------------|
| 1166 | Distribution List  |
| 1167 | Text               |
| 1269 | PC/binary file     |
| 1270 | DCA Revisable form |
- If a filecode isn't allocated for your file format, contact Hewlett-Packard to ask for one to be allocated for you.

#### Transition

Look at extending the file conversions available within OpenMail . . .

## 13-7. Extending File Conversions

### Extending File Conversions

The KEYpak document converter provides conversions between any of:

- DCA
- DisplayWrite III/IV
- MS-Word
- MS-Word/Mac
- MS-Word for Windows
- Q-one
- Samna Word
- Text
- Wordmarc Composer Plus
- WordPerfect 4.2
- WordPerfect
- WordStar
- Uniplex

Keyword Office Technologies Ltd  
2816 Eleventh Street N.E.  
Calgary, Alberta  
Canada T2E 7S7

(403) 250-1770 (tel)  
(403) 250-1964 (fax)

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Converters are shipped with OpenMail for:

DCA > text

HP Word/PC > text

HP AdvanceWrite > text

HP Executive Memomaker > text

NewWave package > broken into constituent items, then converted as above

The recommended solution for extending these is to purchase independent software vendor Keyword's KEYpak converter. This runs many Unix platforms. The KEYpak converter is designed to work with OpenMail and is easily installable.

## 13-7. Extending File Conversions

Instructor Notes

### Purpose

Explain how to extend the file conversions available within OpenMail - with particular reference to Keyword's KEYpak converter.

### Key Points

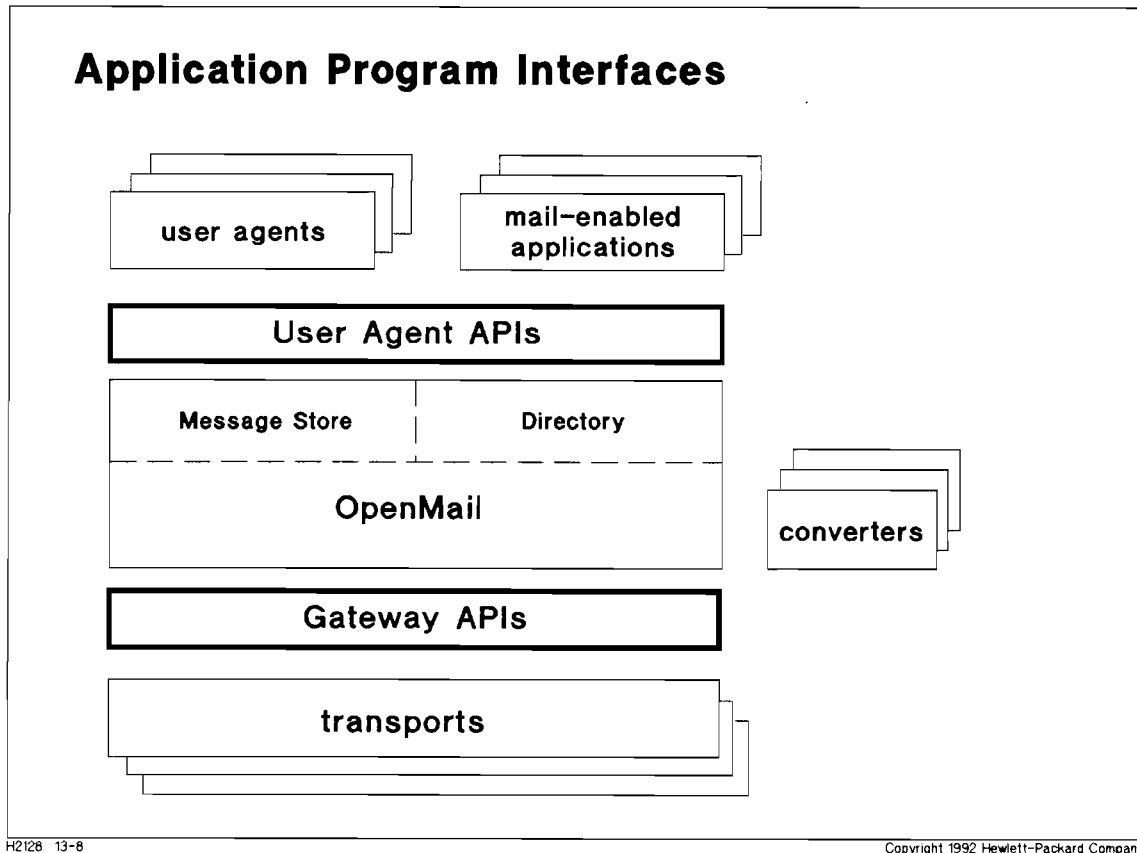
- The converter programs shipped with OpenMail are located in `/usr/openmail/bin`:
  - `advrt.browse`
  - `dca.browse`
  - `hpword.browse`
  - `memomkr.browse`
  - `nw.browse`
- If you have knowledge of source and target file formats, you can write your own converter programs and install these.

### Transition

Look at the programmatic interfaces to OpenMail ...

# Module 13 — Customizing OpenMail

## 13-8. Application Program Interfaces



The currently released APIs are:

- |                |                                                                                                                             |
|----------------|-----------------------------------------------------------------------------------------------------------------------------|
| User Agent API | UAL (User Access Layer). This is proprietary to OpenMail but architecturally equivalent to the APIA (API Association) UAPI. |
| Gateway API    | GAPI (Gateway API). This is proprietary to OpenMail but architecturally equivalent to the X.400 P3 protocol.                |

Examples of the types of application currently being developed by independent software vendors and re-sellers around the world include:

- Clients, such as: MS-Mail, Apple Macintosh, Videotex, and cc:Mail.
- Mail-enabled applications, such as: scheduler and workflow applications
- Gateways, such as: DEC ALL-IN-1 and, IBM DISOSS.
- PABX integration

### Purpose

Describe the Application Program Interfaces that make OpenMail a truly open system.

### Key Points

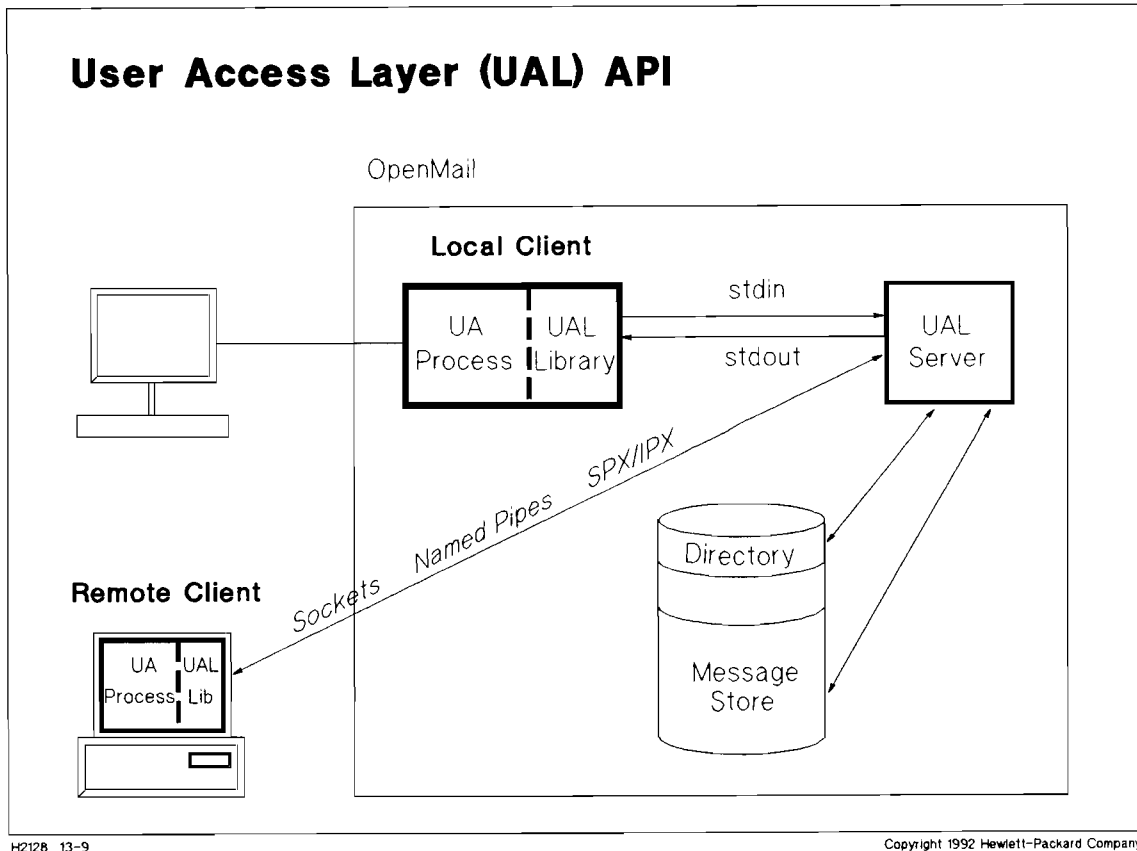
- OpenMail is “sandwiched” around Application Program Interfaces (APIs), to allow for maximum programmatic integration.
- The UAL provides a fully functional programmatic interface, enabling ISVs, VARs, and customers to write user agents to work with OpenMail.
- The UAL can be used to write programs (“mail-enabled applications”) that interact directly with OpenMail’s Directory.
- The Gateway API enables third parties to write gateways to other mail systems (for instance to proprietary mail systems).
- The Software Developer’s Kit providing API support and documentation is currently available direct from Hewlett-Packard, but will in the future be released as a standard product option.
- Future releases will also support:
  - X.400 P7 User Agent protocol
  - APIA gateway API
  - Other de facto standard electronic mail APIs (e.g. Microsoft’s MAPI and XAPIA’s VIM).
- Other converter programs can also be integrated (as we’ve seen earlier).

### Transition

Look at the UAL . . .

# Module 13 — Customizing OpenMail

## 13-9. User Access Layer (UAL) API



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The commands supported by the UAL allow the following functionality to be made available to a calling user agent:

|                           |                                                                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User Registration         | Sign on, sign off, and view user's configuration details.                                                                                                   |
| Message Retrieval         | List the contents of the Message Store, and extract message attributes and message content.                                                                 |
| Message Filing            | Copy/move/delete a message within the Message Store.                                                                                                        |
| Message Submittal         | Prepare a message and submit it for mailing, and to reply to and forward messages in the Message Store.                                                     |
| Message Tracking          | Set tracking (acknowledgement) requests on outgoing messages and receive information for mailed messages, along with ability to generate and mail messages. |
| Message Browsing/Printing | Request a textual representation of a message in the Message Store to be returned or printed.                                                               |
| OpenMail Directory Access | Check a name or list of names against the OpenMail Directory.                                                                                               |

## 13-9. User Access Layer (UAL) API

Instructor Notes

### Purpose

Explain how UAL agents work with OpenMail.

### Key Points

- Access to the UAL Server is currently via:

Local Client      Standard pipes (stdin and stdout)

Remote Client    Berkeley Sockets, LM/X Named Pipes, or Netware SPX/IPX

Other networking will be supported by the UAL for remote clients in future releases.

- Code for the UAL Library is required on the client system, and is highly portable.
- UAL Library consists of just six commands:

```
ual_connect
ual_disconnect
ual_sendcommand
ual_recreply
ual_sendfile
ual_recfile
```



### Transition

A Lab in which you write a script to use the Request Server ...



## Module 13 — Customizing OpenMail

### 13-10. LAB: Write a Script to Use the Request Server

In this Lab, you use one of the supplied example scripts to create an information service for the distribution of product datasheets. Users should be able to mail a message to the Request Server with a particular subject name and receive a text file in return.

1. Create a directory called `infobase` in your home directory. Create two text files with the name `Product1` and `Product2` in the `infobase` directory.
2. Go to the directory `/usr/openmail/examples/req` and copy the script `info` to the directory `/usr/openmail/req` as a file called `infon`, where  $n$  is the number of the system that you are using.
3. Edit the script as necessary to reflect the name of the directory containing the product datasheets.
4. Using the mailbox access commands, send a message to the Request Server to get one of the datasheets. Then list your In Tray on the host to check that you have received the message, and then read it.

## 13-10. LAB: Write a Script to Use the Request Server

Instructor Notes

### Purpose

To see how the Request Server handles simple scripts.

### Preparation

- Make sure that the directory permissions are set correctly (ie to 777 on `/usr/openmail/req` so that all users can write into the directory.
- Make sure that the file permissions are set correctly (ie to 777 on `/usr/openmail/req/infon` so that the file can be edited.

### Procedure

1. 

```
cd
mkdir infobase
cd infobase
cat > product1 and add some text
cat > product2 and add some text
```
2. 

```
cd /usr/openmail/example/req
ls -l
cp info /usr/openmail/req/infon
```

3. Edit the file so that the line

```
INFOBASE=/usr/infobase
```

is changed to the user's home directory:

```
/users/omacn/infobase
```

4. Use the command `omsend -t "infon +req/nyn,admin,systems"` to send the message, and `omlist` to check that the message is in the In Tray. Use `omreadmessage_number` to read the message.

### Transition

A Lab in which you use ACLs to limit access to the Request Server script ...

## Module 13 — Customizing OpenMail

---

### 13-11. LAB: Using ACLs

In this Lab you will create an Access Control List to limit access to the Request Server script that you created in the previous Lab.

1. Create two new OpenMail users on your local mailnode. Make sure that neither of them has Admin capability.
2. Create an ACL for the Request Server script file using the `omaddacl` command.

Once you have done this, access to the script file is removed for those users without Admin capability.

3. Use the `omaddacln` command to grant access to the list to *one* of the users you have just created.
4. As each user, send a message to the Request Server script, and check that the datasheet is returned *only* to the user that was given access to the script file via the ACL.

# Module 13 — Customizing OpenMail

## 13-11. LAB: Using ACLs

## Instructor Notes

### Purpose

To see how ACLs can be used to limit access to OpenMail resources.

### Preparation

- Encourage students to use the man pages to understand the command syntax.
- The file `/users/openmail/nls/$LANG/acl.cfg` contains configuration information.

### Procedure

1. **Create two new OpenMail users on your local mailnode. Make sure that neither of them has Admin capability.**
2. **Create an ACL for the Request Server script file using the `omaddacl` command.**

Use the command:

```
omaddacl -t req -l infon
```

to create the ACL.

3. **Use the `omaddacln` command to grant access to the list to one of the users you have just created.**

Use the command:

```
omaddacln -t req -l infon -n "username/local mailnode -c ex
```

to give one of the users execute capability on the script.

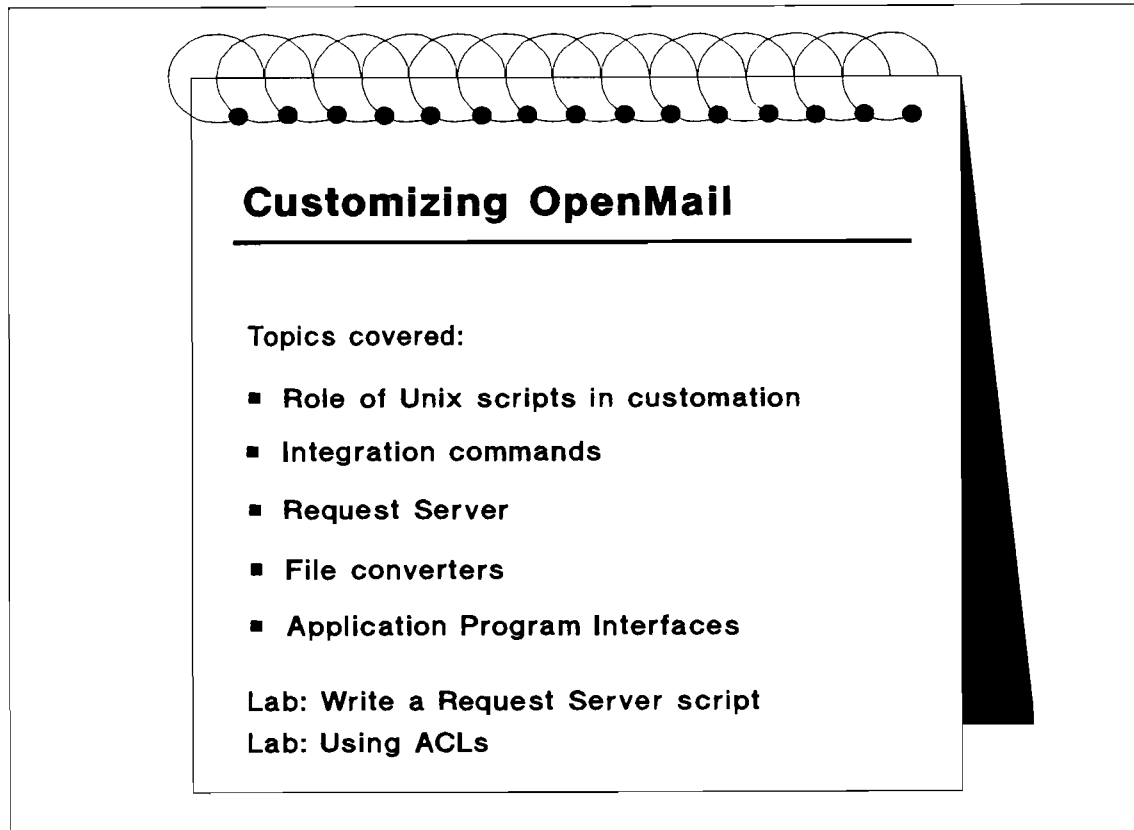
4. **As each user, send a message to the Request Server script, and check that the datasheet is returned only to the user that was given access to the script file via the ACL.**

Either the client interface, or the mailbox access commands can be used to perform this function.

### Transition

To summarize ...

## 13-12. Summary



**Customizing OpenMail**

Topics covered:

- Role of Unix scripts in customization
- Integration commands
- Request Server
- File converters
- Application Program Interfaces

Lab: Write a Request Server script  
Lab: Using ACLs

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## Notes

# Module 13 — Customizing OpenMail

---

## 13-12. Summary

## Instructor Notes

### **Purpose**

Review what has been covered in Module 13.

### **Key Points**

- Scripts are the way to customize system administration to your requirements.
- Scripts combined with the Request Server are a very powerful facility.
- Additional file converters can easily be installed.
- The programmatic interfaces allow total integration with other clients/applications.

### **Transition**

The next Module provides an introduction to X.400.

# Module 13 — Customizing OpenMail

## **Module 14 — Introduction to X.400**

---

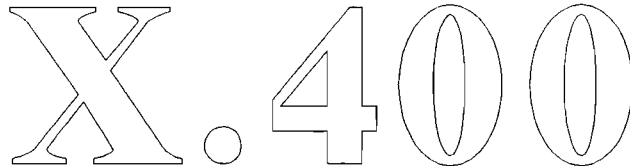
### **Objectives**

After spending 1 hour completing this Module, you will be able to:

- Understand what the X.400 standard defines
- Describe X.400 software components used to distribute mail
- Explain how the X.400 network manages the routing of messages
- Use full X.400 mail addresses



## 14-1. The X.400 Standard



**International Standard for InterPersonal Messaging**

**Defined by CCITT: X.400 Message Handling System (MHS)**

**Adopted by ISO: 10021 Message Oriented Text Interchange System (MOTIS)**

H2128 14-1

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- X.400 was first defined in 1984 (X.400/84), and was further defined in 1988 (X.400/88).

The standard runs to several hundred pages, covering all conceivable needs, a subset of which are defined as 'mandatory' items.

- In addition, both US and UK governments have defined their own (different) subset of 'mandatory' features, known as GOSIP (Government OSI Profile).

OpenMail and associated X.400 transport have been certified by the US government NIST (National Institute of Standards and Technology) as compliant to the US GOSIP/84 definition.

- OpenMail has also received COS certification from the Corporation for Open Systems International - a consortium of international IT vendors and users with the mission to accelerate worldwide acceptance of open systems.
- OpenMail's strategy is to:
  - Implement all X.400/88 and GOSIP/88 mandatory features
  - Follow standards as they evolve
  - Ensure OpenMail retains a leadership position in regard to standards conformance

## 14-1. The X.400 Standard

Instructor Notes

### Purpose

Explain what the CCITT/ISO X.400 interpersonal messaging standard defines.

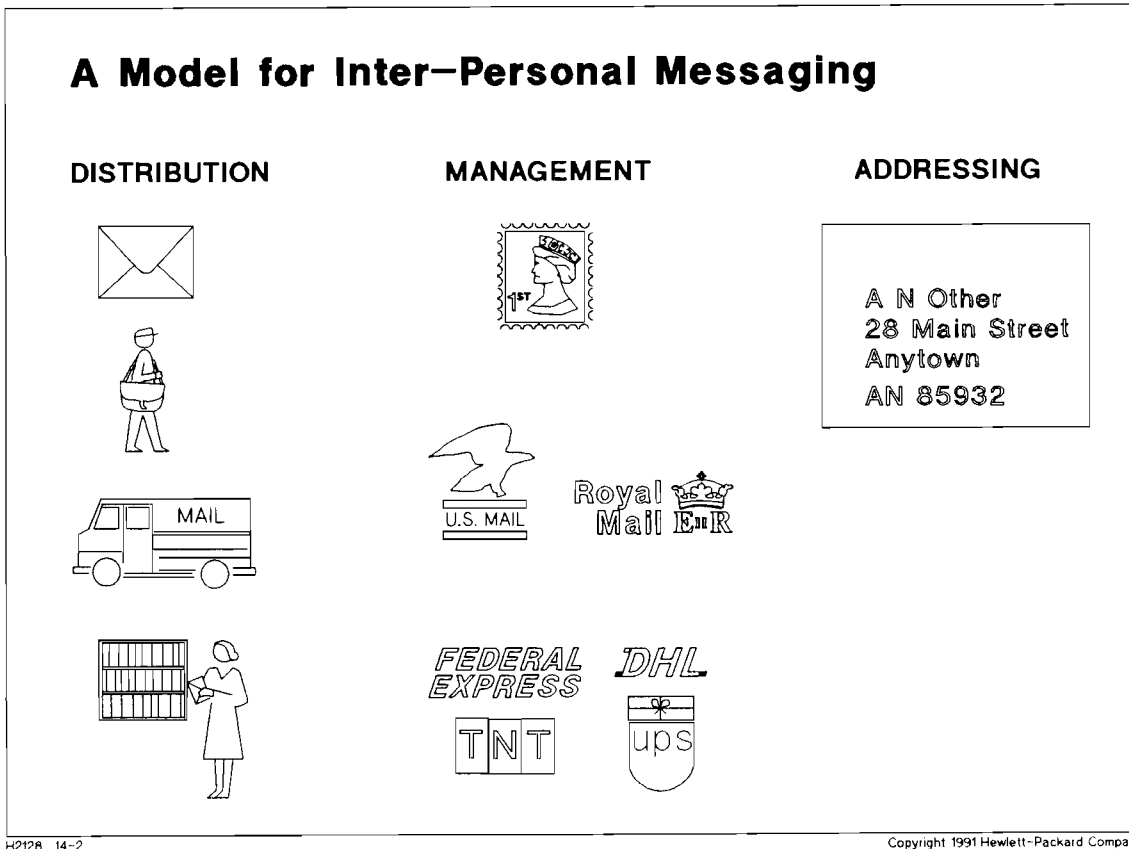
### Key Points

- Version A.01.00 of OpenMail conforms to:
  - 100% of the mandatory items in UK GOSIP/84
  - Many 88 items, such as a Message Store, remote Distribution Lists (PDLs) and filetype Object ID.
- With standards specifications, *conformance* - using the standard as a guide to your needs - is more important than looking for *compliance* - ticking off the number of standard items any product implements. Conformance should ensure *interoperability* between different systems.

### Transition

Look at a model for interpersonal messaging ...

## 14-2. A Model for Inter-Personal Messaging



The Postal Service has been around for 150 years, operates worldwide, is based on certain standards, and is administered by national postal authorities. It provides a good model for understanding X.400, as it highlights the 3 main elements of any mail system:

- Distribution mechanism
- Management of the distribution process
- Addressing convention that is adhered to by all participants, such as name, street, town, etc.

## 14-2. A Model for Inter-Personal Messaging

## Instructor Notes

### Purpose

Provide a model for InterPersonal Messaging, and highlight the 3 essential constituents - distribution, management, and addressing - by looking at the Postal Service.

### Key Points

- This provides the model and background on which to explain X.400 concepts in the rest of the Module:
  - X.400 software does the distribution
  - ADMs and PRMs provide the management
  - X.400 O/R addresses standardize the addressing
- Talk through with students a letter being delivered using the postal service; use the slide to prompt them; draw a flow chart on the whiteboard.

### Distribution

- A letter must be:
  - placed in an envelope
  - posted in a postbox provided by the Postal Authority
  - collected by a postman
  - taken to sorting office(s), and sorted
  - franked to show date/time of receipt
  - delivered, etc.

### Management

- The service is *paid for* with a stamp.
- One or more national Postal Authorities may be involved.
- Private carriers can also provide this service, such as Federal Express, DHL, UPS, TNT.

### Addressing

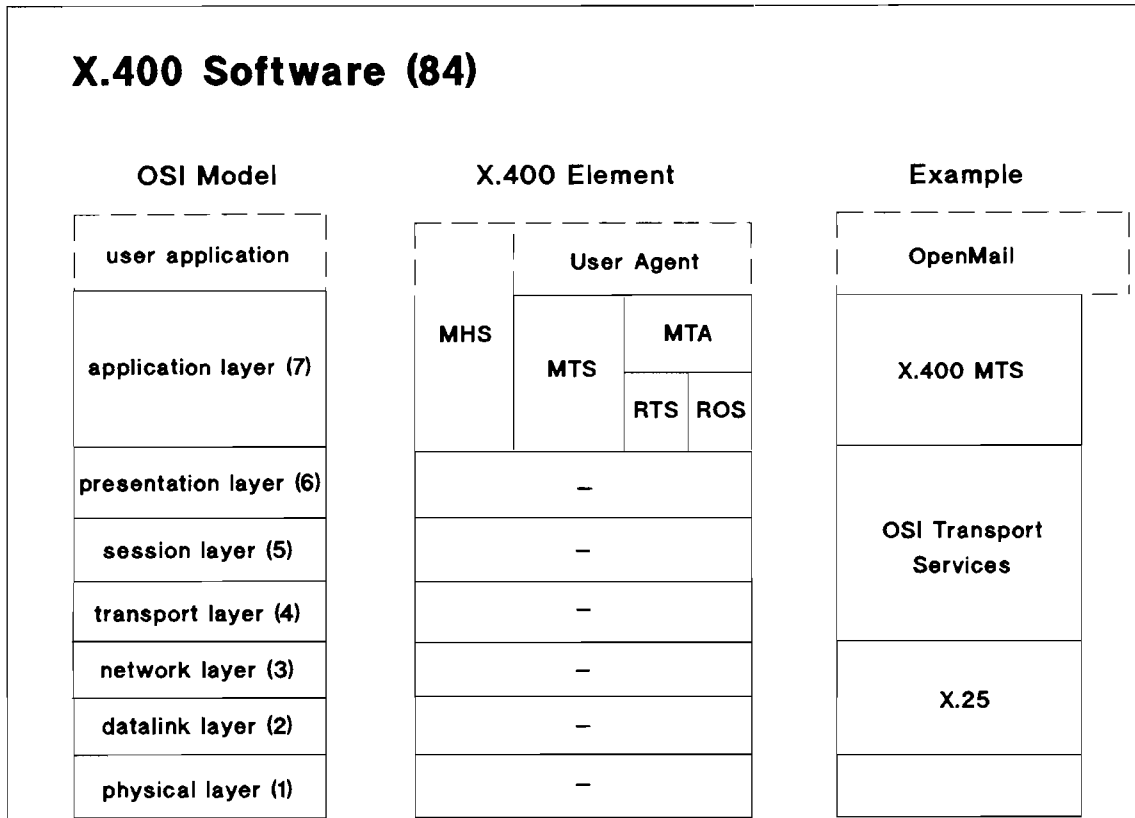
- Optional components of a postal address can be:
  - Title (Mr, Ms, etc)
  - Middle Initials
  - Department name and Organization name
  - County/State name (if the city is big enough to be well known)
  - Return address
- Some components are only mandatory in some circumstances; for example a country name is required only if the letter is destined for a foreign country.

### Transition

Look at the distribution (software) components of an X.400 system ...

# Module 14 — Introduction to X.400

## 14-3. X.400 Software (84)



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- X.400 conforms to ISO's Open Systems Interconnection (OSI) model for datacommunications.
- In the 1984 Recommendations, X.400 defines a Message Handling System (MHS), which in OSI terms covers both the user application and the top layer of the datacomm model.
- The user application that utilizes X.400 is referred to as the User Agent, and is responsible for the origination, submission, and receipt of mail. OpenMail is a native X.400 User Agent - because it uses X.400 addressing internally.
- X.400 software covers layer 7 of the OSI model, and is referred to as the X.400 Message Transfer System (MTS). The lower layers can be any that conform to the OSI model.
- Within the MTS, one or more Message Transfer Agents (MTAs) are responsible for the relay and delivery of mail, working with the Reliable Transport Service (RTS) and Remote Operations Service (ROS).

RTS is responsible for ensuring reliable transfer between MTAs, and ROS for initiating and terminating the message exchange.

- OSI Transport Services can run over IEEE 802.3 LANs or X.25.

### Purpose

Present an overview of X.400 software components used in the distribution of mail, as defined by the 1984 CCITT Recommendations.

### Key Points

- The OSI datacomm model, often referred to as the 7 Layer Model, defines:

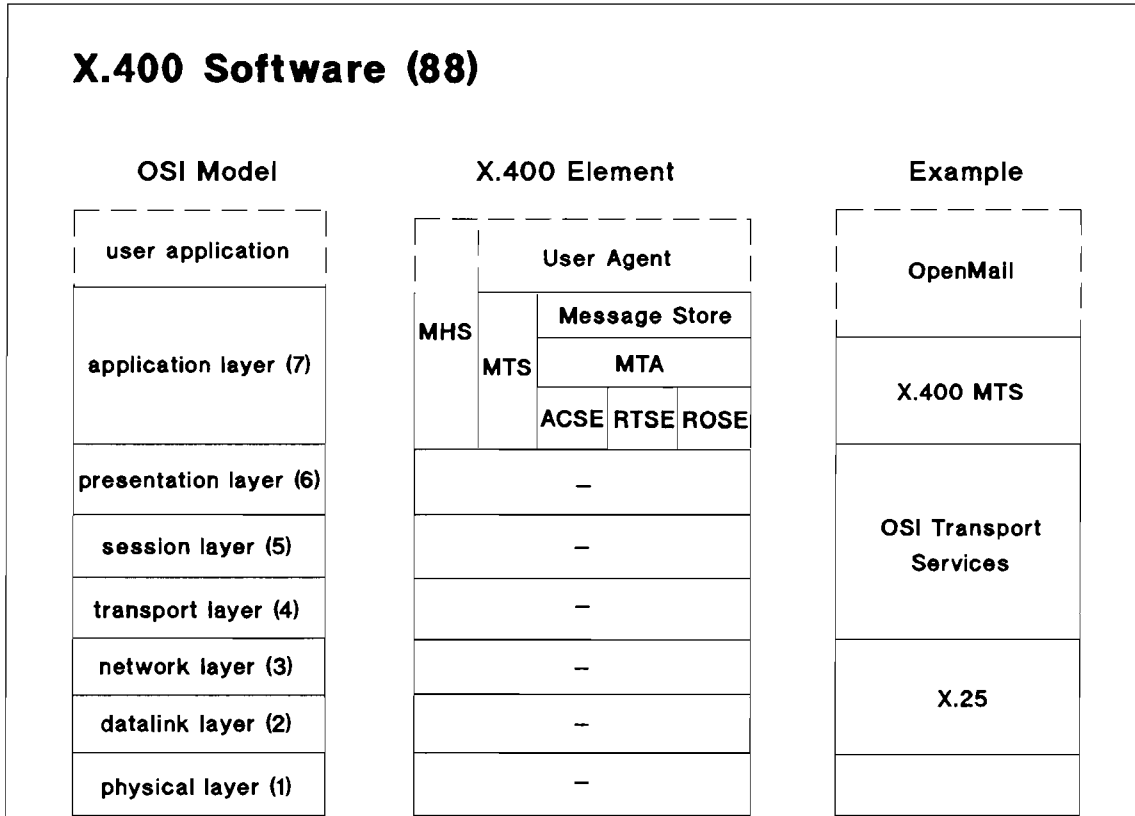
|              |                                                                                    |
|--------------|------------------------------------------------------------------------------------|
| Application  | Provides services for the user, such as file transfer and terminal access.         |
| Presentation | Handles data for the user, such as text compression and encryption.                |
| Session      | Establishes connections between users.                                             |
| Transport    | Ensures data integrity during transmission, such as re-transmissions of lost data. |
| Network      | Determines the routing between nodes.                                              |
| Data Link    | Packages data for transmission.                                                    |
| Physical     | Defines the electrical signals sent down the line and the cabling used.            |
- Since each layer in the OSI model performs a unique function, and only knows about the immediately preceding layer, X.400 can rely on any lower layers that conform to the model - in the example these are OSI Transport Services.
- OpenMail is shown overhanging the other layers because it implements some features outside the 84 standard (eg Message Store), as well as non-X.400 features (eg routing of mail via Sendmail).
- CCITT is the Committee Consultatif International Telephone et Telegraphie.
- ISO is the International Standards Organization.

### Transition

Look at the changes to the X.400 software definition in the 88 standard . . .

# Module 14 — Introduction to X.400

## 14-4. X.400 Software (88)



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- A Message Store (MS) was added between the User Agent and the MTA; this both stores messages and enables them to be retrieved by the User Agent in whatever way it wishes.
- The MTS was brought into line with the evolving OSI definition with the addition of the ACSE (Association Control Service Element), which creates/terminates MTA-to-MTA sessions.

The slightly renamed RTSE (Reliable Transport Service Element) and ROSE (Remote Operations Service Element) perform the same functions as before.

### Purpose

Present an overview of X.400 software components used in the distribution of mail, as revised by the 1988 CCITT Recommendations.

### Key Points

- Of CCITT Recommendations:
  - 84 were “first-pass” and should be seen as interim.
  - 88 Recommendations revised areas that proved difficult to implement and extended the standard to cover all basic messaging features.
  - 92 Recommendations - when published - will probably just tidy up some areas, with not extra features expected.
- OpenMail is shown extending into layer 7 of the model here because it implements a Message Store, which is technically part of the X.400 definition.

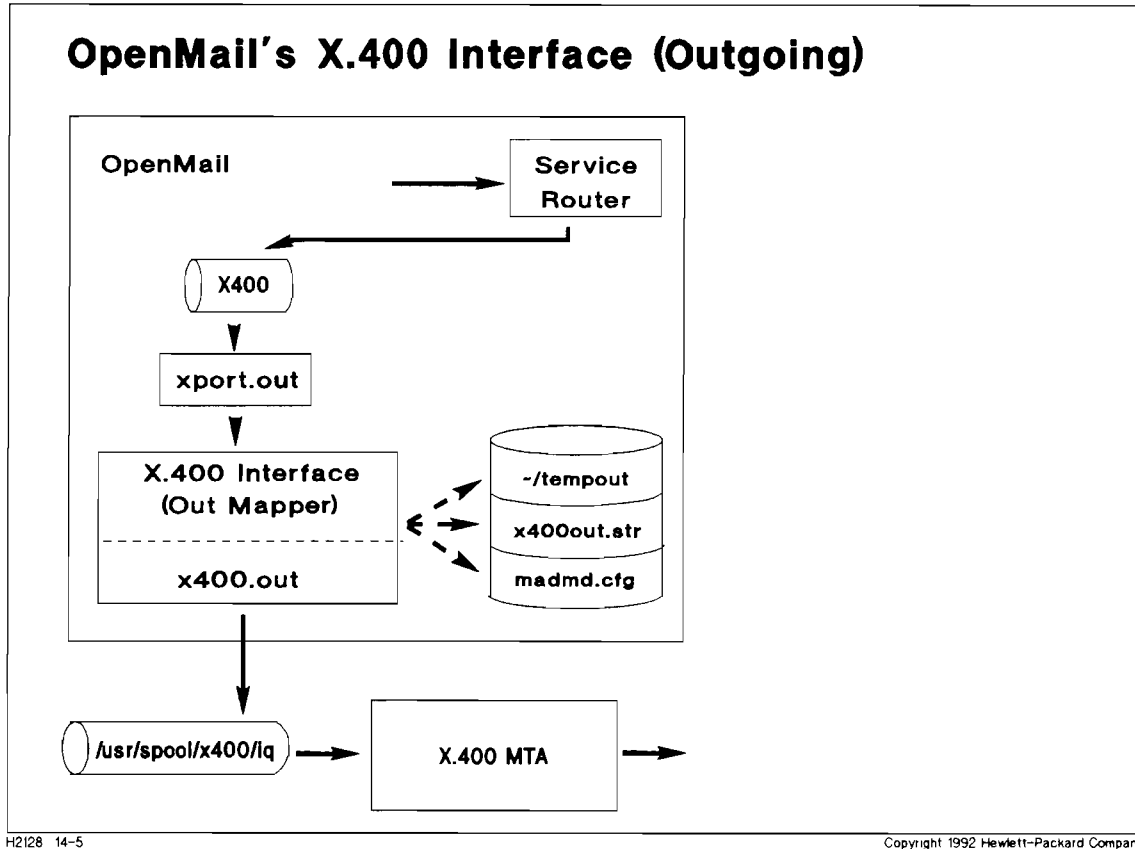
### Transition

Look at how OpenMail's X.400 Interface works to deliver mail to an X.400 MTA ...



## Module 14 — Introduction to X.400

### 14-5. OpenMail's X.400 Interface (Outgoing)



1. The Service Router puts the message on the X400 queue.
2. If OpenMail's X.400 Service is running, the xport.out daemon reads the queue, serializes the message and passes it to the X.400 Out Mapper (x400.out) to handle the message.
3. The Out Mapper then:
  - i. Puts the message in a temporary directory /users/openmail/x400/tempout
  - ii. Converts the OpenMail message from OpenMail's internal format (Transaction File plus Content Files) into an X.400 IPM message (one file in X.400 ASN.1 format).
  - iii. Converts Content Files to supported X.400 body types - to ASCII text, or if it cannot do that, to binary. These conversions are specified in the file /users/openmail/sys/x400out.str
  - iv. Adds the external attributes of the X.400 address - Country, ADMD, PRMD, and Organization - to the any OpenMail mailnodes that didn't already include them (from the file /users/openmail/sys/madmd.cfg).
  - v. Puts the message on the X.400 MTA Input Queue (/usr/spool/x400/iq), and then terminates.
4. The X.400 MTA picks up the message from that queue and routes it on.

## 14-5. OpenMail's X.400 Interface (Outgoing)

Instructor Notes

### Purpose

Explain how OpenMail's X.400 Interface delivers mail to the X.400 MTA.

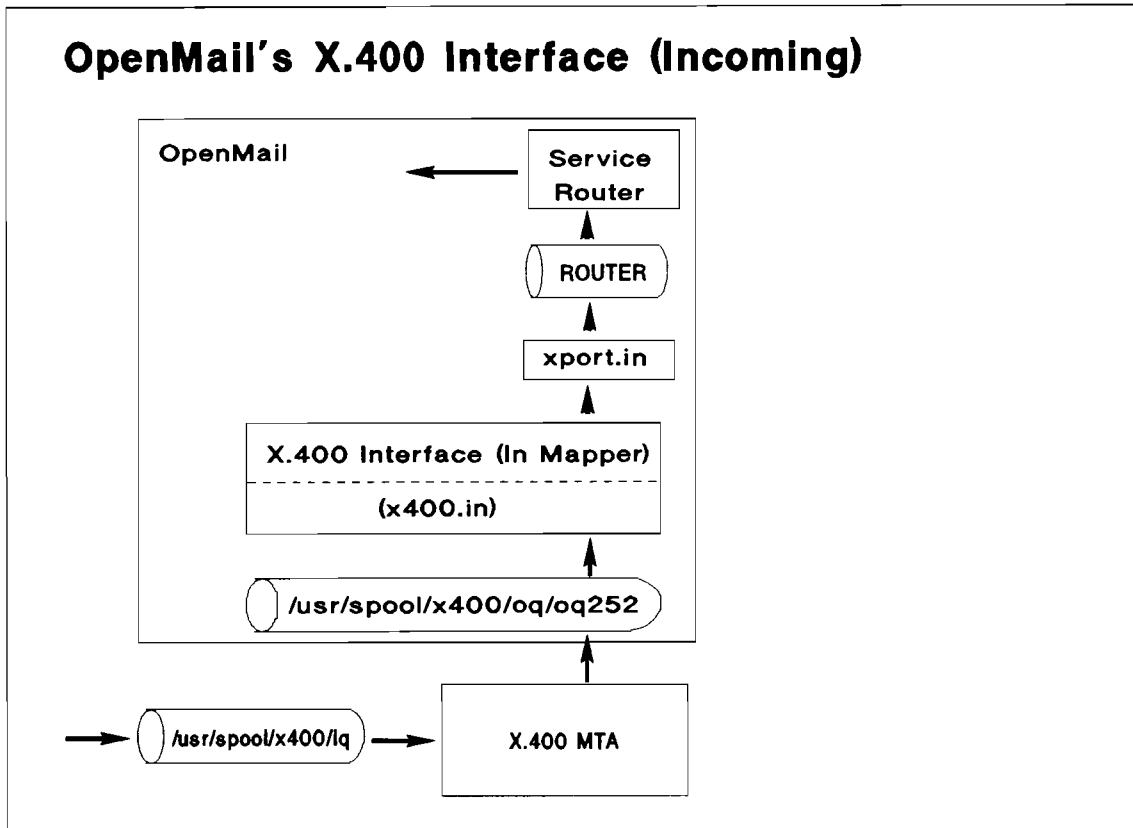
### Key Points

- X.400 Interface comprises two processes, one of which, the Out Mapper (`x400.out`), converts mail from OpenMail format to X.400 format.
- X.400 Interface can be seen as a Delivery Agent to OpenMail's User Agent - where "OpenMail" includes its clients, such as AdvanceMail.
- Version A.00.00 of OpenMail required Sendmail, to interface between the Service Router and the X.400 Interface.
- Sometimes no conversions are performed for the '88 standard.
- The file used by OpenMail to add the full X.400 address details for the originator and any OpenMail recipients (who may not be in the same country as the sender but are treated as such on the message sent out to X.400) is `/users/openmail/sys/madmd.cfg`. This enables replies to all users to be routed back to the point of exit from the OpenMail network. This is the file that must be edited at installation time to include these configuration details, which are:
  - Country name
  - ADMD name
  - PRMD name
  - Organization name
  - Encoding
  - Forwarding level
  - MTA name
- As of version A.01.00, OpenMail now supports the transmission of complex objects between OpenMail systems over X.400. This allows users to transfer, for example, NewWave objects between OpenMail nodes over X.400 networks, without the objects being converted and losing their file-type information at the X.400 Gateway . To enable this feature, answer Y to the question *Does this route go to an OpenMail system* when adding an X.400 route.

### Transition

Look at mail coming in through the X.400 Interface from an X.400 MTA ...

## 14-6. OpenMail's X.400 Interface (Incoming)



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1. Mail arrives at the local X.400 MTS and is put in the MTA's Input Queue (`/usr/spool/x400/iq`) by the RTS.
2. The MTA picks up the message; and, following its configuration, routes mail for OpenMail into the input directory of OpenMail's In Mapper (`x400.in`), which is `/usr/spool/x400/oq/oq252`
3. The In Mapper then:
  - i. Converts the X.400 IPM message (in ASN.1 format) into a serialized format.
  - ii. Performs any necessary conversions specified in the `/users/openmail/sys/x400in.str` steering file.
  - iii. Invokes the `xport.in` daemon to route the message to the Service Router.
4. `xport.in` then:
  - i. Converts the message into OpenMail format.
  - ii. Puts the message in the ROUTER queue (the input queue to the Service Router).

## 14-6. OpenMail's X.400 Interface (Incoming)

Instructor Notes

### Purpose

Explain how OpenMail's X.400 Interface receives mail from the X.400 MTA.

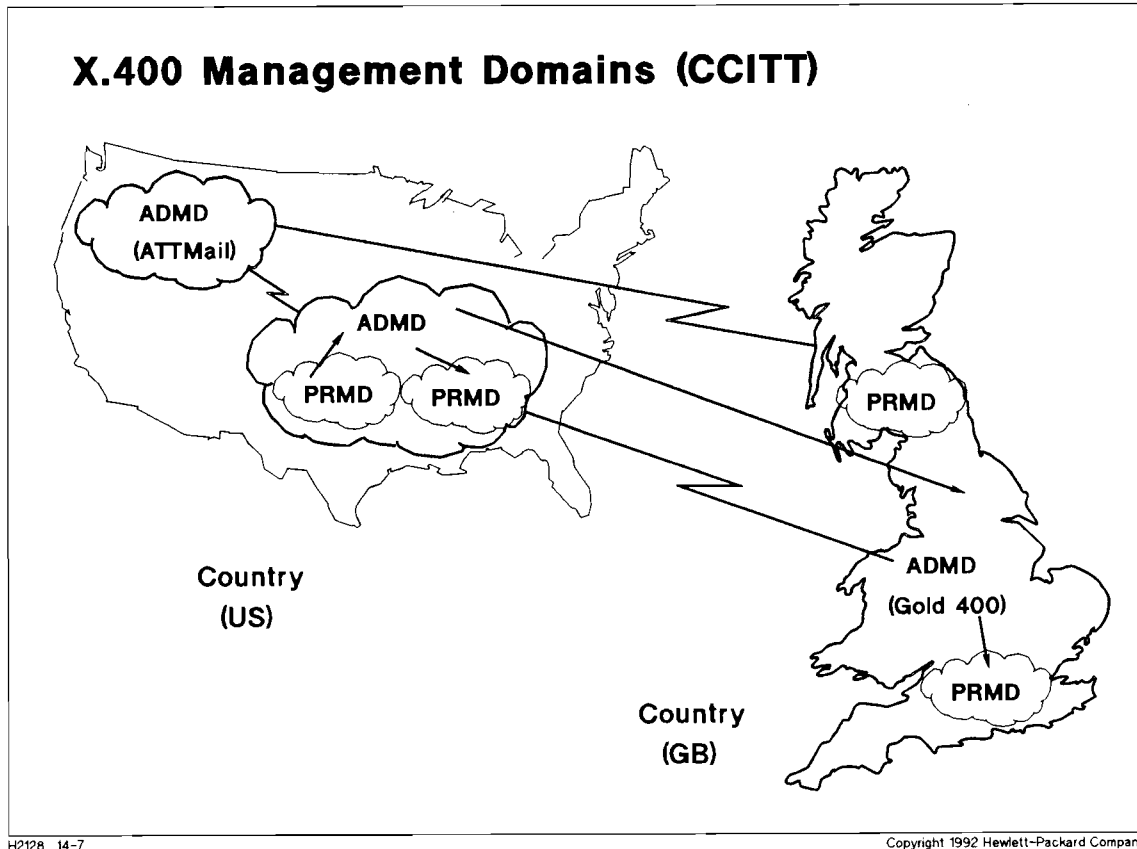
### Key Points

- X.400 Interface comprises two processes, one of which, the In Mapper (`x400.in`), converts mail from X.400 to OpenMail format.
- No conversions on the contents are attempted unless configured ('88 standard only).

### Transition

Look at how X.400 divides the world up into Management Domains ...

## 14-7. X.400 Management Domains (CCITT)



X.400 divides the world first geographically, into countries, and further logically, into two kinds of **Management Domain** - Administration Management Domain (ADMD) and Private Management Domain (PRMD).

The ADMD is the public network, within a country, managed by a national Public Telephone and Telegraph authority (PTT) or a private common carrier. The US has several ADMDs, managed by private carriers like AT&T (ATTMail) and MCI (MCI Mail). In Europe there is usually one ADMD per country, managed by the national PTT (for example Gold 400, managed by British Telecom in the UK).

The PRMD is a private network, managed by a company or other private organization. It need not be restricted to one country and can be worldwide. An example is HP, which is the PRMD for Hewlett-Packard.

All systems within a PRMD can exchange mail, either directly or through a hub. Under the CCITT definition, unconnected PRMDs interconnect via one or more ADMDs. ADMDs must exchange mail directly or through other ADMDs; they cannot communicate via a PRMD.

## 14-7. X.400 Management Domains (CCITT)

## Instructor Notes

### Purpose

Explain how X.400 views networks as Management Domains in the CCITT definition.

### Key Points

- OpenMail has been tested and shown to be fully interoperable with many X.400 ADMDs, including:

|                         |                     |                    |
|-------------------------|---------------------|--------------------|
| <b>AT&amp;T</b>         | ATTMail Gateway 400 | Vers. 4.0 Rev.8    |
| <b>AT&amp;T</b>         | PMX/X.400           | Ver. 1.21 Rel. 1.0 |
| <b>DIALCOM</b>          | Mail X400           | 6.0m               |
| <b>MCI</b>              | MCIMail/X.400       | DEC MRX 2.0        |
| <b>Sprint (TeleNet)</b> | SprintMail/X.400    | A03                |
| <b>BT</b>               | Gold 400            |                    |
| <b>French PTT</b>       | Atlas/X.400         |                    |

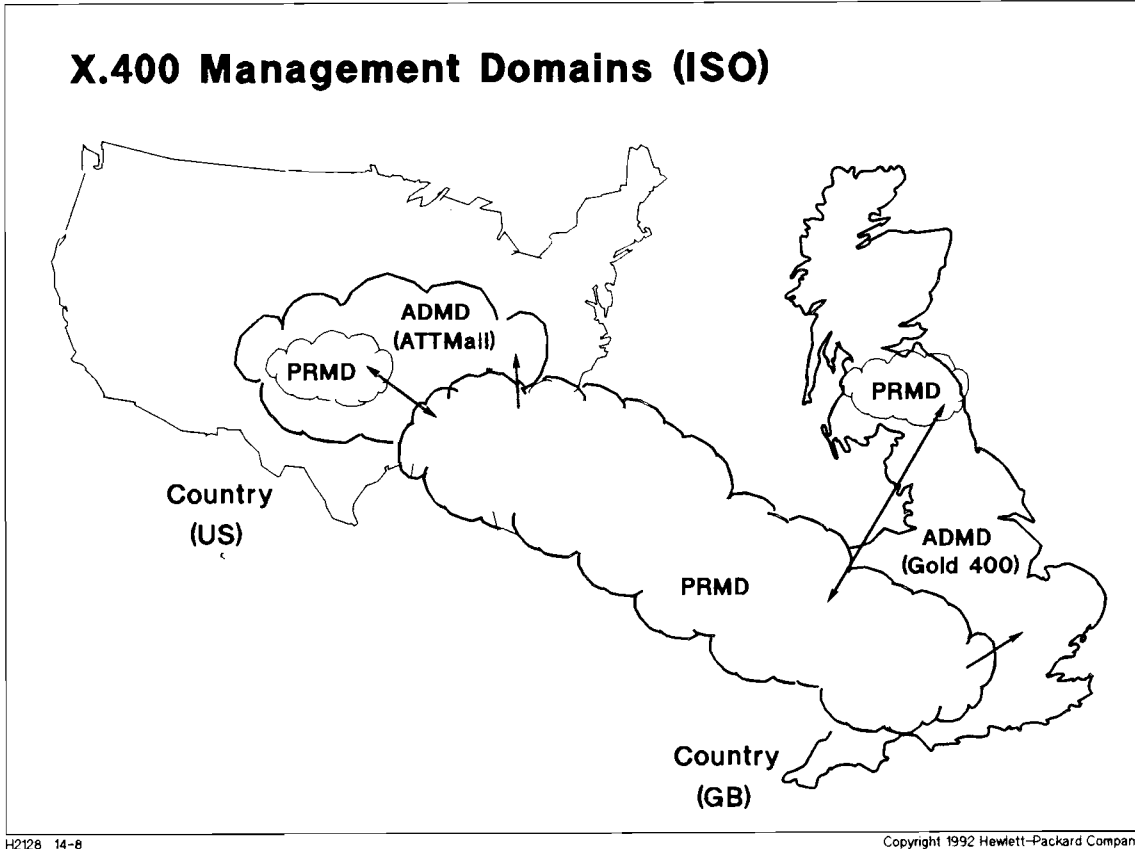
- OpenMail has been tested and shown to be fully interoperable with many X.400 systems, including:

|                     |                        |        |
|---------------------|------------------------|--------|
| <b>Data General</b> | DG/X.400               | 1.10   |
| <b>DEC</b>          | Message Router         | 3.1    |
| <b>IBM</b>          | AIX OSIMF/6000         | 1.0    |
| <b>Nixdorf</b>      | TARGON MAIL            | 2.0/02 |
| <b>Olivetti</b>     | IBIS/X MAIL            | 2.1    |
| <b>Prime</b>        | Prime_X400             | 1      |
| <b>Retix</b>        | Open Server            | 2.02   |
| <b>Touch</b>        | Touch WorldTalk X.400  | 1.0    |
| <b>Unisys</b>       | OSI Mail Manager       | 1.1.2  |
| <b>Xerox</b>        | XNS X.400 Mail Gateway | 11.2.5 |

### Transition

Look at the ISO Management Domains . . .

## 14-8. X.400 Management Domains (ISO)



Under the ISO definition, PRMDs can exchange mail directly with each other, and ADMDs can be transnational. Both interpretations can co-exist, subject to the approval of national regulatory bodies.

---

## 14-8. X.400 Management Domains (ISO)

Instructor Notes

### Purpose

Explain how X.400 views networks as Management Domains in the ISO definition.

### Key Points

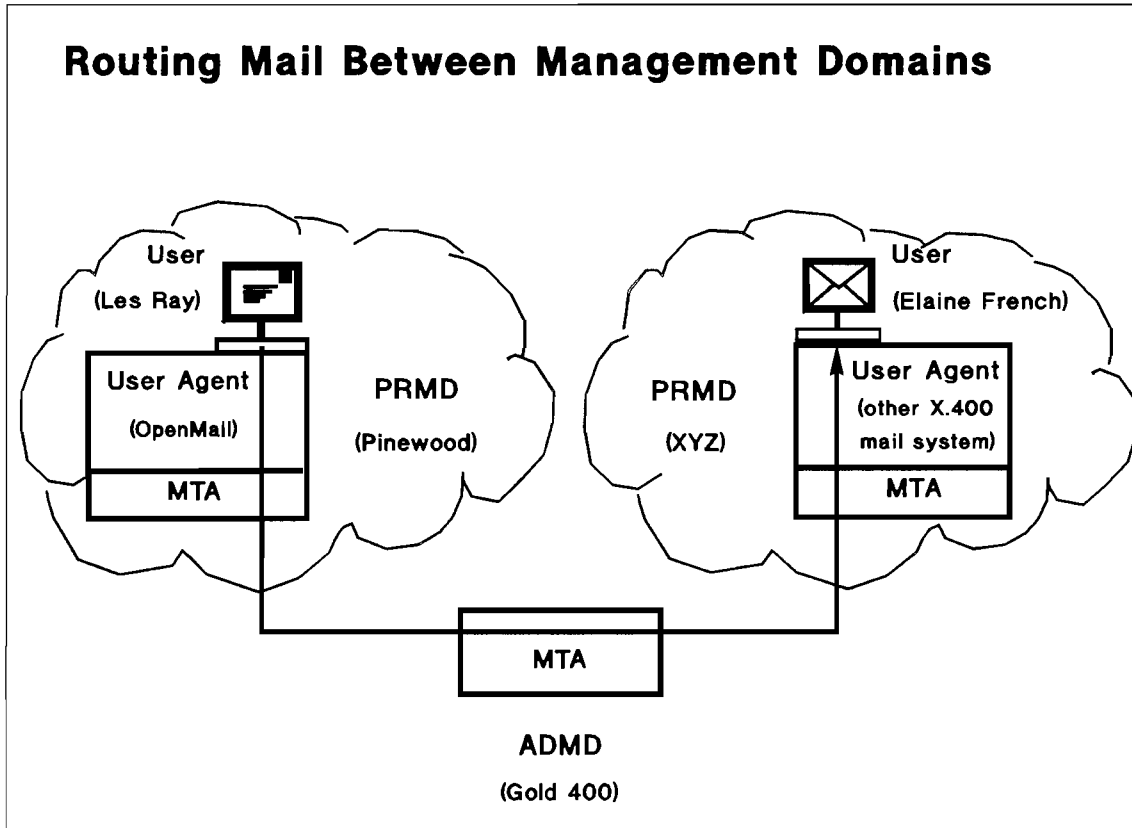
- CCITT definition is ADMD-oriented [CCITT is a committee of PTTs], while ISO definition is PRMD-oriented; we'll use the CCITT definition.

### Transition

Look at how X.400 Management Domains are used to route mail . . .



## 14-9. Routing Mail Between X.400 Management Domains



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1. Pinewood Inc's London office and XYZ Company are both within the **Gold 400** ADMD.
2. BT Gold 400 recognizes Pinewood Inc's network by the PRMD name **Pinewood** and XYZ Company's network as **XYZ**
3. OpenMail user, Les Ray, mails a message to Elaine French at XYZ Company.
4. The message is passed by OpenMail to its X.400 Interface, and on to the local X.400 MTA, which routes the message out of Pinewood's PRMD (**Pinewood**) to the ADMD (**Gold 400**).
5. Within the ADMD, one or more MTAs route the message to an MTA in XYZ's PRMD, using the full X.400 address to do so.

(Typically, the ADMD also records information for billing Pinewood for the service.)

6. Once in XYZ's PRMD, is forwarded to the User Agent that provides mail capabilities to Elaine French.

## 14-9. Routing Mail Between X.400 Management Domains

Instructor Notes

### Purpose

Explain how X.400 Management Domains are used to route mail.

### Key Points

- Explain the message flow from one PRMD to another.
- If both PRMDs were not within the same ADMD, the ADMD at the originating end would route the messages to the appropriate ADMD containing the recipient's PRMD (according to the CCITT definition).
- OpenMail supports connection to multiple ADMDs (eg both Gold 400 and ATTMAIL), which can reduce connection charges in some networks.

### Transition

Look at how X.400 Originator/Recipient Addresses add domains to the Organizational Units used within OpenMail . . .

## 14-10. X.400 Originator/Recipient Addresses

| <b>X.400 Originator/Recipient Addresses</b> |                                   |                      |
|---------------------------------------------|-----------------------------------|----------------------|
| <b>Component</b>                            | <b>Use</b>                        | <b>Example</b>       |
| Personal Name                               | Identifies user                   | Elaine J. French II. |
| Organizational Unit 1                       | Identifies user's department      | ny                   |
| Organizational Unit 2                       |                                   | sales                |
| Organizational Unit 3                       |                                   | admin                |
| Organizational Unit 4                       |                                   |                      |
| Organization Name                           | Identifies company (or division)  | XYZSales             |
| Country Code                                | Identifies country                | GB                   |
| Administration Domain Name                  | Identifies public X.400 carrier   | Gold 400             |
| Private Domain Name                         | Identifies private X.400 network  | XYZ                  |
| X.121 Address                               | International numeric address     | 011-81-6-3040219     |
| UA Unique Numeric Identifier                | Unique X.400 user agent number    | 13 54 67 89 296      |
| Domain Defined Attributes                   | Extra user addressing information | elainej@chigo        |

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The slide shows the address elements that the Administrator of an external X.400 mailing system might provide for messages to reach users on their particular system.

The full X.400 address is made up of Personal Name, Organizational Units, Organization Name, Country Code, ADMD and PRMD. In certain mailing systems these may be replaced by an X.121 Address, a UA Unique Identifier, or Domain Defined Attributes (see later).

Just as a postal address must be in the right order — name, road, town, etc — so must mailnode information for X.400. The slide shows X.400 address components in their correct order. An address with components in the wrong order will not be recognized.

Addressing other users within the same PRMD requires just the Personal Name and Organizational Units (as within an OpenMail network); these are known as the “internal attributes” of the address. A full X.400 address, including external attributes, is only required if the user must be reached via an ADMD.

### Purpose

Explain the information carried in a full X.400 address, especially those additional to the name components and organizational units used within OpenMail.

### Key Points

- Personal name equates to OpenMail user name attributes; Given name, Surname, Initials, Generation.
- Address comprises up to 4 organizational units (as in OpenMail) - here 3 are used: ny,sales,admin.
- Organization: XYZSales (XYZ Company's designation for itself or - as in this case - part of itself; there can be several Organizations within the same PRMD, for different constituent companies within a conglomerate organization).
- Private Domain: XYZ (the Gold 400 designation for XYZ's PRMD)
- Admin Domain: Gold 400 (the X.400 designation for British Telecom's ADMD)
- Country: GB (the X.400 designation for the United Kingdom)

Some other country codes defined by the standard are:

|    |               |
|----|---------------|
| CA | Canada        |
| DE | Germany       |
| FR | France        |
| IT | Italy         |
| JP | Japan         |
| MX | Mexico        |
| US | United States |

- X.121 Address is a unique international numeric address, used over X.25 packet switched networks, which uniquely identifies the receiving system. This could be the telephone number of a system, a fax number, or a telex number.
- The UA Identifier is a unique user agent number, which uniquely identifies the receiving User Agent. This is allocated by the Administration Domain.
- Domain Defined Attributes are additional addressing elements that can be defined in any way by the Private Domain.

### Transition

Look at valid variants of X.400 addresses . . .

## 14-11. X.400 Address Variants

### X.400 Address Variants

**Mnemonic Form:**

|      |   |          |
|------|---|----------|
| C    | = | GB       |
| ADMD | = | Gold 400 |
| PRMD | = | XYZ      |
| O    | = | XYZSales |
| OU   | = | Sales    |
| S    | = | French   |
| G    | = | Elaine   |

**Numeric Form:**

|       |   |                 |
|-------|---|-----------------|
| C     | = | GB              |
| ADMD  | = | Gold 400        |
| UA-ID | = | 13 54 67 89 296 |

**Terminal Form:**

|      |   |                  |
|------|---|------------------|
| C    | = | GB               |
| ADMD | = | Gold 400         |
| X121 | = | 011-81-6-3040219 |

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An X.400 address does not have to uniquely identify an actual user - providing a message can be routed to a unique User Agent or PRMD, it is then the responsibility of the receiving system/network to route the message internally.

An X.400 address could be composed from any of the following combinations of attributes that uniquely identify a recipient User Agent:

Mnemonic form: Name/Country/ADMD/PRMD  
Numeric form: Country/ADMD/UA Identifier  
Terminal form: Country/ADMD/X.121 Address

### Purpose

Explain the different valid permutations of X.400 addresses.

### Key Points

- Every X.400 address does not contain all the elements we looked at previously - they allow for flexibility in addressing users - the key alternatives being:
  - Personal Name/PRMD
  - UA Identifier
  - X.121 Address

Some attributes (like Organization Name and some Organizational Units) are optional descriptive detail.

- OpenMail currently requires a name to also be supplied with the UA ID or X.121 address variants, so that they can be stored in the OpenMail Directory.
- '88 Recommendations - not all of which are currently implemented in OpenMail - also support *postal* addressing attributes, such as `StreetNameAndNumber`, `TownName`, `RegionName`, which allows messages to be printed out and physically delivered.

### Transition

Look at how X.400 addressing is used to deliver mail . . .

## 14-12. Using Full X.400 Addresses

### Using Full X.400 Addresses

#### OpenMail user: Les Ray

##### X.400 Components of Address:

C=GB; ADMD=Gold 400; PRMD=Pinewood; O=Pinewood; OU=lon; S=Ray; G=Les

##### Address format in OpenMail:

Les Ray/lon,corp,admin/Pinewood/GB/Gold\_400/Pinewood

#### X.400 user: Elaine French

##### X.400 Components of Address:

C=GB; ADMD=Gold 400; PRMD=XYZ; O=XYZSales; O=sales; S=French; G=Elaine

##### Address format in OpenMail:

Elaine French/sales,admin/XYZSales/GB/Gold\_400/XYZ

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1. Les Ray, OpenMail user at Pinewood in London, addresses a message to Elaine French at the XYZ Company:

```
T0: Elaine French/sales,admin/XYZSales/GB/Gold_400/XYZ
FROM: Les Ray
```

2. The OpenMail Directory adds additional internal X.400 addressing units (the mailnode) for Les:

```
T0: Elaine French/sales,admin/XYZSales/GB/Gold_400/XYZ
FROM: Les Ray/lon,corp,admin
```

and the Routing Table indicates that the message should be passed to the X.400 Interface.

3. As the message passes through the OpenMail X.400 Interface, the full X.400 address for the OpenMail system is added to Les Ray's FROM address:

```
T0: Elaine French/sales,admin/XYZSales/GB/Gold_400/XYZ
FROM: Les Ray/lon,corp,admin/Pinewood/GB/Gold_400/Pinewood
```

## 14-12. Using Full X.400 Addresses

## Instructor Notes

### Purpose

Explain how X.400 addressing is used to deliver mail.

### Key Points

- The correct position and accuracy of each address component are essential for delivery in X.400. That's why it is important to record external X.400 users in the OpenMail Directory, so that Les Ray has only to enter Elaine's name. Failing that, it is better to use the aided addressing that user clients, such as AdvanceMail, provide for X.400 addresses, with entry boxes for the address components.
- The message passes from the Pinewood PRMD into the ADMD Gold\_400, under control of the X.400 MTS. The ADMD routes the message to the XYZ PRMD. The receiving mailing system at XYZ delivers the message to Elaine.
- The components of the X.400 address, as listed on the slide, are in the form users would typically print on stationery, business cards, etc. Typically, however, only the first Organizational Unit (OU) needs to be shown.

Note this is different from the form in which they are represented in OpenMail.

- An underscore is used by OpenMail to represent the space in "Gold 400".
- Notice that Pinewood's ORG name is the same as its PRMD name - that is it doesn't bother to distinguish between parts of the company in the X.400 address - while XYZ have more particular ORG names, one of which is XYZSales.

### Transition

A written exercise to check that you agree X.400 is easy to understand . . .



## Module 14 — Introduction to X.400

### 14-13. QUIZ: Understanding X.400

Give your best answer to each question, referring back in your Workbook if you need to. For many questions there is not a “correct” answer - just give your own interpretation.

1. What is X.400?
2. How would you assess conformance with the X.400 standard?
3. How would you describe OpenMail's relation to X.400 software?
4. What is the name of OpenMail's input queue for messages received from X.400?
5. Give two examples of an ADMD.
6. How many unique ways are there to identify a user with X.400 addressing, and what are they?
7. If you already have an X.400 address of your own, write it down. If not, create an imaginary one for yourself, using what you think would be appropriate address elements.

## 14-13. QUIZ: Understanding X.400

## Instructor Notes

### Purpose

Test students' understanding of X.400 concepts.

### Suggested Answers

1. What is X.400?

X.400 is an international (CCITT/ISO) standard for inter-personal messaging. It covers messages originated and distributed electronically, and usually also delivered electronically (though X.400 does support postal addresses to enable mail to be printed and forwarded in hardcopy to physical locations.)

2. How would you assess conformance with the X.400 standard?

By number of *mandatory* items implemented, by adherence to a GOSIP profile, or by COS certification.

3. How would you describe OpenMail's relation to X.400 software?

OpenMail is basically a user agent to X.400. The X.400 MTA is level 7 in the OSI datacomm model, and OpenMail is an end-user application communicating with it.

4. What is the name of OpenMail's input queue for messages received from X.400?

`/usr/spool/x400/oq/oq252` is the input directory of the In Mapper process of the X.400 Interface.

5. Give two examples of an ADMD.

ATTMail, MCI Mail, Gold 400, etc [see list on page 14-11]

6. How many unique ways are there to identify a user with X.400 addressing, and what are they?

Three:

Mnemonic form  
Numeric form  
Terminal form

7. If you already have an X.400 address of your own, write it down. If not, create an imaginary one for yourself, using what you think would be appropriate address elements.

These can be written in OpenMail form or X.400 form; for example:

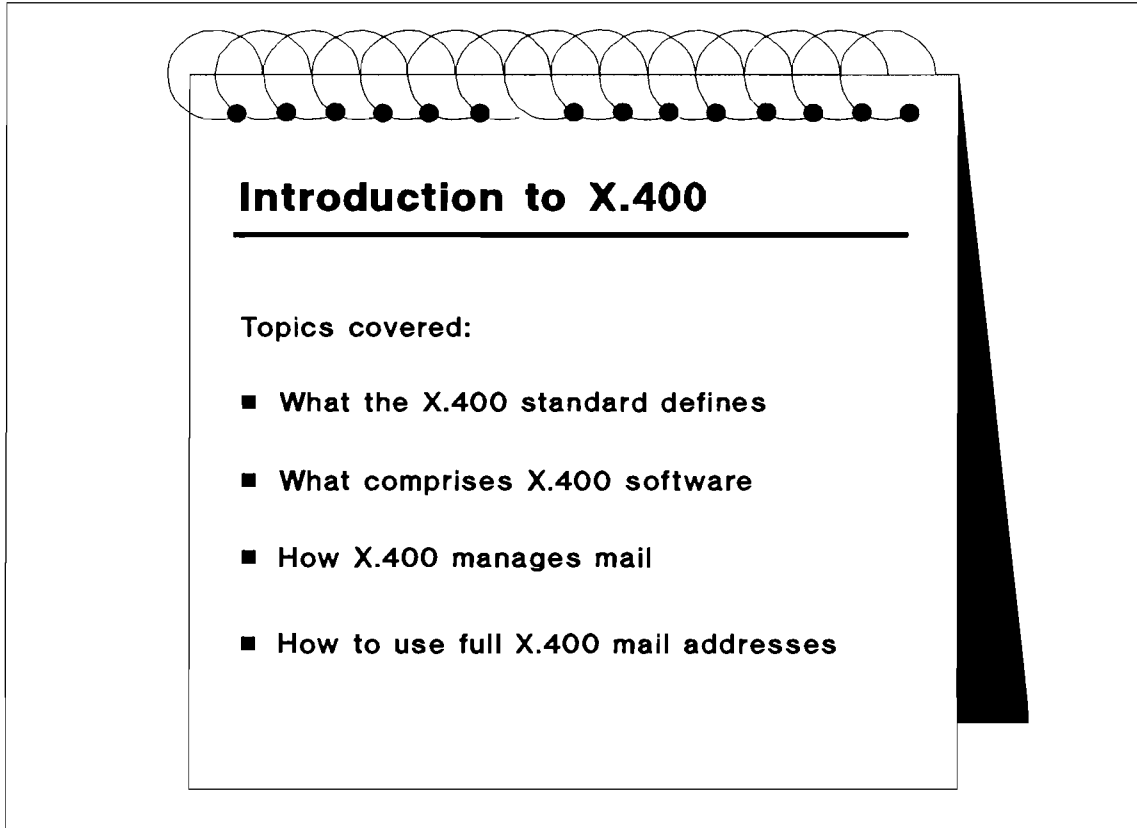
OpenMail: Roger Williams/pinewood,ls,hpopd/HP/GB/Gold\_400/HP

X.400: C=GB;ADMD=Gold 400;PRMD=HP;ORG=HP;OU1=Pinewood;SN=Williams;GN=Roger

### Transition

To summarize ...

## 14-14. Summary



**Introduction to X.400**

Topics covered:

- What the X.400 standard defines
- What comprises X.400 software
- How X.400 manages mail
- How to use full X.400 mail addresses

H2128 14-14

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## Notes

### Purpose

Review what has been covered in Module 14.

### Key Points

- The model helped classify the different aspects of the X.400 standard:
  - Distribution of mail by software
  - Management of networks by PTIs/Private Carriers
  - Full X.400 addressing
- This Module aims only to overview of X.400 concepts necessary for administering the OpenMail interface to X.400.
- It is assumed there will be an X.400 specialist at your site, responsible for running the X.400 software.
- For more information on X.400, recommend HP's introductory self-paced video course:

*Message Handling Systems - X.400* (HP product number B1797)

- The CCITT Red Book (84) and Blue Book (88) defining the X.400 standard are available from:

#### **N America**

Omnicom  
115 Park St, S.E.  
Vienna  
Virginia 22180  
USA

#### **Europe**

Omnicom International Ltd.  
Forum Chambers, The Forum  
Stevenage  
Hertfordshire SG1 1EL  
UK

### Transition

The next Module covers planning an X.400 Interface.

# Module 14 — Introduction to X.400

## **Module 15 — Planning an X.400 Interface**

---

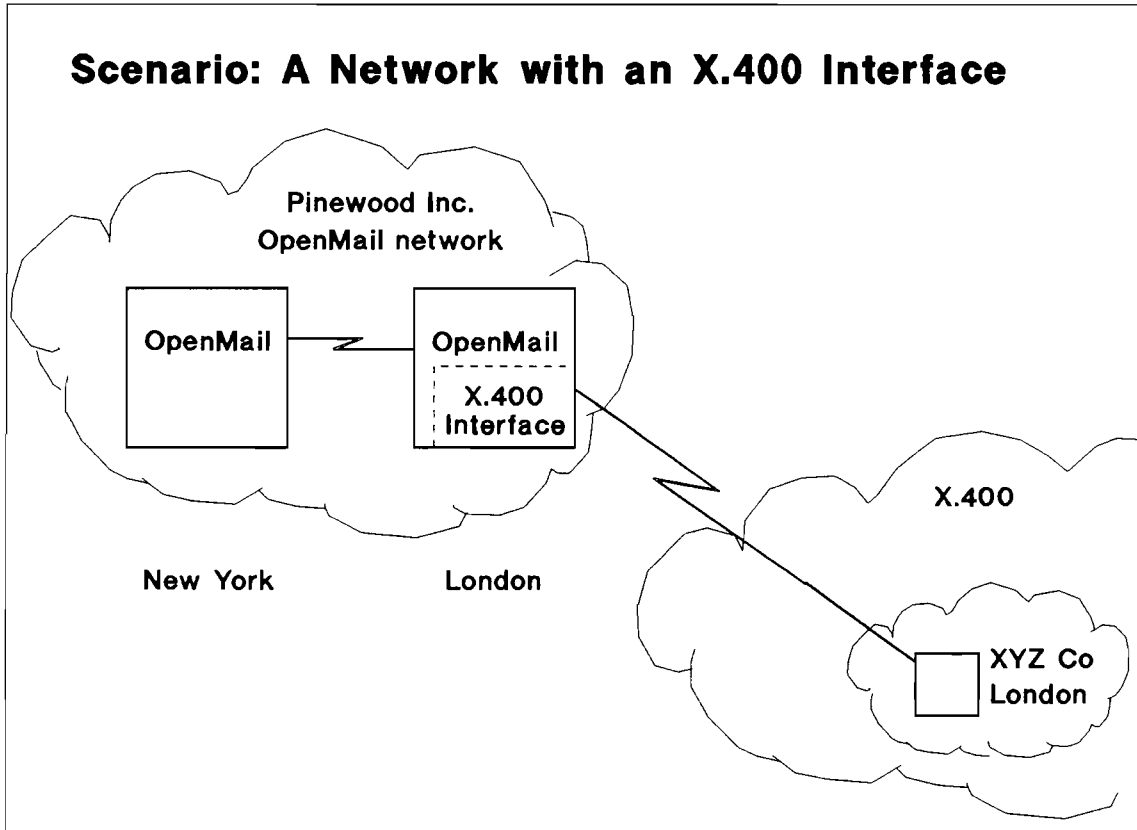
### **Objectives**

After spending 1 hour completing this Module, you will be able to:

- Plan an X.400 Interface
- Understand how OpenMail routes mail to X.400
- Obtain necessary information from X.400 System Administrators
- Decide what extra entries to make in the Directory

# Module 15 — Planning an X.400 Interface

## 15-1. Scenario: A Network with an X.400 Interface



H2128 15-1

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Pinewood Inc have acquired XYZ Company, situated in London, England. This company has its own X.400-based mailing system running on a proprietary mainframe. Pinewood management decided they will communicate with some departments at XYZ via OpenMail's X.400 Interface.

You are still the New York OpenMail Administrator, but you are now also responsible for establishing communication between Pinewood's OpenMail network and X.400. In this role, you have been called to Pinewood's London office to help them to plan the X.400 Interface that is to be established there.

# Module 15 — Planning an X.400 Interface

## 15-1. Scenario: A Network with an X.400 Interface

### Instructor Notes

### Purpose

Introduce the scenario used as the main example in this Module.

### Key Points

#### Situation

- Pinewood Inc have acquired the XYZ Company which is situated in London, England.
- Pinewood management has decided that they want to have electronic mail links with XYZ Company who currently use a different X.400-based mailing system.
- Pinewood has taken the first step: they have installed the X.400 Interface component on the OpenMail system at their London site. The X.400 Interface, once configured, will allow the exchange of electronic mail between Pinewood's OpenMail network and XYZ's system.

#### Your Job

- You are still the New York Administrator.
- You have been invited to London to help with the planning and configuration of the X.400 Interface (because you were so successful in setting up the pilot system in New York!)
- This module explains what you need to understand in order to plan the Interface.

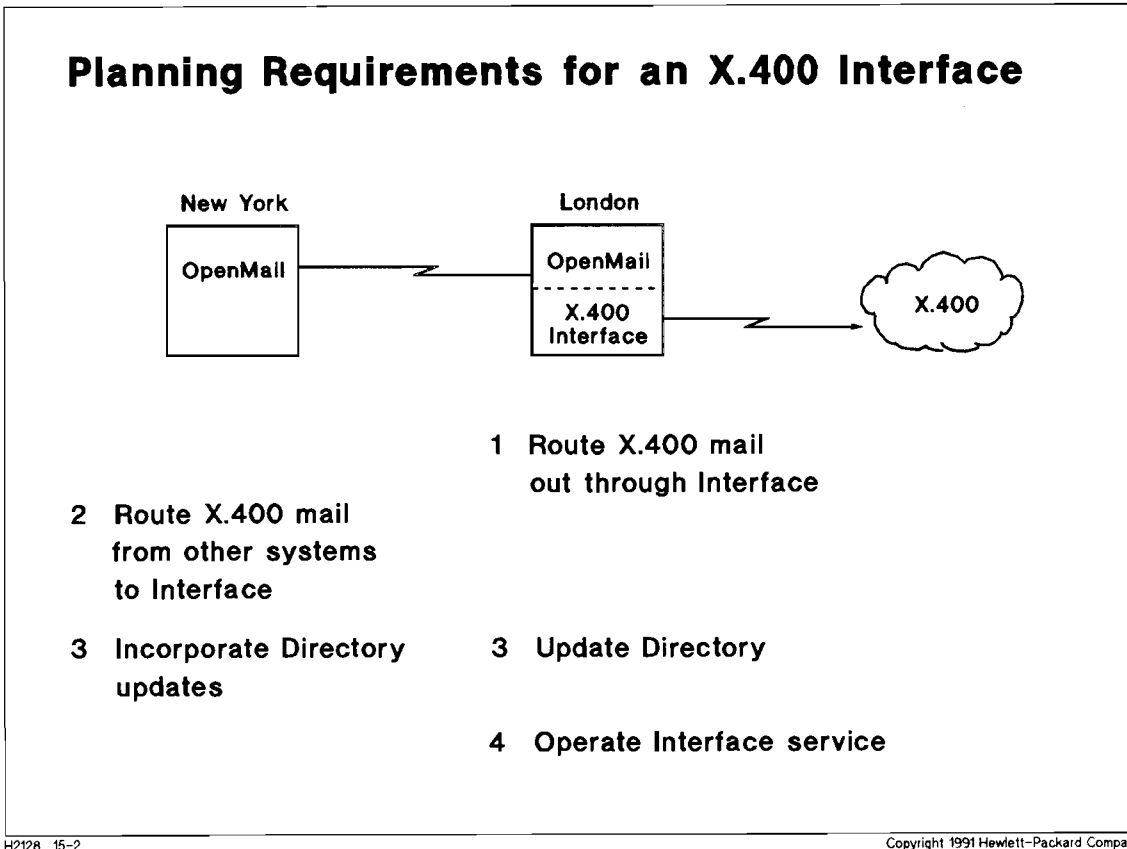
#### Transition

Look at the planning requirements for implementing an X.400 Interface ...



## Module 15 — Planning an X.400 Interface

### 15-2. Planning Requirements for an X.400 Interface



The basic planning requirements for implementing a connection out of an OpenMail network to external X.400 are:

1. Decide what access to allow to X.400, and therefore what entries will be needed in the Routing Table of the X.400 Interface system.
2. Add routes to the chosen X.400 domains from other systems in the network, in terms of a route to the OpenMail system with the X.400 Interface.
3. Decide whether to add any X.400 users to the Directory for ease of addressing. Replicate these additions to all other Directories in the network.
4. Operate and maintain the X.400 Interface service on the system with the Interface.

---

## 15-2. Planning Requirements for an X.400 Interface

**Instructor Notes**

### **Purpose**

Overview the main implementation phases required to enable connection out of an OpenMail network into external X.400.

### **Key Points**

- We'll go through each of these stages in detail as we go through this Module, including the variations that are possible.

### **Transition**

Look at planning routes to X.400 addresses . . .

# Module 15 — Planning an X.400 Interface

## 15-3. Planning Routes to X.400 Addresses

### Planning Routes to X.400 Addresses

Plan as many routes as required to access all addresses:

|                                            | OU1-4 | ORG      | PRMD | ADMD     | C  |
|--------------------------------------------|-------|----------|------|----------|----|
| Within a division of a business partner:   | *     | XYZSales | XYZ  | Gold 400 | GB |
| Within business partner's private network: | *     | *        | XYZ  | Gold 400 | GB |
| Within a local administration domain:      | *     | *        | *    | Gold 400 | GB |
| Within the local country:                  | *     | *        | *    | *        | GB |
| Worldwide:                                 | *     | *        | *    | *        | *  |

H2128 15-3

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X.400 allows you to access users worldwide. While you could allow access to all of them, in practice you'll want to restrict access for reasons of cost and security. Typically, this would mean adding a route to the private network of each company with which your company has regular business contacts. For example, Pinewood need to set up a route to XYZ's PRMD.

Wildcarding is the way to specify the routes you require. With wildcards, the order of significance of the address attributes is as follows:

Country, ADMD, PRMD, Org, Org Unit1, Org Unit2, Org Unit3, Org Unit4, Personal Name

This is just an extension of the scheme used within OpenMail to wildcard mailnodes (that is, Org Units 1-4). And the same wildcarding rules apply - basically, if an attribute is wildcarded, all attributes of lesser priority must be wildcarded.

Note that the order of significance of address attributes for wildcarding is not the same order in which a full X.400 address is displayed within OpenMail.

## 15-3. Planning Routes to X.400 Addresses

Instructor Notes

### Purpose

Explain how to plan routes to all the X.400 addresses you want to access.

### Key Points

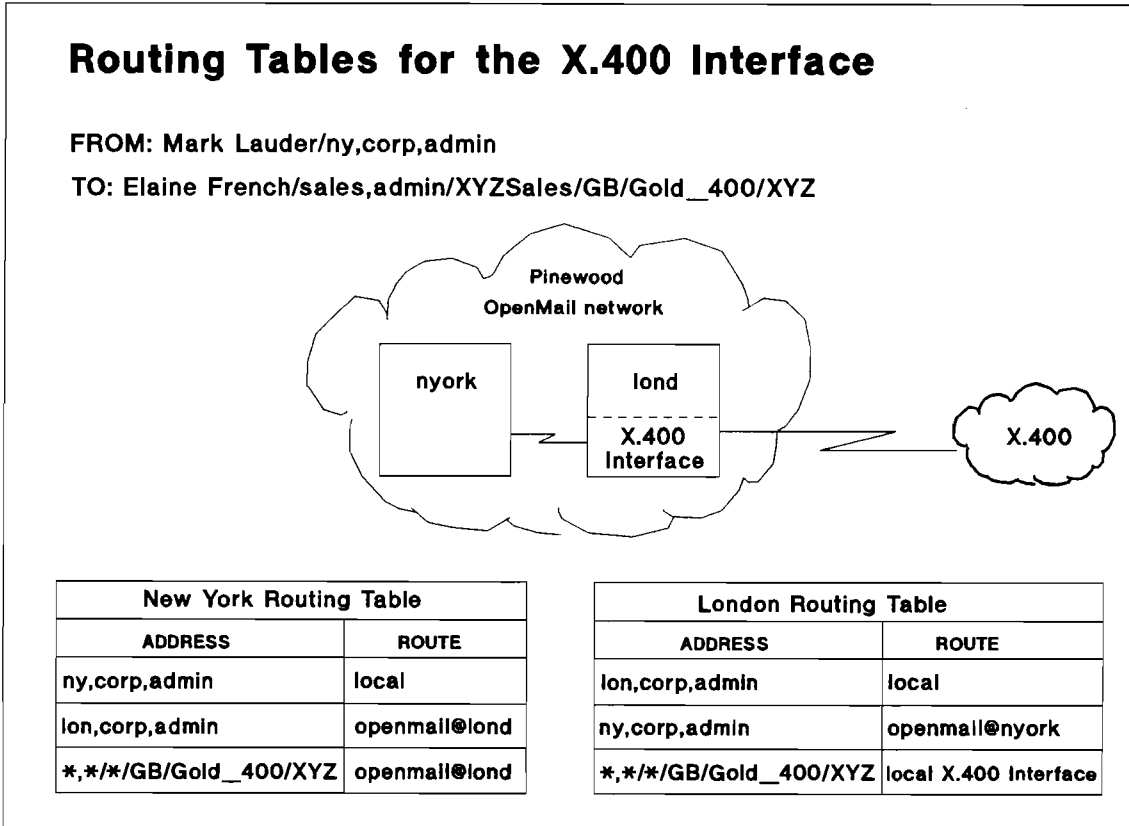
- Complete wildcarding is inadvisable, since this would become the default route in the Routing Table for any unresolved mailnode in the OpenMail network. This would result in such mail being sent into X.400 before being returned undelivered, at cost to you.
- The London OpenMail Administrator needs to establish who within the OpenMail network want to communicate with which X.400 users, and at what level of specificity - for example whole company, a division of that company, etc.
- They may need to contact the Administrators of the other companies mail systems to obtain their exact addressing details, for example PRMD name.
- Knowledge of individual users in the other companies will only be required if it is intended to add their full addresses into the OpenMail Directory for easy addressing by OpenMail users.
- Once entered using the appropriate command or screen of the Administration Interface, the routes are marked in the Routing Table as for delivery to the X.400 Interface on this system.

### Transition

Look at the Routing Tables at the X.400 Interface system and elsewhere in the network ...

# Module 15 — Planning an X.400 Interface

## 15-4. Routing Tables for the X.400 Interface



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In addition to configuring routes to X.400 on the system with the X.400 Interface (London), if you wish to exchange mail with users of external X.400 and the OpenMail X.400 Interface is not on your local system, you must set up routes to the OpenMail X.400 Interface system.

In this example Pinewood Inc, New York wants to exchange mail with XYZ Company and will need to plan routes to London for the X.400 addresses because the X.400 Interface is at London.

The Routing Table at the New York system indicates that X.400 must be first sent to the local OpenMail system. There, the Routing Table indicates that X.400 mail should be passed to the local X.400 Interface for delivery out to the local MTA, and from there on the XYZ Co.

# Module 15 — Planning an X.400 Interface

## 15-4. Routing Tables for the X.400 Interface

Instructor Notes

### Purpose

Explain how the Routing Tables, once set up, will route mail from anywhere in the OpenMail network to X.400.

### Key Points

- You are the New York Administrator (back home now!). You do not have an X.400 Interface configured on your system. However, your users want to be able to communicate with X.400 users at XYZ.
- You receive information from the London Administrator, (which has also been sent out to the other OpenMail Administrators), giving you the address components you need for planning your routes to X.400 addresses in XYZ.
- You will probably decide to use the same wildcarding in the Routing Table of the New York system as is in use at the X.400 Interface system in London.

This means the London system controls access to X.400.

However, you could leave the Interface system completely open, and give the responsibility for controlling access to X.400, to individual systems in the OpenMail network, such as New York. In this case, the Routing Tables would look like this:

| New York                     |               | London     |                       |
|------------------------------|---------------|------------|-----------------------|
| *,*/XYZSales/GB/Gold_400/XYZ | openmail@lond | *,**/**/** | local X.400 Interface |

### Transition

Look at adding X.400 users to the Directory ...

# Module 15 — Planning an X.400 Interface

## 15-5. Adding X.400 Users to the Directory

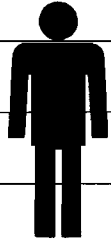
### Adding X.400 Users to the Directory

Find out:

- Personal Names:
- Internal X.400 address attributes:

You should already know external X.400 attributes:

| Directory            |
|----------------------|
| Elaine French        |
| sales,admin/XYZSales |
| XYZ                  |
| Gold 400             |
| GB                   |



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The Administrator of the OpenMail X.400 Interface system (London in the example), will have to decide which, if any, X.400 users to put into the Directory. Their full X.400 address (including a Personal Name) will be needed for this.

The initial entry in the Directory of the X.400 Interface system could be by means of the data-entry screen provided in the Administration Interface, or more efficiently using the `omaddent` command. Once the initial entry is completed, the contents of the `om_record` file can be sent to all other OpenMail Administrators so that they can include the X.400 entries in their local Directory by using the command update procedure.

If your OpenMail system has the X.400 Interface installed, you will be the primary contact with Administrators of external X.400 systems:

- Collect X.400 user data and make the relevant entries to your own Directory.
- Advise other OpenMail Administrators of the extent of external X.400 coverage.
- Pass on regular update files of X.400 user information for use with the command update procedure.

## 15-5. Adding X.400 Users to the Directory

Instructor Notes

### Purpose

Explain how to plan to add X.400 users to the OpenMail Directories.

### Key Points

- All OpenMail users regularly exchanging mail with external X.400 mailing systems will want Directory assistance wherever possible, in order to cope with the long, error-prone addresses.
- OpenMail Directories such systems should be kept up to date with as many of the external X.400 users as practicable being recorded. (Given that X.400 allows the capability to address thousands of external users, you'll be unlikely to try to include all of them in the Directories.)

### Transition

A written exercise to plan an X.400 Interface . . .



# Module 15 — Planning an X.400 Interface

## 15-6. WRITTEN EXERCISE: Plan an X.400 Interface

You are the OpenMail Administrator for Pinewood Inc at the London site, planning the X.400 Interface.

Pinewood wants to establish communication with another business partner - Cambridge Robotics. You have already contacted the mailing System Administrator at Cambridge. His name is Harry Hurd, and the information he has sent is in the following letter:

---

Dear Mark

I enclose the details of the Cambridge Robotics users that you requested.

| <b>Users</b>    | <b>Org Units/Organization</b> |
|-----------------|-------------------------------|
| John Cambridge  | board,admin/CR Labs           |
| Huw Griffiths   | research,admin/CR Labs        |
| Chris McIlvaney | research,admin/CR Labs        |
| Robert Neil     | research,admin/CR Labs        |
| Ian N. Hanson   | accs,admin/CR Marketing       |
| Kanta Patel     | accs,admin/CR Marketing       |
| Sean Haskey     | sales,manf/CR Marketing       |
| Liz Bakker      | sales,manf/CR Marketing       |

As agreed, we'll not be setting up communication with our *CR Defense* subsidiary.

I would also like to confirm the following domain details:

|               |             |
|---------------|-------------|
| PRMD:         | Camrobotics |
| ADMD:         | Gold 400    |
| Country Code: | GB          |

Looking forward to receiving OpenMail messages soon!

Regards

Harry Hurd

Cambridge Robotics Mail Administrator

---

### Task 1 — Plan the Routing Table at London

### Task 2 — Plan the Routing table at New York

Enter the addresses and routes for the relevant OpenMail systems on the planning forms. Remember to wildcard according to the rules discussed earlier in this module.

---

## 15-6. WRITTEN EXERCISE: Plan an X.400 Interface

Instructor Notes

### Purpose

Explain how to complete the written planning exercise.

### Preview

- In the first part of the exercise, you plan the London site using the information supplied in the letter from Harry Hurd, the mailing System Administrator from XYZ Company.
- In the second part, you plan access to the X.400 Interface from the New York site.
- Enter the addresses and routes for the relevant OpenMail systems on the planning forms.
- Notice that Cambridge Robotics don't want to allow Pinewood access to all their users, that is, not those in the Organization CR Defense.

### Transition

Complete the X.400 Planning Sheets for both the London and New York systems . . .

# Module 15 — Planning an X.400 Interface

## 15-6. WRITTEN EXERCISE: (Continued)

Complete the Planning Sheets for both the London and New York Routing Tables.

### The London Routing Table

| X.400 Address |     |      |      |         | Route |
|---------------|-----|------|------|---------|-------|
| Org Units     | Org | PRMD | ADMD | Country |       |
|               |     |      |      |         |       |
|               |     |      |      |         |       |
|               |     |      |      |         |       |

### The New York Routing Table

| X.400 Address |     |      |      |         | Route |
|---------------|-----|------|------|---------|-------|
| Org Units     | Org | PRMD | ADMD | Country |       |
|               |     |      |      |         |       |
|               |     |      |      |         |       |
|               |     |      |      |         |       |

# Module 15 — Planning an X.400 Interface

## 15-6. WRITTEN EXERCISE: (Continued)

Instructor Notes

### Suggested Answers

#### The London Routing Table

| X.400 Address |              |           |          |         | Route                 |
|---------------|--------------|-----------|----------|---------|-----------------------|
| Org Units     | Org          | PRMD      | ADMD     | Country |                       |
| *,*           | CR Labs      | CamRobots | Gold 400 | GB      | local X.400 Interface |
| *,*           | CR Marketing | CamRobots | Gold 400 | GB      | local X.400 Interface |

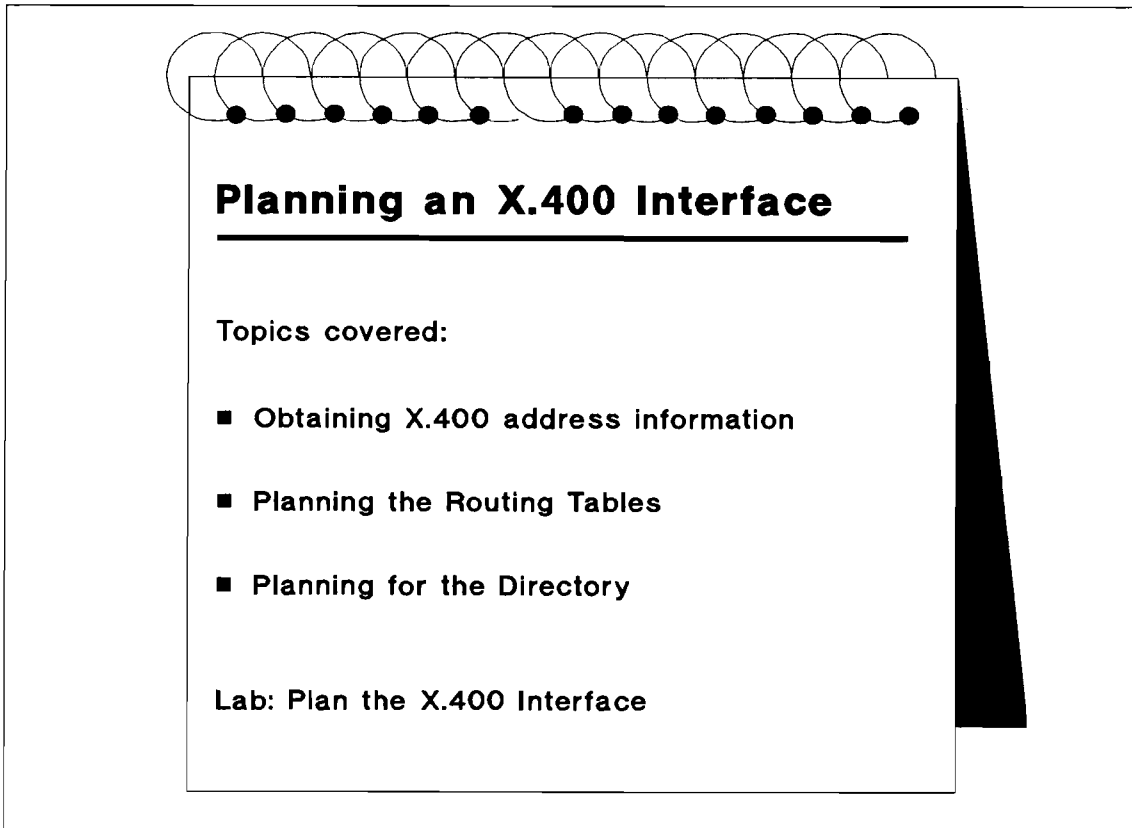
#### The New York Routing Table

| X.400 Address |     |           |          |         | Route         |
|---------------|-----|-----------|----------|---------|---------------|
| Org Units     | Org | PRMD      | ADMD     | Country |               |
| *,*           | *   | CamRobots | Gold 400 | GB      | openmail@lond |

### Transition

To summarize ...

## 15-7. Summary



**Planning an X.400 Interface**

Topics covered:

- Obtaining X.400 address information
- Planning the Routing Tables
- Planning for the Directory

Lab: Plan the X.400 Interface

H2128 15-7

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## Notes

## 15-7. Summary

## Instructor Notes

### Purpose

Review what has been covered in Module 15.

### Key Points

- You must plan routes to X.400, for configuration in the Routing Table of the OpenMail system with the X.400 Interface.
- You must plan routes to the OpenMail system with the X.400 Interface, for configuration in the Routing Tables of any other systems in the network.
- You can wildcard routing entries. But, remember that the order of significance for wildcarding is different from the order in which address attributes appear in OpenMail.
- Whether the X.400 Interface is local, or remote, you should consider what entries to configure in the Directory.
- The Administrator of the X.400 Interface system should send out information on X.400 user names and mailnodes to the other systems so that they can configure their Routing Tables and Directories accurately, preferably as `om_record` update files for use with the command update procedure.

### Transition

The next Module covers the configuration of an X.400 Interface.

**Module 15 — Planning an X.400 Interface**

## **Module 16 — Configuring an X.400 Interface**

---

### **Objectives**

After spending 20 minutes completing this Module, you will be able to:

- On the X.400 Interface system, configure routes to X.400 addresses
- Configure routes from other OpenMail systems to the system with the X.400 Interface
- Configure X.400 users in the Directory
- Operate an X.400 Interface



# Module 16 — Configuring an X.400 Interface

## 16-1. Configuring Routes to X.400 Addresses

**Configuring Routes to X.400 Addresses**

To get there:

- Main Menu
- ROUTES
- X.400 ROUTES
- Action Menu
- Add Route

|                                          |              |                |
|------------------------------------------|--------------|----------------|
| Organizational Units                     |              |                |
| *,*                                      |              |                |
| Organization                             |              |                |
| *                                        |              |                |
| Country                                  | Admin Domain | Private Domain |
| GB                                       | Gold 400     | XYZ            |
| -----                                    |              |                |
| X.400 Route Name                         |              | DEFAULT        |
| Does this route go to an OpenMail system |              | N              |
| Add                                      |              |                |
|                                          | Action Menu  | Help           |
|                                          |              | Exit           |

H2128 16-1

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration screen, select X400 ROUTES
3. From the Action Menu, select Add Route and press Select
4. Enter the X.400 address.
5. Press Add to configure the address on your system.

A new Add a route screen appears ready for your next entry.

6. Repeat steps 4 and 5 to configure any other X.400 routes.
7. Press Exit to return to the X.400 route administration menu.

Alternatively, you could use the `omaddrt` command, for example:

```
omaddrt -m "*,*,*,*/XYZSales/GB/Gold_400/XYZ" -q X400 -i DEFAULT
```

# Module 16 — Configuring an X.400 Interface

## 16-1. Configuring Routes to X.400 Addresses

Instructor Notes

### Purpose

Show how to configure a route to each X.400 address that needs to be accessed from OpenMail, so that messages intended for those addresses are routed to the X.400 Interface.

### Key Points

- To allow X.400 recipients to be reached from OpenMail, the addresses that are to be accessed need to have routes to them configured so that OpenMail sends mail addressed to them to the X.400 Interface.
- These addresses are added to the Routing Table. All messages sent to these X.400 addresses are then routed to the X.400 Interface, and from there on to the X.400 MHS and out into the wide world.
- If this is done on the London system, the London OpenMail Administrator can distribute the resulting `om_record` file to other systems in the OpenMail network, such as New York, so they can update their Routing Tables.
- External address attributes and message characteristics can be defined in the `/users/openmail/sys/madmd.cfg` configuration file.
- As of version A.01.00, OpenMail now supports the transmission of complex objects between OpenMail systems over X.400. This allows users to transfer, for example, NewWave objects between OpenMail nodes over X.400 networks, without the objects being converted and losing their file-type information at the X.400 Gateway. To enable this feature, answer Y to the question `Does this route go to an OpenMail system` when adding an X.400 route.

### Transition

Look at configuring route(s) to the OpenMail system with the X.400 Interface ...

# Module 16 — Configuring an X.400 Interface

## 16-2. Configuring Route(s) to the X.400 Interface System

**Configuring Route(s) to the X.400 Interface System**

To get there:  
Main Menu  
ROUTES  
OPENMAIL ROUTES  
Action Menu  
Add Route

|                              |              |                |
|------------------------------|--------------|----------------|
| Remote Mailnode              |              |                |
| *,*                          |              |                |
| -----                        |              |                |
| Organization                 |              |                |
| *                            |              |                |
| Country                      | Admin Domain | Private Domain |
| GB                           | Gold 400     | XYZ            |
| -----                        |              |                |
| Sendmail address of computer |              |                |
| openmail@lond                |              |                |
| Add                          |              |                |
|                              | Action Menu  |                |
|                              | Help         | Exit           |

H2128 16-2

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration menu, select OPENMAIL ROUTES
3. From the Action Menu, select Add Route and press Select
4. Enter the Remote Mailnode and Sendmail address
5. Complete the remaining fields with the X.400 mailnode details - which you complete will depend on your wildcarding decisions.
6. Press Add to configure the route.
7. Repeat steps 4 through 6 to add any other routes.
8. Press Exit to return to the OpenMail route administration menu.

Alternatively, you could use the `omaddrt` command, for example:

```
omaddrt -m "*,*/XYZSales/GB/Gold_400/XYZ" -q SMINTFC -u "openmail@lond"
```

# Module 16 — Configuring an X.400 Interface

---

## 16-2. Configuring Route(s) to the X.400 Interface System

Instructor Notes

### Purpose

Show how to configure a route *to* the system with the X.400 Interface *from* each other system in the OpenMail network that needs to access it.

### Key Points

- This is the same process as adding routes to other OpenMail systems that your local system needs to access, except here you also complete the full X.400 address details too.

### Transition

Look at adding Directory entries for X.400 users ...

# Module 16 — Configuring an X.400 Interface

## 16-3. Adding X.400 Users to the Directory

**Adding X.400 Users to the Directory**

To get there:  
Main Menu  
DIRECTORIES  
ADD ENTRY

|               |              |                 |           |
|---------------|--------------|-----------------|-----------|
| Name          |              | Directory       |           |
| Elaine French |              |                 |           |
| Mailnode      |              |                 |           |
| sales,admin   |              |                 |           |
| -----         |              |                 |           |
| Organization  |              |                 |           |
| XYZSales      |              |                 |           |
| Country       | Admin Domain | Private Domain  |           |
| GB            | Gold 400     | XYZ             |           |
| -----         |              | -----           |           |
| Attribute     |              | Attribute Value |           |
|               |              |                 |           |
| Add           |              | Action Menu     | Help Exit |

H2128 16-3

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1. From the Main Menu, select **DIRECTORIES**
2. From the Shared directory administration menu, select **ADD ENTRY**
3. Enter a name, mailnode, and other X.400 address attributes.
4. Press **Add** after address (name and mailnode).

A new screen appears for the next entry.

5. Repeat steps 4 and 5 to configure any other users.
6. Press **Exit** to return to the Shared directory administration menu.

Alternatively, you could use the **omaddent** command.

# Module 16 — Configuring an X.400 Interface

## 16-3. Adding X.400 Users to the Directory

Instructor Notes

### Purpose

Show how to configure X.400 users in the OpenMail Directory.

### Key Points

- To allow X.400 users to be simply addressed by OpenMail users - by just entering their name - those X.400 users who you've decided will be frequently communicated with need to be entered in the Directory.
- This is the same process as adding OpenMail users on other systems in the network to your Directory so that they can be easily addressed.
- If this is done on the London system, the London OpenMail Administrator can distribute the resulting `om_record` file to other systems in the OpenMail network, such as New York, so they can update their Directories.

### Transition

Look at operating an X.400 Interface ...

# Module 16 — Configuring an X.400 Interface

## 16-4. Operating an X.400 Interface

### Operating an X.400 Interface

|                                    |                                                  |
|------------------------------------|--------------------------------------------------|
| <code>omon -s x400</code>          | Start the X.400 Interface service                |
| <code>omstat -s x400</code>        | Give status of X.400 service                     |
| <code>omstat -q X400</code>        | List mail on X.400 Interface input queue         |
| <code>omshowlog -s x400 -l9</code> | Display Event Log for X.400 Interface at level 9 |
| <code>omx4trace -on in</code>      | Set tracing on X.400 In Mapper                   |
| <code>-on out</code>               | Set tracing on X.400 Out Mapper                  |

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### X.400 Interface Tracing

Tracing can be set on the X.400 interface, using the command `/usr/openmail/diag/omx4trace`.

Out Mapper tracing copies to the directory `~/openmail/x400/trace.out` every incoming Transaction File, and to the directory `/usr/spool/x400/openmail/trace.out` every output IPM message

In Mapper tracing copies to the directory `/usr/spool/x400/openmail/trace.in` every incoming IPM message and to the directory `~/openmail/x400/trace.in` every output Transaction File

Transaction Files in these directories can be read in the normal way with the OpenMail `tf.browse` utility, and X.400 IPM messages can be read with an X.400 ASN.1 decoder such as `x4asnview`

To manage Mapper tracing:

|                                                    |                                     |
|----------------------------------------------------|-------------------------------------|
| <code>/usr/openmail/diag/omx4trace -off in</code>  | Turns off tracing on the In Mapper  |
| <code>/usr/openmail/diag/omx4trace -off out</code> | Turns off tracing on the Out Mapper |
| <code>/usr/openmail/diag/omx4trace -clean</code>   | Cleans out trace files periodically |

# Module 16 — Configuring an X.400 Interface

## 16-4. Operating an X.400 Interface

## Instructor Notes

### Purpose

Explain the day-to-day operations and troubleshooting procedures for the X.400 Interface.

### Key Points

- The Trace Files should be cleaned occasionally to free up disk space, since as everything is logged to them, they can rapidly get quite large.
- Undelivered mail goes onto the Undelivered Queue `/usr/spool/x400/uq`
- Can use scripts to capture messages at the gateway.
- Can use `x400.out` and `x400.in` with specific options to look at Transaction Files.

### Lab Suggestion

Unless an X.400 MTA is set up on the training system, setting up an operational X.400 Interface in class is beyond the scope of this course.

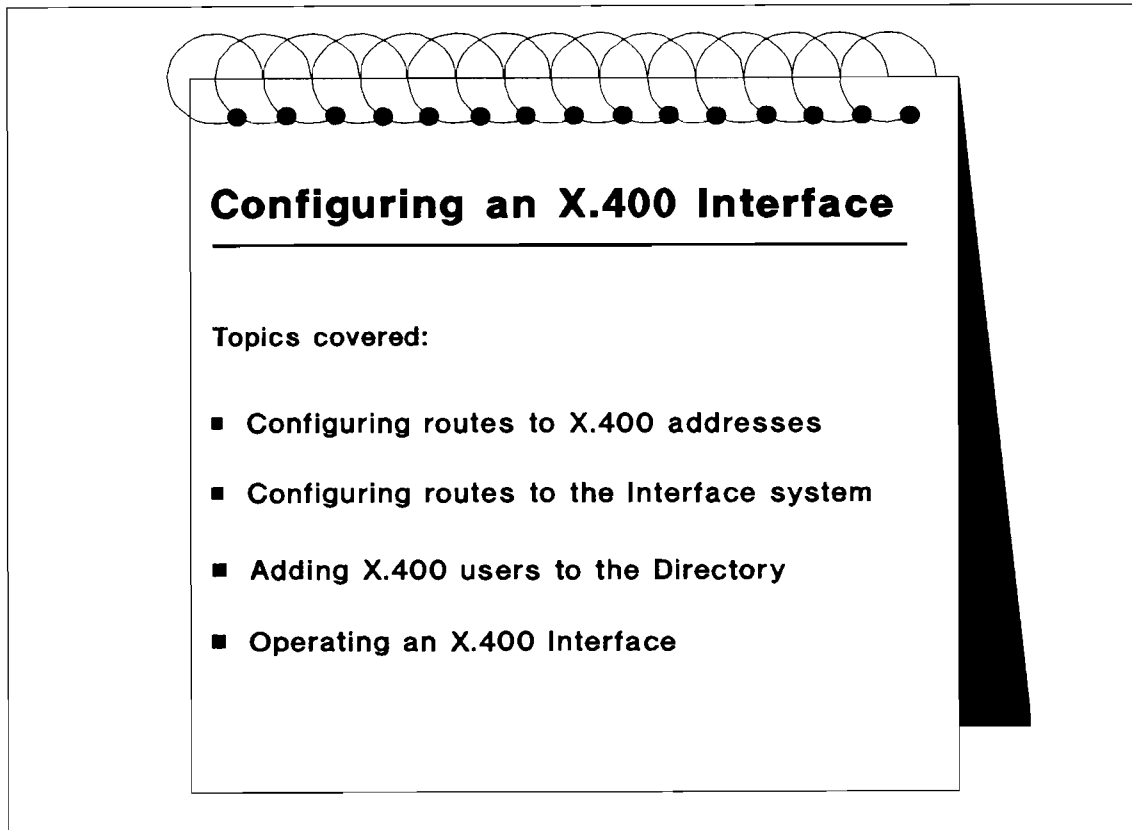
An alternative, if you have access to a network that already contains an X.400 interface, is to demonstrate X.400 inter-company mailing. This can be done by sending a message from OpenMail to an X.400 user at one of the students' companies, and phoning up the recipient and asking them to reply immediately via X.400. This exchange will clearly show the full X.400 addressing in action.

### Transition

To summarize ...



## 16-5. Summary



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## Notes

# Module 16 — Configuring an X.400 Interface

---

## 16-5. Summary

Instructor Notes

### Purpose

Review what has been covered in Module 16.

### Key Points

- You need to configure X400 ROUTES on the system with the X.400 Interface.
- You need to configure OPENMAIL ROUTES to the system with the X.400 Interface, on every other system in an OpenMail network.
- You can add Directory entries for X.400 users on the first system - either via `omadmin` or the `omaddent` command - and on subsequent systems with the Directory update file.

### Transition

The next Module covers the planning of a Unix mail Gateway.

# Module 16 — Configuring an X.400 Interface

## **Module 17 — Planning a Unix mail Gateway**

---

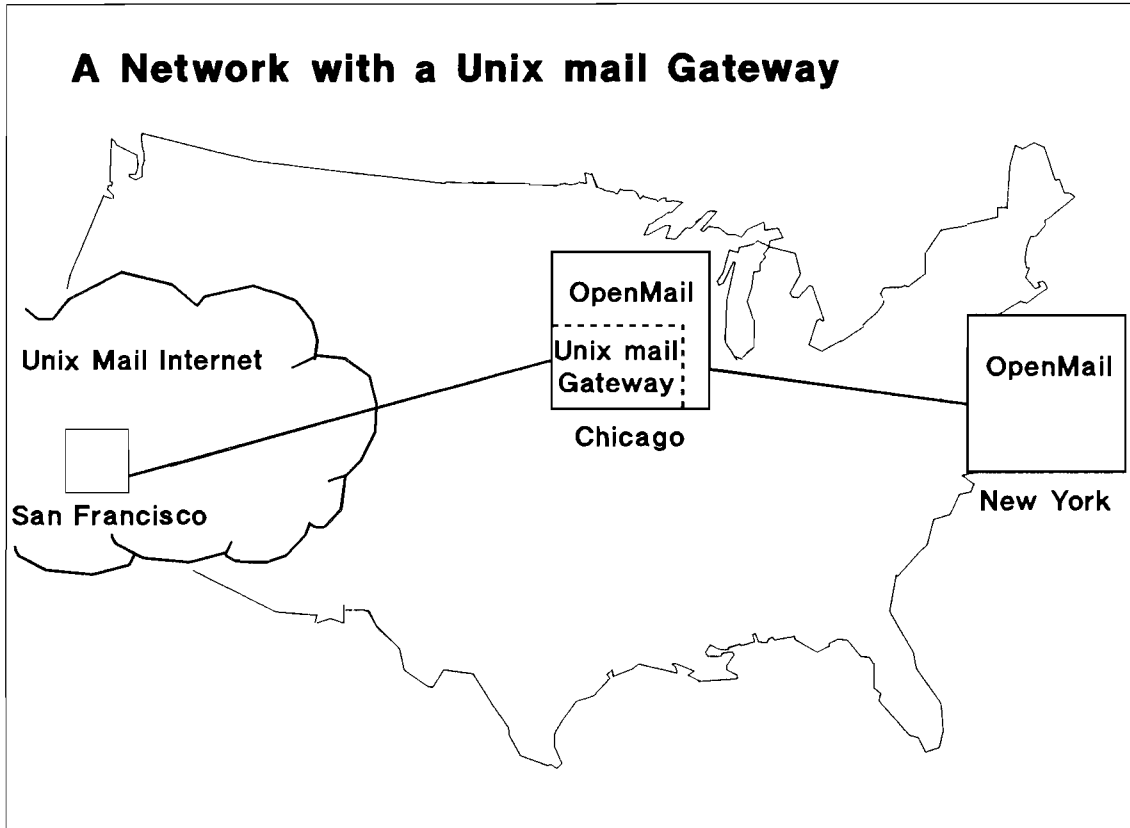
### **Objectives**

After spending 40 minutes completing this Module, you will be able to:

- Plan a Unix mail Gateway
- Understand how OpenMail communicates with Unix mail
- Forward OpenMail users' Unix mail into their OpenMail In Tray.
- Plan routes from OpenMail to external Unix mail systems
- Decide what extra entries to make in the Directory

# Module 17 — Planning a Unix mail Gateway

## 17-1. Scenario: A Network with a Unix mail Gateway



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Pinewood have a Sales Division in San Francisco that uses a Unix mail system. The Sales Division has a Distribution Department. Users throughout Pinewood's OpenMail network want to exchange mail with San Francisco. Pinewood management decide to install a Unix mail Gateway on their OpenMail system in Chicago.

You are still the New York OpenMail Administrator. However you have been called to Pinewood's Chicago office to advise them on planning the Unix mail Gateway.

# Module 17 — Planning a Unix mail Gateway

## 17-1. Scenario: A Network with a Unix mail Gateway

Instructor Notes

### Purpose

Introduce the scenario used as the main example in this Module.

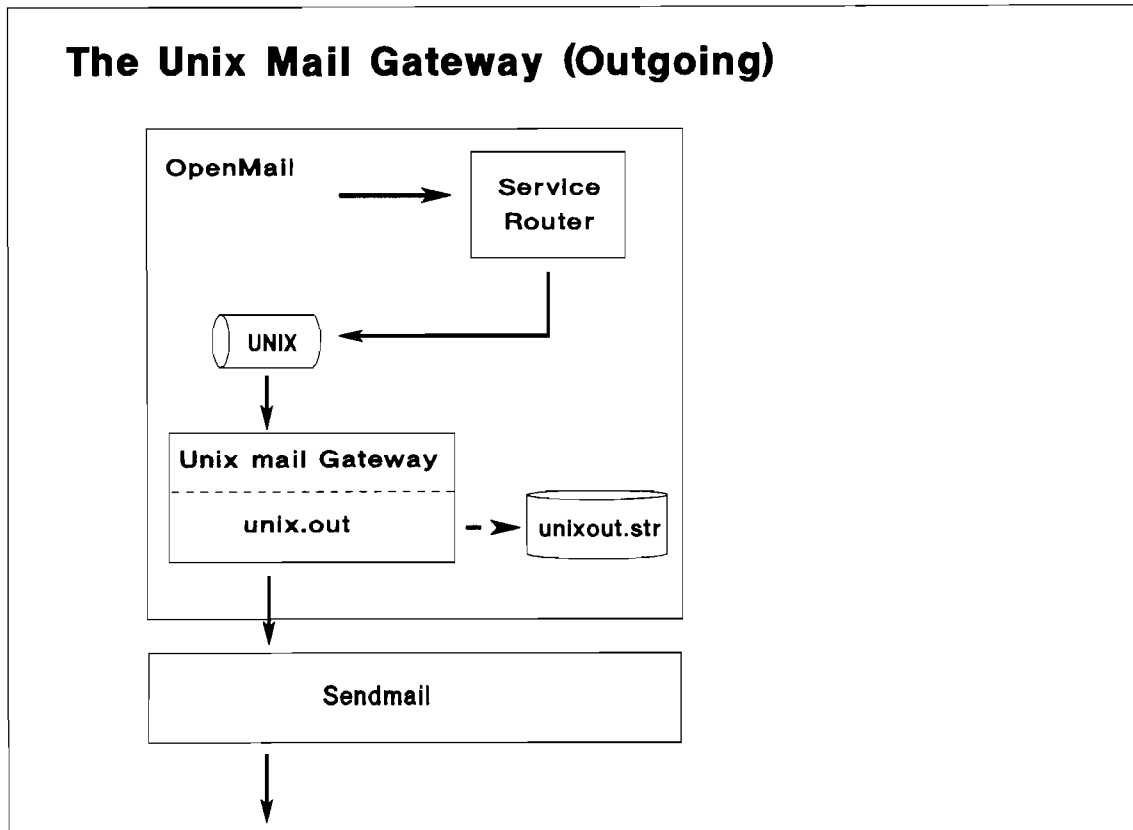
### Key Points

- Pinewood Inc have a well established Unix network in the San Francisco office. This was set up before Pinewood bought OpenMail. In fact, one of the company's reasons for buying OpenMail was that they would be able to communicate with San Francisco with ease using the OpenMail Unix mail Gateway.
- Pinewood executives have now confirmed that they want the OpenMail network to communicate with their smaller Unix mailing system in San Francisco.
- The Unix mail Gateway has been installed at Chicago.
- You are still the New York Administrator.
- You have been called to advise the Chicago Unix System Administrator how to plan for mail exchange with OpenMail from their system (your renown is spreading!)
- You also have to find out what it is necessary to do on your own system (New York) so that your users can exchange messages with Unix users in San Francisco.

### Transition

Look at how mail is sent out through the Unix mail Gateway to Sendmail . . .

## 17-2. The Unix mail Gateway (Outgoing)



H2126 17-2

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1. An outgoing message is put on the UNIX queue by the Service Router.

It is identified as intended for Unix mail by the mailnode, eg (pinewood,unix) in brackets as a foreign address, or supplied from the Directory of the Gateway system.

2. The Unix mail Gateway's unix.out process then:
  - i. Converts the originator's address to Unix mail format and substitutes the Unix mail recipient addresses - either from their Directory entries or a foreign address supplied with the message, and puts them into an ARPA header.
  - ii. Converts content files to 7-bit ASCII text, or if it cannot do that, outputs them in shar format. These conversions are specified in the file /users/openmail/sys/unixout.str
  - iii. Passes the message through SMTP to Sendmail for delivery.

## 17-2. The Unix mail Gateway (Outgoing)

Instructor Notes

### Purpose

Explain how OpenMail's Unix mail Gateway delivers mail to Sendmail.

### Key Points

- OpenMail is seen as a User Agent to Sendmail.
- The outgoing Unix mail Gateway process `unix.out` converts mail from OpenMail to Unix mail format
- Heading information mapping is based on Unix standards (by adoption) RFC 987 and RFC 1148.
- OpenMail's internal 8-bit character set is ISO 8859/1 - the gateway converts to 7-bit IA5.
- Content parts that can't be converted are passed through the Unix `shar` program to create a single shell archive script. `Shar` protects the body parts from inappropriate processing while in Unix mail.

The recipient can execute the shell archive to extract the original content parts.

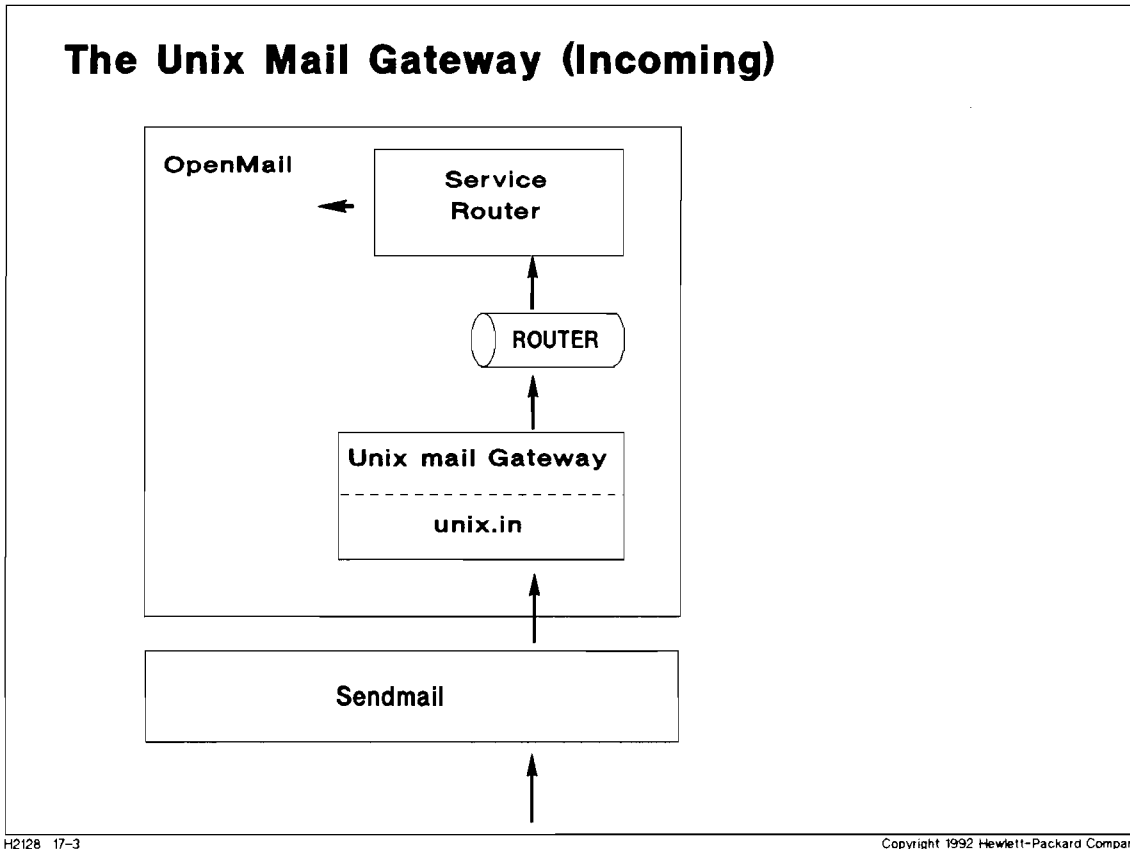
### Transition

Look at how mail is received in through the Unix mail gateway from Sendmail . . .



## Module 17 — Planning a Unix mail Gateway

### 17-3. The Unix mail Gateway (Incoming)



1. An incoming message is passed by Sendmail to the Unix mail Gateway process `unix.in`, via SMTP.

Sendmail identifies mail intended for OpenMail by the forward slash in the username of the Sendmail address.

2. The `unix.in` daemon:
  - i. Converts the message into OpenMail format: distribution list, ARPA header, and content parts.
  - ii. Doesn't attempt any conversion on the content files.
  - iii. Puts the message on **ROUTER** queue, for onward routing in OpenMail by the Service Router.

---

## 17-3. The Unix mail Gateway (Incoming)

Instructor Notes

### Purpose

Explain how OpenMail's Unix mail Gateway receives mail from Sendmail.

### Key Points

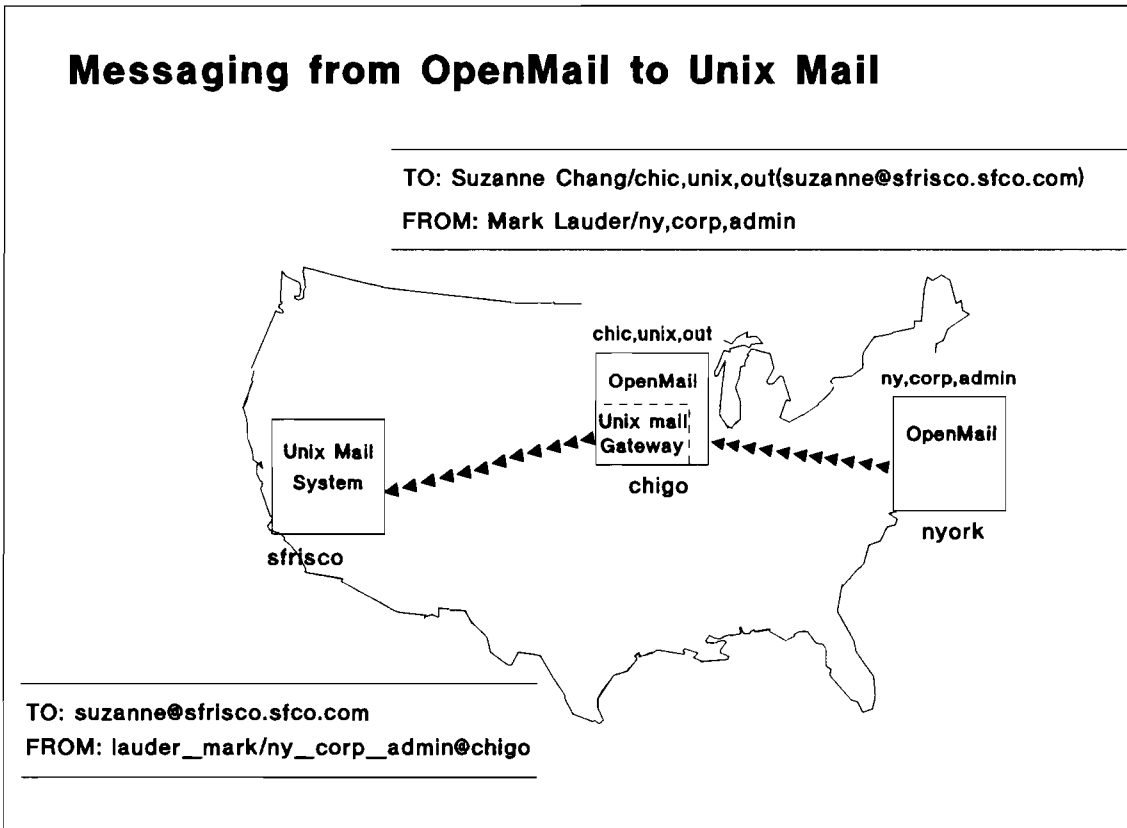
- The incoming Unix mail Gateway process `unix.in` converts mail from Unix mail to OpenMail format.
- Sendmail generally identifies mail intended for OpenMail by the forward slash in the username of the Sendmail address. In some cases, OpenMail addresses could be identified a semi-colon (;), or by the domain.

### Transition

Look at how mail is exchanged between OpenMail and Unix mail ...

# Module 17 — Planning a Unix mail Gateway

## 17-4. Messaging From OpenMail to Unix Mail



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1. OpenMail user Mark Lauder in New York, addresses his message to Unix mail user Suzanne Chang in San Francisco, as shown at the top of the slide.
2. The OpenMail mailnode `chic,unix,out`, given in the address, is used within OpenMail to route the message to the Unix mail Gateway. The rest of the address - `suzanne@sfrisco.sfco.com` - is a Foreign Address which isn't used by OpenMail but is needed beyond the Gateway for delivery on the Unix mail.
3. The Unix mail Gateway removes the OpenMail addressing information leaving the Unix mail format TO address. It also converts the FROM mailnode to Unix mail format, adding the Sendmail address of the gateway system. This is shown at the bottom of the slide.
4. When the Gateway has converted the addresses, the message is passed to Sendmail which delivers the message to the Unix mail user.

## 17-4. Messaging From OpenMail to Unix Mail

Instructor Notes

### Purpose

Explain how OpenMail handles a message destined for Unix mail.

### Key Points

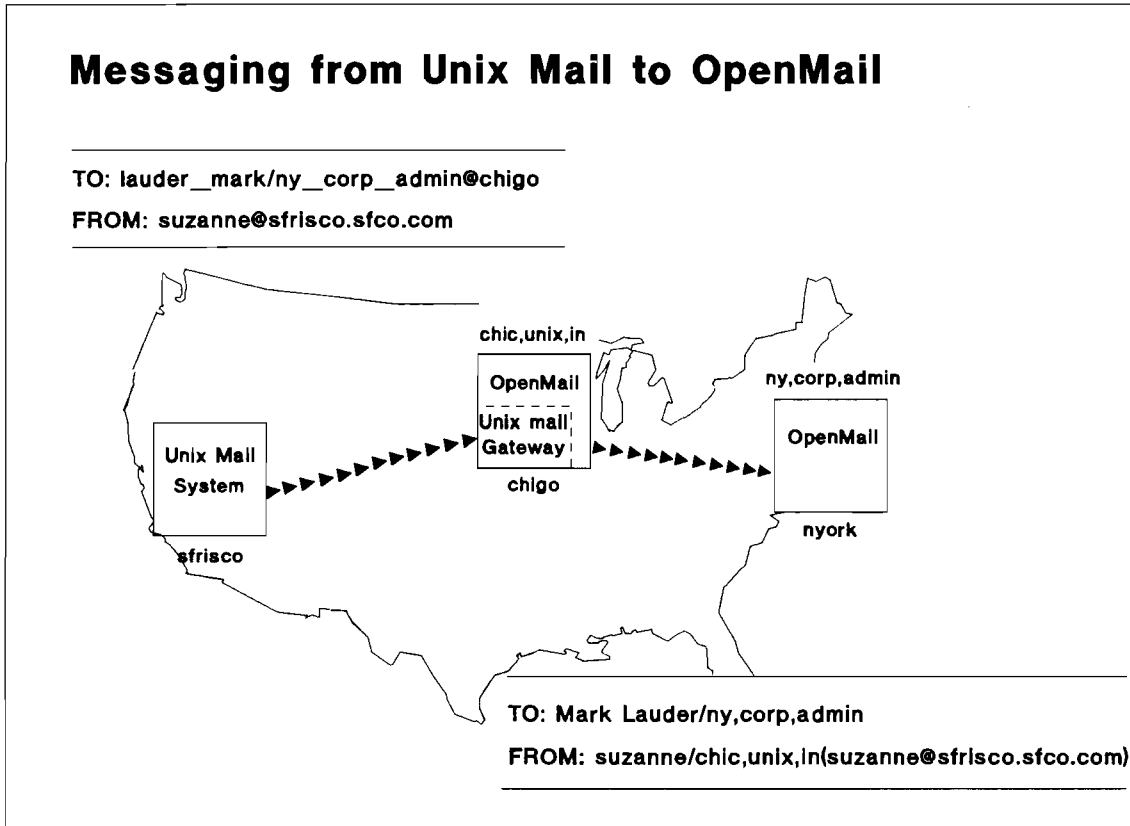
- Talk through a message being sent from OpenMail (on the right of the slide) to Unix mail (on the left) through a Unix mail Gateway (in the middle).
- There could be several mailnodes for the gateway, if it was desired to allocate a separate mailnode to specific Unix mail domains - eg for internal billing purposes.

### Transition

Look at how OpenMail handles a message received from Unix mail . . .

# Module 17 — Planning a Unix mail Gateway

## 17-5. Messaging From Unix Mail to OpenMail



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1. The message from `suzanne@sfrisco.sfco.com` travels from the Unix system in San Francisco, to the Unix system holding the OpenMail Unix mail Gateway at Chicago, addressed as at the top of the slide.
2. The Unix mail Gateway converts the recipient address into OpenMail format to enable it to be forward routed to the recipient within OpenMail (shown at the bottom of the slide).

The originator address cannot be converted unless the OpenMail Administrator has configured an OpenMail mailnode for Unix mail users (`chic,unix,in` here), so that an OpenMail format address can be created. The sender's Unix mail address, `suzanne@sfrisco.sfco.com`, becomes a foreign address ignored by OpenMail, but retained for reply and error notification purposes.

3. Mark Lauder, the recipient in New York, can send a reply successfully and the Unix mail Gateway converts the address back for delivery in Unix mail to `suzanne@sfrisco.sfco.com`.

If Mark tried to reply to Suzanne, and no mailnode was configured at Chicago, OpenMail would not be able to route the reply because the `FROM` address of the original message (`suzanne@sfrisco.sfco.com`) contains no mailnode that OpenMail can use.

## 17-5. Messaging From Unix Mail to OpenMail

Instructor Notes

### Purpose

Explain how OpenMail handles a message received from a Unix mail user.

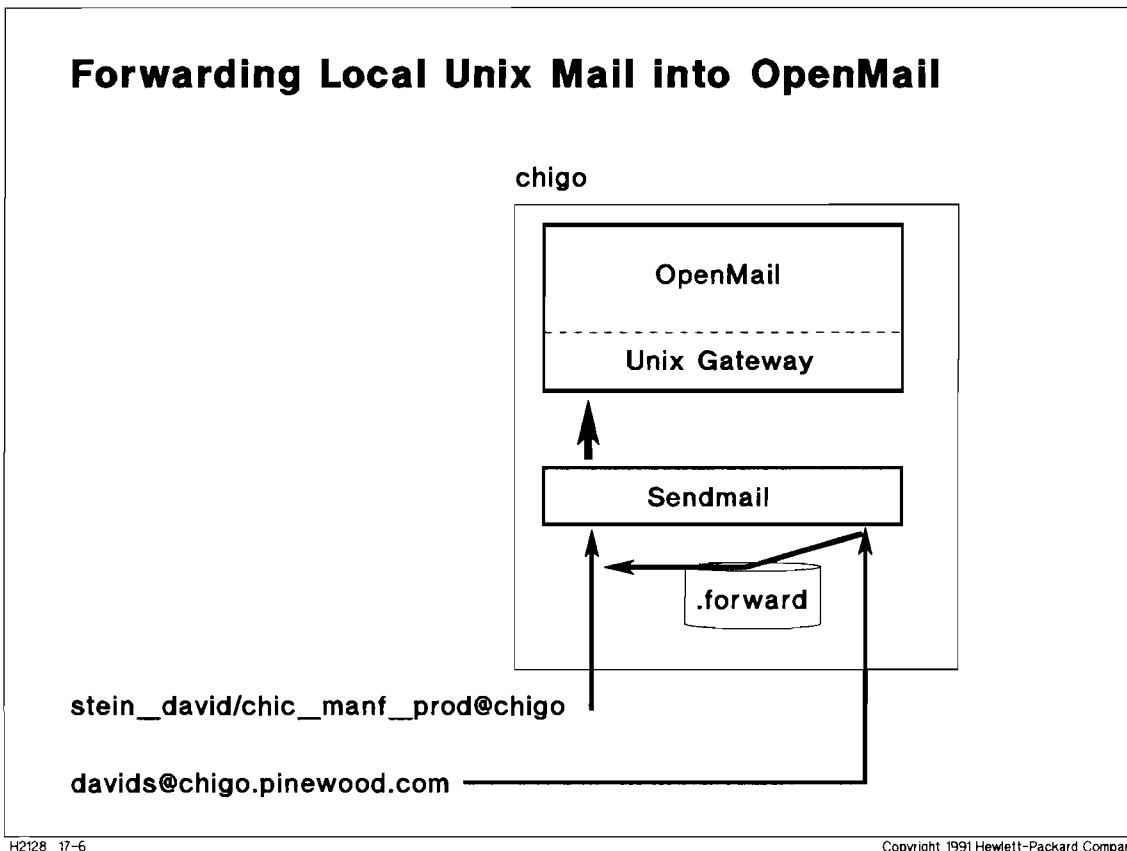
### Key Points

- Talk through a message being sent from Unix mail (on the left of the slide) to OpenMail (on the right) through the central Unix mail Gateway System.
- Emphasize the role of the “dummy” mailnode applied to incoming Unix mail addressed enabling replies to be generated in OpenMail.
- The incoming mailnode is also automatically configured as an outgoing mailnode so that a route is set up for replies to reach the gateway.
- The incoming mailnode should be the same as one of the outgoing mailnodes; in which case only the incoming mailnode would have to be configured on the Gateway system, and only one route would have to be configured to the Gateway from other OpenMail systems (instead of two).

### Transition

Look at forwarding incoming Unix mail into OpenMail . . .

## 17-6. Forward Locally Received Unix Mail into OpenMail



Unix mail received through the Unix mail Gateway, addressed with the Unix form of the OpenMail address, will get forwarded to the user's In Tray; wherever in the OpenMail network. For example:

```
stein_david/chic_manf_prod@chigo
```

However, if a user receives Unix mail on their local system, addressed in Unix mail form, for example:

```
davids@chigo.pinewood.com
```

the mail will stack up in their Unix mail account, and needs to be explicitly forwarded into OpenMail via the Unix mail Gateway for the recipient to be able to read it in their OpenMail In Tray.

This is achieved by a Sendmail file called `.forward` which, if it exists in the user's home directory and is owned by the user, will cause the Unix mail to be forwarded to any address specified in the file. If this file is their OpenMail address (specified in Unix form with the name of the Unix mail Gateway system), all their Unix mail will then automatically be forwarded into their OpenMail In Tray.

This must be done for each OpenMail user who will receive local incoming Unix mail, and involves creating the file to specify their OpenMail forwarding address.

## 17-6. Forward Locally Received Unix Mail into OpenMail

Instructor Notes

### Purpose

Explain how to route incoming Unix mail into each user's In Tray.

### Key Points

- This is necessary so that OpenMail users who receive local incoming Unix mail (addressed in Unix mail format, for example `user@node.co.com`) can view it in their OpenMail In Tray. If it is not done, users can still read their Unix mail but have to do so from Unix.
- Unix mail received with an OpenMail format address (for example `stein_david/chic_manf_prod@chigo`) via the Unix mail Gateway, has its address converted to OpenMail format by the gateway, from where it is routed via OpenMail to the recipient's In Tray.
- If the Unix mail Gateway is not on the system where the Unix mail was received (for example, is in New York), it must be forwarded to OpenMail at the system with the gateway (in this case, Chicago).
- It must be set up for every OpenMail user who will need it.
- Example file would contain something like:

```
stein_david/chic_manf_prod@chigo
```

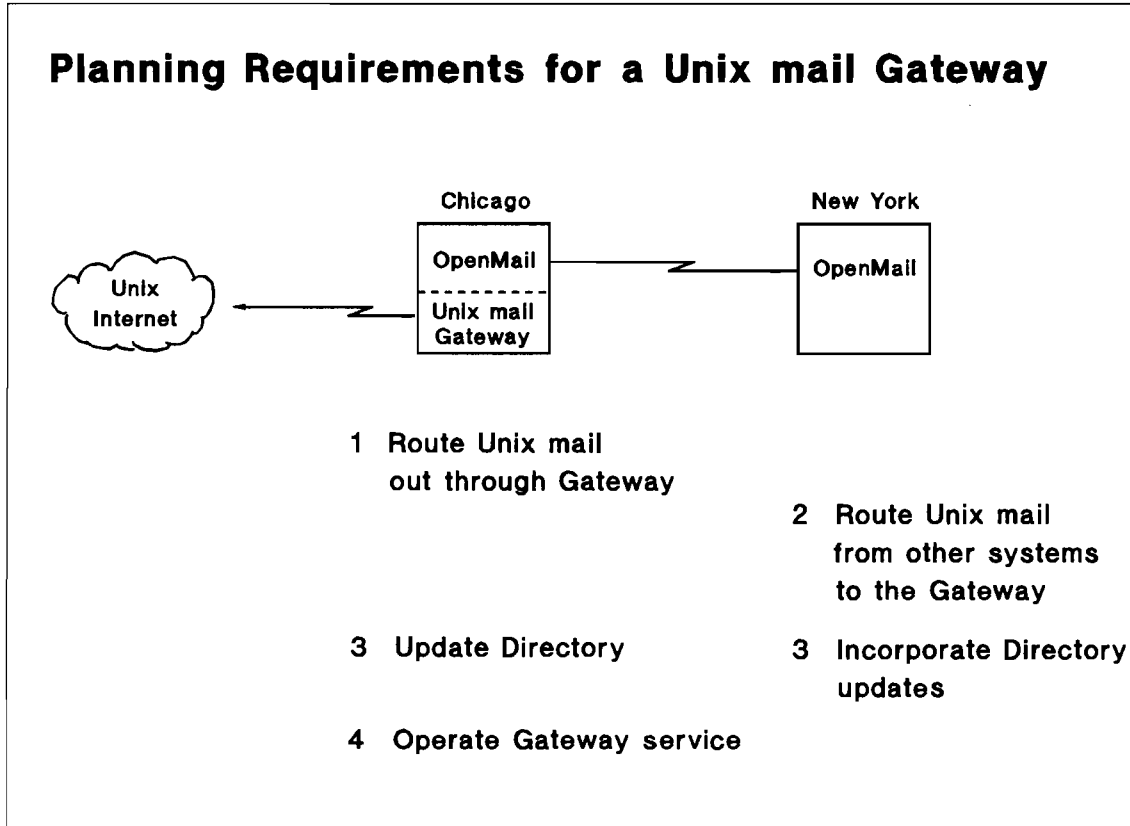
### Transition

Look at the planning requirements for implementing a Unix mail Gateway ...



# Module 17 — Planning a Unix mail Gateway

## 17-7. Planning Requirements for a Unix mail Gateway



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The basic requirements for implementing a connection out of an OpenMail network to Unix mail are:

1. Decide how many gateways to have - one for the whole Internet or one per internet (private Unix mail network)? Do you want to restrict access to Unix mail? Where should the gateways go?
2. Add routes to the Gateway from other systems in the network, in terms of a route to the OpenMail system with the Unix mail Gateway. (If wildcards are used this may not need to be done.)
3. Decide whether to add any Unix mail users to the Directory for ease of addressing. If this is not done, users will have to supply Sendmail addresses (as foreign addresses) interactively. Replicate these additions to all other Directories in the network.
4. Operate and maintain the Unix mail Gateway service on the system with the Gateway.

---

## 17-7. Planning Requirements for a Unix mail Gateway

Instructor Notes

### Purpose

Overview the main implementation phases required to enable connection out of an OpenMail network to Unix mail.

### Key Points

- We'll go through each of these stages in detail as we go through this Module, including the variations that are possible.

### Transition

Look at the Routing Tables at the Unix mail Gateway system and elsewhere in the network ...

# Module 17 — Planning a Unix mail Gateway

## 17-8. Routing Tables for the Unix mail Gateway

### Routing Tables for the Unix mail Gateway



| New York Routing Table |                |
|------------------------|----------------|
| ADDRESS                | ROUTE          |
| ny,corp,admin          | local          |
| chic,manf,prod         | chigo!openmail |
| chic,unix,out          | chigo!openmail |
| chic,unix,in           | chigo!openmail |

| Chicago Routing Table |                    |
|-----------------------|--------------------|
| ADDRESS               | ROUTE              |
| chic,manf,prod        | local              |
| chic,unix,out         | local Unix Gateway |
| chic,unix,in          | local Unix Gateway |
| ny,corp,admin         | nyork!openmail     |

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In addition to configuring routes to Unix mail on the system with the Unix mail Gateway (Chicago), if you wish to exchange mail with users of a Unix mail system and the OpenMail Unix mail Gateway is not installed on your system, you must set up routes to the gateway system.

In this example, Pinewood, New York, wants to exchange mail with its subsidiary in San Francisco, and will need to plan routes to Chicago for Unix mail addresses because that is where the gateway resides.

The Routing Table at the New York system indicates that Unix mail must first be sent to the Chicago OpenMail system. There, the Routing Table indicates that Unix mail should be passed to the local Unix mail Gateway for delivery to Sendmail, and on to San Francisco.

## 17-8. Routing Tables for the Unix mail Gateway Instructor Notes

### Purpose

Explain how to plan routing tables for the Unix mail Gateway which, once set up, will route mail from anywhere in the OpenMail network out to Unix mail.

### Key Points

- When the Unix mail Gateway is local, you enter Unix mail addresses so that the Routing Table recognizes them and passes them to the Unix mail Gateway for onward transmission to Unix mail.
- When the Unix mail Gateway is remote, you must plan routes to the OpenMail system with the gateway.
- Notice that on the slide, wildcards could be used in the routing table.

### Transition

Look at adding Unix mail users to the Directory ...

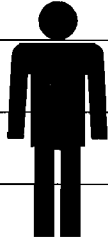
## 17-9. Adding Unix mail Users to the Directory

**Adding Unix mail users to the Directory**

Find out:

- Actual name:
- Mailnode of appropriate gateway:
- User's Sendmail address:

| Directory                |
|--------------------------|
| Suzanne Chang            |
| chic,unix,out            |
| suzanne@sfrisco.sfco.com |
|                          |
|                          |
|                          |



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To allow Unix users to be simply addressed by OpenMail users - by just entering their name - those Unix users who you've decided will be frequently communicated with need to be entered in the Directory.

This is the same process as adding OpenMail users on other systems in the network to your Directory so that they can be easily addressed.

In the scenario, the Chicago OpenMail Administrator has to configure the users in the Directory and then send out an update file (`om_record`), perhaps via a system coordinator, so that other Administrators can update their systems' Directories using the Directory update file.

---

## 17-9. Adding Unix mail Users to the Directory Instructor Notes

### Purpose

Explain the benefits of configuring commonly addressed Unix mail users in the Directories.

### Key Points

- To address a Unix mail user who is not configured in the Directory, an OpenMail user has to supply their Sendmail Address in brackets (as a foreign address) after the mailnode assigned to their Unix system.

### Transition

To summarize ...

## 17-10. Summary



### Planning a Unix mail Gateway

Topics covered:

- How OpenMail and Unix mail link
- The use of mailnode(s) for outgoing mail
- The use of a mailnode for incoming mail
- Planning for the Routing Tables
- Planning for the Directory

## Notes

### Purpose

Review what has been covered in Module 17.

### Key Points

- When the Unix mail Gateway is local, there are several aspects of planning:
  - The routing entries for passing messages to the Gateway.
  - The mailnode for converting incoming Unix mail addresses.
  - The Directory initial configuration.
  - Distribution of routing information to other Administrators.
  - Distribution of Directory updates.
- When the Unix mail Gateway is remote, things to plan on receipt of the above information are:
  - OpenMail routes to the Unix mail Gateway system
  - Updating the Directory

### Transition

The next Module covers the configuration of a Unix mail Gateway.



# Module 17 — Planning a Unix mail Gateway

## Module 18 — Configuring a Unix mail Gateway

---

### Objectives

After spending 1 hour completing this Module, you will be able to:

- Configure the Unix mail addresses to be accessed through the gateway
- Configure a mailnode to be used on incoming Unix mail
- Configure routes from other OpenMail systems to the system with the Unix mail Gateway
- Configure Unix mail users in the Directory
- Operate a Unix mail Gateway

# Module 18 — Configuring a Unix mail Gateway

## 18-1. Configuring Routes to Unix mail Addresses

**Configuring Routes to Unix Mail Addresses**

To get there:

- Main Menu
- ROUTES
- UNIX ROUTES
- Action Menu
- Add Route

Mailnode

chic,unix,out

AddAction MenuHelpExit

H2128 18-1

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration screen, select UNIX ROUTES
3. From the Action Menu, select Add Route and press **Select**

The Unix mail gateway route administration screen appears.

4. Enter the name of the Unix mailnode.
5. Press **Add** to configure the mailnode. The mailnode is listed.
6. Repeat steps 4 and 5 to configure any other Unix mailnodes.
7. Press **Exit** to return to the Unix Routes menu.

Alternatively, you could use the `omaddrt` command, for example:

```
omaddrt -m "chic,unix,out" -q UNIX
```

---

## 18-1. Configuring Routes to Unix mail Addresses

Instructor Notes

### Purpose

Show how to configure mailnode(s) for Unix mail systems so that messages addressed to those mailnodes are routed to the Unix mail Gateway.

### Key Points

- You can have more than one route configured in some circumstances.
- The course assumes that Sendmail is already set up, according to the appropriate manual.

### Transition

Look at how to configure a mailnode to be used on incoming Unix mail . . .

# Module 18 — Configuring a Unix mail Gateway

## 18-2. Configuring a Mailnode for Incoming Unix Mail

**Configuring a Mailnode for Incoming Unix Mail**

To get there:

Main Menu  
ROUTES  
DEF UNIX ROUTE

Default Unix Mail Gateway route

chic,unix,in

Update    Action Menu  Help  Exit

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration screen, select DEF UNIX ROUTE
3. The Specify the default Unix Mail Gateway route screen appears.
4. Enter the mailnode name to be used on Unix mail that comes in through the gateway.
5. Press **Update** to configure the mailnode.

Alternatively, you could use the omconfux command, for example:

```
omconfux -m "chic,unix,in"
```

---

## 18-2. Configuring a Mailnode for Incoming Unix Mail

Instructor Notes

### Purpose

Show how to configure a mailnode for the Unix mail Gateway that is used as the FROM mailnode on incoming Unix mail.

### Key Points

- This allows replies to messages from Unix users to be carried back to the Unix mail Gateway.
- The mailnode is automatically added to the Routing Table as an outgoing mailnode, to allow further replies back to Unix mail.

### Transition

Look at configuring route(s) to the OpenMail system with the Unix mail Gateway ...

# Module 18 — Configuring a Unix mail Gateway

## 18-3. Configuring Route(s) to the Gateway System

**Configuring Route(s) to the Gateway System**

To get there:

- Main Menu
- ROUTES
- OPENMAIL ROUTES
- Action Menu
- Add Route

|                                 |  |  |  |             |  |      |      |
|---------------------------------|--|--|--|-------------|--|------|------|
| Remote Mailnode                 |  |  |  |             |  |      |      |
| chic,unix,out                   |  |  |  |             |  |      |      |
| -----                           |  |  |  |             |  |      |      |
| [ignore X.400 parts of address] |  |  |  |             |  |      |      |
| -----                           |  |  |  |             |  |      |      |
| Sendmail address of computer    |  |  |  |             |  |      |      |
| chigo!openmail                  |  |  |  |             |  |      |      |
| Add                             |  |  |  | Action Menu |  | Help | Exit |

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration menu, select OPENMAIL ROUTES
3. From the Action Menu, select Add Route and press **Select**
4. Enter the Remote Mailnode and Sendmail address for the mailnode for outgoing Unix mail.  
(The X.400 fields are not required for a Unix mail Gateway.)
5. Press **Add** to configure the route.
6. Repeat steps 4 through 5 to add a route to the mailnode for incoming Unix mail.
7. Press **Exit** to return to the OpenMail route administration menu.

Alternatively, you could use the `omaddrtr` command, for example:

```
omaddrtr -m "chic,unix,out" -q SMINTFC -u "chigo!openmail"
omaddrtr -m "chic,unix,in" -q SMINTFC -u "chigo!openmail"
```

---

## 18-3. Configuring Route(s) to the Gateway System

Instructor Notes

### Purpose

Show how to configure a route to the system with the Unix mail Gateway from each other system in the OpenMail network that needs to access it.

### Key Points

- This is not carried out on the gateway system but on every other OpenMail system in the network that needs to access the gateway.
- This is the same process as adding routes to other OpenMail systems that your local system needs to access.

### Transition

Look at adding Directory entries for Unix mail users . . .



# Module 18 — Configuring a Unix mail Gateway

## 18-4. Adding Unix Mail Users to the Directory

### Adding Unix Mail Users to the Directory

To get there:

Main Menu  
DIRECTORIES  
ADD ENTRY

|                                                       |                      |                                     |                                     |
|-------------------------------------------------------|----------------------|-------------------------------------|-------------------------------------|
| Name                                                  |                      | Directory                           |                                     |
| <input type="text" value="Suzanne Chang"/>            |                      | <input type="text"/>                |                                     |
| Mailnode                                              |                      |                                     |                                     |
| <input type="text" value="chic,unix,out"/>            |                      |                                     |                                     |
| -----                                                 |                      |                                     |                                     |
| DDA (foreign address)                                 |                      |                                     |                                     |
| <input type="text" value="suzanne@sfrisco.sfco.com"/> |                      |                                     |                                     |
| -----                                                 |                      |                                     |                                     |
| Attribute                                             |                      | Attribute Value                     |                                     |
| <input type="text"/>                                  |                      | <input type="text"/>                |                                     |
| <input type="button" value="Add"/>                    | <input type="text"/> | <input type="text"/>                | <input type="text"/>                |
| <input type="button" value="Action Menu"/>            | <input type="text"/> | <input type="button" value="Help"/> | <input type="button" value="Exit"/> |

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1. From the Main Menu, select **DIRECTORIES**
2. From the Shared directory administration menu, select **ADD ENTRY**. Enter at least the:
  - Unix mail user's name
  - Mailnode of the Unix mail Gateway
  - User's Unix mail (Sendmail) address in the DDA (foreign address) field
3. Press **Add** to configure the Unix user in the Directory.
4. Repeat steps 2 and 3 to configure any other users.
5. Press **Exit** to return to the Shared directory administration menu.

Alternatively, you could use the `omaddent` command, for example:

```
omaddent -e "S=Chang/G=Suzanne/OU1=chic/OU2=unix/OU3=out/DDV1=suzanne@sfrisco" or
omaddent -x -e "Suzanne Chang/chic,unix,out (suzanne@sfrisco)"
```

You also need to set up a Unix login for each Unix mail user.

## 18-4. Adding Unix Mail Users to the Directory

Instructor Notes

### Purpose

Show how to configure Unix mail users in the OpenMail Directory for ease of addressing.

### Key Points

- To allow Unix users to be simply addressed by OpenMail users - by just entering their name - those Unix users who you've decided will be frequently communicated with need to be entered in the Directory.
- This is the same process as adding OpenMail users on other systems in the network to your Directory so that they can be easily addressed.
- In the scenario, it is the Chicago OpenMail Administrator who would need to configure Unix users. If they do this, they can distribute the resulting `om_record` file to other systems in the OpenMail network, such as New York, so they can update their Directories.
- Ignore the X.400 address components: Organization, Country, Admin Domain, Private Domain, X.121 Address, UA Identifier
- Leave the DDA Type field at its default value. This will identify the Sendmail Address entry as a Foreign Address rather than an X.400 DDA.

### Transition

Look at operating and maintaining a Unix mail Gateway . . .

## 18-5. Operating a Unix mail Gateway

### Operating a Unix mail Gateway

|                                     |                                            |
|-------------------------------------|--------------------------------------------|
| <code>omon -s unix</code>           | Start the Unix mail Gateway service        |
| <code>omstat -s</code>              | Give status of Gateway services            |
| <code>omstat -q UNIX</code>         | List mail on Unix mail Gateway input queue |
| <code>omshowlog -s unix -l 9</code> | Display Event Log for Gateway at level 9   |
| <code>mailq</code>                  | List mail on Sendmail queue                |

H2128 18-5

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The Unix mail Gateway can be started from the Administration Interface or using the `omon` command.

`omstat` will give the status of the Unix mail Gateway service and queue, as it does for other services.

The Unix mail Gateway will be logged to the Event Log, at the specified level, and can be viewed with `omshowlog`

---

## 18-5. Operating a Unix mail Gateway

Instructor Notes

### **Purpose**

Explain the day-to-day operations and troubleshooting procedures for the Unix mail Gateway.

### **Key Points**

- Since Unix mail is received via Sendmail, like ordinary OpenMail messages, the troubleshooting procedures are similar to those covered for OpenMail network mail (Module 11).

### **Transition**

A Lab in which you configure a gateway to Unix mail on your own system . . .

# Module 18 — Configuring a Unix mail Gateway

## 18-6. LAB: Configure a Unix Mail Gateway

In this Lab you configure a gateway between OpenMail and Unix mail - both on your local system - and then exchange mail between the two. Refer back to the procedures earlier in the Module if you need to.

### 1. Configure the Unix Gateway

- i. Configure a mailnode for mail going out to Unix mail.

Use a name such as *ny,corp,unix*

- ii. Configure a mailnode for incoming Unix mail.

Use a name such as *unixmail*

### 2. Create a .forward file containing your OpenMail address.

This should be created in the home directory of your OpenMail user. Enter your address in Unix form, for example:

```
name_your/ny_corp_admin@localnode
```

### 3. Configure a new Unix user.

- i. Login as the Unix user.
- ii. Send a message to your OpenMail address.

```
mail name_your/ny_corp_admin@localnode
Hello
This message was sent from Unix mail with an OpenMail format address.
(Ctrl) + (D)
```

- iii. Send a message to your Unix mail address.

```
mail yourlogin@localnode
Hello
This message was sent from Unix mail with a Sendmail format address.
(Ctrl) + (D)
```

### 4. Go into AdvanceMail.

For example: `advmail "Your Name"`

- i. Look for both messages.

Check how the addresses have been converted to OpenMail format. The message received through the Unix mail Gateway should have the incoming mailnode in the sender's address.

If message haven't arrived, check their progress with `omstat` and, if necessary, `mailq`

- ii. Reply to both messages.

### 5. Go into Unix mail and read the replies.

```
mail
```

## 18-6. LAB: Configure a Unix Mail Gateway

Instructor Notes

### Purpose

Configure a gateway to Unix mail on the local system and exchange mail between OpenMail and Unix.

### Preview

Sendmail must be running on each/the training system for this Lab, and these services must be running: Terminal UI, Service Router, Local Delivery, Unix mail Gateway.

The Lab can't be done in the playpen systems. Use the "real" OpenMail system and gather the class round to watch someone perform the Lab.

1. **Configure the Unix Gateway**
2. **Create a .forward file containing your OpenMail address**

Contains students' own OpenMail address and is created in their home directory. Tell students the name of the local node.

3. **Configure a new Unix user**

Students should either configure their own, or use a spare login that already exists on their system.

- i. **Login as the Unix user**
- ii. **Send a message to your OpenMail address**

Use one of the Unix mail systems, such as mail, mailx, elm

- iii. **Send a message to your Unix mail address**

This creates a message to be forwarded to the Gateway via the .forward file created in step 3.

4. **Go into AdvanceMail**

This can be done without changing login, provided there is a password on their mailbox.

- i. **Look for both messages**

If the messages haven't arrived, use this as an opportunity to troubleshoot, that is:

- check .forward file, gateway configuration, and that OpenMail services are running
- use omstat to locate the message within OpenMail, or mailq to find it in Sendmail

- ii. **Reply to both messages**

Both foreign addresses (in brackets) are used to route replies back out the gateway.

5. **Go into Unix mail and read the replies**

Check both replies arrive.

# Module 18 — Configuring a Unix mail Gateway

## Procedure

1.
  - i. `omaddrt -m "ny,corp,unix" -q UNIX`
  - ii. `omconfux -m "unixmail"`
2.
  - cd
  - vi `$HOME/.forward`  
`name_your/ny_corp_admin@localnode`  
:wq
3.
  - i. Login as root and use an appropriate system administration utility
  - ii. `login johnd`
  - iii. `mail name_your/ny_corp_admin@localnode`  
Hello  
This message came from Unix mail with an OpenMail format address.  
`(Ctrl) + (D)`
  - iv. `mail yourlogin@localnode`  
Hello  
This message came from Unix mail with a Sendmail format address.  
`(Ctrl) + (D)`
4.
  - i. `advmail "Your Name"`
  - ii. In Tray
  - iii. `Reply + Mail + Exit`
5. `mail`

## Transition

To Summarize ...

## Module 18 — Configuring a Unix mail Gateway



## 18-7. Summary



### **Configuring a Unix mail Gateway**

Topics covered:

- Configuring routes to Unix mail addresses
- Configuring a mailnode for incoming Unix mail
- Configuring routes to the Gateway
- Adding Unix mail users to the Directory
- Operating a Gateway

Lab: Configure a Gateway

## Notes

### Purpose

Review what has been covered in Module 18.

### Key Points

- You need to configure `UNIX ROUTES` on the system with the Unix mail Gateway.
- You need to configure `OPENMAIL ROUTES` to the system with the Unix mail Gateway from any other system in the OpenMail network.
- You can add Directory entries for Unix mail users on the first system - either via `omadmin` or the `omaddent` - and on subsequent systems with the Directory update file.

### Transition

The next Module covers the planning and configuration of a Fax Gateway.

# Module 18 — Configuring a Unix mail Gateway

## **Module 19 — Planning and Configuring a Fax Gateway**

---

### **Objectives**

After spending 40 minutes completing this Module, you will be able to:

- Plan a Fax Gateway
- Understand how OpenMail links to the fax network
- Configure a mailnode to route faxes to the gateway
- Configure an OpenMail mailnode for use on incoming faxes, if applicable

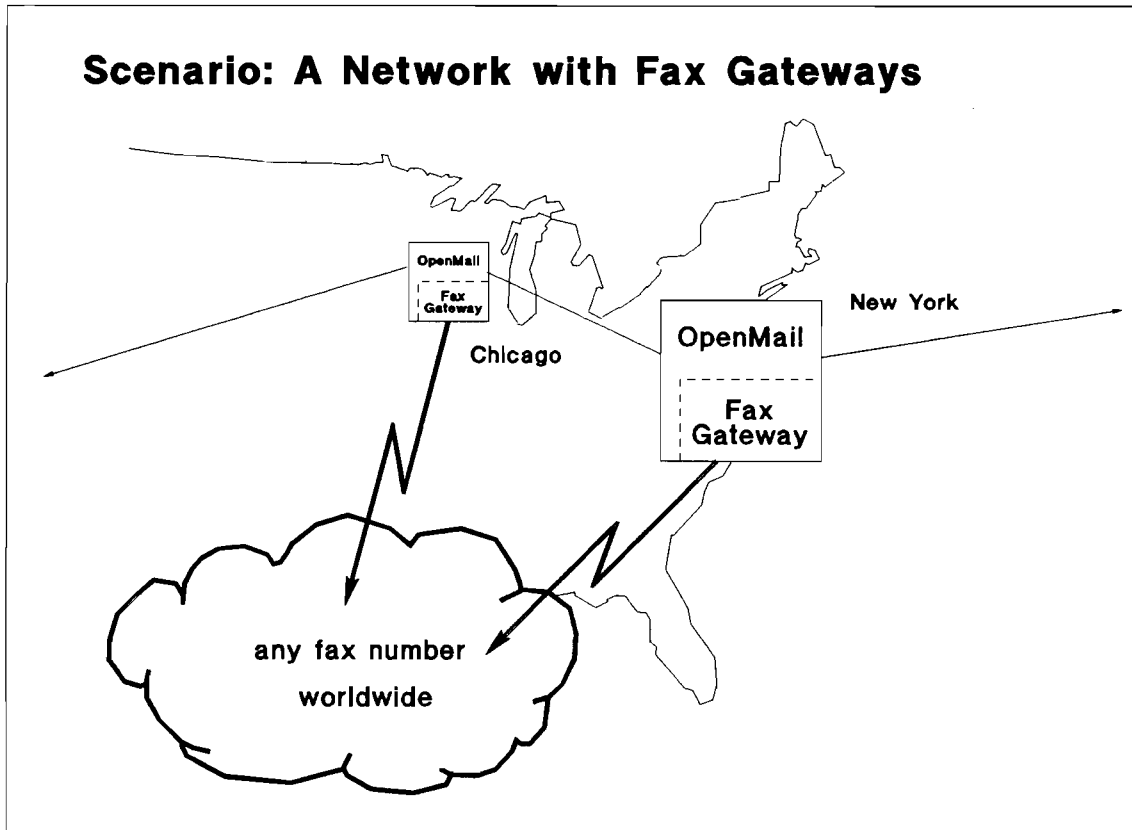
### **Manual References**

*HP OfficeFax Installation*

*HP OfficeFax Administration*

# Module 19 — Planning and Configuring a Fax Gateway

## 19-1. Scenario: A Network with Fax Gateways



H2128 19-1

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Pinewood have decided to install a Fax Gateway on their New York system, because there is currently a lot of fax traffic at that site, especially with small local suppliers. As New York Administrator, you now need to plan and configure the Fax Gateway in OpenMail.

Depending on the use that is made of the Gateway, Pinewood may add another Fax Gateway at New York, and may go on to install Fax Gateways on each main OpenMail system; Chicago is the most likely site for the next gateway.

The Fax Gateway is not primarily a replacement for fax machines but an aid to user productivity. Being able to send faxes *from* OpenMail is especially useful:

- for reaching external companies not on X.400 or Unix mail, such as small local suppliers.
- when you need to send the same message to internal electronic mail users and external people.

# Module 19 — Planning and Configuring a Fax Gateway

---

## 19-1. Scenario: A Network with Fax Gateways

## Instructor Notes

### Purpose

Introduce the scenario used as the main example in this Module.

### Key Points

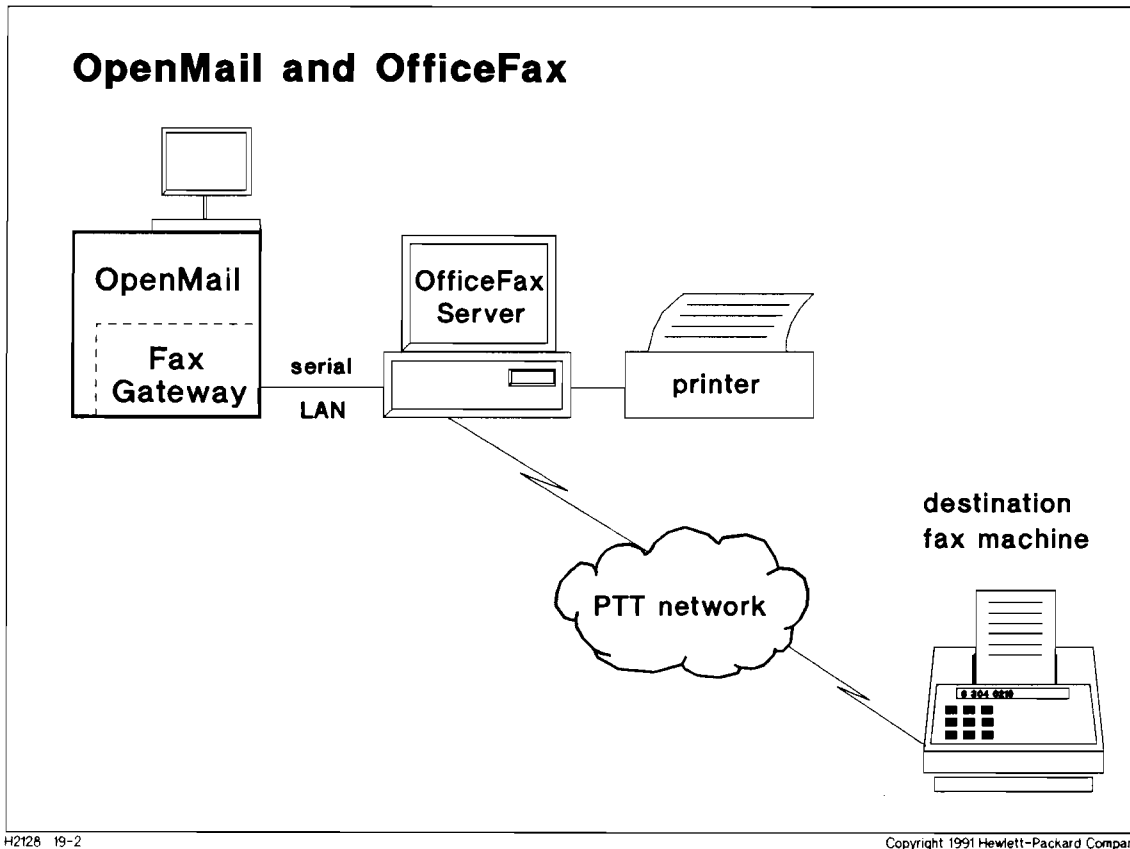
- There are over 8 million fax numbers in use, worldwide.
- It will not normally make sense to route mail from other systems through to a Fax Gateway on another OpenMail system - unlike other gateways the guide here should be one gateway per system.

### Transition

Look at how the OpenMail Fax Gateway uses OfficeFax to link to the PTT network ...

# Module 19 — Planning and Configuring a Fax Gateway

## 19-2. OpenMail and OfficeFax



Link between Fax Gateway and public network is made by HP OfficeFax, a PC-based server. HP OfficeFax runs on a dedicated IBM-compatible PC, connected to the OpenMail server, via a serial or LAN (Sockets) link.

A message to be sent as a fax can contain:

- ASCII Text
- TIFF (Tagged Image File Format) graphics files - typically scanned images
- HP Graphics Gallery files

OfficeFax automatically retries transmitting the fax until it is successful (up to the maximum configured number of times). If after that time, the fax has not been transmitted for any reason, it is returned to the sender.

## 19-2. OpenMail and OfficeFax

## Instructor Notes

### Purpose

Explain how OpenMail's Fax Gateway links to the PTT network via an OfficeFax server.

### Key Points

- Hand out the HP OfficeFax data sheet, if available.
- The OfficeFax server requires:
  - IBM PC/AT-compatible (minimum)
  - MS-DOS 3.3 or 4.01
  - Hard disk
  - MS-Windows-supported video display
  - Serial port or LAN card
- Connection to the phone network is via one or more GammaFax CP/T boards.
- Availability of this facility will increase fax traffic! Though you can configure non-urgent faxes to be sent overnight to reduce line costs.

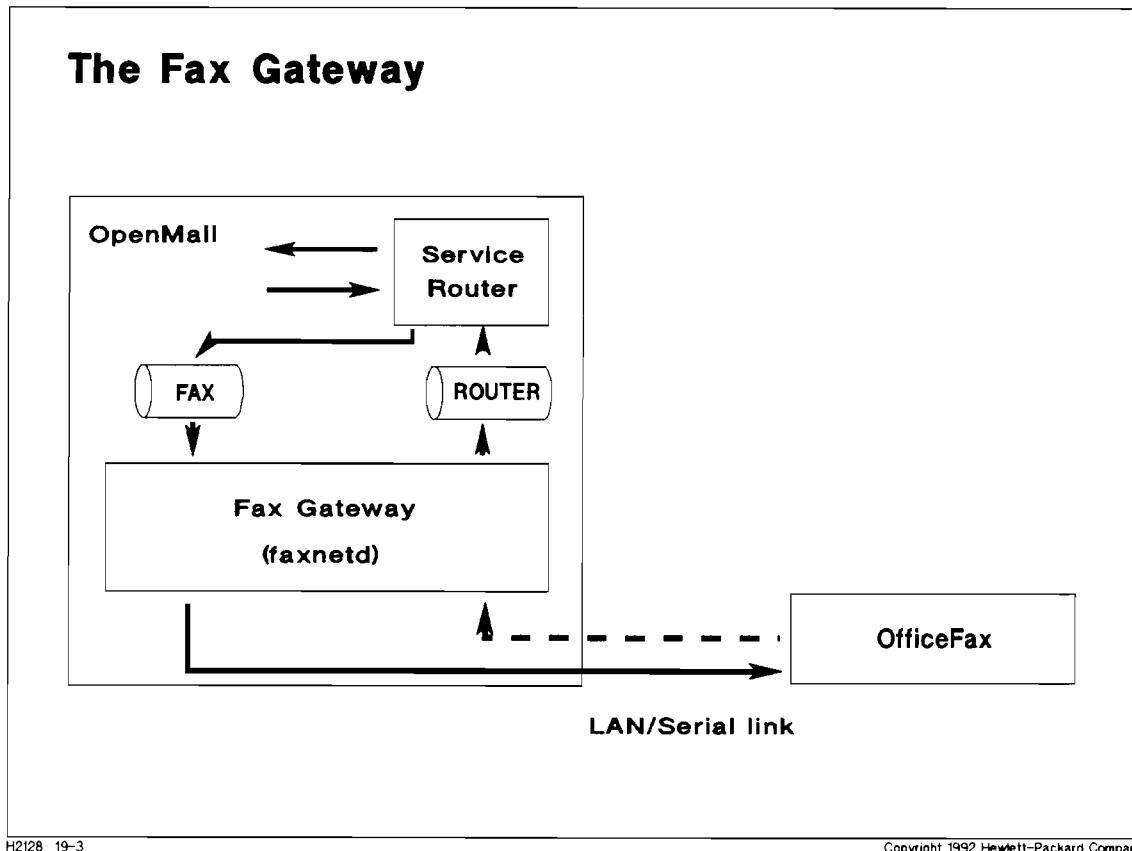
### Transition

Look at how the Fax Gateway software works . . .



# Module 19 — Planning and Configuring a Fax Gateway

## 19-3. The Fax Gateway



1. An outgoing fax is put in the FAX queue by the Service Router.
2. The Fax Gateway process (`faxnetd` on systems with LAN links) then:
  - i. Converts the files to ASCII text, or if it cannot do that, to TIFF format (with Type 2 compression).  
These conversions are specified in the file `/users/openmail/sys/fax.str`
  - ii. Strips off the OpenMail mailnode for the recipient address.
  - iii. Passes the message to OfficeFax for delivery.
3. The OfficeFax server:
  - i. Converts the message to CCITT Group III Fax format
  - ii. Adds a pre-configured cover sheet
  - iii. Puts the fax in the queue for transmission to the specified fax number.

Incoming faxes arrive at the OfficeFax server, and are typically printed off and hand forwarded.

---

## 19-3. The Fax Gateway

Instructor Notes

### **Purpose**

Explain how OpenMail's Fax Gateway delivers and receives mail from the fax network.

### **Key Points**

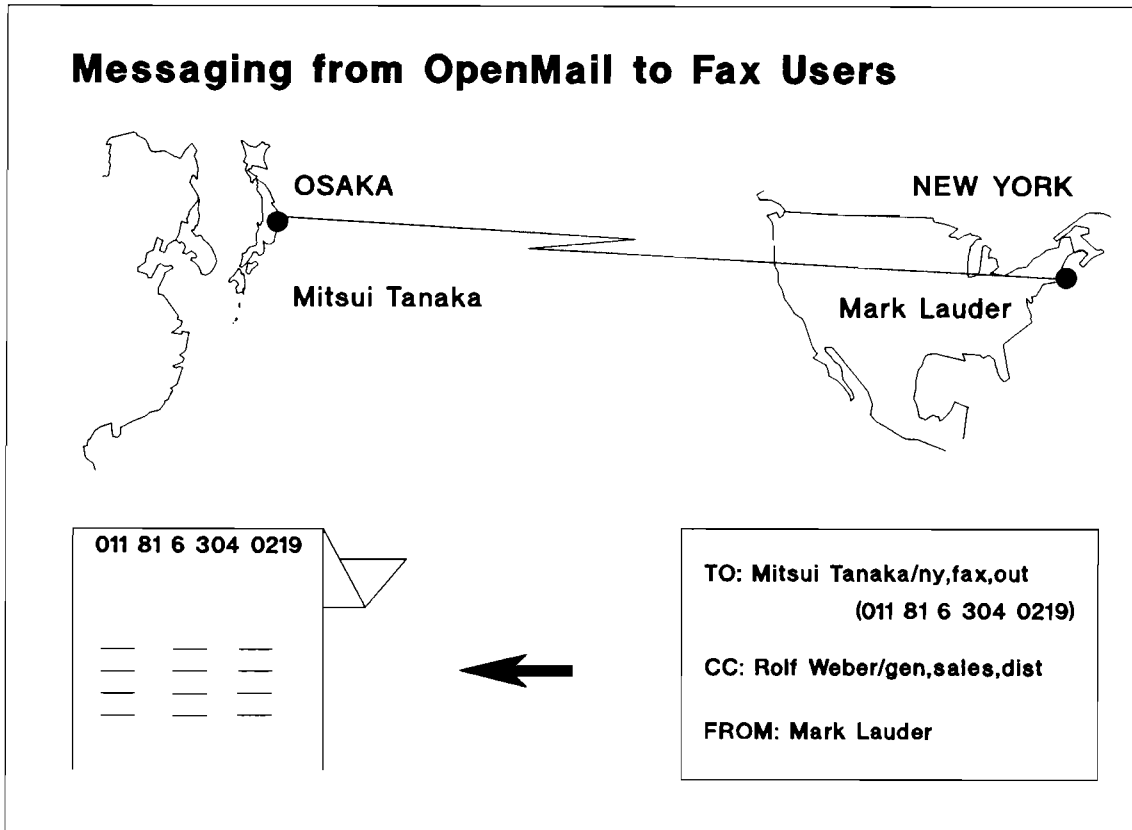
- Fax Gateway was not available with OpenMail release A.00.00

### **Transition**

Look at how mail is send from OpenMail to the fax network ...

# Module 19 — Planning and Configuring a Fax Gateway

## 19-4. Messaging from OpenMail to Fax Users



H2128 19-4

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1. OpenMail user, Mark Lauder, at New York sends a message to Mitsui Tanaka in Osaka, Japan - who is not on an electronic mail network - and copies it to an OpenMail user in Geneva, Switzerland.
2. Mark addresses his message as in the slide and mails it.
3. The Service Router on the New York system copies the message and sends one copy through the Sendmail Interface to the CC'd recipient on the Geneva system. The Service Router identifies the ny,fax,out mailnode and routes a copy of the message to the Fax Gateway.
4. The Fax Gateway passes the message to the OfficeFax server.
5. The OfficeFax server puts the fax in the queue for transmission to the specified fax number over the phone network.
6. The fax is received at a fax machine in Osaka, from where it is hand-delivered to Mitsui Tanaka.

## 19-4. Messaging from OpenMail to Fax Users

Instructor Notes

### Purpose

Explain how mail sent out of OpenMail becomes a fax, and how faxes can be received by OpenMail.

### Key Points

- One message can be sent to multiple fax numbers, or to a mix of mail users and fax numbers.
- Incoming faxes are printed by OfficeFax on a printer attached to the Fax Server PC, or redirected to a local fax machine to be printed.

The OfficeFax Administrator can forward faxes directly to OpenMail users - but for this to make sense:

- User must have an application that can read/print/manipulate the TIFF format file in which the fax is received.
- OpenMail system must have sufficient disk resource to accommodate the storage of large TIFF files.

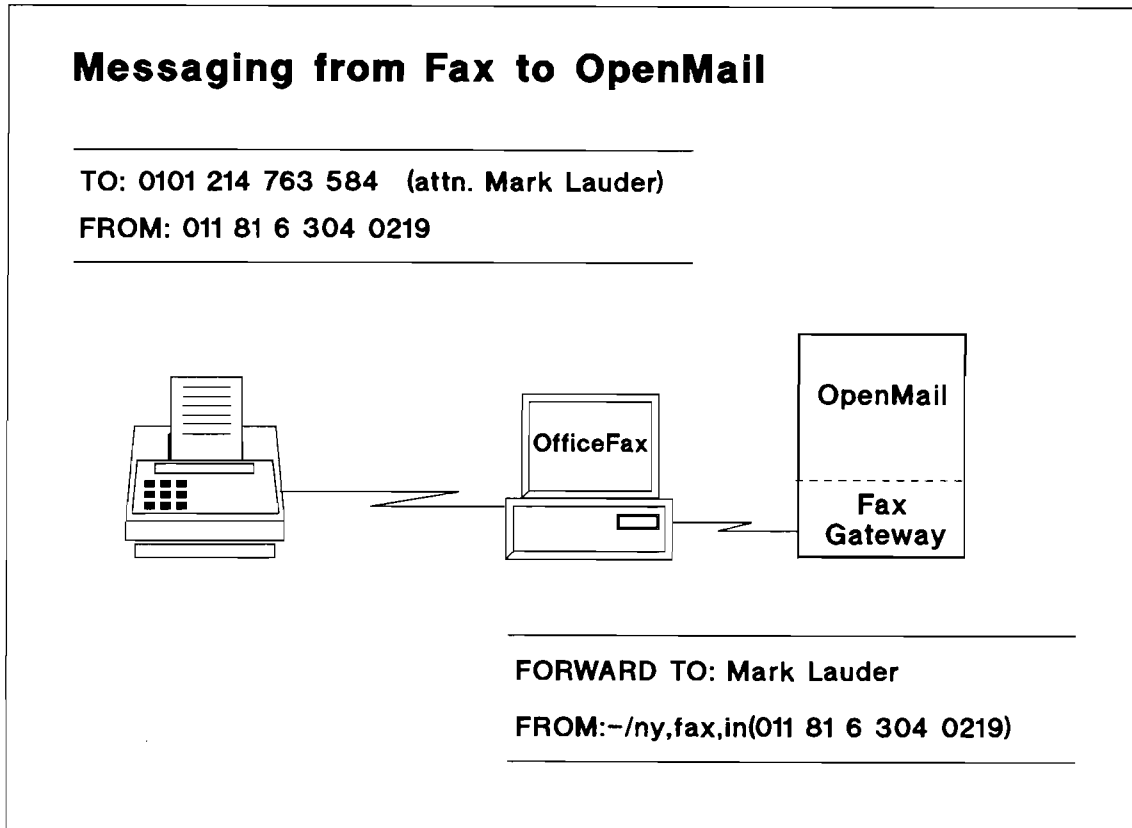
### Transition

Look at how mail is sent into OpenMail from the fax network ...



# Module 19 — Planning and Configuring a Fax Gateway

## 19-5. Messaging from Fax to OpenMail



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You can configure a mailnode too be used on incoming faxes, which provides an OpenMail format FROM address, and which can be used to route replies back to fax numbers from OpenMail users.

OfficeFax automatically extracts the sending fax machine's CSID (identifier) from the protocol information sent with the fax, and passes it on as the sender id. If this id is the complete fax number of the sending machine - as it often is - it can be used to reply to. If it is not - for example Acme Fax machine, it obviously cannot be used. You'll probably not need to do this because you'll print faxes rather than forward them into OpenMail.

# Module 19 — Planning and Configuring a Fax Gateway

---

## 19-5. Messaging from Fax to OpenMail

Instructor Notes

### **Purpose**

Explain how faxes can be routed into OpenMail and replied to.

### **Transition**

Look at what is required to plan a Fax Gateway . . .

## 19-6. Planning Requirements for a Fax Gateway

### Planning Requirements for a Fax Gateway

- Set up HP OfficeFAX server PC and install the Fax Gateway
- For serial connections, activate the fax Unix login
- For LAN connections, configure IP address of server PC in `/etc/hosts`
- Configure a mailnode for the Fax Gateway
- Optionally configure a mailnode for incoming faxes
- Optionally add fax numbers to the Directory
- Optionally configure routes to the Fax Gateway

H2128 19-6

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- Ensure HP OfficeFAX server PC is configured and operational. Refer to HP OfficeFAX manuals for details.
- Ensure the Fax Gateway component of OpenMail is installed on the gateway system.
- On versions of OpenMail that support a serial link to OfficeFAX, installing the Fax Gateway component automatically sets up a Unix login `fax`, which is used by the serial connection. This user is de-activated (for security reasons), and must be activated - by changing the password to a name of your choice using the Unix `passwd` command. This does not apply to LAN connections to OfficeFAX.

For LAN connections, either add the IP address of the OfficeFAX server PC to the `/etc/hosts` file, or add it to the Yellow Pages Nameserver.

- Configure a mailnode for the Fax Gateway. Default mailnode name, `fax`, will usually be appropriate. This can be changed if your addressing convention demands it, or if you have 2 fax gateways (one per fax server) on the same system.

## 19-6. Planning Requirements for a Fax Gateway Instructor Notes

### Purpose

Explain what steps are required to configure a Fax Gateway.

### Key Points

- Configure a mailnode for the Fax Gateway. This is used in addressing with the fax number supplied as a foreign address, for example:

Mitsui Tanaka/ny,fax,out(011 81 6 304 0199)

- You could add commonly used fax numbers to the Directory, just as with other foreign addresses, to save users typing fax numbers. This is less important with the Fax Gateway, as the flexibility to send to any number is part of its usefulness.
- You could route faxes to the gateway from other OpenMail systems - if they didn't have their own fax facilities or to make use of leased lines - but otherwise this gateway is different in not requiring this.

### Transition

Look at configuring a route to the Fax network ...



## 19-7. Configuring a Route to the Fax Network

**Configuring a Route to the FAX Network**

To get there:

- Main Menu
- ROUTES
- FAX ROUTES
- Action Menu
- Add Route

Mailnode

`ny,fax,out`

|     |  |  |  |             |  |      |      |
|-----|--|--|--|-------------|--|------|------|
| Add |  |  |  | Action Menu |  | Help | Exit |
|-----|--|--|--|-------------|--|------|------|

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration screen, select FAX ROUTES
3. From the Action Menu, select Add Route and press **Select**

The Add a route screen appears.

4. Enter your name of the fax mailnode, or accept the default fax
5. Press **Add** to configure the mailnode. The mailnode is listed.
6. Press **Exit** to return to the Fax Gateway Route administration menu.

Alternatively, you could use the `omaddrt` command, for example:

```
omaddrt -m "ny,fax,out" -q FAX
```

## 19-7. Configuring a Route to the Fax Network

Instructor Notes

### Purpose

Show how to configure route to fax mailnode so messages addressed to fax numbers are routed to Fax Gateway.

### Key Points

- You can have more than one route configured in some circumstances - for instance, if you have more than one Fax Gateway on the same OpenMail system.
- The default mailnode name supplied, `fax`, is intended to make it easy for users to address messages to fax users without need for including them in the Directory or referring to a manual.

### Transition

Look at how to configure a mailnode to be used on incoming faxes . . .

## 19-8. Configuring a Mailnode for Incoming Faxes

**Configuring a Mailnode for Incoming Faxes**

To get there:

- Main Menu
- ROUTES
- DEF FAX ROUTE

Default Fax Gateway route

ny,fax,in

Update    Action Menu  Help  Exit

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration screen, select DEF FAX ROUTE
3. The Specify the default Fax Gateway screen appears.
4. Enter the mailnode name to be used on faxes that comes in through the gateway.
5. Press Update to configure the mailnode.

Alternatively, you could use the `omconffax` command, for example:

```
omconffax -m "ny,fax,in"
```

---

## 19-8. Configuring a Mailnode for Incoming Faxes

Instructor Notes

### Purpose

Show how to configure a mailnode for the Fax Gateway to be used as FROM mailnode on incoming faxes.

### Key Points

- This is also used to carry replies to messages from Fax users back to the Fax Gateway.
- As discussed earlier, this is not currently generally needed.
- You could go on to add commonly used fax numbers in the Directory, in just the same way we've added other remote users.
- You could go on to configure routes to the Fax Gateway from other OpenMail systems, in just the same way we've added routes to remote systems.
- A default incoming mailnode name—`fax`—is supplied.

### Transition

Look at operating a Fax Gateway ...

## 19-9. Operating a Fax Gateway

### Operating a Fax Gateway

|                                   |                                              |
|-----------------------------------|----------------------------------------------|
| <code>omon -s fax</code>          | Start the Fax Gateway service                |
| <code>omstat -s fax</code>        | Give status of Gateway service               |
| <code>omstat -q FAX</code>        | List mail on Fax Gateway input queue         |
| <code>omshowlog -s fax -l9</code> | Display Event Log for Fax Gateway at level 9 |

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The Fax Gateway can be started from the Administration Interface or using the `omon` command.

`omstat` will give the status of the Fax Gateway service and queue, as it does for other services.

The Fax Gateway will be logged to the Event Log, at the specified level, and can be viewed with `omshowlog`

# Module 19 — Planning and Configuring a Fax Gateway

---

## 19-9. Operating a Fax Gateway

Instructor Notes

### **Purpose**

Explain the day-to-day operations and troubleshooting procedures for the Fax Gateway.

### **Transition**

To summarize . . .

## 19-10. Summary

A graphic of a spiral-bound notebook with a white page. The page has a spiral binding at the top and a black shadow on the right side. The text on the page is as follows:

### **Plan and Configure Fax Gateway**

---

Topics covered:

- How to plan a Fax Gateway
- How OpenMail links to the fax network
- Configuring a mailnode to route faxes to the gateway
- Configuring a mailnode for incoming faxes

Topics covered:

- How to plan a Fax Gateway
- How OpenMail links to the fax network
- Configuring a mailnode to route faxes to the gateway
- Configuring a mailnode for incoming faxes

## Notes

# Module 19 — Planning and Configuring a Fax Gateway

---

## 19-10. Summary

## Instructor Notes

### Purpose

Review what has been covered in Module 19.

### Key Points

- Fax Gateways are a productivity benefit for OpenMail users rather than a replacement for fax machines.
- Unlike other gateways, you would typically have one (or more depending on the load) per system, rather than one per network.
- Configuration in OpenMail is straightforward - most administration is carried out on the OfficeFax server.

### Transition

The next Module covers the planning of an HP DeskManager Gateway.



# Module 19 — Planning and Configuring a Fax Gateway

## Module 20 — Planning an HP Desk Gateway

---

### Objectives

After spending 40 minutes completing this Module, you will be able to:

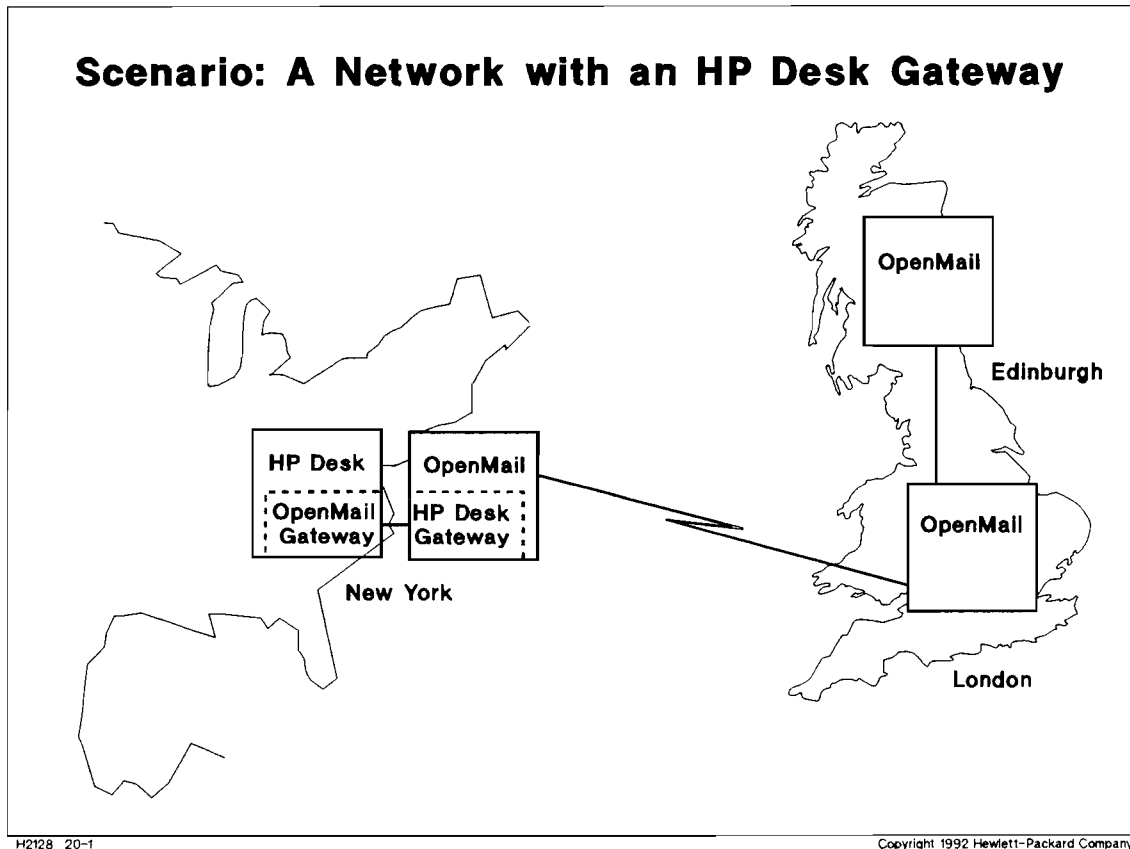
- Understand how OpenMail communicates with HP Desk
- Plan the HP Desk Gateway configuration
- Plan a Translation Table between OpenMail mailnodes and HP Desk locations/sublocations
- Plan routes from other OpenMail systems to the system with the HP Desk Gateway
- Decide what extra entries to make in the Directory

### Manual Reference

*OpenMail/HP DeskManager Connection Technical Guide*

## Module 20 — Planning an HP Desk Gateway

### 20-1. Scenario: A Network with an HP Desk Gateway



The Market Research department of Pinewood Inc is located in New York, at a different site from the other offices. On that site they communicate using an HP DeskManager electronic mail system, running on an HP 3000 computer. Pinewood management want to integrate the Market Research department into the company network, which is based around OpenMail.

In preparation, an HP Desk Gateway has been installed at the New York site. It is your job to plan for the configuration of that gateway, in co-operation with the HP Desk Administrator, who needs to configure an OpenMail Gateway on the HP Desk system.

Only the New York OpenMail system will have an HP Desk Gateway. Users in other parts of the OpenMail network wishing to send mail to Market Research must first have their messages routed to the New York system, and then through its HP Desk Gateway to the HP Desk system. Return mail from HP Desk to OpenMail will take the reverse path.

# Module 20 — Planning an HP Desk Gateway

## 20-1. Scenario: A Network with an HP Desk Gateway

Instructor Notes

### Purpose

Introduce the scenario used as the main example in this Module.

### Key Points

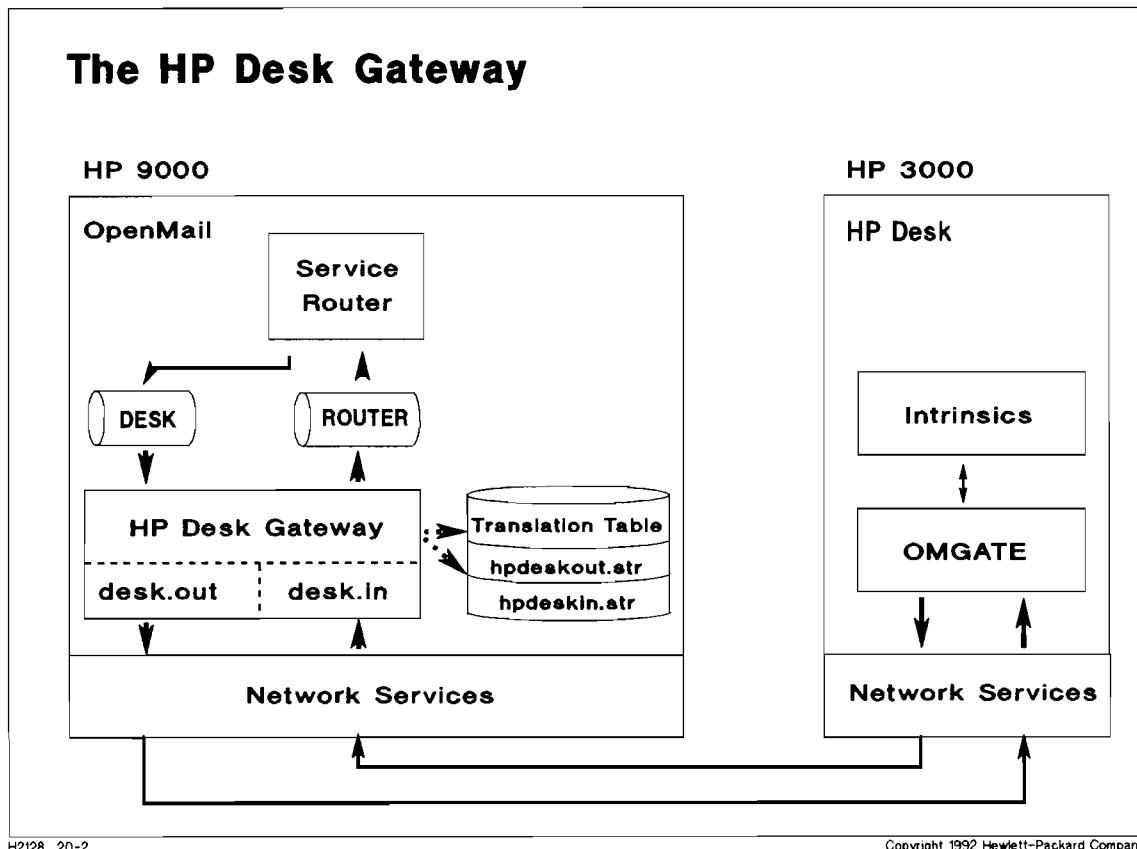
- Where OpenMail is running on HP-UX, it is able to exchange mail with Hewlett-Packard's proprietary HP DeskManager (HP Desk) integrated office system, which runs on HP 3000 minicomputers.
- The HP Desk Gateway has been installed on the New York OpenMail system. Once configured, this will allow exchange of messages between the two systems.
- New York users' mail for HP Desk must be directed to the HP Desk Gateway, so the local Routing Table must have entries for HP Desk mailnodes for this purpose.
- The HP Desk Gateway can be accessed by users throughout the OpenMail network, providing routes are configured to the New York system where the gateway resides.
- The other half of the connection resides on the HP 3000 - in the form of HP Desk's OpenMail Gateway - which needs to be configured by the HP Desk Administrator.

### Transition

Look at how the HP Desk Gateway software works . . .

# Module 20 — Planning an HP Desk Gateway

## 20-2. The HP Desk Gateway



H2128 20-2

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1. An outgoing message is put on the DESK queue by the Service Router.
2. The HP Desk Gateway process `desk.out` then:
  - i. Substitutes OpenMail mailnodes with the HP Desk location/sublocations held in the Translation Table, using the default mailnode on any locations without corresponding entries.
  - ii. Converts the message from OpenMail format into one file in ASCII ARPANET format.
  - iii. Does not perform any conversions on content files contained in the message; this is the default set in the file `/users/openmail/sys/hpdeskout.str`
  - iv. Transfers the file to the HP 3000, using the Network Services DSCOPY program.
3. An incoming message is passed to the Service Router by the Gateway process `desk.in`, after it has:
  - i. Either substituted mailnodes from the Translation Table or else simply converted HP Desk locations to OpenMail format
  - ii. Not performed any conversions on content files; this is the default set in the file `/users/openmail/sys/hpdeskin.str`

## 20-2. The HP Desk Gateway

## Instructor Notes

### Purpose

Explain how OpenMail's HP Desk Gateway delivers and receives mail to/from HP Desk.

### Key Points

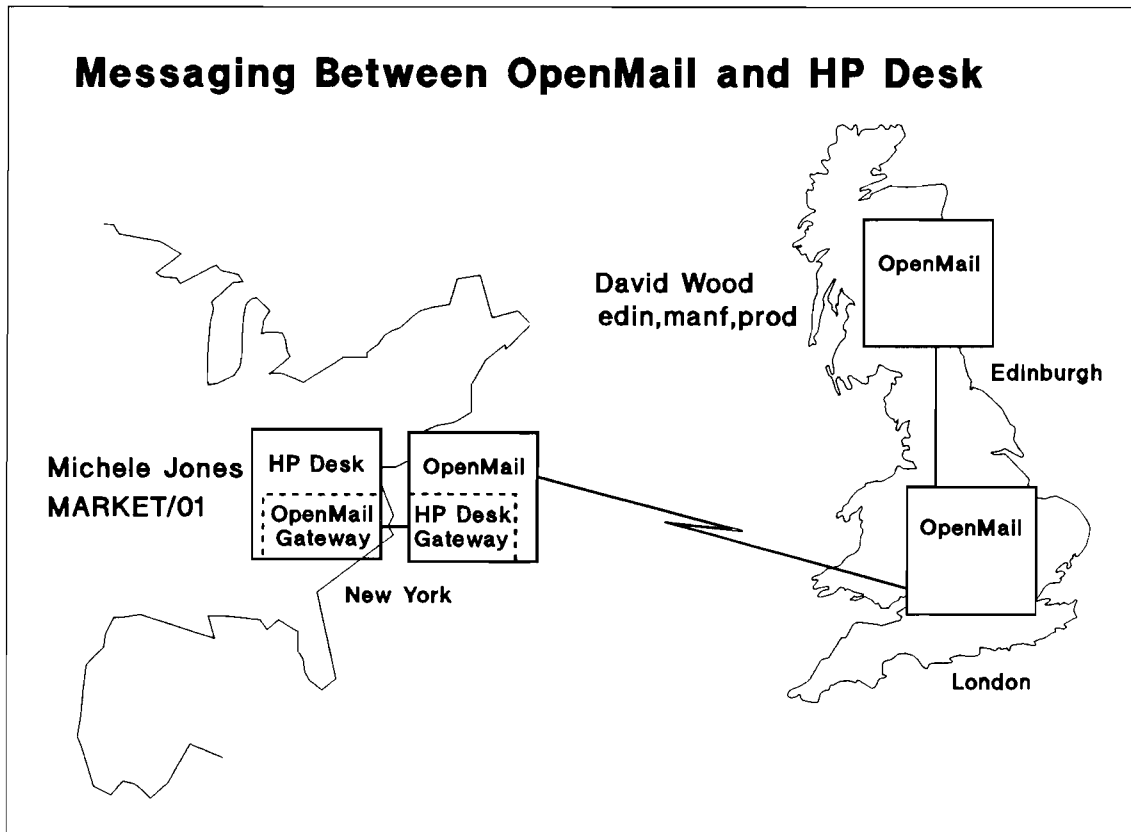
- On the HP 3000, the OpenMail Gateway program OMGATE converts a received message from ARPANET to HP Desk format, and passes the file into HP Desk via the HP Desk Intrinsic.
- A message reaching OpenMail from HP Desk has already had content files converted by HP Desk as follows:
  - HP Slate -> text
  - HP Draw -> HP Drawing Gallery
  - HP Word -> HP Word/PC
  - NewWave package -> exploded into constituent files

### Transition

Look at how mail is exchanged between OpenMail and HP Desk . . .

# Module 20 — Planning an HP Desk Gateway

## 20-3. Messaging between OpenMail and HP Desk



H2128 20-3

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1. David Wood (in Edinburgh) sends a message to Michelle Jones, at the New York HP Desk system:

```
FROM: David Wood/edin,manf,prod
TO: Michelle Jones/market,01
```

2. The message is routed via London to New York, where it is routed to the HP Desk Gateway. This substitutes HP Desk addresses from the Translation Table, and passes the message to HP Desk:

```
FROM: DAVID WOOD/EDMANF/PR
TO: MICHELLE JONES/MARKET/01
```

3. When Michelle replies from HP Desk the addresses in her message look like this:

```
FROM: MICHELLE JONES/MARKET/01
TO: DAVID WOOD/EDMANF/PR
```

4. The Mail Address Translation Table in OpenMail's HP Desk Gateway converts these to:

```
FROM: Michelle Jones/market,01
TO: David Wood/edin,manf,prod
```

## Module 20 — Planning an HP Desk Gateway

---

### 20-3. Messaging between OpenMail and HP Desk Instructor Notes

#### **Purpose**

Explain how OpenMail handles messages destined for and received from HP Desk users.

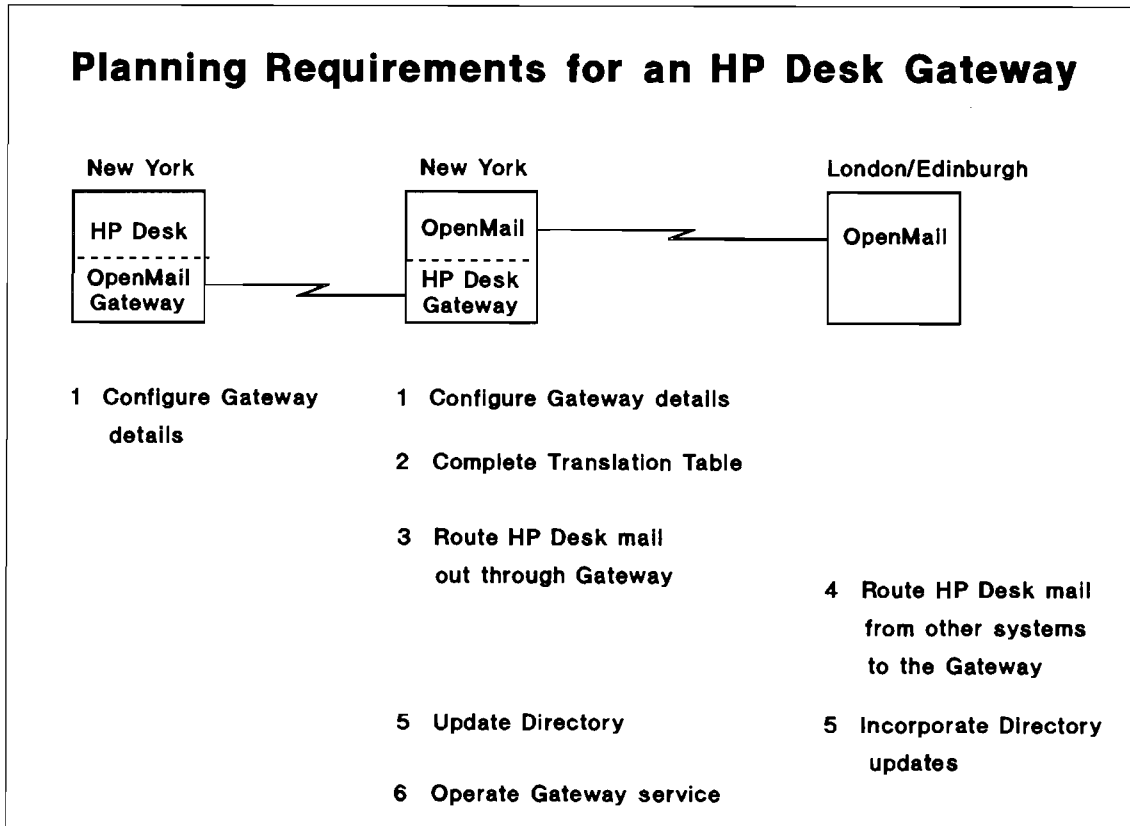
#### **Transition**

Look at the planning requirements for implementing an HP Desk Gateway . . .



# Module 20 — Planning an HP Desk Gateway

## 20-4. Planning Requirements for an HP Desk Gateway



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The basic requirements for implementing a connection out of an OpenMail network to HP Desk are:

1. Configure information on both the HP 9000 and HP 3000 to allow Network Services to make a connection between OpenMail and HP Desk.
2. Decide what entries to make in the Mail Address Translation Table.
3. Configure a route to the HP Desk Gateway for each mailnode entered in the Translation Table.
4. Add routes to the Gateway from other systems in the network, for each mailnode entered in the Translation Table, in terms of a route to the OpenMail system with the HP Desk Gateway.
5. Decide whether to add any HP Desk users to the Directory for ease of addressing. Replicate these additions to all the Directories in the network.
6. Operate and maintain the HP Desk Gateway service on the system with the gateway.

---

## 20-4. Planning Requirements for an HP Desk Gateway

Instructor Notes

### Purpose

Overview the mail implementation phases required to enable connection out of an OpenMail network to HP Desk.

### Key Points

- We'll go through each of these stages in detail as we go through this Module, including the variations possible.

### Transition

Look at the HP Desk Gateway configuration details . . .

## 20-5. HP Desk Gateway Configuration Information

### HP Desk Gateway Configuration Information

#### HP 3000 CONNECTION INFORMATION

- Network Services node name: hpdesk@pimr
- HPOFFICE account password: mickey
- OPENMAIL.HPOFFICE user password: jerry

#### DEFAULT ADDRESSES

- HP Desk location of OpenMail Gateway: omail/gw
- OpenMail mailnode of HP Desk Gateway: ny,hpdesk,gateway
- HP Desk location of HP Desk/X.400 Gateway: x400/gw

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To allow OpenMail to connect to HP Desk, find out from the HP Desk Administrator the:

- Network Services (NS) node name of the HP 3000 where OpenMail messages enter HP Desk.
- HPOFFICE account password on the HP 3000, needed to obtain access to HP Desk.
- OPENMAIL.HPOFFICE user password on the HP 3000, also needed to access HP Desk.

Agree with the HP Desk Administrator default addresses for message transfer between the two systems:

- HP Desk location/sublocation for HP Desk's OpenMail Gateway, used on:
  - Messages sent from OpenMail to HP Desk, whose mail addresses are not in the Translation Table.
  - X.400 messages sent from HP Desk to X.400, via an X.400 Interface in an OpenMail system. The HP Desk user addresses them quoting this mailnode, followed by the X.400 address in brackets.
- OpenMail mailnode for OpenMail's HP Desk Gateway, used on messages arriving from HP Desk, whose mail addresses are not in the Translation Table and which cannot be automatically converted.
- HP Desk location/sublocation for an X.400 gateway in the HP Desk network, used on messages between OpenMail and X.400, via an X.400 Gateway in the HP Desk network (if one exists).

# Module 20 — Planning an HP Desk Gateway

---

## 20-5. HP Desk Gateway Configuration Information

## Instructor Notes

### Purpose

Explain what information needs to be provided to enable OpenMail's HP Desk Gateway to connect to HP Desk.

### Key Points

- The following HP 3000 configuration details allow OpenMail to connect to HP Desk:
  - NS node name
  - HPOFFICE account password
  - OPENMAIL.HPOFFICE user password
- The default addresses are used when no relevant translations are configured in the Mail Address Translation Table.
- HP Desk Administrator will likewise need the following HP 9000 configuration details for connecting to OpenMail:
  - NS node name
  - Unix password for openmail user

### Transition

Look at the Mail Address Translation Table . . .

# Module 20 — Planning an HP Desk Gateway

## 20-6. The Mail Address Translation Table

### The Mail Address Translation Table

| OpenMail mailnode  |   | HP Desk location/sublocation |
|--------------------|---|------------------------------|
| edin,manf,prod     | → | EDMANF/PR                    |
| lon,sales,dist     | → | LOSALE/DI                    |
| ny,corp,admin      | → | NYCORP/AD                    |
| ...                |   | ...                          |
|                    |   |                              |
| ny,market,research | ← | MARKET/01                    |
| ...                |   | ...                          |

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OpenMail addressing uses *mailnodes* of up to 4 organizational units, for example: `edin,manf,prod`

HP Desk uses a scheme of *location/sublocation*, (6 characters/2 characters), for example: `MARKET/01`

The New York OpenMail site needs to configure a Mail Address Translation Table. This is used to:

- Substitute an HP Desk location/sublocation for each OpenMail mailnode on outgoing messages. These conversions are required. For example:

`edin,manf,prod -> EDMANF/PR`

- Substitute an OpenMail mailnode for each HP Desk location/sublocation on incoming messages, for example:

`MARKET/01 -> ny,market,research`

These conversions are optional, and if they are not configured the Gateway will simply convert the format of the HP Desk address into OpenMail format, for example:

`MARKET/01 -> market,01`

## 20-6. The Mail Address Translation Table

Instructor Notes

### Purpose

Explain how a Translation Table is used to convert mail addresses between OpenMail and HP Desk formats.

### Key Points

- The Translation Table has to contain each OpenMail mailnode in the network and give a corresponding HP Desk location/sublocation.
- The HP Desk Administrator will have to be consulted so that no location/sublocations are used that already exist in the HP Desk system.
- The Translation Table can - but does not have to - contain each HP Desk location/sublocation and give a corresponding more meaningful OpenMail mailnode.

### Transition

Look at routes . . .

# Module 20 — Planning an HP Desk Gateway

## 20-7. Routing Tables for the HP Desk Gateway

**Routing Tables for the HP Desk Gateway**

| ADDRESS        | ROUTE         |
|----------------|---------------|
| edin,manf,prod | local         |
| lon,sales,dist | londlopenmail |
| ny,corp,admin  | openmail@lond |
| market,01      | openmail@lond |

| ADDRESS        | ROUTE              |
|----------------|--------------------|
| ny,corp,admin  | local              |
| market,01      | local Desk Gateway |
| lon,sales,dist | openmail@lond      |
| edin,manf,prod | openmail@lond      |

| ADDRESS        | ROUTE          |
|----------------|----------------|
| lon,sales,dist | local          |
| edin,manf,prod | eburglopenmail |
| ny,corp,admin  | openmail@nyork |
| market,01      | openmail@nyork |

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Entries are needed in the New York system's routing table to indicate that messages addressed to HP Desk mailnodes must be directed to the HP Desk Gateway. This is done by adding the mailnodes to the HP Desk Routes list. A data entry screen is provided to add mailnodes to the list. External X.400 address extensions may be included if mail is likely to be routed through HP Desk to another X.400 system.

Other OpenMail systems, in this case Edinburgh and London, will need to add routing information to their routing tables to direct messages with HP Desk mailnodes to the HP Desk Gateway system (New York).

The details of the network shown in the slide are:

|                                    |                           |
|------------------------------------|---------------------------|
| site = Edinburgh, computer = eburg | mailnode = edin,manf,prod |
| site = London, computer = lond     | mailnode = lon,sales,dist |
| site = New York, computer = nyork  | mailnode = ny,corp,admin  |
|                                    | mailnode = market,01      |

# Module 20 — Planning an HP Desk Gateway

## 20-7. Routing Tables for the HP Desk Gateway

Instructor Notes

### Purpose

Explain how to plan Routing Tables for the HP Desk Gateway which, once set up, will route mail from anywhere in the OpenMail network through to HP Desk.

### Key Points

- On the OpenMail system with the HP Desk Gateway, HP Desk mailnodes are listed in the Routing Table with an indication that any messages for these mailnodes are to be passed to the HP Desk Gateway for conversion and delivery.
- Routing Tables on all other systems in the OpenMail network should be configured so that messages for HP Desk users are routed to the HP Desk Gateway system. That system's Routing Table will pass them to the Gateway, as described above.
- As with normal OpenMail routing, wildcard notation can be used to avoid repetition.

### Transition

Look at Directory entries . . .




## 20-8. Adding HP Desk Users to the Directory

### Adding HP Desk Users to the Directory

Find out:

- Actual name:
- Mailnode translation:
- External X.400 attributes:  
(only for X.400 users located through an HP Desk/X.400 Gateway)

| Directory      |
|----------------|
| Michelle Jones |
| market,01      |
|                |
|                |
|                |
|                |
|                |



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As with other mailing activity, it is a great advantage to users to have HP Desk addresses recorded in the Directory. To acquire Directory information you can just obtain a list from the HP Desk Administrator.

Alternatively, you can use the information from the HP Desk Global Database to add all HP Desk users to the Directory. The HP Desk Administrator can use a utility (MAILUTIL) to list the HP Desk Global Database in batch format and transfer the batch file over the network to the gateway Unix machine.

When the batch file has been copied into your home directory, use the following commands to convert the Global Database information into OpenMail format names and mailnodes.

```
ommakdirs file > dir To convert the data
omadddir -f dir To load to the Directory
```

*file* being the name of the file containing the Global Database entries  
*dir* being the name of the file that will hold all the converted entries

# Module 20 — Planning an HP Desk Gateway

## 20-8. Adding HP Desk Users to the Directory

Instructor Notes

### Purpose

Explain how to enter details of HP Desk users in the Directory.

### Key Points

- Liaise with the HP Desk Administrator to obtain HP Desk users' information for your Directory
- The information the Directory needs is Name and Mailnode (organizational units).
- If you plan to mail to an X.400 system via an HP Desk/X.400 Gateway, also enter this information:
  - Organization
  - Country
  - Admin Domain
  - Private Domain
- For a large amount of information the Global Database dump is easier.

### Transition

A Written Exercise in which you plan an HP Desk Gateway ...

## Module 20 — Planning an HP Desk Gateway

### 20-9. WRITTEN EXERCISE: Plan an HP Desk Gateway

Pinewood Market Research is situated at a separate site from the New York OpenMail users, served by an HP 3000 running an HP Desk mail system.

Their HP Desk location/sublocation is MARKET/01

The users at MARKET/01 are:

Michelle Jones  
Julie McCracken  
Richard Katz

You'll need to know the following details about the HP 3000:

|                                  |             |
|----------------------------------|-------------|
| NS node name:                    | hpdesk@pimr |
| HPOFFICE account password:       | MICKEY      |
| OPENMAIL.HPOFFICE user password: | JERRY       |

On HP Desk, the location/sublocation of the OpenMail Gateway is:

OMAIL/GW

You will need to create an OpenMail mailnode for the HP Desk Gateway.

When completing the Mail Address Translation Table, in addition to setting up HP Desk translations for OpenMail mailnodes, you'll also have to decide whether to leave the HP Desk mailnode to be translated into OpenMail format automatically or whether to set up an explicit translation.

Complete the Planning Sheets so that you are ready to configure the information in the Lab at the end of the next Module.

---

## 20-9. WRITTEN EXERCISE: Plan an HP Desk Gateway

**Instructor Notes**

### **Purpose**

A written exercise to plan an HP Desk Gateway.

### **Preview**

- Some solutions may vary, for example, use of wildcarding can differ.
- The HP Desk location/sublocation used to address X.400 in HP Desk is not applicable here.
- The Directory and Translation details can be entered manually. This is suitable for a small amount, but the use of the Global Database is more sensible for large numbers.

### **Transition**

Complete the Planning Sheets for the Mail Address Translation Table and the Gateway Configuration details . . .

# Module 20 — Planning an HP Desk Gateway

## 20-9. WRITTEN EXERCISE: (Continued)

### HP Desk Gateway Configuration Information

|                                                          |  |
|----------------------------------------------------------|--|
| <b>Message Transfer Information</b>                      |  |
| Network Services node name of entry HP 3000              |  |
| HPOFFICE account password on HP 3000                     |  |
| OPENMAIL.HPOFFICE user password on HP 3000               |  |
| <b>Default Addresses</b>                                 |  |
| HP Desk location/sublocation of the Gateway              |  |
| OpenMail mailnode of the Gateway                         |  |
| HP Desk location/sublocation of X.400 Gateway in HP Desk |  |

### Mail Address Translation Table

| OpenMail Mailnode | HP Desk Location/Sublocation |
|-------------------|------------------------------|
|                   |                              |
|                   |                              |
|                   |                              |
|                   |                              |
|                   |                              |
|                   |                              |
|                   |                              |

### New York Routing Table

| Address  |     |      |      |         | Route |
|----------|-----|------|------|---------|-------|
| Mailnode | Org | PRMD | ADMD | Country |       |
|          |     |      |      |         |       |
|          |     |      |      |         |       |
|          |     |      |      |         |       |

# Module 20 — Planning an HP Desk Gateway

## 20-9. WRITTEN EXERCISE: (Continued)

Instructor Notes

### Suggested Answers

#### HP Desk Gateway Configuration Information

| Message Transfer Information                             |                   |
|----------------------------------------------------------|-------------------|
| Network Services node name of entry HP 3000              | HPDESK@PIMR       |
| HPOFFICE account password on HP 3000                     | MICKEY            |
| OPENMAIL.HPOFFICE user password on HP 3000               | JERRY             |
| Default Addresses                                        |                   |
| HP Desk location/sublocation of the Gateway              | OMAIL/GW          |
| OpenMail mailnode of the Gateway                         | ny,hpdesk,gateway |
| HP Desk location/sublocation of X.400 Gateway in HP Desk | not applicable    |

#### Mail Address Translation Table

| OpenMail Mailnode                                        | HP Desk Location/Sublocation |
|----------------------------------------------------------|------------------------------|
| edin,manf,prod                                           | EDMANF/PR                    |
| lon,sales,dist                                           | LOSALE/DI                    |
| ny,corp,admin                                            | NYCORP/AD                    |
|                                                          |                              |
|                                                          |                              |
| No Desk->OpenMail entries - automatic translation chosen |                              |

#### New York Routing Table

| Address   |     |      |      |         | Route                 |
|-----------|-----|------|------|---------|-----------------------|
| Mailnode  | Org | PRMD | ADMD | Country |                       |
| market,01 | —   | —    | —    | —       | local HP Desk Gateway |
|           |     |      |      |         |                       |
|           |     |      |      |         |                       |

## Module 20 — Planning an HP Desk Gateway

### 20-9. WRITTEN EXERCISE: (Continued)

#### Directory Entries

|                              |  |
|------------------------------|--|
| <b>Name</b>                  |  |
| <b>Mailnode</b>              |  |
| <b>Organization</b>          |  |
| <b>Country</b>               |  |
| <b>Admin Domain</b>          |  |
| <b>Private Domain</b>        |  |
| <b>DDA (foreign address)</b> |  |

|                              |  |
|------------------------------|--|
| <b>Name</b>                  |  |
| <b>Mailnode</b>              |  |
| <b>Organization</b>          |  |
| <b>Country</b>               |  |
| <b>Admin Domain</b>          |  |
| <b>Private Domain</b>        |  |
| <b>DDA (foreign address)</b> |  |

|                              |  |
|------------------------------|--|
| <b>Name</b>                  |  |
| <b>Mailnode</b>              |  |
| <b>Organization</b>          |  |
| <b>Country</b>               |  |
| <b>Admin Domain</b>          |  |
| <b>Private Domain</b>        |  |
| <b>DDA (foreign address)</b> |  |

## Module 20 — Planning an HP Desk Gateway

### 20-9. WRITTEN EXERCISE: (Continued)

Instructor Notes

#### Suggested Answers

##### Directory Entries

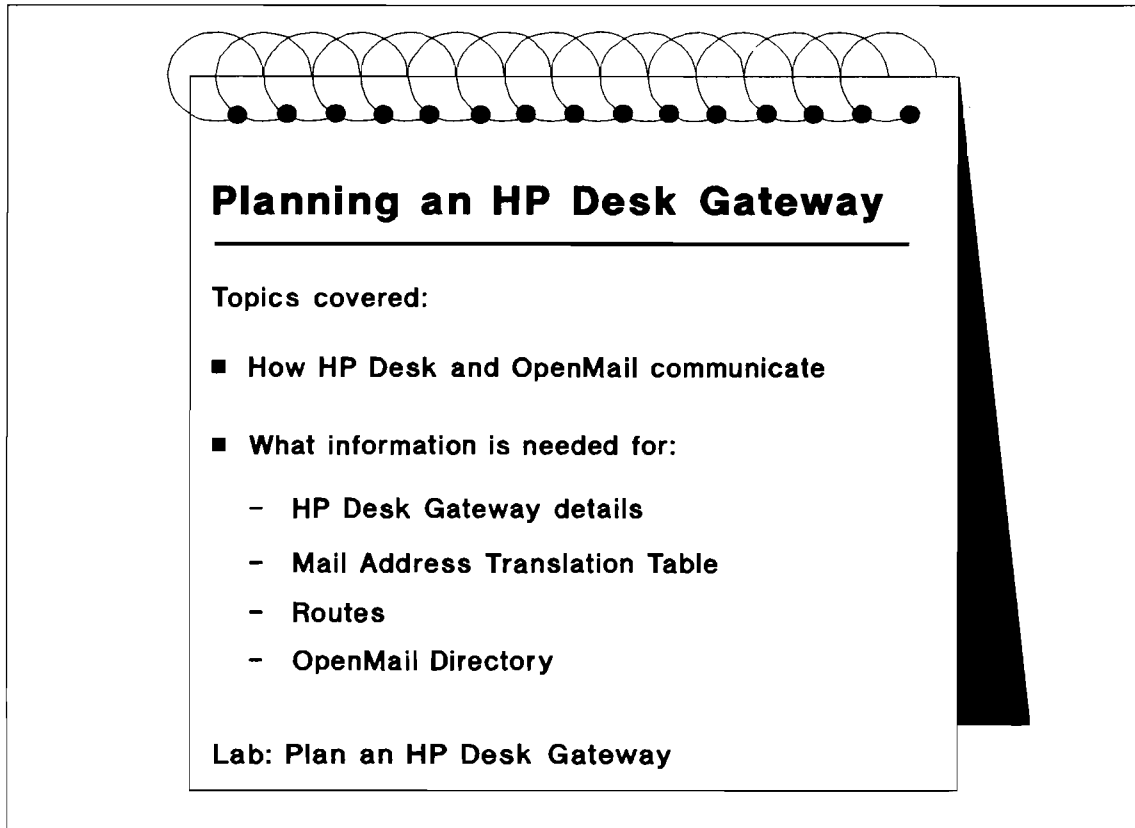
|                              |                |
|------------------------------|----------------|
| <b>Name</b>                  | Michelle Jones |
| <b>Mailnode</b>              | market,01      |
| <b>Organization</b>          |                |
| <b>Country</b>               |                |
| <b>Admin Domain</b>          |                |
| <b>Private Domain</b>        |                |
| <b>DDA (foreign address)</b> |                |

|                              |                 |
|------------------------------|-----------------|
| <b>Name</b>                  | Julie McCracken |
| <b>Mailnode</b>              | market,01       |
| <b>Organization</b>          |                 |
| <b>Country</b>               |                 |
| <b>Admin Domain</b>          |                 |
| <b>Private Domain</b>        |                 |
| <b>DDA (foreign address)</b> |                 |

|                              |              |
|------------------------------|--------------|
| <b>Name</b>                  | Richard Katz |
| <b>Mailnode</b>              | market,01    |
| <b>Organization</b>          |              |
| <b>Country</b>               |              |
| <b>Admin Domain</b>          |              |
| <b>Private Domain</b>        |              |
| <b>DDA (foreign address)</b> |              |



## 20-10. Summary



**Planning an HP Desk Gateway**

Topics covered:

- How HP Desk and OpenMail communicate
- What information is needed for:
  - HP Desk Gateway details
  - Mail Address Translation Table
  - Routes
  - OpenMail Directory

Lab: Plan an HP Desk Gateway

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## Notes

# Module 20 — Planning an HP Desk Gateway

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## 20-10. Summary

## Instructor Notes

### Purpose

Review what has been covered in Module 20.

### Key Points

- This Module has looked at what is involved in planning the HP Desk Gateway.
- Good communications with the HP Desk Administrator are vital.
- Use of the Global Database in providing Directory and mailnode information is particularly helpful.
- More details are found in the *OpenMail/HP DeskManager Connection Technical Guide*. Refer to this manual before communicating with the HP Desk Administrator.

### Transition

The next Module covers the configuration of an HP Desk Gateway.

# Module 20 — Planning an HP Desk Gateway

## Module 21 — Configuring an HP Desk Gateway

---

### Objectives

After spending 40 minutes completing this Module, you will be able to:

- Configure HP Desk details for the gateway
- Configure the Mail Address Translation Table
- Configure the HP Desk mailnodes to be accessed through the gateway
- Configure HP Desk users in the Directory

### Manual Reference

*OpenMail/HP DeskManager Connection Technical Guide*

# Module 21 — Configuring an HP Desk Gateway

## 21-1. Configuring HP Desk Gateway Details

**Configuring HP Desk Gateway Details**

To get there:  
Main Menu  
ROUTES  
DESK GATEWAY

|                                     |                            |  |  |             |  |      |      |
|-------------------------------------|----------------------------|--|--|-------------|--|------|------|
| NS node name                        |                            |  |  |             |  |      |      |
| hpdesk@PIMR                         |                            |  |  |             |  |      |      |
| HPOffice password                   | OpenMail.HPOffice password |  |  |             |  |      |      |
| MICKEY                              | JERRY                      |  |  |             |  |      |      |
| Default HP Desk location of gateway |                            |  |  |             |  |      |      |
| OMAIL/GW                            |                            |  |  |             |  |      |      |
| Default HP Desk Gateway route       |                            |  |  |             |  |      |      |
| ny,hpdesk,gateway                   |                            |  |  |             |  |      |      |
| Default X.400 Gateway location      |                            |  |  |             |  |      |      |
|                                     |                            |  |  |             |  |      |      |
| Update                              |                            |  |  | Action Menu |  | Help | Exit |

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration menu, select DESK GATEWAY
3. In the Configure the HP Desk Gateway screen, complete each field using the information planned for your HP Desk Gateway.
4. Press Update

Alternatively, you could use the `omconfdsk` command, for example:

```
omconfdsk -n hpdesk@PIMR -a MICKEY -u JERRY -l "OMAIL/GW" -m "ny,desk,gateway"
```

# Module 21 — Configuring an HP Desk Gateway

---

## 21-1. Configuring HP Desk Gateway Details

Instructor Notes

### Purpose

Show how to configure connection details for the HP Desk Gateway.

### Key Points

- Supply the information in the fields from your planning sheet for the gateway details.

### Transition

Look at configuring mail address translations ...

# Module 21 — Configuring an HP Desk Gateway

## 21-2. Configuring Mail Address Translations

**Configuring Mail Address Translations**

To get there:  
Main Menu  
ROUTES  
DESK TRANS  
Action Menu  
Add Trans

|                              |              |                |
|------------------------------|--------------|----------------|
| Organizational Units         |              |                |
| edin,manf,prod               |              |                |
| Organization                 |              |                |
|                              |              |                |
| Country                      | Admin Domain | Private Domain |
|                              |              |                |
| -----                        |              |                |
| HP Desk Location/Sublocation |              |                |
| EDMANF/PR                    |              |                |
| Add                          |              |                |
|                              |              |                |
| Action Menu                  |              |                |
|                              | Help         | Exit           |

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1. From the Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration menu, select DESK TRANS
3. From the Action Menu, select Add Trans and press **Select**
4. Enter the OpenMail mailnode and HP Desk location/sublocation
5. Press **Add** to configure the translation.
6. Repeat steps 4 and 5 to configure translations for all the OpenMail mailnodes in your system.
7. Press **Exit** to return to the OpenMail to HP Desk mailnode translation screen.

Alternatively, you could use the `omaddmt` command, for example:

```
omaddmt -g "edin,manf,prod" -d "EDMANF/PR"
```

# Module 21 — Configuring an HP Desk Gateway

---

## 21-2. Configuring Mail Address Translations

Instructor Notes

### Purpose

Show how to configure translations between OpenMail mailnodes and HP Desk locations/sublocations.

### Key Points

- Enter OpenMail mailnodes and the HP Desk translations (location and sublocation) in the fields provided.

### Transition

Look at configuring routes to the HP Desk mailnodes at the Gateway ...



# Module 21 — Configuring an HP Desk Gateway

## 21-3. Configuring Routes to HP Desk Mailnodes

**Configuring Routes to HP Desk Mailnodes**

To get there:

- Main Menu
- ROUTES
- DESK ROUTES
- Action Menu
- Add Route

|              |              |                |             |
|--------------|--------------|----------------|-------------|
| Mailnode     |              |                |             |
| market,01    |              |                |             |
| Organization |              |                |             |
|              |              |                |             |
| Country      | Admin Domain | Private Domain |             |
|              |              |                |             |
| Add          |              |                | Action Menu |
|              |              |                | Help        |
|              |              |                | Exit        |

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1. From Main Menu, select ROUTES
2. From the Route, service ACL, and gateway administration menu, select DESK ROUTES
3. From the Action Menu, select Add Route and press **Select**
4. From the Add a route screen, enter the HP Desk mailnode.

If there is an X.400 Gateway in the HP Desk network, use the fields provided to enter the full X.400 address of the X.400 user. If not, ignore the X.400 external address attributes.

5. Press **Add** to configure the mailnode.
6. Repeat steps 4 and 5 to configure any other HP Desk mailnodes.
7. Press **Exit**

Alternatively, you could use the `omaddrtr` command, for example:

```
omaddrtr -m "market,01" -q DESK
```

# Module 21 — Configuring an HP Desk Gateway

---

## 21-3. Configuring Routes to HP Desk Mailnodes Instructor Notes

### **Purpose**

Show how to configure routes to HP Desk mailnodes so that messages for these addresses are routed to the HP Desk Gateway.

### **Transition**

Look at adding Directory entries for HP Desk users ...

# Module 21 — Configuring an HP Desk Gateway

## 21-4. Adding HP Desk Users to the Directory

**Adding HP Desk Users to the Directory**

To get there:  
Main Menu  
DIRECTORIES  
ADD ENTRY

|                               |                            |                           |  |                    |  |             |             |
|-------------------------------|----------------------------|---------------------------|--|--------------------|--|-------------|-------------|
| <b>Name</b><br>Michelle Jones | <b>Directory</b><br>       |                           |  |                    |  |             |             |
| <b>Mailnode</b><br>market,01  |                            |                           |  |                    |  |             |             |
| <b>Organization</b><br>       |                            |                           |  |                    |  |             |             |
| <b>Country</b><br>            | <b>Admin Domain</b><br>    | <b>Private Domain</b><br> |  |                    |  |             |             |
| <b>Attribute</b><br>          | <b>Attribute Value</b><br> |                           |  |                    |  |             |             |
| <b>Add</b>                    |                            |                           |  | <b>Action Menu</b> |  | <b>Help</b> | <b>Exit</b> |

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1. From the Main Menu, select **DIRECTORIES**
2. From the Shared directory administration menu select **ADD ENTRY**
3. From the Add an entry screen, enter at least the:
  - HP Desk user's name
  - HP Desk mailnode
  - Full X.400 details for an X.400 user accessed through an X.400 Gateway in the HP Desk network
  - Foreign address for a user of another mail system accessed through a gateway in HP Desk
4. Press **Add** to configure the HP Desk user in the Directory.
5. Repeat steps 3 and 4 to configure any other users.
6. Press **Exit** to return to the Shared directory administration menu.

Alternatively, you could use the `omadddir` command, for example:

```
omadddir -n "Michelle Jones/market,01"
```

## 21-4. Adding HP Desk Users to the Directory

Instructor Notes

### Purpose

Show how to configure HP Desk users in the OpenMail Directory for ease of addressing.

### Alternative Method

- If you have obtained a file in your home directory which contains the HP Desk Global Database.

1. `ommakodirs file > dir`

*file* is the name of the source file that contains the Global Database

*dir* is the name for the target file that will contain translated names and HP Desk mailnodes

2. You can display the translated names and HP Desk mailnodes by typing the command: `more dir`
3. Store the list of names and HP Desk mailnodes in the OpenMail Directory, type:

```
omadddir -f dir
```

4. Examine the contents of your directory using the Admin screens.

### Transition

Look at operating and maintaining an HP Desk Gateway ...

## 21-5. Operating an HP Desk Gateway

### Operating an HP Desk Gateway

|                                    |                                               |
|------------------------------------|-----------------------------------------------|
| <code>omon -s desk</code>          | Start the HP Desk Gateway service             |
| <code>omstat -s desk</code>        | Give status of Gateway service                |
| <code>omstat -q DESK</code>        | List mail on HP Desk Gateway input queue      |
| <code>omshowlog -s desk -l9</code> | Display Event Log for Desk Gateway at level 9 |

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The HP Desk Gateway can be started from the Administration Interface or using the `omon` command.

`omstat` will give the status of the HP Desk Gateway service and queue, as it does for other services.

The HP Desk Gateway will be logged to the Event Log, at the level specified, and can be viewed with `omshowlog`

# Module 21 — Configuring an HP Desk Gateway

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## 21-5. Operating an HP Desk Gateway

Instructor Notes

### **Purpose**

Explain the day-to-day operations and troubleshooting procedures for the HP Desk Gateway.

### **Transition**

A Lab in which you configure an HP Desk Gateway . . .

# Module 21 — Configuring an HP Desk Gateway

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## **21-6. LAB: Configure an HP Desk Gateway**

- 1. Configure OpenMail/HP Desk Connection Information**
- 2. Configure the Translation Table**
- 3. Configure Mailnodes for the HP Desk Gateway**
- 4. Enter HP Desk Users In the Directory**

# Module 21 — Configuring an HP Desk Gateway

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## 21-6. LAB: Configure an HP Desk Gateway

Instructor Notes

### Purpose

Configure an HP Desk Gateway in OpenMail using the Administration Interface.

### Preview

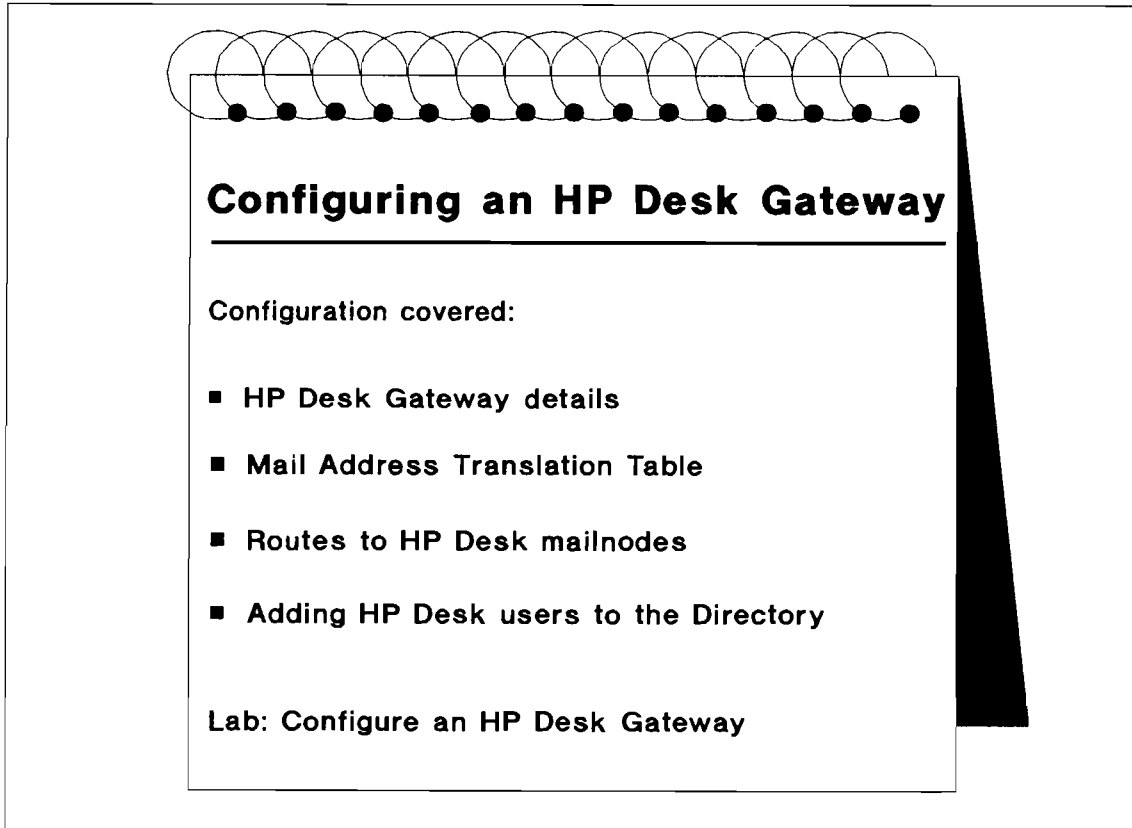
- Talk through Lab Tasks 1 to 4
- Refer students to their planning notes in order to complete the exercise.
- If using the playpens, an error message will be displayed because the HP Desk Gateway is not present on the playpen system. This does not matter for this exercise, so just press the space bar to clear the error message.

### Transition

To summarize . . .



## 21-7. Summary



**Configuring an HP Desk Gateway**

Configuration covered:

- HP Desk Gateway details
- Mail Address Translation Table
- Routes to HP Desk mailnodes
- Adding HP Desk users to the Directory

Lab: Configure an HP Desk Gateway

H2128 21-7

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## Notes

# Module 21 — Configuring an HP Desk Gateway

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## 21-7. Summary

## Instructor Notes

### **Purpose**

Review what has been covered in Module 21.

### **Key Points**

- This module has shown the HP Desk Gateway Configuration screens and given you the opportunity to try them out.

### **Transition**

End of course - review, wrap up, and wish students success with OpenMail!

# Module 21 — Configuring an HP Desk Gateway

# Glossary

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## X.400 Standard Terminology

84

Shorthand for the *CCITT* 1984 Recommendations for *MHS*. Also known as the “Red Book”.

88

Shorthand for the *CCITT* 1988 Recommendations for *MHS*. Also known as the “Blue Book”.

### ACSE

88 element of an OSI application layer that works with *RTSE* and *ROSE* to create/terminate application-application sessions.

### Address

Information defining the identity and location of a *user*, which is used to route a message from the *originator* to the *recipient(s)*.

### ADMD

Administration Management Domain. A group of *MTAs* that provide communication services for the general public. In Europe these services are usually provided by *PTTs*, resulting in one administration *domain* per country; while in the USA there are multiple administration domains.

### ADMD Name

Attribute of an *O/R Address* that specifies the *ADMD*.

### Admin Domain

see *ADMD*

### Alias

An alternative name provided for a *recipient* or a list of recipients (a mailing or distribution list).

### ASCII

American Standard Code for Information Interchange. A 7-bit character set defined by the American National Standards Institute.

### ASN.1

Abstract Syntax Notation One. Defined by *X.409*. Syntax used to describe *PDU*s. The format in which *messages* are transferred.

### Attribute

A component that goes to make up an X.400 *address*; for example, surname and organization name.

# Glossary

## AU

Access Unit. Provides an interface from *MTA* to other services such as *physical delivery* and telematic services.

## Body

An element of a *P2* encoded message, which contains the text or information that the *user* wants to communicate to the *recipient*, and an indication of format used, for example *IA5 Text*. Originally formats could be either text or binary, but from the 1988 specification, they can include fax, graphics, voice, and user-defined.

## CCITT

Committee Consultatif International Telephone et Telegraphic. A division of the United Nations that coordinates standards-setting activities.

## Conformance

Adherence to a product specification; along with *interoperability*, a defining characteristic of an *OSI-compatible* product.

## Content

The actual information of a *message* that is delivered to the *recipient*; split into *heading* and *body*.

## COS

Corporation for Open Systems. A consortium of international IT vendors and users with the mission to accelerate worldwide acceptance of open systems.

## Country

A United Nations member state with its own *PTT*, and often its own *ADMD*. Used as an *attribute* of an *X.400 O/R Address*. Countries are known by a standard set of codes, such as *US* for the United States and *GB* for the United Kingdom.

## DDA

Domain Defined Attribute. A flexible *attribute*, which can contain various types of information, dependent on the *domain*.

## DL

Distribution List. 88 extension of X.400. Known in OpenMail as a PDL (Public Distribution List).

## Domain

A message address space. Each domain has an administrative entity that ensures that message addresses within the domain uniquely correspond to the address destinations; these can be *ADMDs* or *PRMDs*.

## EDI

Electronic Data Interchange.

# Glossary

**Envelope**

Contains all the information needed to deliver a *message* (much like a postal envelope). This includes the *address* of each *recipient*, return address, the priority of the message, how the message should be delivered, and the time of submittal of the message to the *MTA*.

**External Attributes**

Attributes of an *O/R Address* that are used to *route* messages outside of the originating *PRMD*.

**Gateway Node**

The machine in which messages are converted from one form to another so that they can be exchanged between two different mail systems.

**Generation**

Final attribute of a *personal name* that can provide a generational quantifier such as Snr, II, etc.

**Given Name**

First attribute of a *personal name*, defining a user's first or Christian name.

**GOSIP**

Government Open Systems Interconnection Profile. A subset of X.400/84, first defined by the UK government in 1986, and subsequently also by the US government in 1987.

**Heading**

The part of the *contents* of an *IPM* containing information such as the names and addresses of *recipients*. Really "letterhead" information; not used in delivery.

**Hops**

The number of machines that a message passes through to reach its destination.

**IA5 Text**

International Alphabet Number 5. A character set defined by the *CCITT* and recommended by *ISO*. This alphabet represents 7-bit *ASCII* text.

**IEEE 802.3/5**

Standards for local area networking, developed by the Institute of Electrical and Electronic Engineers.

**Internal Attributes**

Attributes of an *O/R Address* that are used to route messages within a *PRMD*, consisting of the *personal name* and *organizational units*. Contrast with *external attributes*.

**Interoperability**

The ability of different vendors' products to communicate across a network; along with *conformance*, a requirement of an *OSI* product.

# Glossary

**IOP**

InterOperability Testing.

**IPM**

InterPersonal Messaging. A content format specified in the 1984 *CCITT* X.400 recommendations. The IPM format is used for electronic mail, and is made up of an IPM *envelope* and *contents*. Also used, as interpersonal message, to refer to a *message*. Note that X.400 can also support other messaging formats, such as EDI and voice.

**ISO**

International Standards Organization. The international body coordinating the effort to establish *OSI* standards for multivendor networking.

**ISO6937 Text**

An 8-bit character set that includes accented characters.

**ISP**

International Standardized Profile. *ISO*-defined functional profile that will probably replace *GOSIP* and *NIST* as the implementation/conformance benchmark.

**Management Domain**

see *Domain*.

**Message**

The information that is transmitted. The message consists of the *envelope* and its *contents*.

**Message Store**

Component of an *MHS* that provides *users* with *message* storage.

**MHE**

Message Handling Environment. Term for all the components of an *MHS* and its *users*.

**MHS**

Message Handling System. A collection of *UAs* and an *MTA*. Conveys *messages* from the *originator* to one or more *recipients*. Facilitates the preparation of messages, routing of them, recovers from errors, delivers the messages, and notifies the originator of the success/failure of operations.

**Mnemonic Addressing**

Addressing using textual *attributes* (ie *personal name*, *country*, *ADMD*, *PRMD*).

**MOTIS**

Message Oriented Text Interchange System. *ISO* adopted definition of *CCITT* X.400, as *ISO* 10021. There are some differences between the *ISO* and *CCITT* definitions - for instance, *MOTIS* allows *PRMDs* to communicate directly.

# Glossary

**MTA**

Message Transfer Agent. Usually a node in a store and forward network, with any number of *UAs* associated with it. Responsible for *envelope* generation and passing *messages* through the network to the *recipient(s)*. Layer 7 of the OSI datacomm model.

**MTL**

Message Transfer Layer. Another name for an *MTA*; referring to the application layer of the *OSI* model that the *MTA* inhabits.

**MTP**

see *PI*.

**MTS**

Message Transfer System. A collection of one or more *MTAs*. Provides delivery service for *messages*.

**NIST**

National Institute of Standards and Technology. US body responsible for developing implementation profiles for X.400, such as US *GOSIP*.

**NonDelivery Report**

A textual message returned to the *originator* of a message if that *message* cannot be delivered.

**Numeric Addressing**

Addressing using numeric *attributes* (ie *country*, *ADMD*, *UA Identifier*).

**OpenMail**

An X.400 *UA*, providing mailing services to users.

**Open Systems Interconnection**

see *OSI*.

**Organization**

A private entity, or part of a private entity, having its own network. An *attribute* of an *O/R Address*, often the same as the *PRMD* name.

**Organizational Unit**

Attributes of an *O/R Address* that uniquely define a location within an *organization*. With the *personal name*, form the *internal attributes* of an *O/R Address*.

**O/R Name/Address**

Originator/Recipient Name/Address. This is the basis for *interpersonal messaging* within X.400. It has a number of *attributes*, such as *country*, *personal name*, *organization*, etc, providing a description of a *UA*.



# Glossary

**Originator**

A person or application that sends a *message*.

**OSI**

Open Systems Interconnection. A seven layer model produced by ISO (ISO 7498), upon which X.400 standards are based.

**P1**

A Message Transfer Protocol observed between two *MTAs* - effectively defining the *envelope*.

**P2**

An *IPM* "protocol" observed between two *UAs*, comprising *heading* and multiple *body* types (effectively the *content* of an *IPM*). In strict OSI terms, P2 is a format definition rather than a protocol.

**P22**

An 88 extension of *P2*.

**P3**

A Submission and Delivery Protocol, defining access to an *MTA* from *user agents* and *message stores*.

**P5**

A Teletext Access Protocol, defining access from the *MTA* to telex/teletext services.

**P7**

An Indirect Submission and Retrieval Protocol for access to the *message store*, defining how user interfaces communicate with a *UA*.

**PD**

Physical Delivery. A facility introduced in 88, to allow postal delivery of electronically originated *IPMs*.

**PDU**

Protocol Data Unit.

**Personal Name**

The name *attributes* of an *O/R Address*; comprising *given name*, *initials*, *generation*, and *surname*.

**PICS**

A matrix or document showing which parts of the X.400 standard a vendor supports. *GOSIP* is an example of this.

**Postal Addressing**

Addressing using *physical delivery* attributes (ie *StreetNumber*, *TownName*, or *RegionName*), which allows a message to be printed out and hand-delivered.

# Glossary

**Private Domain**

see *PRMD*

**PRMD**

Private Management Domain. A group of *MTAs* that are owned and managed by a private *organization*. Responsible for registration of *UAs* in the *domain*, and the configuration of routing within each domain and between domains.

**Protocol**

A formal set of conventions controlling the format and timing of message exchanges between two communicating processes.

**PTT**

Post, Telegraph, and Telephone authority for a country.

**Recipient**

A person or application that receives a *message* from an *MHS*.

**ROS**

Remote Operations Service. A request/response protocol that manages message exchange via *P3*.

**ROSE**

Remote Operations Service Element. 88 version of *ROS*.

**Route**

The path that a *message* takes through a network to reach its destination.

**Routing Rules**

A list of rules used by the *MTA* to route messages. These are configured by a Network Administrator and can be simple or complex, depending on the size of the network.

**RTS**

Reliable Transfer Server. A protocol used between the session layers of the *OSI* model, which provides file transfer between *MTAs*.

**RTSE**

Reliable Transfer Server Element. 88 version of *RTS*.

**Surname**

Family name *attribute* of a *personal name*.

**Terminal Addressing**

Addressing using telematic attributes (ie *country*, *ADMD*, *X.121 address*).

# Glossary

## Transport Agent

Either a receiving or delivery agent, depending on the content in which it is used.

## UA

User Agent. The interface between the user and the *MHS* (eg OpenMail). The UA allows the *user* to create, send, and receive *messages*.

## UA Identifier

A unique numeric number that can be given to a *UA*, and which can form an *attribute* of an *O/R Address*.

## User

Either a person or an application *originating* and *receiving* interpersonal messages.

## X.121 Address

*CCITT* addressing standard that accompanies *X.25*.

## X.25

*CCITT* packet switching protocol.

## X.400

Message Handling System and Service Overview. Also general way of referring to all the recommendations for *IPM*, defined by the *CCITT*, for the elements of an *MHS*.

## X.401

Basic Service Elements and Optional User Facilities. Defines international *interoperability*.

## X.408

Encoded Information Type Conversion Rules. Defines the algorithms used by the *MHS* when converting between different types of encoded information.

## X.409

Presentation Transfer Syntax and Notation. Defines *ASN.1*

## X.410

*ROS* and *RTS*. Defines the lower layer of the *MTS*. Re-defined in 88 as X.218, X.219, X.228 and X.229.

## X.411

*MTS* Abstract Service. Defines *P1* and *P3*.

## X.420

Inter-Personal Messaging. Defines *P2*.

# Glossary

**X.430**

Interworking with Telematic Services. Defines *P5*.

**X.435**

*EDI* standard.

**X.500**

Standard for distributed directory service, for use with X.400 - the electronic mail network "white pages" directory.

## Unix Networking Terminology

### **absolute mail address**

A mail address that defines the recipient mailbox in terms of its hierarchic domain location, for example *ARPA addressing*.

### **alias**

An alternate name for a recipient or list of recipients.

### **anonymous ftp**

A variant of *ftp*, enabling the retrieval of files from an archive server, via a special login "anon" which allows access to a limited filesystem on the server.

### **ARP**

Address Resolution Protocol. Used to acquire the physical network address of a host when the *IP address* is known.

### **ARPA**

Advanced Research Projects Agency, of the US Dept of Defense. Originator in the 1970s of the ARPAnet - the first public mail network. Now known as DARPA (Defense ARPA).

### **ARPA addressing**

A form of addressing, specifying the destination host or domain only, in the form:

`user@host[.domain]`

This address is absolute, applying to the user from whichever host they are addressed. Contrast to *UUCP addressing*.

### **ARPA Services**

Term for all the Unix networking services deriving from the System V implementation of Unix. Enables communications across both Unix and non-Unix environments. Comprises *DNS*, *ftp*, *SMTP*, *telnet*.

### **Berkeley Services**

Term for all the Unix networking services deriving from *BSD* Unix, originating at UCB (University of California at Berkeley). Comprises *BIND*, *rcp*, *rlogin*, *rsh*, *Sendmail*, *Sockets*.

### **BIND**

Berkeley Internet Name Daemon. Optional hierarchical network look-up service to resolve *domain* names. Berkeley implementation of *ARPA DNS*.

### **binding**

The process of mapping one level of network address, such as an *ARPA* domain address, onto another level, such as an *IP address*.

# Glossary

**BSD**

Berkeley Software Distribution. One of the two original implementations of Unix (with *System V*), from which for example SUN Unix and DEC Ultrix are derived.

**client**

A program that uses a resource in the network.

**daemon**

A process that runs continuously in the background, waiting to be called, say, by a *client*. Usually started at boot time by the *rc* start-up script. The Sendmail daemon waits on TCP port 25, the well-known port for incoming SMTP connections.

**Delivery Agent**

A program that accepts mail from a routing facility and delivers it to a local destination or, via a communications medium, to a remote *receiving agent*. Also called a *mailer*.

**DNS**

Domain Name Server. *ARPA* implementation of *BIND*, providing a hierarchical network lookup service to resolve *domain* names.

**domain**

A hierarchical division of an *internet*, defining a grouping of organizationally or geographically related hosts.

**elm**

A screen-oriented, public-domain mail *user agent*.

**/etc/hosts**

A file that contains host name and *IP address* mappings.

**envelope**

The information needed for routing and delivery (or returning non-delivery information) of a message.

**.forward file**

A file that, if it exists in a user's home directory, is used by *Sendmail* to forward mail to the address(es) listed in the file.

**header**

A series of one-line descriptions in a message specifying auxiliary message information, such as date, subject, return address, etc. Defined by *RFC-822*.

**IAB**

Internet Activities Board. Manages the Internet.

# Glossary

**rsh**

Remote Shell. A *Berkeley* service enabling the listing of remote users.

**Sendmail**

A *delivery agent*. A *Berkeley* service enabling routing of internet mail using the *SMTP* service.

**sendmail.cf**

*Sendmail's* configuration file. Contains a set of commands that control the operation of *sendmail* program.

**server**

A program that makes a resource available to the network.

**shar**

A program that bundles files into a shell archive script for mailing. Used to protect message body parts from inappropriate processing while in Unix mail. The recipient executes the shell archive to extract the original body parts.

**smail**

A *delivery agent* designed to replace *Sendmail*. Functionally equivalent but with different configuration information.

**SMTP**

Simple Mail Transfer Protocol. An *ARPA* service enabling the sorting and distribution of mail. Implemented by *Sendmail* and defined by *RFC-821*. SMTP uses a reliable, synchronous byte-stream protocol such as TCP.

**socket**

Endpoint of a communication between a program and the network (via *TCP*). The mainstay of *IPC* on Unix.

**Sockets**

A *Berkeley* service, enabling *IPC* via *sockets*.

**System V**

One of the two implementations of Unix (with *BSD*). Originated by AT&T. HP-UX and IBM AIX derive from System V.

**TCP**

Transmission Control Protocol. Enables the underlying network communication for *Sockets* interprocess communication.

**TCP/IP**

Transmission Control Protocol/Internet Protocol. A transport protocol originating on Unix, and now also widely used in many non-Unix environments.

# Glossary

199901

## telnet

An *ARPA* service enabling login to remote hosts. Present in all *TCP/IP* implementations.

## Transport Agent

Either a *receiving agent* or a *delivery agent*, depending on the context used.

## UCB

University of California at Berkeley. Originators of *BSD*.

## UDP

A protocol providing datagram communication (as opposed to the stream communication used by *TCP*).

## User Agent

A program providing a user interface for creating, reading, and managing mail, before it is passed to a routing facility. OpenMail is a user agent, as are *mail*, *mailx*, *elm*, *emacs*, *mh*, *nwsh*, *xmail*, etc.

## Unix

Generic term for all flavors of the UNIX operating system originally developed by AT&T, which now includes DEC Ultrix, HP-UX, IBM AIX, SCO UNIX, and Sequent Dynix/ptx, amongst many others.

## UUCP

Unix-Unix Copy. A protocol and suite of programs providing batch connectivity between Unix systems over serial lines, usually over dial-up/modem connections.

## UUCP addressing

An older form of addressing, using the ! character to delimit components of the address. Specifies a relative path to the destination host in the form:

host![host!]user

Contrast with *ARPA addressing*.

## xmh

An X-Windows version of the *MH* user agent.

## YP

Yellow Pages. Now known as *NIS*. A domain-based name server used to propagate system configuration (i.e. */etc/password* and */etc/hosts* files) across the network. Originated by SUN.



# Glossary