

INSTALLATION
GUIDE

InterMail[®]

Version 4.1.2

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1

Planning the InterMail Mx Installation

Before you install InterMail Mx, you need to:

- Understand how the InterMail components work. This information can be found in the *InterMail Mx Reference Guide* and the *InterMail Mx Operations Guide*.
- Know the supported platforms
- Be familiar with the hardware terms and considerations that affect InterMail's performance
- Develop a server distribution strategy
- Assess your hardware requirements

Supported Platforms

InterMail 4.0 is designed to run on the Digital UNIX, Sun Solaris, and Silicon Graphics IRIX platforms. Software requirements include

- Oracle 7.3.4
- Solaris 2.5.1
- Disk Striping/High Availability software such as Veritas

Hardware Terms and Considerations

This section describes InterMail system hardware components and suggests ways to configure them to maximize system performance.

The diagram below illustrates these components (Figure 1.);

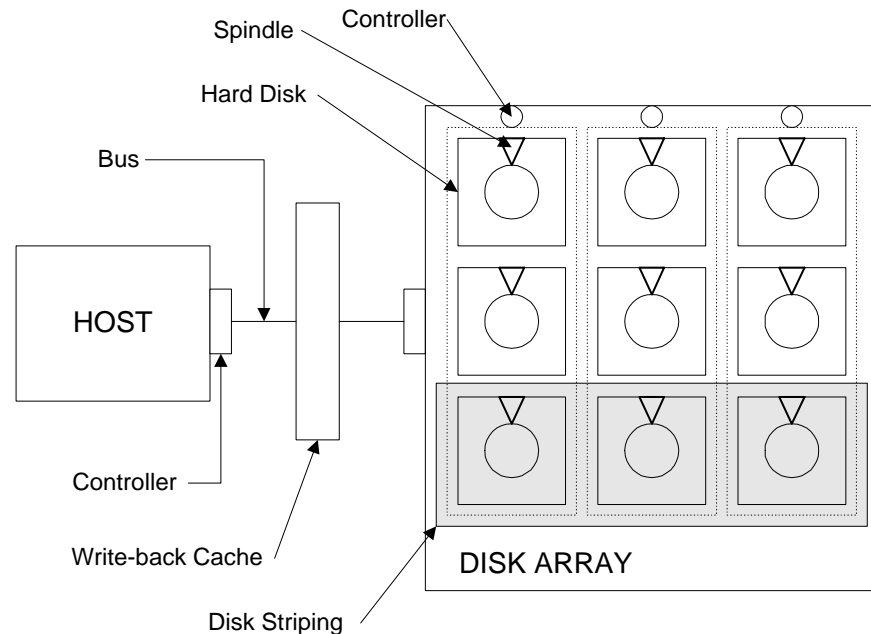


Figure 1. InterMail system hardware components

- **Host**—This is generally a physical machine containing one or more CPUs that operates one or more InterMail servers. This machine is responsible for accepting a connection, writing to disk, performing queries for information, accessing information from disk, and delivering information.
- **Controller**—These manage the operation of external devices, such as hard drives. Controllers can also be used to chain together several external devices in a disk array.
- **Bus**—The actual hardware link between hosts and external devices such as hard disks.
- **Write-back cache**—This is a buffered storage array that is positioned between the host machine and the disk array. It is composed of non-volatile RAM (NVRAM) that is secure because any information that is processed to NVRAM will not lose state. The write-back cache operates with a battery backup and will flush the NVRAM to hard disk in case of emergency.

InterMail performance is optimized by using the write-back cache. Since InterMail does not consider a transaction completed until it has been written to disk, the write-back cache can speed up transaction processing and confirmation.

Note: On Solaris, 8 MB of NVRAM should be allotted for the write-back cache. For DEC and SGI, 64 MB of NVRAM should be allocated.

- **Hard disk**—Each InterMail file system should be placed on its own external (hard) disk to avoid file system contention, which degrades system performance. (A file system refers to an InterMail-specific directory, such as \$INTERMAIL/journal.)

Disk striping—You can stripe multiple disks to provide high availability in an InterMail system. Disk striping allows hard disks to failover to other disks using a RAID (**R**edundant **A**rray of **I**ndependent **D**isks) strategy of information mirroring.

We strongly recommend that you use the Veritas file system software (VxFS) when striping disks. This software aids in the disk striping process and allows file inodes to be allocated in memory instead of on disk, which can help system performance.

Warning! *It is crucial to stripe disks in an array across controllers. Disk striping along a single controller introduces safety concerns and multiple points of failure, for example, if a disk fails or if a controller fails, data may be irretrievable.*

See your InterMail implementation professional for more information about capacity planning.

Developing a Server Distribution Strategy

Once you understand how the InterMail components work and what your mail system capacity requirements are, you must determine what the physical locations (machines and disk drives) of the InterMail servers and databases will be.

You may already have the available hardware in place, or you may still be evaluating your hardware needs. In either case, this section will help you to decide how to make the best use of the hardware you have or what additional hardware you will need.

InterMail's Distributed Architecture

InterMail's distributed architecture affords you great flexibility in determining how the servers that perform the basic InterMail functions (message delivery, message storage, and message access) will be allocated.

You can install all the InterMail servers on a single machine (Figure 2.),



Figure 2. Single-host installation

use a separate host for each function (Figure 3.),



Figure 3. Separating functions by host

or assign multiple machines to each function (Figure 4).

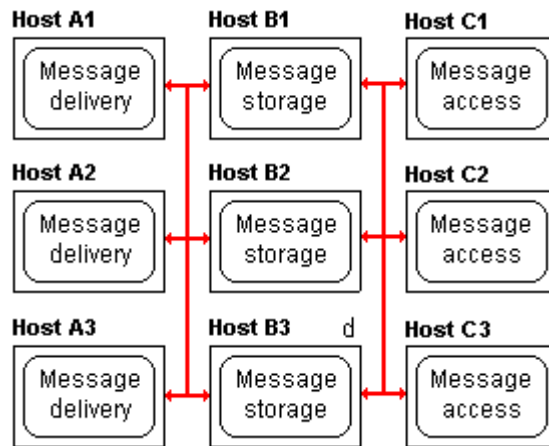


Figure 4. A multi-host system

How you distribute the InterMail servers will ultimately depend on your mail system's performance requirements and the amount of hardware you have or plan to have available. Naturally, the greater your mail system size, security, and availability requirements, the more machines, memory, and disk drives you'll need.

Each InterMail installation is unique, so you'll want to work closely with your InterMail Professional Services team to plan your system configuration. As you do, consider the following elements:

- Disk space requirements
- Processing power scalability
- Security
- System availability
- File system distribution

Determining Disk Space Requirements

In determining your disk space requirements, consider:

- The Integrated Services Directory (ISD) database, the Message Store database, and the Message File system each require a substantial amount of disk space. This includes space for the primary data as well as the necessary journal and log files. Although there is only one ISD in an InterMail system, each MSS host contains its own Message Store database and Message File System.
- Disk space needs to be allotted for mail in transit that is temporarily stored by the MTA, the Queue server, and the journal files generated by the Queue server.
- The `tmp` directory, where temporary files will be written during the InterMail installation process, requires at least 20 MB.

Growing the System Processing Power

There are two ways to expand your systems's CPU processing power:

- *Horizontal scaling* means adding new machines to the system. It is appropriate for servers that can be run on low-cost hardware or that have no associated storage requirements, such as the POP, IMAP, Directory cache, Queue, and MTA servers.
- *Vertical scaling* involves adding CPUs to existing machines. Machines that host the Message Store Server (MSS) and the ISD should be vertically scalable.

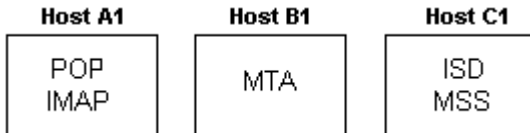
Security Considerations

You will want to restrict access to and provide extra security for servers and files that contain sensitive data. The ISD, Directory cache, POP, and IMAP servers should be considered security risks because they require access to account information. Message data is highly sensitive, so the message files stored in the MS database should be carefully safeguarded.

System Availability Strategies

InterMail supports a number of strategies you can use to ensure that your system stays online when hardware errors occur:

- **Server Redundancy**—You can make more than one server is available to fulfill a given function. If one of the servers goes down, another server can pick up the load.
- **Disk Mirroring**—You can "mirror" critical disks. 'Hot spare' mirror disks can provide access to data if a disk fails, then bring the main disks back up to date when possible.



- **Failover**—Failover replaces an entire machine with another if

the first machine fails. The InterMail software neither includes nor requires failover software; however, we recommend that you employ a failover strategy for MSS hosts to insure that actual message data is accessible at all times.

The MSS alternate should be an active MSS machine or a 'hot spare' machine. When a main MSS machine fails, the alternate assumes the network identity of the failed machine and accesses its disk array through a second port.

Distributing the File Systems

A file system refers to an InterMail-specific directory, for example, `$INTERMAIL/journal`.

Server components in InterMail contain numerous file systems that should each be placed on its own disk. These file systems include:

- **System data files**—These files are stored in InterMail-specific directories such as `$INTERMAIL/bin` and `$INTERMAIL/tmp`. They exist on every host, regardless of what server is running on that host.

- **Permanent message storage system components**—These should be distributed as widely as possible, ideally as per Figure 5. (In reality, system resources and other operational issues may preclude such a set-up.)

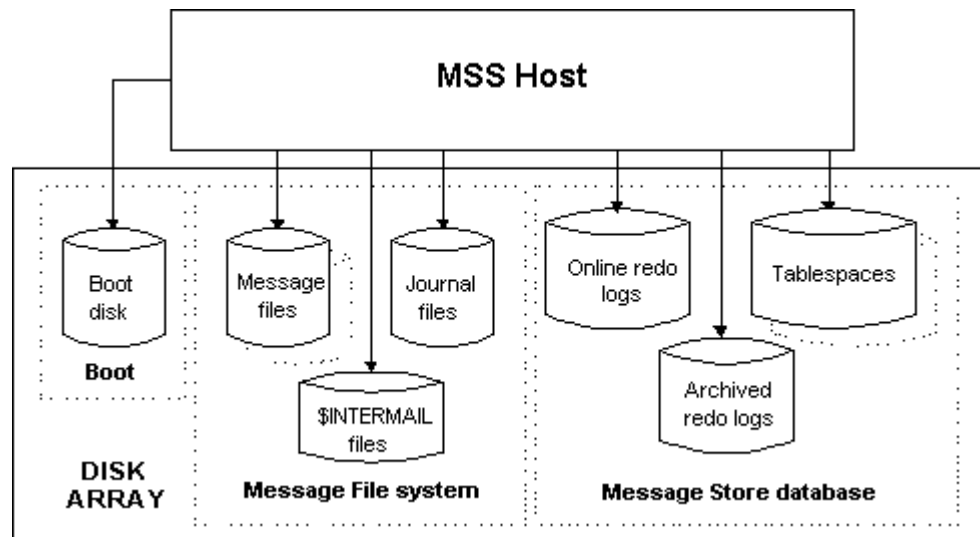


Figure 5. Possible MSS distribution

Distribution requirements for MSS components are as follows:

- Ideally, the MSS host boot disk will ideally be on its own file system in the disk array.
- All message files in InterMail are stored in the msgfiles directory. They should be distributed across as many file systems as possible to avoid file system contention.
- The directories containing the InterMail binaries (`bin` and `lib`), the log files (`log`), and the temporary files (`tmp`) should be contained on at least one file system inside the disk array or on an internal disk.
- By putting the journal directory on its own file system, you can increase the speed with which journal files are written. This is important because InterMail does not complete the processing of a transaction until it has been successfully written to a journal file, so the time gained can significantly improve system performance.
- Online redo logs, which record transactions in the (Oracle) Message Store database, should be kept on separate file systems. If possible, they should be split, with the odd and even members of each group on a separate file system.
- Archived redo logs are redo logs that have “filled up” with transactions and been archived. A new archived redo log is created for every 25 MB of data. Each redo log should be stored on a separate file system.
- Each Oracle tablespace, including the system, index, and data tablespaces, should be on its own file system. This provides for optimal performance and allows room for growth.

- Temporary mail files, which contain mail that is in process or that has been deferred for any reason, are stored in the spool and queue directories on the MTA and Queue server machines, respectively, and should not be distributed.

Temporary mail files must also not contain any links (hard or symbolic) to a separate file system. This is because the spool and queue directories use the UNIX `mv` utility to move file information from one subdirectory to another. The `mv` utility cannot move files between file systems, and does not provide error checking when the mail file movement operation fails, possibly leading to a loss of mail.

Sample Hardware Configurations

As discussed, an InterMail system can be distributed over numerous host machines in a variety of ways. This section describes several possible InterMail configurations and the hardware necessary to support them. To determine the installation configuration that suits your needs, you must work with your InterMail Professional Services team.

Scenario One: A Simple InterMail Configuration

A simple InterMail configuration might consist of three host machines: one host running the MTA, one host running the POP and IMAP servers, and one host containing the MSS and ISD (Figure 6.).

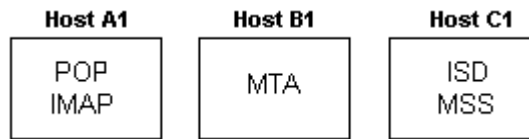


Figure 6. Three-host configuration

Because of security concerns, a firewall is employed, with the MTA outside and the POP and IMAP servers inside the firewall (Figure 7.).

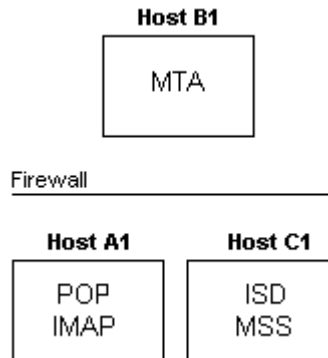


Figure 7. Three-host configuration with a firewall

Note: If dial-up connections were provided by a third party, POP and IMAP servers would have to be outside of the firewall so as to be accessed by remote users. Scenario Two: Heavy Message Traffic and Storage; Limited Message Retrieval

Scenario Two: Heavy Message Traffic and Storage, Limited Message Retrieval

Suppose that you expect your InterMail system to experience high volumes of message traffic and persistent storage of messages, but that message retrieval is not a serious concern because the number of users that will access their mailboxes at any one time will be few, or because the number of connections to the POP and IMAP servers is expected to be relatively short. In this scenario, hardware can be configured as in the following example:

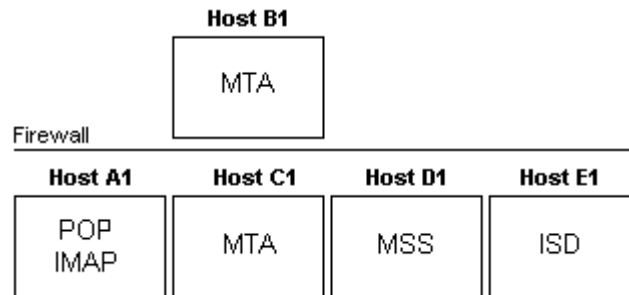


Figure 8. Four host configuration with a firewall

In this scenario, there will be one host servicing POP and IMAP requests, multiple MTA hosts (at least one outside the firewall), and multiple MSS hosts. With multiple MTA and MSS hosts, you can accommodate high volumes of message traffic.

Scenario Three: Heavy Message Traffic, Storage, and Message Retrieval

This scenario might apply if you expect that your InterMail system will experience high volumes of message traffic, storage, and retrieval.

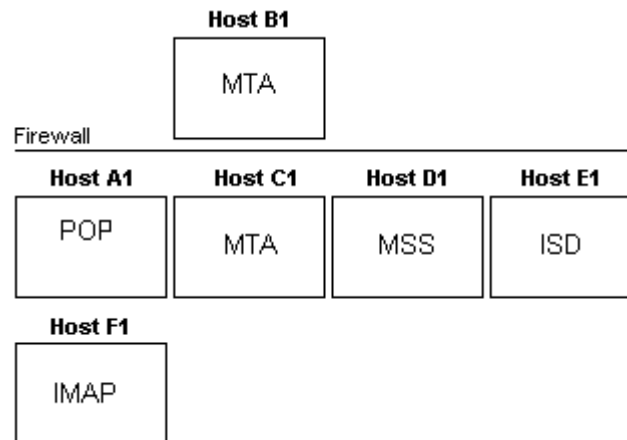


Figure 9. Five host configuration with a firewall

Assessing your hardware needs

You're ready to install InterMail if you know the answers to the questions below:

1. What hardware has been dedicated for use by the InterMail messaging system?
2. How many servers of each type will be installed?
3. Which servers will run on which machines?
4. How many backups will there be for each server?
5. On how many external devices or mounted file systems will the Integrated Services Directory be distributed?
6. How many Directory Cache Servers will access the Integrated Services Directory?

2

The Installation Process

This chapter shows you how to install InterMail 4.1.2 messaging system.

- Installation Overview
- Installation Order
- Installation Tasks
- Troubleshooting
- Notes and Reference

Installation Overview

The InterMail system can be installed on a variable number of hosts. You can install more than one component on the same host, and multiple copies of the some components can be installed on different hosts.

Before you begin the installation, you should

- read and understand the information in this chapter
- know which servers will run on which hosts
- ensure that all of the necessary hardware is properly configured and in place. (For more information, see Chapter 1, Planning the InterMail Mx Installation.)

An InterMail installation can be described as a series of tasks. The specific tasks you perform on each host in the installation depend on which InterMail servers are to be installed it.

The chart below identifies the tasks, the order in which they should be performed, and which hosts require them:

For example, to install an MTA and a Directory Cache Server on the same host, you would:

	Message Transport Agent (MTA)	Queue Server	Directory Cache Server	Message Store Server (MSS)	POP Server	IMAP Server	Configuration Server	SNMP Server	Integrated Services Directory (ISD)	Message Store Database	Web Server
Complete the InterMail 4.0 Deployment Worksheet	Complete once per InterMail installation.										
Create an Oracle user and group				✓					✓	✓	
Create an InterMail user and group	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Create the Oracle User's Directory				✓					✓	✓	
Create the InterMail User's Directory	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Check Port Assignments	✓	✓	✓	✓	✓	✓	✓	✓			✓
Increase Shared Memory and Semaphores	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Install the Integrated Services Directory									✓		
Configure the SQLNet Client			✓								
Install InterCore	✓	✓	✓	✓	✓	✓	✓	✓			✓
Install the Message Store Database										✓	
Install InterMail	✓	✓		✓	✓	✓		✓			✓

Table 1: Installation task grid

1. Complete the 4.0 Deployment Worksheet
2. Create an InterMail user and group.
3. Create the InterMail user's home directory.
4. Check port assignments.
5. Increase shared memory and semaphores.
6. Configure the SQLNet client.
7. Install InterCore.
8. Install InterMail.

Installation Order

Because each InterMail installation is unique, your particular circumstances will govern how and when you install InterMail on each host. However, there are components that must be installed before others, so we recommend the following host installation order:

1. The Integrated Service Directory (ISD) host
2. The Configuration server host
3. Other hosts as required

Installation Tasks

The following tasks are described in this section. They are listed in the order they should be performed on each server.

1. Completing the InterMail 4.0 Deployment Worksheet
2. Creating an Oracle User and Group
3. Creating an InterMail User and Group
4. Creating the Oracle User's Directory
5. Creating the InterMail User's Directory
6. Checking Port Assignments
7. Increasing Shared Memory and Semaphores
8. Installing the Integrated Services Directory
9. Configuring the SQLNet Client
10. Installing InterCore
11. Installing the Message Store Database
12. Installing InterMail

Note: *Throughout the Installation Guide, `imail` and `oracle` will be used as the names of the InterMail and Oracle users. You should use these default user names and groups unless a.) there are predefined site standards, b.) InterMail will be used in conjunction with servers that share resources with other applications, or c.) you already have Oracle installed with a different user and group specification.*

Note: *These processes assume that you are using a local file system. This document does not cover creating a new user and home directory using Network Information Service.*

Completing the InterMail 4.0 Deployment Worksheet

The InterMail 4.0 Deployment Worksheet, `deploymentworksheet.xls`, is an Excel spreadsheet consisting of a number of separate worksheets. These are used to specify sizing requirements for the Oracle databases used in InterMail.

You'll need to enter the required information into all the worksheets, including the last one that generates the `imoraparams.txt` text file that the InterMail installation process actually uses. Then copy this file to each host where InterMail is being installed.

Help for using `deploymentworksheet.xls` is included with it, but as you fill it out, remember to:

- Select the checkbox at the top of the InterManager Input tab
- Set the COS data file pathnames on the Directory Input tab to what is appropriate for your configuration.

Creating an Oracle User and Group

Before you begin, please note the following:

- If you are also creating NIS entries, make sure that these entries match exactly those of the local file system entries, or InterMail will not function properly.
- The Oracle user and group must not exist in any other groups.
- The Oracle user and group names must be consistent on every host running InterMail.
- Neither the `imail` nor the `oracle` user should possess superuser/root privileges, as this may introduce unnecessary security risks.

1. Create a new Oracle user in `/etc/passwd`. For example:

```
oracle:x:1000:101:Oracle Account:/vol1/oracle:/bin/csh
```

2. Create a new Oracle group in `/etc/group`. For example:

```
dba::101:
```

Creating an InterMail User and Group

Before you begin, please note the following:

- If you are also creating NIS entries, make sure that these entries match exactly those of the local file system entries, or InterMail will not function properly.
- The InterMail user and group must not exist in any other groups.
- The InterMail user and group names must be consistent on every host running InterMail.
- Neither the `imail` nor the `oracle` user should possess superuser/root privileges, as this may introduce unnecessary security risks.

1. Create a new InterMail user in `/etc/passwd`. For example:

```
imail:x:30000:250:InterMail common user:/imail/imail:/bin/csh
```

2. Create a new InterMail group in `/etc/group`. For example:

```
imail::250:
```

Creating the Oracle User's Directory

1. Set user to root: `su`
2. Create a new Oracle home directory and set the correct permissions and ownerships:

```
mkdir -p /<OracleHome>
chmod 775 /<OracleHome>
chown <OracleUser> /<OracleHome>
chgrp <oracleGroup> /<OracleHome>
```

For example:

```
mkdir -p /vol1/oracle
chmod 775 /vol1/oracle
chown oracle /vol1/oracle
chgrp dba /vol1/oracle
```

Creating the InterMail User's Directory

1. Set user to root: su
2. Create a new InterMail home directory and set the correct permissions and ownerships:

```
mkdir -p /<InterMailHome>
chmod 775 /<InterMailHome>
chown <IemailUser> /<InterMailHome>
chgrp <IemailUser> /<InterMailHome>
```

For example:

```
mkdir -p /imail/imail
chmod 775 /imail/imail
chown imail /imail/imail
chgrp imail /imail/imail
```

Checking Port Assignments

The InterMail installation process configures servers using numerous port numbers. Some ports are standard and not subject to modification. Some are well known ports, such as the SMTP, POP, and IMAP ports, which are defined in RFC specifications and should not be changed. Other servers in InterMail do not use well known ports. The defaults for these ports have been specifically chosen in order to avoid conflict with port numbers used for common UNIX applications (i.e., X Servers).

Although precautions have been taken to eliminate port conflicts, you should check `/etc/services` for system port assignments, then review any third-party applications running on the host on which InterMail will be installed to ensure that there are no conflicts.

SSL

If you choose to use InterMail's Secure Socket Layer (SSL) server authentication for the POP and MTA servers, you'll need to assign alternative port numbers for the SSL POP and SSL MTA servers.

Failover Groups

If a host are identified as a member of a failover group, InterMail will require that all servers installed on the host have unique port numbers. This enables any server on this machine to fail over and run on any other machine in the failover group with no port conflicts.

Increasing Shared Memory and Semaphores

Depending upon the current system limits, the maximum shared memory segment and semaphore size *typically* will be increased before installing the Oracle databases (the Integrated Services Directory and the Message Store database). The variables SHMMAX (for shared memory size) and SEMMSL (for semaphores) will need to be increased in the appropriate system for file—`etc/system` on Solaris, and `/etc/sysconfigtab` on OSF1.

You can find more on this subject on the *Tuning the SGA* tab of the 4.0 Deployment Worksheet (`deploymentworksheet.xls`).

Installing the Integrated Services Directory

1. Change to the Oracle user:
`su - oracle`
2. Create a log to record this installation:
`script <LogName>`
3. Locate and run `imorainstall`.
4. Respond to the following prompts:

Prompt	Response
Select a menu item (1 to 10): [10]	2 ...to install a new Directory database.
Pausing... [Hit enter to continue]	Press enter ...after you have read the accompanying text. This will appear a number of times.
Do you accept these (installation configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process See Installation Configuration Settings for help on configuring these settings.
Install using values saved from the Deployment Worksheet? (Y/N)	Y Choosing N installs a pre-configured ISD that is not suitable for most production environments.
Please enter the name of this (imoraparams.txt) file [/vol/tmp/imoraparams.txt] /vol1/tmp/imoraparams.txt	Enter the location of the imoraparams.txt file.
Relink Oracle now?	Y ...unless you are certain that Oracle does not require relinking.
Would you like a schema report generated?	Y
Enter file name for report [/vol1/oracle/admin/reportIMD1.txt]	Enter a name and location for the report file.

Prompt	Response
Display the (schema)report?	N ...unless you want to see it.
Select a menu item (1 - 11)	11 - to quit.

5. Change to the Oracle home directory. For example:

```
cd /vol1/oracle
```

6. Enter:

```
source .cshrc.
```

7. Change to the Oracle /oraInst directory. For example:

```
cd /vol1/oracle/7.3.4/oraInst
```

8. su to root.

9. Enter:

```
./root.sh
```

10. Respond to the following prompts:

Prompt	Response
Are these (environment variables) settings correct?	<ul style="list-style-type: none"> • Y if the settings are okay • N to change settings
Enter the full pathname of the local bin directory.	Enter the path for the Oracle bin directory. For example: vol1/oracle/7.3.4/bin
ORACLE_HOME does not match the home directory for oracle. Okay to continue?	Y This does not affect the installation.

11. Type exit to finish the logging script.

Configuring the SQLNet Client

This procedure installs a subset of Oracle that lets InterMail servers on a host connect to the Message Store database.

1. Change to the Oracle user:

```
su - oracle
```

2. Create a log to record this installation:

```
script <LogName>
```

3. Locate and run `imorainstall`.

4. Respond to the following prompts:

Prompt	Response
Select a menu item (1 - 10)	<p>3 - if this host is running a Message Store database or an ISD</p> <p>7 - if this host is not running a Message Store database or an ISD</p>
Do you accept these (Installation Configuration) settings?.	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process
Please enter the name of this (imoraparams.txt)file.	Enter the name and location of the imoraparams.txt file.
Identify this host by its number (1 to 3) from the list above.	Choose the number that identifies the current host.
Is this host named <Host-Name>?	<p>Y</p> <p>...unless it isn't.</p>
Do you wish to configure tnsnames.ora now via method (1)?	<p>Y</p> <p>...unless you don't have or don't want to use the values in the imoraparams.txt file. See Configuring SQLNet Settings via Command Line Arguments for help on using option 2.</p>
Select a menu item (1 - 10)	10 - to quit.

5. Type `exit` to finish the logging script.

Installing InterCore

The InterCore script installs the following 4.1.2 servers:

- Configuration (on just one host)
- Directory Cache
- Manager
- Web
- SNMP

1. Create a log to record the InterCore upgrade:

```
Script /<temp_directory>/<file_name.log>
```

For example:

```
Script /tmp/InterCoreUpgrade.log
```

2. Copy the `InterCore.tar` file from the installation media to the local host.
3. Untar the `InterCore.tar` file:

```
tar xvf InterCore.tar iminstall (non-Solaris hosts)
tar xvf InterCore.tar (Solaris hosts only)
```

The `InterCore.tar` file is untared and the `InterCore` directory is created.

4. Set user to root: `su`
5. Run `pkgadd` on the `InterCore` directory: (Solaris hosts only)

```
pkgadd -d . InterCore
```

6. Respond to the following prompts:

Prompt	Response
Is this an upgrade installation?	n
In what directory is the previous installation's configuration form?	The location of the configuration form. For example: /imail/imail/config
What is the Logical Host Name of this machine?	Enter the name. For example: venus
What is the Unix username that InterCore will use?	Enter the InterMail user name. For example: imail
What is the Unix group name that InterCore will use?	Enter the InterMail group name. For example: imail

Prompt	Response
Will the imconfserv run here?	<ul style="list-style-type: none"> • Enter y if configuration server is installed on the current host • Enter n if the configuration server is installed on a different host <p><i>Note: The configuration server runs on only one host.</i></p>
What is the imconfserv port on <HostName>?	The configuration server port. For example: 5000
What is the imconfserv administrative port on <HostName>?	The configuration server administrative port. For example: 5001
Would you like the config server running after the installation is complete?	y
Do you accept these (Inter-Core) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process
Do you want to keep old port number entries (or discard and then re-assign anew in install) (Keep) [Discard] ?	Keep ...unless you have compelling reasons to change the port settings.
Do you want to setup Failover Groups?	N You can set up failover groups after the installation is complete. To learn more about failover groups, see the InterMail Installation Guide.
Do you accept these (server installation) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process
Will the SNMP server (snmpdm) run on this host?	<ul style="list-style-type: none"> • yes if you want to install it • no if you don't
Will SNMP monitoring be enabled on this host?	<ul style="list-style-type: none"> • yes if you want to install it • no if you don't

Prompt	Response
Will the Web server (httpd) run on this host?	<ul style="list-style-type: none"> • yes if you want to install it • no if you don't
Do you accept these (SNMP) settings?	yes ...unless you have compelling reasons to change the port settings
Do you accept these (Local Directory Cache server) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process
Do you accept these (Httpd server) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process
Do you accept these (Oracle configuration) settings? (Yes/No/Quit) [yes]	yes
(Prompts to install various other files)	yes ... when asked if you want to install files that have a user ID conflict or with superuser privileges

7. Type `exit` to finish the logging script.

Installing the Message Store Database

1. Change to the Oracle user:

```
su - oracle
```
2. Create a log to record this installation:

```
script <LogName>
```
3. Locate and run imorainstall.
4. Respond to the following prompts:

Prompt	Response
Select a menu item (1 to 10): [10]	1 ...to install a new Message Store database.
Pausing... [Hit enter to continue]	Press enter ...after you have read the accompanying text. This will appear a number of times.
Do you accept these (installation configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process See Installation Configuration Settings for help on configuring these settings.
Install using values saved from the Deployment Worksheet? (Y/N)	Y Choosing N installs a pre-configured MS database that is not suitable for most production environments.
Please enter the name of this (imoraparams.txt)file:	Enter the location of the imoraparams.txt file.
Relink Oracle now?	N
Would you like a schema report generated?	Y
Enter file name for report [/vol1/oracle/admin/reportIMD1.txt]	Enter a name and location for the report file.
Display the (schema)report?	N ...unless you want to see it.
Select a menu item (1 - 11)	11 - to quit.

5. Change to the Oracle home directory. For example:

```
cd /vol1/oracle
```

6. Enter:

```
source .cshrc.
```

7. Change to the Oracle /oraInst directory. For example:

```
cd /vol1/oracle/7.3.4/oraInst
```

8. su to root.

9. Enter:

```
./root.sh
```

10. Respond to the following prompts:

Prompt	Response
Are these (environment variables) settings correct?	<ul style="list-style-type: none"> • Y if the settings are okay • N to change settings
Enter the full pathname of the local bin directory.	Enter the path for the Oracle bin directory. For example: vol1/oracle/7.3.4/bin
ORACLE_HOME does not match the home directory for oracle. Okay to continue?	Y This does not affect the installation.

11. Type exit to finish the logging script.

Installing InterMail

The InterMail installation script installs the following servers:

- POP
- MTA
- MSS
- Queue
- IMAP
- Manager

Note: You should install the *Queue* and *MTA* servers on the same host to take advantage of the stateless MTA architecture. For more information, see the InterMail Reference Guide.

1. Become the InterMail user:

```
su - imail
```

2. Create a log to record this installation:

```
script <LogName>
```

3. Locate and untar the InterMail.tar file:

```
tar xvf InterMail.tar iminstall (non-Solaris hosts)
tar xvf InterMail.tar (Solaris hosts only)
```

4. Set user to root: su (Solaris hosts only)

5. Run pkgadd on the InterMail directory: (Solaris hosts only)

```
pkgadd -d . InterMail
```

6. Respond to the following prompts:

Prompt	Response
Is this an upgrade installation?	n
In what directory is the installation's configuration form located?	The location of the configuration form. For example: /imail/imail/config
Do you accept these (Inter-Mail configuration file) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process
Do you accept these (Inter-Mail host) settings?	<ul style="list-style-type: none"> • yes if the settings are correct • quit to stop the install process

Prompt	Response
Do you accept these (server installation) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings
Do you accept these (MTA configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings <p><i>Note: Do not change the port settings!</i></p>
Do you accept these (queue configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings <p><i>Note: Do not change the port settings!</i></p>
Do you accept these (POP configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings <p><i>Note: Do not change the port settings!</i></p>
Do you accept these (imap configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings <p><i>Note: Do not change the port settings!</i></p>
Do you accept these (mss port configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings <p><i>Note: Do not change the port settings!</i></p>
Do you accept these (httpd configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change settings • quit to stop the install process
Do you accept these (remote imdircache configuration) settings?	<ul style="list-style-type: none"> • yes if the settings are okay • no to change the primary directory cache host or add additional directory cache hosts • quit to stop the install process
Where would you like to start searching for available port numbers?	Accept the default unless you have a compelling reason for not doing so.

7. Type `exit` to finish the logging script.

Troubleshooting

The following situations may occur during the installation process if all instructions have not been followed or if a syntactical or other user error was accidentally introduced. Where appropriate, diagnostic instructions are shown, as well as the effect the error will have on the system.

Failed Database Installation

If either the ISD or Message Store database installation is aborted, a subsequent re-installation may not be able to install the Oracle database correctly until shared memory segments have been de-allocated.

Here are two methods for de-allocating shared memory. Try the second one if the first one fails.

Use ShutdownDB

1. Shut down the Oracle instance, and make sure that no other Oracle instances are running.
2. Run `shutdownDB<instance>` from the Oracle directory, where `<instance>` is the offending Oracle instance.

```
cd $ORACLE_HOME/bin
shutdownDB <IMD1>.
```

3. Re-install the ISD or Message Store database.

Kill Oracle Processes and Shared Memory Segments

1. Shut down the Oracle instance, and make sure that no other Oracle instances are running.

2. As the Oracle user, check to see which Oracle processes are running:

```
cd - oracle
ps -aef | grep oracle
```

3. Kill all of the processes listed in the `ps` output using `kill -9`

4. As root, display the Oracle shared memory segments (m) and semaphores (s) in use by issuing a UNIX `ipcs` command:

```
su - root
ipcs
```

The output might look something like this:

```
IPC status from <running system> as of Tue Apr  7 12:16:26
1998
Message Queue facility not in system.
Shared Memory:
m      0 0x0ddd0251 --rw-r-----   oracle      dba
m      1 0x0ddd0248 --rw-r-----   oracle      dba
m     1002 00000000 --rw-rw----    imail      imail

Semaphores:
s      0 00000000 --ra-r-----   oracle      dba
s      1 00000000 --ra-r-----   oracle      dba
```

Figure 10. Checking for shared memory segments and semaphores.

5. Change to the appropriate user shown in Figure 6, and use `ipcrm -m` and `ipcrm -s` to remove the shared memory segments and semaphores. For example:

```
su - oracle
ipcrm -m 0
ipcrm -m 1
ipcrm -s 0
ipcrm -s 1
su - imail
ipcrm -m 1002
```

6. Reinstall the ISD or Message Store database.

Omission of Reserved Accounts

During the InterCore and/or InterMail installation scripts, if the reserved accounts—`imail`, `root`, `mailer-daemon` and `postmaster`—have not been created, the `imservctrl start` or `imctrl start` commands may report an error that Oracle has failed to update account information. This is because InterMail tried to synchronize the local account information with the Directory Cache database, but no account information existed. This is typical, and is corrected as soon as accounts are provisioned.

Notes and Reference

Installation Configuration Settings

Setting	Explanation
Intermail Oracle user name and password	The settings for the InterMail user and password (not the Oracle user and password).
Oracle SYSTEM password	An administrative password used independently of InterMail's support for Oracle. Any name can be chosen for this password, but be sure to remember it. InterMail usually doesn't need this password.
Base Install directory	The Oracle installation directory. For example: <code>voll/oracle</code>
ORACLE_HOME directory	The Oracle version subdirectory. For example: <code>/voll/oracle/7.3.4</code>
TNS_ADMIN	An Oracle environment variable required to connect to Oracle. For example: <code>voll/oracle/7.3.4/network/admin</code>
Install source directory	The source directory of the installation media. For example: <code>/voll/oracle</code>
Scratch directory for temporary install files	The location in which the installation process should write temporary files. These files are removed after the installation process is complete.
"oracle" home user directory	The Oracle installation directory. For example: <code>voll/oracle</code>

Setting	Explanation
Service instance	<p>The number of the database service to be installed.</p> <p>When installing the ISD, this number must be 1, since there is only one ISD per installation. When installing an MS database, this number should be the number of the MS database you are installing.</p>
Database instance name	<p>The name of the connection string used for Oracle.</p> <p>By default, IMD1 is the name for the ISD, and IMM1 is the name for the Message Store database.</p> <p><i>Note: This value is limited to 8 digits.</i></p>

Configuring SQLNet Settings via Command Line Arguments

If some difficulty prevents SQLNet from being configured through the Deployment Worksheet, you can configure it manually as follows:

1. In the Oracle /bin directory, shutdown and restart IMD1:

```
cd /vol1/oracle/7.3.4/bin
shutdownDB IMD1 startupDB
```

2. Create a SQLNet listener, specifying the Oracle home directory, database instance, and fully qualified host name with domain. For example:

```
createListenerConfig /vol1/oracle/7.3.4 IMD1 venus.soft-
ware.com
```

3. Create a SQLNet instance, specifying the Oracle home directory, database instance, and fully qualified host name with domain.

```
createSqlNetInstance /vol1/oracle/7.3.4 IMD1 venus.soft-
ware.com
```

4. Start the listener by typing `lsnrctl start`.

3

Post Installation Tasks

This section discusses the tasks that need to be performed after InterMail is installed but before you can launch your production environment. These tasks include:

- testing the installation
- making sure the servers work
- checking the directory permissions
- creating test accounts
- sending sample messages

These and other tasks are described in the following sections:

- Disclaimers
- Logging into the System
- Sourcing the InterMail Environment
- Taking Directory Snapshots
- Starting and Stopping Servers
- Pinging Servers and Checking Processes
- Checking the Databases
- Testing Message Flow
- Moving On

Disclaimers

- No two InterMail installations are the same, so the information provided in this chapter may not represent the file layout and structure of your system.
- This chapter describes post-installation checks and does not discuss InterMail configuration or system maintenance. See the *InterMail Operations Guide* for help on these subjects.
- If the commands in this chapter are unfamiliar to you, see the command syntax, usage and options descriptions the *InterMail Reference Guide*.

Logging into the System

The first step in testing the InterMail installation is to log on to the system as the InterMail user. Steps that should be followed in this procedure for each host in the system are:

1. Change to the InterMail user you created during the installation. For example:

```
su - imail
```
2. Check the home directory by issuing a `pwd` command. The directory indicated should be the InterMail directory you created during the installation.
3. Check the Oracle installation directory and user by issuing a `su - oracle`. Repeat steps 1 and 2; the home directory indicated should be the Oracle directory you created during the installation.

Sourcing the InterMail Environment

After logging in, check the user environment. In the installation process, InterMail created `.cshrc` (C shell profile) and `.profile` (Bourne shell profile) resource files. These files provide InterMail with basic environment variable information such as the path to the InterMail home directory, InterMail binaries, shared library files, the Oracle home directory, and Oracle binaries. When you log into the system, InterMail reads in all of the environment variables contained in one of these files.

You can use the `source .cshrc` command in the InterMail home directory to view these variables. Below is an example of a `.cshrc` file, should you need to restore settings in yours.

```
setenv INTERMAIL /voll/imail
setenv ORACLE_HOME /voll/oracle/7.3.4
setenv TNS_ADMIN /voll/oracle/7.3.4/network/admin
setenv PATH ${INTERMAIL}/bin:${INTERMAIL}/
lib:${ORACLE_HOME}/bin:${INTERMAIL}/pe
rl/bin:/sbin:/usr/sbin:/usr/bin:/usr/sadm/install/bin:.
setenv SR_LOG_DIR /voll/imail/log
setenv SR_AGT_CONF_DIR /voll/imail/config
setenv SR_MGR_CONF_DIR /voll/imail/config
setenv TCL_LIBRARY $INTERMAIL/lib/tcl
setenv NLSPATH $INTERMAIL/lib/nlslib/%L/%N.cat
```

```
setenv PERL5LIB /vol1/imap/perl/lib/perl5/sun4-solaris/
5.003:/vol1/imap/perl/l
ib/perl5:/vol1/imap/perl/lib/perl5/site_perl/sun4-
solaris:/vol1/imap/perl/lib/
perl5/site_perl:.
setenv ORACLE_USERINFO imap/imap
setenv ORACLE_DB_SERVICE IMD1
setenv ORACLE_SID IMD1
setenv EPC_DISABLED TRUE
if (! $?LD_LIBRARY_PATH) setenv LD_LIBRARY_PATH ""
setenv LD_LIBRARY_PATH ${ORACLE_HOME}/lib:${INTERMAIL}/
lib:
setenv MANPATH /usr/share/catman:/usr/share/man:/usr/cat-
man:/usr/man:${INTERMAIL
}/man:${INTERMAIL}/perl/man
set filec=true
set history=50
```

Taking Directory Snapshots

After installing InterMail, keep a record of all directories and associated permissions as they were initially installed. For this operation, typing:

```
ls -lR > <filename>
```

will create a list of all files in “long” format so that the structure and file permissions for all InterMail directories will be shown.

Repeat this step for all host machines in the system and also run this command at \$ORACLE_HOME (the Oracle home directory).

Taking snapshots of InterMail directories has two important benefits:

- It helps in a troubleshooting situation where permissions on files have changed due to unforeseen circumstances or operator error.
- It reveals the exact structure of the Message File System. This is important because you’ll need to create it exactly if it is lost or corrupted.

Note: With few exceptions, the permissions for all directories and files in the InterMail system should be `imap` for user and group.

Starting and Stopping Servers

After logging in to the InterMail system and setting the environment, start the InterMail servers. This can be accomplished in one of two ways: through `imservctrl` for a local host, and through `imctrl` for local and remote hosts. For the purposes of this chapter, we will use `imservctrl` on a local host, which can be replicated throughout the system.

Starting Servers

- To start InterMail servers on the local system, `cd` to `$INTERMAIL/lib` and issue the following command:

```
imservctrl start
```

- To stop InterMail servers, `cd` to `$INTERMAIL/lib` and issue the following command:

```
imservctrl stop
```

By running the `imservctrl stop` command, InterMail stops each (server) process, lists the process ID for each, and removes all information in the `$INTERMAIL/tmp` directory that is specific to the running session that was just stopped.

To confirm running processes, issue a `ps -aef | grep im` command to ensure that no processes are remaining after stopping InterMail:

```
venus% ps -aef | grep im
  imail  5062  5060  0 14:36:43 pts/3    0:01 -csh
  imail  4879  4877  0 10:00:09 pts/1    0:01 -csh
```

Figure 11. Checking for InterMail Processes.

Note: *In a production InterMail system, start the host containing the Configuration Server before any others.*

For more information on these commands, see the *InterMail Operations Guide* and the *InterMail Reference Guide*.

Pinging Servers and Checking Processes

The `imservctrl` command starts all servers on a given host in the required order. It also reports the status of all the servers that were started. If you need a more detailed view of server status, use `imservdisplay`, ping the servers, or check the InterMail processes. These tasks are described below.

Using `imservdisplay`

The `imservdisplay` command can quickly display the status of servers and any log entries that have been written since the server was started.

```
venus% imservdisplay

Message Store Database Report
-----
      Intermail Version: Intermail 4.0
      Number of Messages: 0
      Number of Message Stores: 4

Server Report
-----

imconfserv IS configured to run; 1 imconfserv server is
```

```

currently running
imdircacheserv IS configured to run; 1 imdircacheserv
server is currently running
mta IS configured to run; 1 mta server is currently run-
ning
1 mss's ARE configured to run; 1 mss servers are currently
running
popserv IS configured to run; 1 popserv server is cur-
rently running
imapserv IS configured to run; 1 imapserv server is cur-
rently running
imqueueserv IS configured to run; 1 imqueueserv server is
currently running
immgrserv IS configured to run; 1 immgrserv server is
currently running

```

Figure 12. Reporting on InterMail Servers.

In this example, notice that all servers report as “configured to run”; however, in a multi-host install, only certain servers configured and running may be configured. In those situations, running `imservdisplay` would produce output like the following:

```

....
imconfserv IS NOT configured to run; NO imconfserv server
is currently running
imdircacheserv IS configured to run; NO imdircacheserv
server is currently running
mta IS configured to run; 1 mta server is currently run-
ning
....

```

Figure 13. Reporting on Configured InterMail Servers.

This output would indicate that, of the three servers listed, only the MTA is running.

After displaying the configuration and running status of each server, `imservdisplay` reports any log events. A review of these log events can quickly inform the user if serious problems exist in a server.

```

Launch Report
-----

*** imconfserv*.log *** (Activity Log)
Last launched on: 2027 19980205
Fatal entries after last launch: 0
Urgent entries after last launch: 0
Error entries after last launch: 0
.....
.....

```

Figure 14. Events Reported by Server.

Pinging Servers

While `imservdisplay` can show if a server is running, it is helpful to see the response time of InterMail servers by pinging them.

To ping servers, use the `imservping` command as in the following example:

```
venus% imservping 1 5 mss

Fri Feb 28 10:03:18 EST 1997. imservping: (Info) mss.1
responded
Fri Feb 28 10:03:18 EST 1997. imservping: (Info) mss.2
responded
Fri Feb 28 10:03:18 EST 1997. imservping: (Info) mss.3
responded
Fri Feb 28 10:03:18 EST 1997. imservping: (Info) mss.4
responded
Fri Feb 28 10:03:18 EST 1997. imservping: (Info) mss.5
responded
.....
```

Figure 15. Pinging Servers.

Note: *It is suggested to check server response time by modifying the time intervals that `imservping` uses to check the server.*

Checking InterMail Processes

As a final step, check to see the time/date stamp of InterMail server processes by issuing a `ps -aef | grep im` and observing the time that a process was started. If the time/date stamp does not reflect the latest time servers were started, this may indicate that a process ID remained and needs to be manually removed (`kill -9 <pid>`). Once the process has been removed, restart the affected server with `imservctrl start <server>`.

```
venus% ps -aef | grep im

   imail   446     1  0   Mar 18 ?        0:44 /vol1/imaplib/
lib/mss.1 -db
   imail   629     1  0   Mar 18 ?        0:19 /vol1/imaplib/
lib/imapserve
   imail  5042  4879  0 13:41:38 pts/1    0:00 grep im
   imail   354     1  0   Mar 18 ?        1:01 /vol1/imaplib/
lib/imconfserv
   imail  4879  4877  0 10:00:09 pts/1    0:01 -csh
   imail   523     1  0   Mar 18 ?        3:47 /vol1/imaplib/
lib/mta
   imail   499     1  0   Mar 18 ?        1:19 /vol1/imaplib/
lib/imqueueserv
   imail   413     1  0   Mar 18 ?        2:36 /vol1/imaplib/
lib/imdirccacheserv
   imail   392     1  0   Mar 18 ?        0:09 /vol1/imaplib/
lib/immgrserv
   root    369     1  0   Mar 18 ?        0:01 /vol1/imaplib/
lib/snmpdm -aperror
   imail   581     1  0   Mar 18 ?        0:23 /vol1/imaplib/
lib/popserve
```

Figure 16. Checking Running Processes.

Checking the Databases

At this point—assuming all servers are up, running, and can be contacted—check the health of the Integrated Services Directory and Message Store databases.

To check the operation of each database, use the following procedure:

1. `su` to Oracle.
2. Run `showDB <OracleInstance>`, where `<OracleInstance>` will be the connection string for the Integrated Services Directory (IMD1 by default) and the Message Store database (IMM1 by default).
3. After issuing this command for each database, information about the database schema (rows in the database) will appear.

Testing Message Flow

Take the following steps to insure that the InterMail message flow process is working properly.

1. Create a default domain in the ISD.
2. Create a default domain in the MTA.
3. Create test accounts.
4. Synchronize the ISD and the Directory Cache.
5. Check message delivery.
6. Check message storage.
7. Check message retrieval.

Creating a Default Domain in the ISD

Follow these steps to create a default domain:

1. Create a domain in InterMail.

```
imdbcontrol CreateDomain venus.software.com
```

2. Set this domain as the default domain.

```
imdbcontrol SetDefaultDomain venus.software.com
```

Creating a Default Domain in the MTA

To create a default domain in the MTA, type `imconfedit` and modify the following configuration key:

1. Type `imconfedit`.
2. Set the `*/mta/defaultDomain:` configuration key to the correct setting. For example:

```
.....  
*/mta/defaultDomain: [venus.software.com]
```

Creating Test Accounts

This procedure creates two test accounts.

1. Create `testuser01` as follows:

```
imdbcontrol CreateAccount testuser01 software.com 12345  
testuser01 testuser01 clear software.com A S
```

2. Create `testuser02` as follows:

```
imdbcontrol CreateAccount testuser02 software.com 23456  
testuser02 testuser02 clear software.com A S
```

Synchronizing the ISD and Directory Cache

Type `/lib/imdirsync` to make sure that the Directory Cache has up-to-date information about the accounts you just created.

Checking Message Delivery

To check message delivery, telnet to port 25, log in as `testuser01` and send a message to `testuser02` as follows:

```
venus% telnet 0 25  
  
Trying 0.0.0.0...  
Connected to 0.  
Escape character is '^]'.  
220 venus.software.com ESMTP server (InterMail v4.0 209)  
ready Wed, 25 Mar 1998 15:01:33 -0800  
MAIL FROM: testuser01@software.com  
250 Sender <testuser01@software.com> Ok  
RCPT TO: testuser02@software.com  
250 Recipient <testuser02@software.com> Ok  
DATA  
354 Ok Send data ending with <CRLF>.<CRLF>
```

```
This is a test.
```

```
.
250 Message received: 19980319023730.ACQ28442@software.com
quit
```

After the message has been created and sent, you can check the `mta.log` file to view events related to this test transaction.

Checking Message Storage

After a message has been successfully delivered to `testuser02`, check to make sure that message storage is functioning properly by listing the contents of `testuser02`'s INBOX as in the following example:

```
venus% iminboxlist venus testuser02@software.com -all
0: Date: Wed, 25 Mar 1998 18:34:57 -0800
0: Message-Id: <19980325023730.ACQ28442@software.com >
0: Size: 337
```

Checking Message Retrieval

After confirming that a test message has been successfully delivered and stored, “pop” the user’s mailbox as follows:

1. Telnet to the POP port and log in as `testuser02`

```
venus% telnet 0 110

Trying 0.0.0.0...
Connected to 0.
Escape character is '^]'.
+OK InterMail POP3 server ready.
user testuser02
+OK please send PASS command
pass testuser02
+OK testuser02 is welcome here
```

2. List the contents of `testuser02`'s mailbox (`list`) and retrieve the message (`retr`)

```
list
+OK 2 messages
1 337
.
retr 1
+OK 337 octets
Return-Path: <testuser01@software.com>
Received: from [127.0.0.1] by software.com (InterMail
v4.0 209)
        with SMTP id <19980325023730.ACQ28442@software.com>;
        Wed, 25 Mar 1998 18:37:30 -0800
Message-Id: <19980319023730.ACQ28442@software.com>
```

Date: Wed, 25 Mar 1998 18:37:33 -0800

This is a test

.

venus%

If these operations are successful and no error conditions are shown, message retrieval via POP is operational.

Moving On

Once the installation has been satisfactorily tested, you can prepare your system for production. See the *InterMail Operations Guide* for a checklist of pre-production issues.