System Administrator's Guide to Installing DataMgr™

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ADIC
10949 East Peakview Ave.
Englewood, CO 80111 USA
Phone: 303-792-9700
FAX: 303-792-2465

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Preface

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Purpose of This Book

This book describes how to install and configure DataMgr on both the server and on clients' machines.

Who Should Read This Book

This book is written for the system administrators who has been assigned the task of installing DataMgr.

The table below lists DataMgr books that a system administrator should read:

Books for System Administrators to Read	Topic
DataMgr Overview	Understand how DataMgr works and know what features are available.
System Administrator's Guide to Installing DataMgr	Install & configure DataMgr on server and clients' machines.
System Administrator's Guide to Using DataMgr	Use DataMgr to define migration criteria with either commands or GUI. Description of commands and utilities. Describe backup and restore issues. Provide troubleshooting tools.
quick reference card	Summary of commands and utilities.

How This Book is Organized

This book contains the following chapters:

Chapter 1: Prerequisites — Defines system requirements for DataMgr.

Chapter 2: Install DataMgr — Instructions for installing DataMgr as well as special startup & shutdown procedures.

Chapter 3: Setup Tasks — Instructions for the following tasks:

- Establish access for clients.
- Edit `cron` jobs.
- Change color and fonts on GUIs.

Chapter 4: Post Installation Tasks — Instructions for the following tasks:

- Deinstall and reinstall DataMgr.
- Remove installation directory.

Conventions

The conventions used throughout the DataMgr technical books are listed below:

Convention	Example
The word "library" is a generic way to reference a storage device.	If using HP SunSpot libraries, install patch 1234.

Screen text, file names, program names, and commands are in `Courier` font.	`Files/Dirs created for MFS`
	`/mrktcol:`
	`/mrktcol/Migration`
	`/mrktcol/Migration/locklist`

The root prompt is shown as a number symbol.	`# su root`
What you should type in is shown in `Courier` **bold** font.	`# cd /etc/dmfs/usr/utils`
Site-specific variables are in a *Times italics* font.	`# dmfscntl -p /mfspath`

A backward slash (\ ) denotes the input is continued onto the next line; the printed page is just not wide enough to accommodate the line.	`# rsh nodename -n dd if=/dev\`
	`/tapedevicename/bs=20b | tar\`
	`xvfb - 20`
	Type the entire command **without** the backward slashes.

Pressing <Return> after each command is assumed.	
A menu name with an arrow refers to a sequence of menus or options.	Main Menu -—> Edit —>Add-—> Select Policy

Books

The books described below are part of the technical documentation set and are shipped on CD along with the DataMgr software:

System Administrator's Guide to Installing DataMgr
Install and configure DataMgr on a UNIX server and on clients' workstations.

System Administrator's Guide to Using DataMgr
Define managed file system criteria with either commands or GUI. Describes DataMgr commands and utilities. Describe backup and restore issues. Provides troubleshooting tools.

DataMgr Overview
An introduction to DataMgr, an hierarchical storage management (HSM) application. Contains a glossary.

Client's Guide to Using DataMgr
View migration criteria; start user-initiated migration and reload; and manage file quota system.

quick reference card
Summarizes commands and utilities.

Online Documentation

The software CD contains DataMgr book files and Adobe® Acrobat® Reader. The Reader allows you to view and navigate the online documentation files yet preserves the page design and graphics from the printed books.

Related Publications

The publications described in the table below are created and distributed on an as-needed basis:

Related Publications	Description
"Release Notes"	For each version of DataMgr, the "Release Notes" contain: • Summary of enhancements. • Describes: - Fixed problems. - Known problems. - Installation and configuration issues. • Lists: - Operating system patches. - System requirements.
"Product Alerts"	Informs customers of technical problems and solutions.
"Product Bulletins"	Conveys technical information — not problems — to customers.

Contact Publications Department

To make corrections or to comment on DataMgr publications, please contact Software Technical Publications at our email address: swpubs@adic.com.

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To receive access to the secured site on our home page containing technical product information (Release Notes, Product Alerts, Product Bulletins, FAQs), send e-mail to swpubs@adic.com and include the items below. In return, we will send you instructions and a password.

- Name.
- Company.

- Address.
- Telephone number and fax number.
- DataMgr serial number (or enter "reseller" if you are not a customer).
- Your e-mail address.

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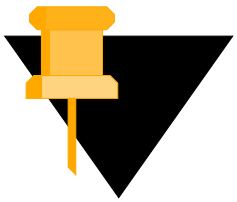
Prerequisites



Roadmap

Task	Refer To Chapter
Install AMASS before installing DataMgr.	
Verify that you have the necessary system requirements.	1
Install DataMgr.	2
Setup tasks: • Establish access for clients. • Edit cron jobs. • Change GUI colors and fonts.	3
Post installation tasks: • Deinstall and reinstall DataMgr. • Remove installation directory.	4

Capacity-based License

ADIC issues a DataMgr license based on the amount of disk space each client machine mounts for management. Capacity-based license levels are described below:

- Level 1 = Less than or equal to 5GB.
- Level 2 = Over 5GB but less than or equal to 25GB.
- Level 3 = Greater than 25GB.

The license is entered when installing the BFS component. The BFS provides the licenses needed by the individual DMFS clients. (For a description of DataMgr components, refer to "Components" on page 1-4 in *DataMgr Overview.*)

Feature Licenses

A separate authorization string is needed for the optional features below. For a description of these features, refer to the Storage Policies chapter in *DataMgr Overview.*

- File Replication.
- Multi-tier Migration.
- File Import.

Permanent Authorization Strings

During installation you are asked to enter either:

- A permanent authorization string.
- Or, a temporary 30-day product key.

Authorization strings have the following format: xxxx-xxxx-xxxx-xxxx-xxx. You can enter the authorization string in one of the following ways:

- Upper or lower case.
- With dashes (-).

- All strung together.

If your Software Certificate does not contain this string, call ADIC at (303) 792-9700 or FAX (303) 792-2465 or email techsup@adic.com and they will issue you an authorization string after you provide them with the required information. How to find this required information is described below:

Serial Number
Look at the DataMgr CD and write down the serial number.
Enter your Serial Number here_____

Host ID
Determine the host ID with the appropriate command in the table below. Enter your Host ID here_____

Operating System	Command
AIX	uname -m
HP-UX	uname -i
IRIX	sysinfo -s
Solaris	hostid

License Information
Write down the licenses for each BFS your company purchased.

Level 1 Licenses_____

Level 2 Licenses_____

Level 3 Licenses_____

Temporary Product Key

The generic 30-day temporary product key is: **U3QEYUCJ.**

> **Note**
>
> The temporary product key does not enable File Replication, Multi-tier, or File Import.

At the end of 30 days, if a permanent Authorization String has not been entered, DataMgr expires, but migrated data will not be lost. If you enter a permanent license after the expiration date, file migration and reload is again enabled through the BFS.

Changing Authorization String

Change the authorization string if any of the following conditions apply:

- You proceed from an evaluation to a purchase.
- You add clients or upgrade clients (therefore add to the disk space) that DataMgr manages.
- You want to enable file replication, multi-tier migration, or file import.

Step 1. Contact ADIC to receive an authorization string.

Step 2. The `/etc/bfs/usr/utils/bfsmaint` utility initializes the license file. Therefore, when you update the temporary Product Key to a permanent Authorization String, use this utility as shown below:

```
# cd /etc/bfs/usr/utils
# ./bfsmaint -i
```

Note

Use the bfsmaint -i utility option only when DataMgr is running.

Step 3. DataMgr replies with the message illustrated below, which confirms that you want to overwrite the license file.

When prompted, enter a new authorization string. Your responses are shown in bold.

```
License information for host zanzibar:

Temporary license expires in 1 month
Okay to overwrite license file? [n] y

Enter your Authorization string for a permanent
license:

AAAA292X2QUV487BJAM

License file written

License information for host zanzibar:
Number of level 1: 10
Number of level 2: 1
Number of level 3: 0
```

BFS Issues License to Clients

The BFS issues each DMFS client the appropriate license level after receiving information on the amount of disk storage it manages on the client machine. If a license for the appropriate level is not available, the BFS issues the client a license for the next higher level. If all licenses are in use, the request is denied. (For a description of DataMgr components, refer to "Components" on page 1-4 in *DataMgr Overview*.)

For example, if a client has 3GB of space for management, it needs a Level 1 license. If a Level 1 licenses is not available, the BFS will try to issue a Level 2 license, and if there are none available, it will try to issue a Level 3 license.

If a client attempts to use either file replication or multi-tier migration, but the BFS does not have the appropriate feature license, the operation will fail.

Registration File Monitors License

On the BFS, DataMgr maintains a registration file located in `/etc/bfs/registered`. This file (an example is shown below) monitors all levels of licenses that are authorized and in use at any given time.

```
Serial number: DM-00539
License installed on Tue Jan 5 17:46:38 1999
Allowed license levels:
Number of level 1: 25
Number of level 2:  3
Number of level 3:  1

Current license levels in use:
Level 1 checked out: 8
Level 2 checked out: 1
Level 3 checked out: 1
```

How to Refresh Registration File

If a client goes down while files are being migrated or reloaded, the `/etc/bfs/registered` file can become out-of-sync with the current client configurations.

To refresh the `registered` file, refer to "Refresh Registration File" on page 6-39 in *System Administrator's Guide to Using DataMgr.*

Requirements

Make sure you read the DataMgr "Release Notes" to obtain the following information:

- A list of current patches and packages required by your servers.
- GUI requirements.
- Known problems.
- The latest AMASS compatibility matrix. Install a compatible version of AMASS on a server on your network to provide storage server resources.

Note

Install and start AMASS before installing DataMgr.

File Pathname Limit

DataMgr supports a file pathname limit of 1023 characters for the DataMgr root directory in AMASS. For example, if client files are going under `/`*archive*`/FMSclients/eureka` on AMASS, then the length of this string (26 characters) must be subtracted from 1023 (1023-26=997). Consequently, succeeding file pathnames can be a total of 997 characters in length.

File System Size & Name

File system size is important. ADIC recommends that your file system not exceed 1 million files. As the number of files approaches 1 million, the system slows considerably. The smaller the file system, the faster most utilities and commands will complete.

The size of a file system name can be a maximum of 24 characters in length.

Large Files

If a DMFS client requires DataMgr to manage files larger than 2GB, the BFS must support large files. Large file support is provided on the following operating system:

- AIX 4.2.1 and 4.3.
- HP-UX 10.20 HP-UX 11.0.
- IRIX 6.2, 6.4, and 6.5
- Solaris 2.6 and 7.0.

Shared Libraries

The tables below list required shared libraries for successful operation of both the Client GUI and the Administrative GUI.

If, for example, your system does *not* have a `libXaw.so.5`, but it does have a `libXaw.so.4` or `libXaw.so`, create a symbolic link to the *actual* library (highest number) with the *required* library. An example follows:

```
# cd  /usr/openwin/lib;     ln -s libXaw.so.4     libXaw.so.5
                            (actual library)      (required library)
```

AIX	
Fileset	**Libraries Included**
X11.base.lib X11.base.rte X11.samples.lib.Core	/usr/lib/libX11.a
	/usr/lib/libXaw.a
	/usr/lib/libXm.a
	/usr/lib/libXext.a

HP-UX	
Fileset	**Libraries Included**
X11R5-SHLIBS	/usr/lib/Motif1.2/libXm.sl
	/usr/lib/X115R/libX11.sl
	/usr/lib/X11R5/libXt.sl

IRIX	
Fileset	**Libraries Included**
x_eoe.sw.eoe motif_eoe.sw.eoe	/usr/lib/libXaw.so
	/usr/lib/libXmu.so
	/usr/lib/libXt.so
	/usr/lib/libX11.so
	/usr/lib/libXext.so

Solaris	
X Windows	**Libraries Included**
Open Windows	
SUNWmfrun	/usr/dt/lib/libXaw.so
	/usr/openwin/lib/libXaw.so
	/usr/openwin/lib/libXmu.so
	/usr/openwin/lib/libXt.so
	/usr/openwin/lib/libX11.so
	/usr/openwin/lib/libXext.so
Add both `/usr/dt/lib` and `/usr/openwin/lib` to the `LD_LIBRARY_PATH` environment variable.	

Disk Space

The table below shows the amount of disk space required by DataMgr:

Operating System	DMFS	BFS	SLD	SSD	/etc/dm*	/etc/dm/raima/bfs and /etc/dm/raima/dmfs#
AIX	32MB	14MB	140KB	4MB	8MB	BFS Database and Managed File System Database
HP-UX	30MB	13MB	66KB	10MB	5MB	
IRIX	37MB	12MB	156KB	4MB	5MB	
Solaris	31MB	10MB	91KB	4MB	5MB	

* The `/etc/dm/log` and `/etc/dm/raima/log` contain log files so this initial size will grow.

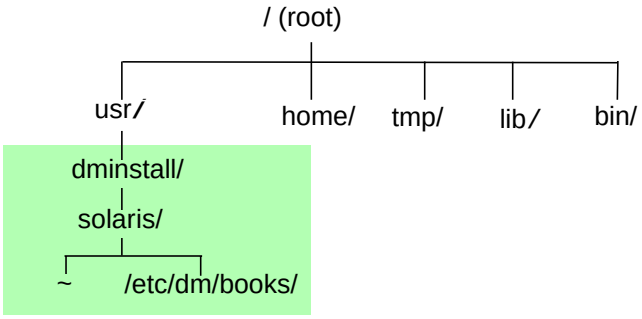
Use the equations found in "Size Databases" on Page 1-18 to calculate the space for these two databases.

The DataMgr installation script will verify that there is enough space available in the installation directory before proceeding. If there is not enough space, the script asks if you want to attempt the install anyway. Typically, you want to stop the install, make the space available, and continue with the installation.

Create Installation Directory

Create a platform-specific directory to contain the DataMgr files extracted from the CD. The default directory is `/usr/dminstall.` For instructions on deleting this directory if space is limited, see "Remove Load Directory" on page 4-6.

If, for example, you have extracted Solaris-specific DataMgr files from the CD, your directory hierarchy would look similar to the illustration below:



Determine Location for Components

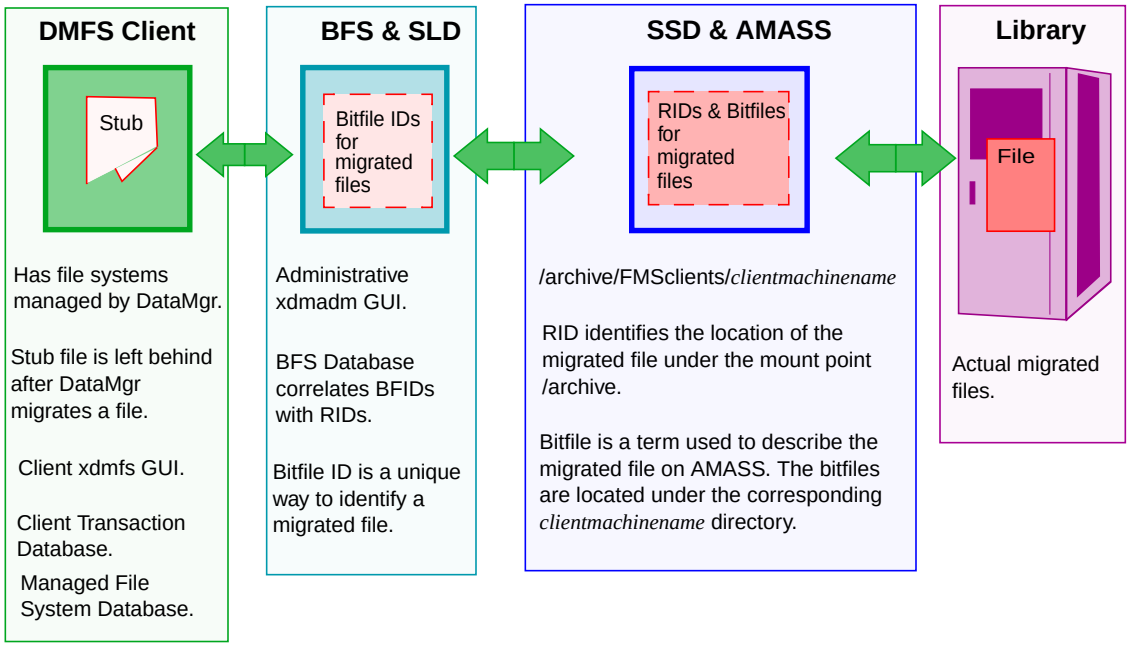
Each DataMgr component (BFS, SSD, SLD, and DMFS) must be installed on a UNIX machine.

- **BFS**: Install the BFS on a server that has network access to the DataMgr clients (DMFS) and to the DataMgr daemons (SSD and SLD). A minimum of one BFS component is required.
- **SSD**: Install SSD on each server where AMASS is installed and will be used for file storage.
- **SLD**: Install the SLD on any machine with network access to the BFS, DMFS clients, and SSD. Only one SLD is required.

- **DMFS**: Install the DMFS on all client machines that have file systems managed by DataMgr. The number of machines is limited by the number and level of licenses you have purchased.

Summary of Elements

The illustration attempts to give you an overview of the DataMgr elements described below.



- Location of DataMgr components.
- Location of DataMgr GUIs:
  - Administrative xdmadm GUI is on the BFS and used by the System Administrator.
  - Client xdmfs GUI is on the DMFS and used by clients as well as the System Administrator.

- Location of DataMgr databases:
  - Transaction Database is on each client's machine.
  - Managed File System Database is on each client's machine. To calculate the size of this database, see "Size Managed File System Database" on page 1-20.
  - BFS Database is on BFS. To calculate the size of this Database, see "Size BFS Database" on page 1-18.
- DataMgr-specific directories on AMASS:
  - Bitfiles are located under /archive/FMSclients/*clientmachinename*.

Create Directories

During the installation process, DataMgr creates and writes to the directories listed in the table below. If you do not use the default directories, DataMgr creates the directory names that you enter in the script and the appropriate symbolic links.

Note

Make sure that enough disk space is available for these directories. For space requirements, see "Disk Space" on page 1-13.

Component	Default Directory	Description
All components	/etc/dm	Location for DataMgr common files, such as the error log. All machines running a DataMgr component will have this directory.
BFS	/etc/bfs	Location of BFS executables.
SLD	/etc/sld	Location of SLD executables.
SSD	/etc/ssd	Location of SSD executables.

Component	Default Directory	Description
DMFS (clients)	/etc/dmfs	Location of DMFS executables.

Complete Table

Complete the table below when answering the installation questions. If you are installing a DMFS client component on more than one machine, make as many copies of this table as needed. If symbolic links are used, write down the appropriate path for each machine in both the Default Path and Symbolic Link Path columns.

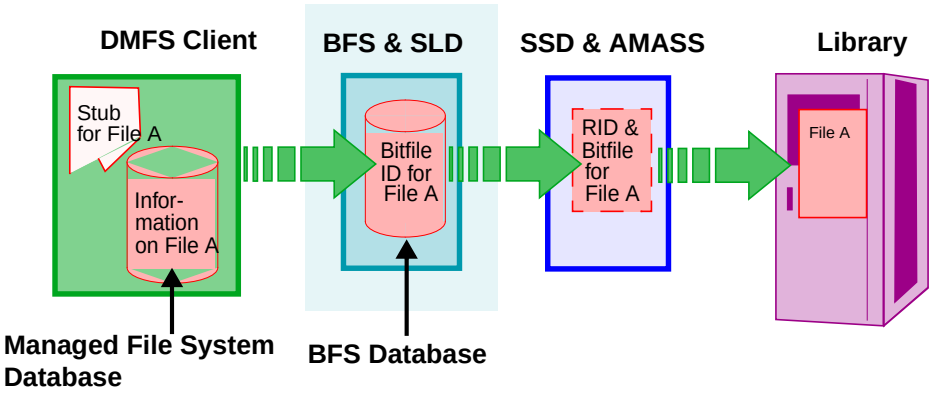
Component	Host Name	UID	GID	Default Path	Symbolic Link Path
SSD					
BFS					
SLD					
DMFS (clients)					
AMASS					

Size Databases

The following database are used in DataMgr:

- BFS Database on the BFS component.
- Managed File System Database on each client.
- Client Transaction Database on each client.

Both the BFS Database and the Managed File System Database must be sized.



Size BFS Database

The BFS Database is located under `/etc/dm/raima/bfs`. This Database contains the bitfile IDs for migrated files. A bitfile ID points to a specific RID (record ID) on AMASS. This is how DataMgr keeps track of where client files have been migrated.

Use the formula below to determine the space required for the BFS Database:

Database size = 64 * Number of files being migrated

If File Replication or Multi-tier Policies are used, then the equation is:

Database size = ((64 + (factor * 16)) * Number of files being migrated

factor = Number of replicated copies or number of tiers.

Example 1: if you have client files using a File Replication policy with 1 primary copy and 1 secondary copy, the equation would look like the following:

Database size = (64 + (1 * 16)) * number of files)

Database size = 80 * number of files

Example 2: if you have client files using a Multi-tier policy with the primary copy and 2 tiers, the equation would look like the following:

Database size = (64 + (2 * 16)) * number of files

Database size = 96 * number of files

Note

A migrated file that is subsequently modified and re-migrated creates a new record in the BFS Database. Also, when a migrated file is removed from a client's managed file system, it's record remains in the BFS Database until its retention time expires **and** the Trashcan is dumped. At that point, the record is available for re-use in the BFS Database.

Note

A BFS Database that is 2GB in size can contain information for 20 million managed files.

Size Managed File System Database

The Managed File System Database is located under `/etc/dm/raima/dmfs`.There is a Managed File System Database for each client's managed file system. The Database contains all the information on each file in the managed file system and stores information used in generating a list of files to migrate.

Prior to selecting a file system for management, you must determined the size of the Managed File System Database.

Use the formula below to determine the size:

```
Database size = ((Number of Directories x 250)+(Number of Files x 650))
```

The values for the Number of Directories and Files are estimates of the maximum number of files and directories that will reside on the client's file system. This estimate assumes a typical directory and file name length of 20 characters or less. If the file name length is longer, add that length to the estimate.

For example, if the typical file name length is 40 the equation would look like the following:

```
Database size = ((Number of Directories x 290)+(Number of Files x 650))
```

Edit Paths

The following environmental paths are **not** automatically set up during installation.

man Pages

Step 1. To use the `man` pages, set the following path.

For each **c shell** environment:

```
setenv MANPATH ${MANPATH}:/etc/dm/usr/share/man
```

For each **bourne shell** environment:

```
MANPATH=$MANPATH:/etc/dm/usr/share/man export MANPATH
```

Utilities

Step 2. The GUIs use the DataMgr utilities to accomplish a task, for example, changing watermarks uses the `dmfscntl` utility. Therefore, set the following paths.

For each **c shell** environment:

```
set path=($path /etc/dm/usr/utils /etc/dmfs/usr/bin\
/etc/dmfs/usr/utils /etc/bfs/usr/bin /etc/bfs/usr/utils\
/etc/sld/usr/daemons /etc/ssd/usr/daemons /etc/bfs/usr/daemons)
```

For each **bourne shell** environment:

```
PATH=$PATH:/etc/dm/usr/utils:/etc/dmfs/usr/bin:/etc/dmfs/usr/utils:\
/etc/sld/usr/daemons:/etc/ssd/usr/daemons:/etc/bfs/usr/daemons:\
/etc/bfs/usr/

export PATH
```

GUIs

Step 3. To run the Client `xdmfs` GUI, add `/etc/dmfs/usr/bin` to your `PATH`.

Step 4. To run the Administrative `xdmadm` GUI, add `/etc/bfs/usr/bin` to your `PATH`.

Step 5. Both the Client GUI and the Administrative GUI require the files below to be in the `/etc/dm/usr/share/gui` directory. These files are located in this directory during a normal DataMgr installation.

- server
- xdmfs
- xdmfs.hlp
- xdmfskeysym

Step 6. **Solaris only:** To run the GUIs, add one of the following to your `LD_LIBRARY_PATH`:

- /usr/dt/lib
- Or, /usr/openwin/lib

Step 7. Both GUIs also expect the `X/Motif/XKeysymDB` file to be in `/usr/lib/X11` directory. If the file is not there, then copy `/etc/dm/usr/share/gui/xdmfskeysym` as follows:

```
# cp   /etc/dm/usr/share/gui/xdmfskeysym  /usr/lib/X11/XKeysymDB
```

On Solaris, do the following:

```
# cp   /etc/dm/usr/share/gui/xdmfskeysym   /usr/openwin/lib/XKeysymDB
```

Edit Temporary Storage Space

The DataMgr `dmfsscan` command controls migration by bringing space usage levels for a managed file system in line with the values defined by the DataMgr administrator with the low and prestage watermarks.

The `dmfsscan` command, as a default, uses `/usr/tmp` for temporary file storage. If you want these files to be directed elsewhere, edit the `/etc/dmfs/config/params` file and add the "`DMFS_TMPDIR=newdir`" entry as shown below:

Add this entry to the file. →

```
# cd /etc/dmfs/config/params

~
DMFS_TMPDIR=newdir
~
```

System Mount Table

The system mount table defines the file systems and disk partitions that are mounted at boot time.

The file system name defined to DataMgr in the `/etc/dmfs/config/dmfstab` file must match an entry in this system mount file.

The location and format of this table varies by system architecture.The table below shows the location of this file on the various supported platforms:

Operating System	System Mount Table	Man Page*
AIX	/etc/filesystem	filesystem
HP-UX	/etc/fstab	fstab
IRIX		
Solaris	/etc/vfstab	vfstab
* For more information, refer to this man page.		

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Installation

Roadmap

Task	Refer To Chapter
Install AMASS before installing DataMgr.	
Verify that you have the necessary system requirements.	1
Install DataMgr.	2
Setup tasks: • Establish access for clients. • Edit cron jobs. • Change GUI colors and fonts.	3
Post installation tasks: • Deinstall and reinstall DataMgr. • Remove installation directory.	4

Extract Files From Local CD

To install DataMgr from CD on a **local** host, perform the following procedure:

Step 1. Log in as **`root`**.

Step 2. Create a temporary directory under `/tmp` and **cd** to that directory.

Step 3. Do an **ls** on the *cdrompath* to determine the case (upper or lower) of the file names. Some platforms will change the name from upper case (DM) to lower case (dm) letters.

Step 4. To extract the files from a CD on a local host, enter the following command:

```
# tar -xmvf/cdrompath/datamgr/platform.TAR
```

where:

Option	Description
cdrompath	Enter the pathname where the CD has been mounted. For example, `/cdrom/DATAMGR`.
platform.TAR	Enter the applicable operating system version. For example, `sol26.TAR`.

Step 5. If you have loaded the extracted files onto a machine that will **not** be running DataMgr, log onto the target machine and NFS mount the platform-specific directory from the machine where the files are located.

Step 6. Continue with "Install DataMgr" on Page 2-6.

Extract Files From Remote CD

To install DataMgr from CD on a **remote** host, perform the following procedure:

Step 1. Log in as **`root`**.

Step 2. Create a temporary directory under `/tmp` and **`cd`** to that directory.

Step 3. Do an **ls** on the *cdrompath* to determine the case (upper or lower) of the file names. Some platforms will change the name from upper case (DM) to lower case (dm) letters.

Step 4. To extract the files from a CD on a **remote** host, enter the following command

```
# rsh nodename -n dd
     if=/cdrompath/datamgr/platform.TAR bs=20b | tar xmvBf -
```

where:

Option	Description
nodename	Enter the remote host name of the machine where the tape device is attached. Make sure the node name is included in the `/.rhosts` file.
cdrompath	Enter the pathname where the CD has been mounted. For example, `/cdrom/DATAMGR`.
platform.TAR	Enter the applicable operating system version. For example, `sol26.TAR`.

Step 5. If you have loaded the extracted files onto a machine that will **not** be running DataMgr, log onto the target machine and NFS mount the platform-specific directory from the machine where the files are located.

Step 6. Continue with "Install DataMgr" on Page 2-6.

Install DataMgr

If the various components are going to be installed on different machines, the installation sequence is as follows:

- SLD.

> **Note**
>
> The SLD component should be installed first and must be running when the DMFS is installed. This only applies if the two components are located on different machines.

- BFS.
- SSD.
- DMFS.

ADIC recommends that each component be started before the next component is installed. This will ensure that each component can *talk* to the others correctly.

> **Caution**
>
> The installation script inserts entries into various system files. These entries are encapsulated between special tags. A typical tag will appear like `%CDVSTART_dmfs%`. Do not alter or remove these tag lines.

From each machine listed in "Complete Table" on Page 1-17, perform the installations steps below:

> **Caution**
>
> If you are **upgrading** DataMgr, make sure you have a successful current backup of your BFS Database.

Step 1. Change directory to the specific *platform* directory created earlier and run the DataMgr installation script.

For example, the commands below go to the hpux directory and runs the DataMgr script.

```
# cd /usr/dminstall/hpux1020
# ./install_dm
```

Step 2. The installation script prompts you to enter the letter that corresponds to the component you want to install.

```
a) DMFS - Data Manager File System (provides migrating file systems)
b) BFS  - Bitfile Server (requires installed SSD)
c) SLD  - Service Locator Daemon (must be one per network)
d) SSD  - Storage Server Daemon (provides local SSD; requires AMASS)
e) ALL - All of the above
Please enter a, b, c, d, e, or a list (eg, ab):
```


You can select — one, all, or a combination — of components. For example, to install all four components on this machine, enter "e" as shown below:

```
Please enter a, b, c, d, e, or a list (eg, ab): e
```

Step 3. The following prompt checks to make sure a full BFS Database back up has been performed.

```
Do you have a current full BFS Database Backup? (y | n) [y]
```

- If you respond with y (default), the installation script will continue.
- If you respond with n, the installation script will terminate. You can Start DataMgr, perform a full BFS Database backup, then run the installation script again.

Step 4. The installation script prompts you to enter both the User ID and Group ID. The specified GID should already exist, but DataMgr will add the UID to the machine's `passwd` file. A sample answer is shown in bold:

```
Please enter the numeric user ID (uid) for the dmfs account: 357
Please enter the base group ID (gid) for the dmfs account: 86
```

Note

When you install the DMFS component, you need to know the AMASS UID and GID.

Step 5. DataMgr uses the standard `syslog` function of the operating system for all of its error messages. All messages are sent using the `local1` facility. Through the `syslog.conf` file, you can control the destination of these messages.

Note

If you have previously installed DataMgr, the installation script asks if you want to replace the entries found in root's `crontab` with defaults. The `crontab` contains administrative tasks, For additional information, see "Schedule cron Jobs" on page 3-4. If you answer **NO**, the script moves on to the next question. You will **not** be given the chance to select specific entries or configure values.

Step 6. If the SLD and the DMFS are going to be installed on different machines, you must go to the SLD machine and start the SLD (run `/etc/rc.dm`) before continuing with this installation.

Step 7. If you want to accept the default location for the files specific to the components, press <Enter>. However, if you want DataMgr to create another directory for these files, enter a new path. Wherever possible, the script allows you to use symbolic links to relocate the actual DataMgr directories.

Note

Do not locate the `/etc/dm/raima` files on a managed file system. Make sure the `/etc/dm/raima` directory does not reside in the `/etc/dmfs/config/dmfstab` file.

```
Enter actual DataMgr home location
[/install/datamgr/dm]: _________________

Append logging entries to
/etc/syslog.conf? (y | n) [n]: _________________

Enter actual SLD (Service Locator Daemon home location
[/etc/sld]: _________________

Enter actual DMFS (DataMgr FileSystem) home location
[/etc/dmfs]:_____________

Enter actual BFS (Bitfile Server) home location
[/etc/bfs]:___________________

Enter actual Raima database journal home location
[/etc/dm/raima/journal]: _____________________________________

Enter actual Raima database home location [/etc/dm/raima]:_____________

Enter actual SSD (Storage Server Daemon) home location
[default is /etc/ssd]:__________________
```

```
Please enter the hostname of the Storage Server to be used for storing
database backups: _____________________________
```

Step 8. If you accept the default location for the mount point, AMASS bitfiles directory, and BFS Database backup directory, press <Enter>.

However, if you want DataMgr to create another directory, enter a new path.

```
Enter actual Storage Server Archive directory location
[/archive/FMSclients]:_________________

Enter actual DataMgr database backup directory location
[/archive/BFSDB_Backup]:_______________
```

Step 9. **Solaris only:**
The following message displays and can be ignored:

```
Could not read symbolic link /dev/bd.off
```

Step 10. If the BFS component is being installed, the script will attempt to detect the need to do a full BFS Database backup when the script finishes. Journaling requires a full BFS Database backup before the journal file is backup.

- If a full backup is required, the following appears:

```
Please do a full backup of your BFS Database before using any migrating
file systems. Press return to continue.
```

Step 11. Enter the license strings that were purchased. For information, see "Capacity- based License" on page 1-3.

Step 12. If you have installed DMFS and the script indicates that you should reboot (some systems require a reboot when the kernel is modified), then reboot when the script is complete.

IRIX only:
An error message similar to the following may appear before the reboot but may be ignored:

```
"Error loading module emass_mfs_: Can't
resolve all symbols in object."
```

Step 13. Proceed to the next chapter.

Startup File

The startup file performs the following tasks:

- Cleans up any migrations or reloads that were in progress when the system went down by running `/etc/dmfs/usr/utils/dmfsck`. It writes the bitfile ID of each file that it recovers to standard output, one per line. This utility can also be run manually. For information, refer to the Utility Reference chapter in *System Administrator's Guide to Using DataMgr.*
- Starts up the DataMgr daemons for the components that are installed on this machine. Startup uses the following daemons:

DataMgr Components	Daemons
BFS	bfsd
SLD	sld
SSD (on AMASS server)	ssd
DMFS (on all clients)	dmfsd

The table below lists the system startup files modified by DataMgr during installation. After modification, these system startup files run the `/etc/rc.dm` script, which contains the DataMgr startup commands.

Operating System	Startup File
AIX	/etc/inittab
HP-UX	/sbin/init.d
IRIX Solaris	/etc/init.d

Startup & Shutdown

Although the command to automatically start DataMgr at bootup is added to the system startup file during installation, a special startup is required, for example, after the system administrator performs system maintenance.

Step 1. To gracefully bring DataMgr down, run the script below. This stops DataMgr and unloads the DMFS driver on systems that support loadable device drivers.

```
# /etc/dm/usr/utils/killdmfs
```

Step 2. To perform a special start of DataMgr, run the `/etc/rc.dm` script.

NOTES

NOTES

3

Setup Tasks

Roadmap

Task	Refer To Chapter
Install AMASS before installing DataMgr.	
Verify that you have the necessary system requirements.	1
Install DataMgr.	2
Setup tasks: • Establish access for clients. • Edit cron jobs. • Change GUI colors and fonts.	3
Post installation tasks: • Deinstall and reinstall DataMgr. • Remove installation directory.	4

Establish Access for DMFS Clients

Step 1. DataMgr is shipped so that only the DataMgr administrator can select clients' file systems for management and can define migration criteria. By default, clients can only *view* managed file system selections and migration criteria.

Therefore, give clients `root` access if you want them to be able to add file systems and edit migration criteria. For information on file permission, refer to the `chmod` manual page.

Step 2. The BFS must be able to determine each client's IP address from its name. Accomplish this task with appropriate entries in either the DNS Database, NIS Database, or `/etc/hosts` file.

Schedule cron Jobs

During installation, DataMgr puts entries in the `root crontab` that perform the tasks described below. If the default schedule does not suit your site's needs, edit the `cron` file. For more information, see "Edit cron File" on page 3-10.

DMFS cron job

On all DMFS Clients, the `crontab` performs the following jobs:

- **Nightly at Midnight:** Runs the `/etc/dmfs/usr/utils/dmfsscan` utility, which migrates client files based on configured watermarks. For more information, see "Back Up Databases" on page 3-6, and refer to the Utility Reference in *System Administrator's Guide to Using DataMgr*.
- **Sunday at 1 a.m.:** Runs the `/etc/dmfs/usr/utils/dmfsaudit` utility, which synchronizes databases. For more information, refer to the Utility Reference chapter in *System Administrator's Guide to Using DataMgr*.
- **Nightly at 11:45 p.m.**: Runs the `/etc/dm/usr/utils/clearlog.sh` script, which backs up the SSD log to `/etc/dm/log/ssd/transfile` and truncates the file. The SSD log indicates each record ID, bitfile ID, and file name that has been migrated by DataMgr. It also contains a file that registers all the AMASS transactions. After running the `clearlog.sh` script, DataMgr saves the SSD log as `transfile.x.` For more information, see "Save SSD Logs" on page 3-9. The `clearlog` script also saves the current and last four system logs.

- **Nightly at 1 a.m.:** Runs the `/etc/dm/usr/scripts/clean_emasslogs` script to move the current set of logs to a file in the same directory with the same name, but appended with a timestamp. For more information, see "Edit cron File" on page 3-10. The clean_emasslogs script also saves seven old log files per log type plus the current log.

BFS cron job

On the BFS, the `crontab` performs the following jobs:

- **Nightly at 2 a.m.:** Runs the `/etc/bfs/usr/utils/bfsmaint -m -d` utility, which automatically replicates files (that are assigned to the File Replication Policy) or automatically migrates files (that are assigned to the Multi-tier Migration Policy). It also manages the retention and expiration of migrated files. For more information, see "Back Up Databases" on page 3-6, or refer to the Utility Reference chapter in *System Administrator's Guide to Using DataMgr*.

- **Nightly at 4 a.m.**: Runs the `/etc/bfs/usr/utils/bfsdb_backup` utility, which backs up the BFS Database. Normally a full backup is performed on Saturday morning and a partial backup is performed every other morning.

  For more information, see "Assign a Backup Volume" on page 3-7. For more information, refer to the Utility Reference chapter in *System Administrator's Guide to Using DataMgr.*

Back Up Databases

To effectively and efficiently manage your clients' file systems, coordinate the execution of the following utilities by scheduling them as cron jobs:

- `/etc/dmfs/user/utils/dmfsscan` — controls file migration.
- /`etc/bfs/usr/utils/bfsmaint` — copies and replicates migrated files according to the defined storage policy as well as manages the retention and expiration of migrated files.

ADIC recommends that you schedule these administrative tasks *after* the backup of a client's managed file systems has completed. Therefore, the sequence of execution should be as follows:

Step 1. Back up the DMFS client managed file system with the DataMgr `dmmode` command and one of the following:

- A third-party backup package.
- Or, the UNIX `tar` or `cpio` command.

Step 2. Edit, if needed, a `cron` job to back up the BFS Database with `/etc/bfs/usr/utils/bfsdb_backup`. For days and times, see "Schedule cron Jobs" on page 3-4.

While the BFS database is being backed up, the database is locked to prevent any modifications to the database until the backup is complete. Successful backups are sent to `/etc/dm/raima/log/bfsdb_backup.completed`.

If this nightly backup fails, DataMgr sends a mail message to `root` notifying the system administrator the status of the `bfsdb_backup`. Failed backups are sent to `/etc/dm/raima/log/bfsdb_backup.`*logfilename*.

You can recover a previous backup version of the database by using the `/etc/bfs/usr/utils/bfsdb_restore` utility that allows you to either restore the most recent backup or restore a specified version. For more information, refer to the Utility Reference chapter in *System Administrator's Guide to Using DataMgr*.

Step 3. Edit, if needed, a `cron` job to run the `/etc/dmfs/user/utils/dmfsscan` utility.

Step 4. Edit, if needed, a `cron` job to run the `/etc/bfs/usr/utils/bfsmaint` utility.

Assign a Backup Volume

Step 1. Restrict the BFS Database backup directory, located under `/archive/BFSDB_Backup` on AMASS, to a specified volume group. In our example, we want the backup to be assigned to volume group 600.

Note

Do not use volume group 0 (zero) for the BFS Database backups.

Step 2. Enter the AMASS `setvolgrp` commands to assign the `/archive/BFSDB_Backup` directory to volume group 600:

```
# cd /archive/BFSDB_Backup

# setvolgrp /archive/BFSDB_Backup 600
```

Step 3. To make sure the directory assignment is correct, enter the AMASS `vgroot` commands to view the relative paths for volume group 600.

```
# vgroot 600
```

Step 4. Assign volumes to volume group 600 with the AMASS `volgroup` command. For specific command information, refer to *Managing the AMASS File System*.

Save SSD Logs

DataMgr saves all file movement by the SSD to the `/etc/dm/log/ssd/transfile` log file. The log files are named `transfile.x`, where "`x`" is an age-related counter with the smaller number being the most current.

At installation, DataMgr schedules a nightly `cron` job that backs up the SSD log and saves the current transfile log to a `transfile.x` file and then creates a new file called `transfile`. However, the old `transfile.x` files are never deleted.

The format of this `transfile.x` is as follows:

```
hhmmss:MMDDYYYY type blocks copy BFID ftoken bfsserver logid errors
filepath
```

where:

Field	Description
hhmmss	Time of SSD log entry.
MMDDYYYY	Date of SSD log entry.
type	Creat = File was created in AMASS.
	Delet = File was deleted in AMASS.
	Renam = File was renamed in AMASS.
blocks	Number of 512-byte blocks. Valid only for Creat type.
copy	File replication copy number. Valid only for Creat type.
BFID	Bitfile ID identifies a file that has been archived to the AMASS file system. Valid for Creat type. and Delet type. For Renam types, this is the original bitfile name.

Field	Description
ftoken	AMASS RID (record ID).
bfsserver	BFS server name. Valid only for Creat type.
logid	Internal log ID number used by DataMgr.
errors	Zero indicates success; non-zero indicates failure.
filepath	Path name to file. For Renam type, this is the new filename.

To review these files in case of system errors, ADIC recommends that you do not delete these "old" `transfile.x` files, but place them in one of the following areas:

- A DataMgr-managed directory so they can be migrated to AMASS.
- Or, directly into an AMASS file system.

Edit cron File

If the default schedule does not suit your site's needs, edit the `cron` file:

Step 1. Log in as **`root`**.

Step 2. The default `crontab` entries for running the maintenance utilities are shown below:

In the `crontab` on all DMFS clients:

```
0 2 * * * /etc/dmfs/usr/utils/dmfsscan -aP

0 1 * * 0 /etc/dmfs/usr/utils/dmfsaudit -av
```

In the `crontab` on the BFS:

```
0 2 * * * /etc/bfs/usr/utils/bfsmaint -v -d 1 -m
0 4 * * 0-5 /etc/bfs/usr/utils/bfsdb_backup -v -n
0 4 * * 6 /etc/bfs/usr/utils/bfsdb_backup -v -n -f
```

Note

The `-n` option of `bfsdb_backup` causes `bfsdb_notify to` send a mail message to `root` notifying the system administrator of any `bfsdb_backup failure`.

In the `crontab` on all DataMgr components:

```
0 1 * * 0 /etc/dm/scripts/clean_emasslogs
0 4 * * 0-5 /etc/bfs/usr/utils/bfsdb_backup -v -n
0 4 * * 6 /etc/bfs/usr/utils/bfsdb_backup -v -n -f
```

Step 3. Modify the `crontab` entries.

Step 4. Save and exit this file.

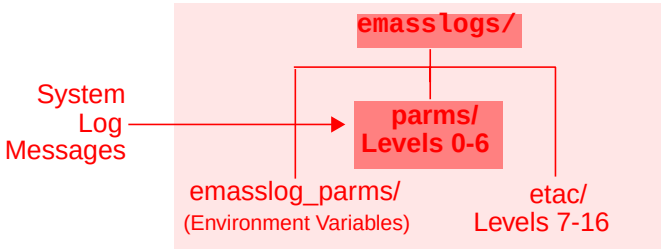
Logging

System log messages are designed to help:

- Assess system operation.
- Monitor performance.
- Check system health.
- Resolve problems.

Logging Hierarchy

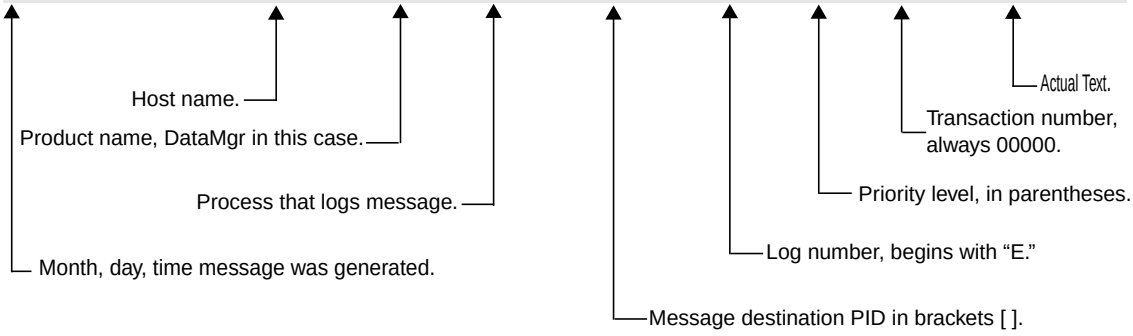
The figure below illustrates the logging hierarchy with the customer-specific `parms/` directory annotated.



Format of Messages

The format of a system log message is illustrated below:

```
Aug 14 1:16:12 nserv dataMgr dmfsd[1001]: E0006 (5) <00000> Message.
```



Priority Levels

All messages are contained within a single file for easy reading and problem solving. This file is located in the `/etc/dm/emasslogs/parms` directory.

Priority levels for the messages are described in the following tables:

Priority Level	Description
0	EMERGENCY: system panic.
1	ALERTS: startup, shutdown, and crash.
2	CRITICAL: system runs but in a degraded mode.
3	ERROR: unsuccessful operation.
4	WARNING: system resources are running short.
5	NOTICE: general system information.
6	INFORMATION: confirms a successful operation.

Priority Level	Description
7	DEBUG: messages.
8	ADIC technical support trace message.

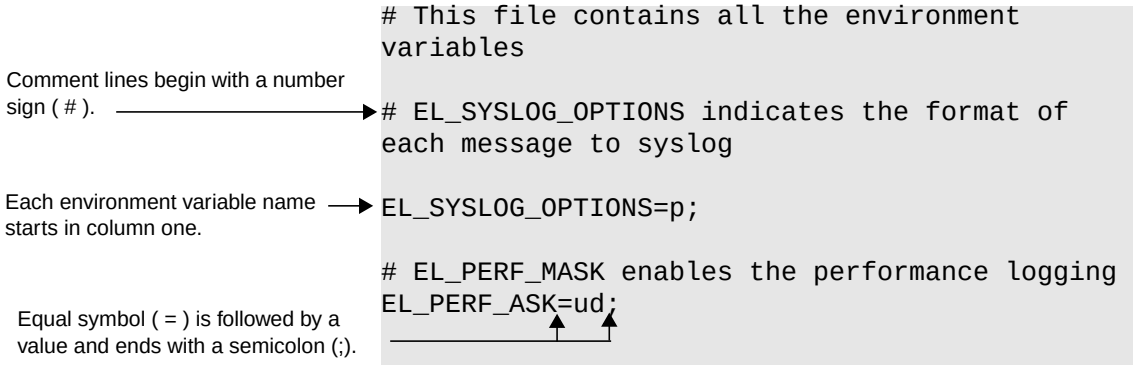
Modify Logging Characteristics

Several characteristics of a system log message can be modified with environment variables in the `/usr/dm/emasslogs/emasslog_parms` file that is created at install time.

When the `emasslog_parms` file is modified, run the `reload_dmlog` script, or stop and start the DMFS to activate the new options.

The `/etc/dm/scripts/reload_dmlog` script allows system administrator to specify which processes to reload with the new logging levels in the `emasslog_parms` file.

An example of the `emasslog_parms` file follows:



Modifiable Variables

The environment variables listed in the table below can be modified if required:

Environment Variable	Description
EL_SYSLOG_FACILITY (DataMgr defaults to 1) (AMASS defaults to 2)	Identifies the UNIX user-definable logging process that sends DataMgr messages to the system log. The options are listed below: 0 = LOG_LOCAL0 1 = LOG_LOCAL1 2 = LOG_LOCAL2 3 = LOG_LOCAL3 4 = LOG_LOCAL4 5 = LOG_LOCAL5 6 = LOG_LOCAL6 7 = LOG_LOCAL7
EL_SYSLOG_OPTIONS (defaults to p)	Indicates message destination. Use one, all, or any combination of options. Options are: p = use LOG_ PID. c = use LOG_CONS to log messages to console too. d = use LOG_NDELAY to log messages without delay.

Environment Variable	Description
EL_SYSLOG_MASK (defaults to ud)	The log mask used for priority 0-7 messages that are directed to the syslog. From the options available use one option or any option combined with "u." Options are: a = use LOG_ALERT for priority level 1 e = use LOG_EMERG for priority level 0. c = use LOG_CRIT for priority level 2 i = use LOG_INFO for priority level 6 n = use LOG_NOTICE for priority level 5 r = use LOG_ERR for priority level 3 u = use LOG_UPTO() to log all priority levels up to (). w= use LOG_WARNING for priority level 4 d = debug For example, • To mask all priority levels except priority level 0, which are emergency messages, edit the file as follows: `EL_SYSLOG_MASK=e;` • To mask all errors except zero "up to" priority level 3 (only levels 0, 1, 2, and 3 will display), edit the file as follows: `EL_SYSLOG_MASK=ur;`

Logging that shows which commands have been run, the time it ran, and whether or not the command succeeded are located in `/etc/dm/emasslogs/history/el_hist_00`.

The clean_emasslogs script will be added to the user's cron file upon installation. When this script is run it moves the current set of logs to a file in the same directory with the same name, but appended with a timestamp.Shown below is an example of a moved logs with the timestamp applied.

```
# ls /etc/dm/emasslogs/history
el_hist_00                          el_hist_00.1999:11:28:01:00:00
el_hist_00.1999:11:25:01:00:00      el_hist_00.1999:11:29:01:00:00
el_hist_00.1999:11:26:01:00:00      el_hist_00.1999:11:30:01:00:00
el_hist_00.1999:11:27:01:00:00      el_hist_00.1999:11:30:15:04:08
```

In addition to the current log, the default script saves up to seven old log files per log type,. To change this default, edit the MAX_COPY parameter in the clean_emasslogs script.

There are two ways to save all log files without deleting the old files:

Note

In both cases a directory must be created prior to modifying the clean_emasslogs script. The clean_emasslogs script does not create the directory.

- The first way to save logs is to create a clean_emasslogs directory in which to store the moved files. Then edit the clean_emasslogs script, SAVE_DIR parameter.

Note

Be aware that as files accumlate, the disk space is reduced.

- The second way to save logs and to make sure that there is always enough disk space, is to create a clean_emasslogs directory in AMASS with it's own volume group, in which to store the moved files. Then edit the `clean_emasslogs` script, `SAVE_DIR` parameter.

- To use the `reload_dmlog` script with the `emasslog_parms` file, follow the steps below:

  Step 1. Edit the `emasslog_parms` file to indicate which logging levels to turn on and off. An example is shown below:

```
EL_SYSLOG_MASK=ud;
```

In our example, we are turning on logging level nine.

Step 2. Save the `emasslog_parms` file.

Step 3. Run the `/etc/dm/scripts/reload_dmlog` script to activate the new settings. The options for the `reload_dmlog` script are described below:

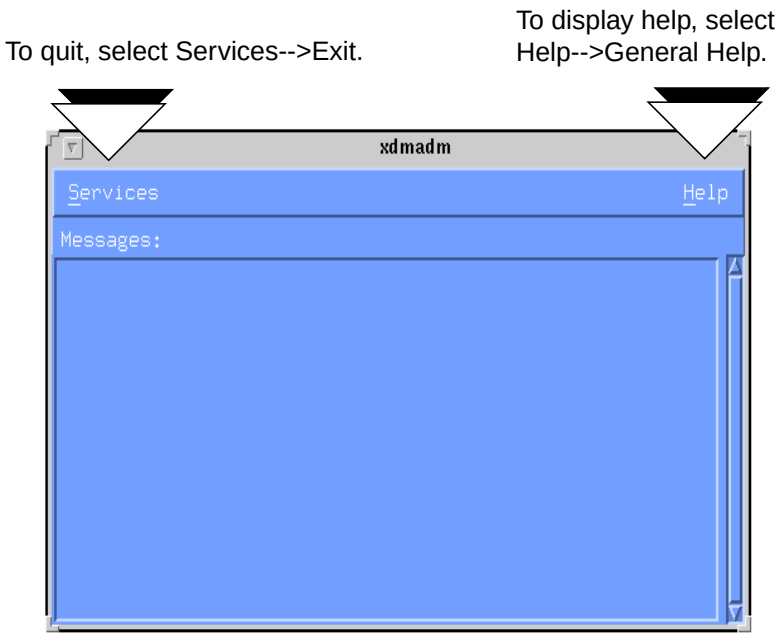
Option	Description
-u	Usage.
-a	Reload all DataMgr processes running.
-p *process*	Specify a single process ID.
-n *name*	Specify a single process name. If multiple processes have the same (e.g. `dmfsd`), then `-n dmfsd` will affect each process.

Start Administrative GUI

Step 1. To run the Administrative GUI, enter the `xdmadm` command.

```
# xdmadm
```

Step 2. The **Services menu** displays status and error messages.

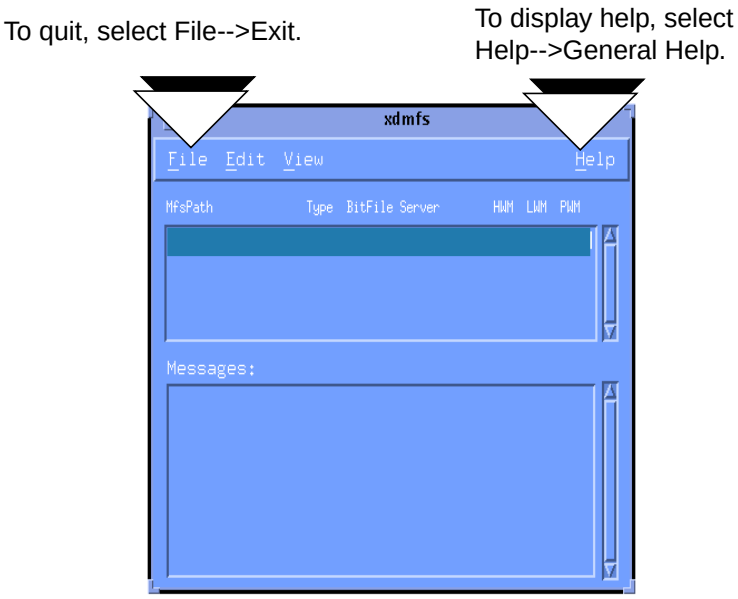


Start Client GUI

Step 1. To run the Client GUI, enter the `xdmfs` command.

```
# xdmfs
```

Step 2. The **Client Main** menu appears.



Change Colors and Fonts

When you start both GUIs, they will use default colors and fonts. To change the defaults file, follow the steps below:

Step 1. **Administrative GUI**: Make a backup copy of the `/etc/dm/usr/share/gui/server` file, which contains default values.

Step 2. **Client GUI**: Make a backup copy of the `/etc/dm/usr/share/gui/xdmfs` file, which contains default values.

Step 3. Use a text editor, such as vi, and edit the original file by substituting the desired colors or fonts.

```
server*font:          9x15
server*fontlist:      9x15
server*background:    steelblue
server*forground:     white
```

Caution

DO NOT CHANGE any other text in this file.

NOTES

4

Post Installation Tasks

Roadmap

Task	Refer To Chapter
Install AMASS before installing DataMgr.	
Verify that you have the necessary system requirements.	1
Install DataMgr.	2
Setup tasks: • Establish access for clients. • Edit cron jobs. • Change GUI colors and fonts.	3
Post installation tasks: • Deinstall and reinstall DataMgr. • Remove installation directory.	4

Deinstall DataMgr

If you no longer want to run DataMgr, you can deinstall it from your system by running the deinstallation script. It will remove all DataMgr directories and files.

Caution

Do not run `deinstall_dm` before upgrading or reinstalling DataMgr because it will totally remove all DataMgr files from your system. On the other hand, the `install_dm` script will remove just the files it needs to before reinstalling DataMgr.

Step 1. To stop DataMgr, run the script below. This stops DataMgr and unloads the DMFS driver on systems that support loadable device drivers.

```
# /etc/dm/usr/utils/killdmfs
```

Step 2. Run the following script:

```
# /etc/dm/scripts/deinstall_dm
```

Reinstall DataMgr

If you upgrade a machine's operating system, you must reinstall DataMgr.

Step 1. Back up the DataMgr directories and files listed below. Depending on the DataMgr component installed, all of these directories may not exist on the same machine.

- /etc/dm
- /etc/dmfs
- /etc/bfs
- /etc/sld
- /etc/ssd

Step 2. When you reinstall DataMgr, both GUI default files (`/etc/dm/usr/share/gui/server` and `/etc/dm/usr/share/gui/xdmfs`) are replaced. These are the files that you modified if you made changes to the colors or fonts in the GUI. For steps on modifying this file, see "Change Colors and Fonts" on page 3-12.

Step 3. Because DataMgr installation is specific to the operating system, extract the appropriate files from the distribution CD. For instructions, see the "Installation" chapter.

Step 4. Stop DataMgr by running the script below. This stops DataMgr and unloads the DMFS driver on systems that support loadable device drivers.

```
# /etc/dm/usr/utils/killdmfs
```

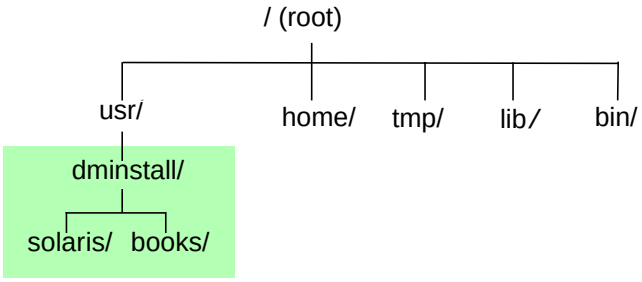
Step 5. Run the installation script, which detects the existence of DataMgr configuration files and will not overwrite them.

```
# /etc/dm/scripts/install_dm
```

Remove Load Directory

After the installation is complete, if space is limited you may want to remove the extracted DataMgr files from the machine where they were loaded.

Step 1. In our example, you have extracted Solaris-specific DataMgr files as well as the PDF books from the CD, your directory hierarchy would look similar to the illustration below:



Step 2. To remove the platform-specific installation directory (but not the `books` directory), enter the UNIX command below on the appropriate machine:

```
# cd /usr/dminstall

# rm -r solaris
```

where:

Option	Description
solaris	The name of your platform-specific load directory.

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