Global Array Manager™ Server Software

Installation Guide and User Manual

for Software Kit 5

MYLEX®

MOVING DATA ▶ SMARTER

Global Array Manager™ Server Software

Installation Guide and User Manual

for Software Kit 5

Form Number SA67-0048-00

Greetings

This manual describes the Mylex® Global Array Manager™ Server Software.

Requests for technical information about this and other Mylex products should be made to your Mylex authorized reseller or Mylex marketing representative.

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About This Manual

This installation guide covers the steps involved to install and use the Mylex® Global Array Manager™ Server Software.

In addition, this document covers installation and use of SNMP, SANArray Manager (SAM), GAM Event Logging, creation of GAM Server diskettes, and GAM Server for Failover or Failback in MSCS.

For information on defining and setting RAID (Redundant Array of Independent Disks) levels as well as configuration of the array, consult the *Global Array Manager Client* manual and the *RAID EzAssist Configuration Utility User Reference Guide* or *RAID EzAssist Configuration Utility Quick Configuration Guide.*

Conventions

Throughout the manual, the following conventions are used to describe user interaction with the product:

bold   The user must enter the bold text exactly as shown.

↵   Press the Enter key.

Enter   Press the key labeled "Enter" (or "Delete", etc.).

File->Run   Select the Run option from the pull-down menu activated when the File menu pad is selected.

☛ **Note**

   Supplementary information that can have an effect on system performance.

⚠ *Caution*

   Notification that a proscribed action has the *potential* to adversely affect equipment operation, system performance, or data integrity.

🛑 **WARNING**

   Notification that a proscribed action will *definitely* result in equipment damage, data loss, or personal injury.

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Introduction

Overview

This manual describes information on how to install the Global Array
Manager™ (GAM) Server software for several supported operating systems.

This chapter describes:

- GAM Server functions
- GAM Server requirements under supported operating systems

Global Array Manager Server software is delivered on the CD-ROM, and is
used to install GAM Server software on a server running a particular
network operating system.

☛ Note

> This manual assumes that the network administrator
> will be performing any of the installation procedures
> described herein.

NetWare®, Windows NT®, and Windows® 2000

Install GAM Server Software for Netware® 4.2/5.1/6, Windows NT® 4.0,
or Windows® 2000 directly from the CD-ROM. See the appropriate chapter
in this manual.

UnixWare® and Solaris®

Use one of the following methods to obtain GAM Server software for UnixWare® 7.x, Solaris® 7 for x86, or Solaris® 8 for x86:

- Retrieve the appropriate GAM Server image file from the CD-ROM and create a GAM Server installation diskette from the DOS image file.

- Insert the CD-ROM into a system running Windows NT® or Windows 2000 then click on "Create Software Diskettes" from the RAID Management Software Installation menu. See Appendix C, "Creating a GAM Server Installation Diskette" for details.

Linux

Before installing the GAM server for Linux on a Mylex PCI controller, you will need to first download and install the Mylex PCI operating system driver. You can get this from the appropriate web site (see Chapter 7, "Linux").

Global Array Manager Server Overview

Global Array Manager (GAM) Server Software is used to manage disk array subsystems attached to a Mylex Disk Array Controller.

Monitoring Functions

The Global Array Manager Server software collects and disseminates information on disk array status and resource utilization. The Global Array Manager (GAM) and SANArray Manger (SAM) Client software organize this information through a graphical display.

SNMP/DMI Support

The Global Array Manager Server software includes SNMP and DMI support, allowing stand-alone monitoring of performance and fault information. This is useful if a management package is already in use. Support for these protocols includes "read only" functions.

Management Functions

The Global Array Manager Server software executes the management instructions the GAM/SAM Client specifies. GAM Server software offers fault management, reliable messaging, and superior operating system support. GAM/SAM Client software manages or performs maintenance on individual disk arrays and drives (with the appropriate authentication), again through means of the graphical user interface.

Configuration Functions

GAM/SAM Client software provides disk array configuration and remote TCP/IP support functions. If your goal is monitoring and simple maintenance or messaging, Global Array Manager Server is sufficient for these tasks.

Requirements

The following information provides the hardware and software requirements for the Global Array Manager Server software under several network operating systems.

The person who will be performing the installation must have Administrator access for the system onto which GAM Server will be installed.

The instruction in this manual assume that the hardware installation for external or PCI products, the system configuration, and the disk array controller configuration are properly completed. If not, please see the *PCI Disk Array Controller Drivers Installation Guide and User Manual* and the *RAID EzAssist Configuration Utility User Reference Guide* or *RAID EzAssist Configuration Utility Quick Configuration Guide*. If you are installing the controller into an external product, please see the appropriate external installation guide. Complete the required procedures described in those manuals before proceeding with installation of GAM Server discussed herein.

Before starting, be sure to read through all applicable instructions to determine the specific requirements for this installation.

The correct environment must be present on the server for the Global Array Manager Server software to work properly. The environment is a combination of hardware and software which meets the following requirements:

Server Hardware and Software – NetWare

- A server running Novell® NetWare 4.2/5.1/6
- 10 MB of free hard disk space on the SYS: volume
- Properly installed and configured Mylex Disk Array Controller with the appropriate NetWare drivers
- (Optional) If SNMP participation is desired, SNMP support (available from third parties) should be installed.
- TCP/IP must be installed

Server Hardware and Software – Windows NT

- A server running Microsoft® Windows NT 4.0 Workstation, Server, or Enterprise edition on x86 with SP5 or SP6 installed

- 10 MB of free hard disk space

- Properly installed and configured Mylex Disk Array Controller with the appropriate Windows NT drivers from Software Kit 5.0

- TCP/IP must be installed

Server Hardware and Software – Windows 2000

- A server running Microsoft Windows 2000 on x86 Professional, Server, or Advanced Server with SP1 (optional)

- 10 MB of free hard disk space

- Properly installed and configured Mylex Disk Array Controller with the appropriate Windows 2000 drivers from Software Kit 5.0

- (Optional) If SNMP participation is desired, SNMP support (available from third parties) should be installed.

- TCP/IP must be installed

Server Hardware and Software – UnixWare

- A server running UnixWare (version 7.x on x86)

- 10 MB of free hard disk space

- Properly installed and configured Mylex Disk Array Controller with the appropriate UnixWare drivers from Software Kit 5.0

- TCP/IP must be installed

Server Hardware and Software – Solaris 7/8 on x86

- A server running Solaris 7/8 on x86

- 10 MB of free hard disk space

- Properly installed and configured Mylex Disk Array Controller with the appropriate Solaris drivers or Sun MLX driver from Software Kit 5.0

- TCP/IP must be installed

Server Hardware and Software – Linux

- A server running Linux version:
  - Red Hat®, 6.2, 7.0, and 7.1 (external products support only 7.1)
  - SuSe® 6.4, 7.1
  - Caldera® 2.4
  - Turbo Linux 6.0, 6.1
- 10 MB of free hard disk space
- Properly installed and configured Mylex Disk Array Controller with the appropriate Linux drivers found on the web site to be used with Software Kit 5.0 (see "Linux" on page 7-1)
- TCP/IP must be installed
- Inetd or Xinetd must be running
- SNMP (Optional)

NetWare

Overview

This chapter describes installation, verification, and startup of the Global Array Manager Server software for Novell® NetWare. The software is provided on the CD-ROM.

☛ **Note**

This chapter assumes that the network administrator for this site will be performing these installation procedures.

Global Array Manager Server Software for NetWare 4.2, 5.1, and 6

Installing Global Array Manager Server Software

The Global Array Manager (GAM) Server software for NetWare has an automated installation utility which is run from the NetWare *server console*. This utility places the Global Array Manager Server application in the correct server directory and modifies the NetWare startup file, AUTOEXEC.NCF, to launch the application when the server is started.

☞ **Note**

> These instructions assume that your CD-ROM drive is properly identified and that CDROM.NLM is loaded.

Follow the steps below to install the GAM server software. Note the difference between NetWare 5.1 and NetWare 4.2 for the first step.

1. If you are using NetWare 5.1, simply insert the Software Kit distribution CD-ROM into the file server's CD-ROM drive; the mount function is automatic. Go to Step 2.

    If you are using NetWare 4.2, mount the Software Kit distribution CD-ROM by typing the following command at the server console prompt:

    `CD MOUNT ALL`

    Make a written note of the volume label that will appear at the end of the messages during the load process. You will need to use the volume label later in the installation.

2. At the console, type the following command and press **Enter** to run the installation.

    `: <Volume Label>:gam\netware\install`

    ☞ **Note**

    > Do not type **any** extension. Type only ....\install. For NetWare 4.2, replace <Volume Label> with the actual volume label you wrote down in Step 1.

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3. The Global Array Manager Server software installation screen displays.

   • To install the GAM Server software, select Install.

   • To cancel the installation, select Exit.

   As the software is installed, the server's AUTOEXEC.NCF file is updated to start the Global Array Manager Server application whenever the server runs this file.

4. Press the **Enter** key at the Update AUTOEXEC.NCF message.

5. Installation is complete. Edit AUTOEXEC.NCF as follows:

   Modify the GAMEVENT and GAMEVLOG lines manually. After each −h parameter, change the GAMEVENT line to include the IP addresses of the client systems you will use to record events. Modify the pathname and filename in the GAMEVLOG command line if you wish to. Refer to Appendix B, GAMEVENT, for more information.

6. Be sure to remove comment markers (such as the character #) from any command line which you intend to enable.

7. Save the modified AUTOEXEC.NCF and exit.

8. Create a user account called gamroot.

9. To load the GAM server components, see "Loading Global Array Manager Server Manually" on page 2-4 after verifying correct server software installation.

Running Global Array Manager Server

The Global Array Manager Server runs on the server and delivers the following information to the Global Array Manager Client:

   • Monitors the controller(s) and disks in the server.

   • Manages the controller(s) and associated disk subsystems in the server.

Loading Global Array Manager Server Manually

The Global Array Manager Server can be loaded manually from the NetWare server console prompt by typing the following two commands:

```
load gamserv ↵
```

```
load gamevent -h <IP Address or Name of Client>
(repeat...)
```

Loading Global Array Manager Server Automatically

The Global Array Manager Server can be custom-made to start up automatically on a NetWare server when it is restarted after installation of Global Array Manager. This capability will be available because the following two files will be automatically copied into AUTOEXEC.NCF, at the end of the file, during the GAM installation.

```
load gamserv
```

```
load gamevent -h <IP Address or Name of Client>
(repeat...)
```

Remember that you will need to edit the IP address line. See Enabling the Event Comment Line in the next section to add an IP address line, as needed.

Enabling the Event Comment Line

To enable event notification to GAM Clients, both local and remote, add "-h DNS_NAME" or "-h IP_NUMBER" to the end of the "load gamevent" line for each GAM Client and uncomment the line. DNS_NAME and IP_NUMBER are the workstation's Computer Name or IP Address. You can add up to 50 clients. To use "DNS _NAME," the "DNS_NAME" must be listed in the "etc/hosts" file or "DNS_NAME" must be resolved by DNS lookup.

Usage:

```
load gamevent -h <IP Address or Name of Client>
(repeat...)
```

For example:

```
load gamevent -h 192.128.2.3 -h 192.128.2.4
-h host1
```

Troubleshooting Server Software Installation

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Problem: **The message "Error in connecting selected server" is displayed or an error is encountered when trying to connect to a server.**

Check: Is the IP address correct?

Check: Is the server software, GAMSERV.NLM, installed and loaded on the server(s)? Use the following NetWare console command to verify that the GAMSERV module is loaded:

`modules GAMSERV` ↵

Check: Is the Ethernet connection good?

Check: Is TCP/IP set up correctly? Try Ping to find the server.

Problem: **Global Array Manager Server will not load.**

Check: Is the installation complete? The files GAMSERV.NLM, GAMDRV.NLM, and GAMEVENT.NLM should be contained in the SYS:SYSTEM directory of the server.

DMI CI Manual Configuration

Optional DMI CI Parameters

After the installation of the DMI CI subcomponent, you have the option to specify an additional parameter, known as the GAM IPC Port. The default IPC port number for the GAM Server driver and Mylex CI port is 43162; however, this number may be modified.

The IPC Port number for the GAM Server driver and the Mylex CI port number must match for proper communication. Therefore, if either the GAM Server driver port number or the Mylex CI port number is changed, be sure to change the other port number to match.

You can specify this parameter through the command line.

The full command line format of Mylex CI is:

```
mdacci [-p <Ipc port>]
```
-p is to specify the IPC port number by which the DMI CI component communicates with the GAM Driver.

☞ **Note**

If "GamIpcPort" is not specified, the default port number will be used.

Overview

This chapter describes installation, verification, and startup of the Global Array Manager (GAM) Server software for Microsoft Windows NT 4.0 (SP5 or SP6). The software is provided on the Software Kit CD-ROM.

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☛ **Note**

This chapter assumes that the network administrator for this site will be performing these installation procedures.

Global Array Manager Server Software for Windows NT 4.0

Installation Overview

Installation of the Global Array Manager Server component requires the Windows NT or Windows 2000 operating systems. (Please refer to "Windows 2000" on page 4-1 if you are using the Windows 2000 operating system.)

You may also choose to install GAM Client or SANArray Manager (SAM) Client at the same time, on the same system. Refer to the *Global Array Manager Client Software Installation Guide and User Manual* for GAM Client installation instructions. Refer to the *SANArray Manager Client Software Installation Guide and User Manual* for SAM Client installation instructions.

File List

Global Array Manager software is shipped on an accompanying distribution CD-ROM. The file list (and path) is as follows (where X: represents the drive letter of your CD-ROM drive):

X:\GAM\WINDOWS

```
_INST32I.EX_        DATA.TAG            SETUP.EXE
_ISDEL.EXE          DATA1.CAB           SETUP.INI
_SETUP.DLL          DATA1.HDR           SETUP.INS
_SYS1.CAB           LANG.DAT            SETUP.LID
_SYS1.HDR           LAYOUT.BIN
_USER1.CAB          OS.DAT
_USER1.HDR
```

Installing Global Array Manager Server Software

Follow the steps below to install GAM Server software for Windows NT 4.0.

1. Make sure TCP/IP is installed and functioning properly.

2. Insert the Software Kit CD-ROM into your CD-ROM drive.

    AutoRun will cause the CD-ROM to display the Mylex RAID
    Management Software Installation menu (Figure 3-1).

    ☞ **Note**

    > If Autorun does not automatically start, locate the
    > Autorun.exe file on your CD-ROM drive and double-
    > click the file.

Figure 3-1. Mylex RAID Management Software Installation Menu

3. Click "Install Global Array Manager." This option is used to install
    GAM Server.

Global Array Manager Setup loads the installation wizard
(Figure 3-2).
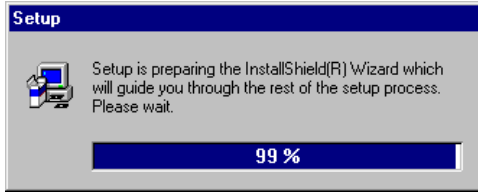
Figure 3-2. Loading the Installation Wizard

4. After a few moments, the Welcome dialog box opens (Figure 3-3).
    After reading the Welcome information, click Next to proceed with the
    installation, or click Cancel to end the installation procedure and return
    to the menu.

Figure 3-3. Welcome Dialog Box

5. When the Mylex Software License Agreement screen displays, click
    Yes to accept the terms of the agreement and continue.

    If you click No, you will not be allowed to continue GAM Server
    installation.

The Select Components dialog box opens as shown in Figure 3-4.
At this point you will select the component(s) you wish to install.

Figure 3-4. Select Components to Install

6. To select Global Array Manager Server for installation, click the box to
   check the Global Array Manager Server option.

   ☛ **Note**

   > You may also choose to install Global Array Manager
   > Client or SANArray Manager Client at this time. If
   > you wish to install **both** GAM Server **and** GAM
   > Client or SAM Client, please refer to either the *Global
   > Array Manager Client Installation Guide and User
   > Manual* for GAM Client installation instructions or
   > *SANArray Manager Client Installation Guide and
   > User Manual* for SAM Client installation instructions.

7. When you select and highlight the Global Array Manager Server
   option, the Change button becomes active to allow you to choose a sub-
   component.

8. Click Change if you want to see the Select Sub-components screen (Figure 3-5). The Program Files will normally be selected if DMI CI applications were installed, such as Intel LDCM. DMI and/or SNMP may be selected or deselected as needed:

    •   If you select DMI, Setup copies the DMI files to the server directory, but it does not configure the DMI files. Please refer to "DMI CI Manual Configuration" and "Optional DMI CI Parameters" near the end of this section.

    •   If you select SNMP, the SNMP files are copied to the server directory and configured automatically. For more information about SNMP and Optional SNMP parameters supported in Mylex products, see Appendix A.

    ☞ **Note**

    The DMI and SNMP selections may not be present in the Select Sub-components screen. If one or both are not displayed, then the setup has detected that your system does not support one or both of them.
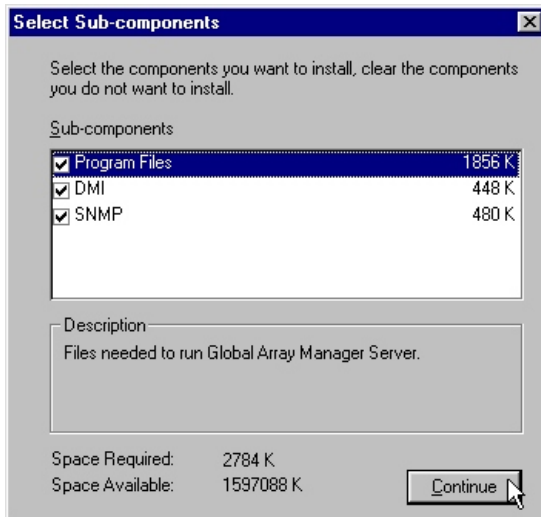
Figure 3-5. Sub-Components List

9. Make your subcomponent selections, then click Continue to return to the "Select Components" dialog box (Figure 3-4).

10. Click Next from the "Select Components" dialog box to continue with the installation.

11. Special Condition: GAM Server Installation

If setup finds a previous installation of GAM Server software, you will see the following message (Figure 3-6).
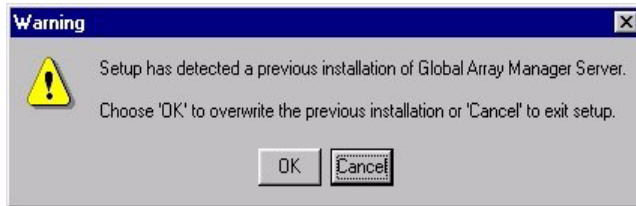
Figure 3-6. Previous GAM Server Found

Click OK to replace the existing GAM Server and GAM Driver with the new installation, OR

Click Cancel to retain your existing GAM Server/GAM Driver installation. Since only one GAM Server/GAM Driver can be present on a server system, setup will exit if you click Cancel.

12. The Installation Summary screen (Figure 3-7) summarizes the components and subcomponents you've selected for installation.

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Click Next to continue, or click Back to change selected components.
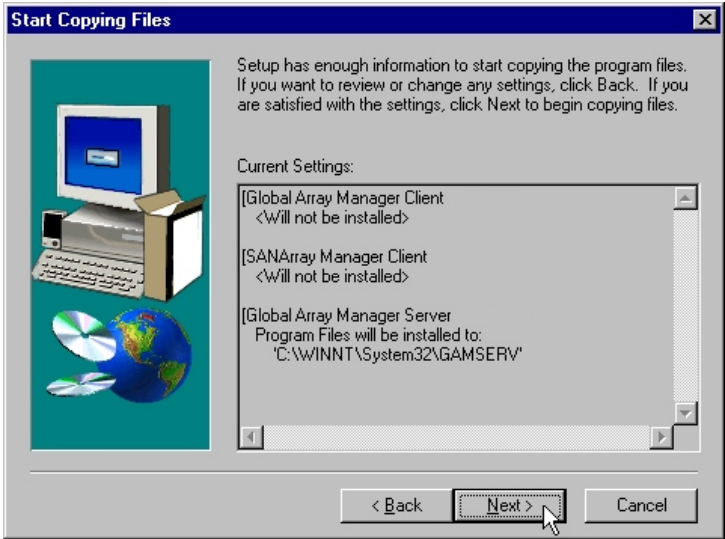
Figure 3-7. Installation Summary Screen

13. *Special Condition: Old PCI Controller Drivers*

If setup finds that an installed PCI driver for any of your Mylex PCI RAID Controllers is older than version 6.90-00, you will see a message of the following type[1] (Figure 3-8):

Figure 3-8. Error – PCI Driver Must Be Version 6.90-00 or Higher

If you will use GAM Server only with Mylex *External* RAID Controllers, you should choose to continue installation by clicking OK.

However, if you will use GAM Server with Mylex *PCI* RAID Controllers, your PCI Controller Drivers must be version 6.90-00 or higher in order to install and run GAM Server. Click Cancel and setup will exit.

After clicking Cancel, follow the instructions in the *PCI Disk Array Controller Drivers Installation Guide and User Manual* to update your PCI driver(s). Then rerun GAM Server installation as described herein.

If the above Special Condition does not apply, installation will continue. Go on to Step 14.

---

1. The actual driver identified in the message will depend on which driver is found to be older than version 6.90-00.

14. During installation, files are decompressed and copied from the installation CD-ROM to the destination folder (Figure 3-9).

   Wait for this process to complete.
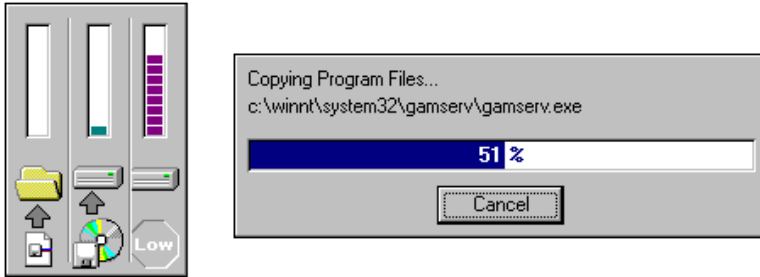
Figure 3-9. Installation Progress Display

15. If the Setup function detects an existing Global Array Manager Server configuration file, the following Configuration File Selection/ Modification dialog box opens so that you can select whether to modify the existing file or not (Figure 3-10).
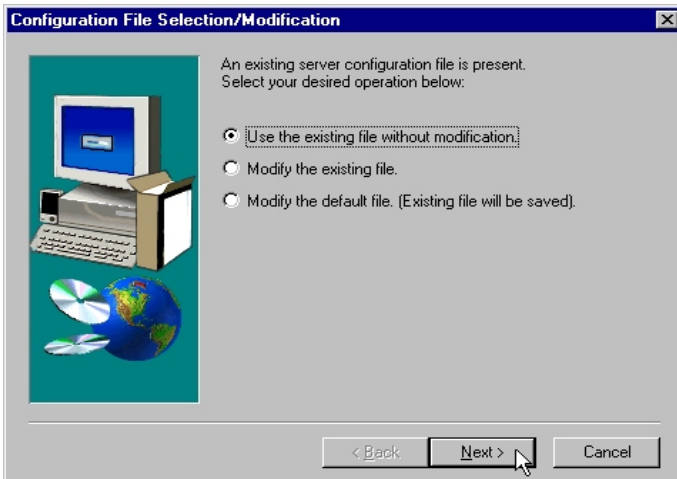
Figure 3-10. Modify Server Configuration File Dialog Box

   If no existing configuration file is found, Setup will create one. Proceed to Step 16.

- If you select "Use the existing file without modification" and click Next, your existing configuration file will continue to be used. Skip ahead to Step 17.

- If you select "Modify the existing file" and click Next, your configuration file will be changed to include features new to this version of GAM Server. Proceed to Step 16.

- If you select "Modify the default file (Existing file will be saved)" and click Next, a new default configuration file will be used which includes features new to this version of GAM Server. Your original file will also be saved unchanged. Proceed to Step 16.

16. The Enter Event Recipients dialog box opens (Figure 3-11). Add IP addresses or node names of client workstations that will receive event notifications from this server. Enter up to 25-50 IP addresses or node names (limit is 1028 bytes) with a space separating each entry.
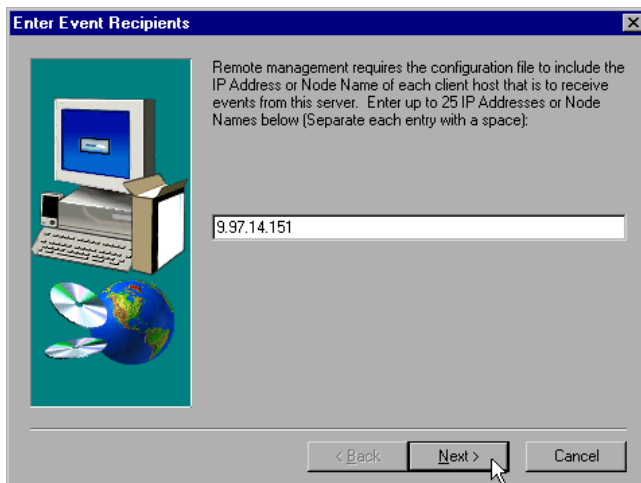
Figure 3-11. Enter Event Recipients Dialog Box

☞ **Note**

Event notifications cannot be received by a client unless its IP address or node name is identified. You may include additional IP addresses or node names by editing the GAMSCM.INI (configuration file) later. See Appendix B "GAMEVENT."

Click Next. If you did not enter any IP addresses or node names in the Enter Event Recipients dialog box, a message appears asking if you want to continue. Click Yes to continue or No to go back and enter IP addresses or node names.

When IP addresses or node names are complete and you click Yes, the Server Event Logging dialog box opens (Figure 3-12). Select "Enable event logging on the server machine" and click Next to enable event logging. See Appendix B, "GAMEVENT," to configure event logging.
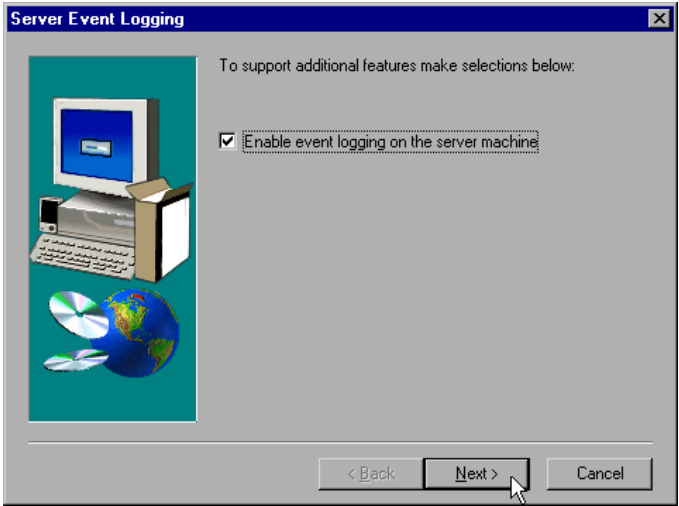
Figure 3-12. Server Event Logging Dialog Box

17. The full path for the configuration file is identified for future reference (Figure 3-13).
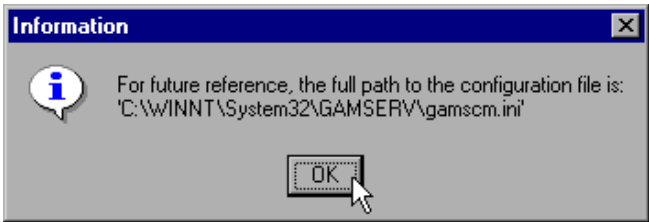
Figure 3-13. Directory Path Information for gamscm.ini File

Click OK.

18. The Setup Complete dialog box displays (Figure 3-14).
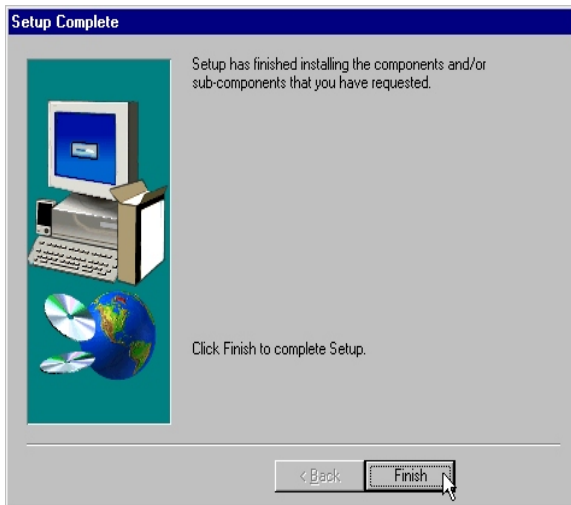
Figure 3-14. Setup Complete.

Setup has finished copying files to your computer.

Click Finish.

19. Create a user account called gamroot.

Setup of Global Array Manager Server is complete.

Running Global Array Manager Server

The Global Array Manager Server runs on the server and delivers the following information to the Global Array Manager Client:

- Monitors the controller(s) and disks in the server.
- Manages the controller(s) and associated disk subsystems in the server.

The automatic installation procedure for Windows NT's Global Array Manager Server loads the GAM Server component as a "service." This service will load automatically at system startup. No special procedure is required to run the GAM Windows NT Server.

To verify that this service has started, go to **Start->Settings->Control Panel->Services**. Find the Mylex GAM Server name. The word "Started" should appear beside it.

Troubleshooting Server Software Installation

Problem: **The message "Error in connecting selected server" is displayed or an error is encountered when trying to connect to a server.**

Check: Is the Ethernet cable connection good?

Check: Are the various port numbers set correctly?

Check: Is the IP address of the Server correct?

Check: Is TCP/IP set up correctly? Try Ping to find the server.

Problem: **Global Array Manager Server does not load.**

Check: Did all of the server files load to the destination directories?
Do you have sufficient disk space for the installation?
A list of files needed for operation is given in Chapter 1.
If necessary, reinstall the software.

DMI CI Manual Configuration

DMI CI files (also known as DMI files) are available for the Mylex Disk Array Controller running under Windows NT. The DMI CI will act as a general monitor to locate events such as hard disk status, driver identification, etc.

DMI CI files must be manually configured after they are copied into the server directory by the GAM server installation.

DMI is selected in the sub-component dialog box during the Global Array Manager Server installation if the DMI application such as Intel LDCM was installed. The DMI subcomponent can also be installed by itself via the server installation utility.

☛ **Note**

> When installation is complete, see "Optional DMI CI Parameters" at the end of this section.

Use the SRVCCFG.EXE utility to configure the DMI files.

You will need to run the following command line from the GAMSERV directory to install the mdacci service manually:

srvccfg MLXDMISRV MYLEXDMI %SystemRoot%\system32\gamserv\mdacci.exe

At this point, you have registered the CI as a service. Now, you need to modify the dependencies of the DMI CI service to make sure the GAM driver and Windows DMI Service Provider can be launched before the DMI CI service at system boot time. This is done by entering the following command line:

srvccfg depend MLXDMISRV gamscm;Win32sl

☛ **Note**

> "gamscm" is the service name of the GAM Server/ Driver. "Win32sl" is the service name of the Windows DMI Service Provider.

DMI CI Files

There are three DMI CI files:

- MDAC.MIF
- MDACCI.EXE
- SRVCCFG.EXE

These files will be copied into the appropriate directory path during the GAM Server installation process:

- %SystemRoot%\system32\gamserv\mdac.mif
- %SystemRoot%\system32\gamserv\mdacci.exe
- %SystemRoot%\system32\gamserv\srvccfg.exe

If the GAM Server installation detects the system environment variable (**%win32dmipath%**) created by Intel®'s LANDesk® Server Manager, these files will also be copied into the following locations:

- %win32dmipath%\mifs\mdac.mif
- %win32dmipath%\bin\mdacci.exe

☛ Note

> If you are using the Intel LANDesk Service Manager, you do not need to manually configure mdacci.exe. Intel's application will take care of this.

Optional DMI CI Parameters

After the installation of the DMI CI subcomponent, you have the option to install an additional parameter, known as the GAM IPC Port. The default IPC port number for the GAM Server driver and Mylex CI port is 43162; however, this number may be modified.

☛ Note

> The IPC Port number for the GAM Server driver and the Mylex CI port number must match for proper communication. Therefore, if either the GAM Server driver port number or the Mylex CI port number changes, be sure to change the other port number to match.

How to Specify the Parameter

You can specify the parameters in the system registry. After the installation of Mylex CI onto a WIN32 system, see the registry key as follows:

`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\MLXDMISRV`

Follow these easy steps to specify the Mylex CI parameter:

1. Access the System Registry, locate the key "MLXDMISRV" according to the above path.

2. Add a key, "Parameters," under "MLXDMISRV".

3. Add a key, "ExtraParameters," under "Parameters."

4. Add a DWORD value, "GamDriverPort," under "ExtraParameters", so you can specify the IPC port number by which the DMI CI component communicates with GAM driver, as done for -p in the NetWare command line in "Optional DMI CI Parameters" in Chapter 2.

☛ **Note**

> If "GamIpcPort" is not specified, the default port number will be used.

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Windows 2000

Overview

This chapter describes installation, verification, and startup of the Global
Array Manager (GAM) Server software for Microsoft Windows 2000.
The software is provided on the Software Kit CD-ROM.

☛ **Note**

This chapter assumes that the network administrator
for this site will be performing these installation
procedures.

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Global Array Manager Server Software for Windows 2000

Installation Overview

Installation of the Global Array Manager Server component requires the Windows 2000 or Windows NT operating systems. (Please refer to "Windows NT" on page 3-1 if you are using the Windows NT operating system.)

You may also choose to install GAM Client or SANArray Manager (SAM) Client at the same time, on the same system. Refer to the *Global Array Manager Client Software Installation Guide and User Manual* for GAM Client installation instructions. Refer to the *SANArray Manager Client Software Installation Guide and User Manual* for SAM Client installation instructions.

File List

Global Array Manager software is shipped on an accompanying distribution CD-ROM. The file list (and path) is as follows (where X: represents the drive letter of your CD-ROM drive):

X:\GAM\WINDOWS

```
_INST32I.EX_       DATA.TAG           SETUP.EXE
_ISDEL.EXE         DATA1.CAB          SETUP.INI
_SETUP.DLL         DATA1.HDR          SETUP.INS
_SYS1.CAB          LANG.DAT           SETUP.LID
_SYS1.HDR          LAYOUT.BIN
_USER1.CAB         OS.DAT
_USER1.HDR
```

Installing Global Array Manager Server Software

Follow the steps below to install GAM Server software for Windows 2000.

1. Make sure TCP/IP is installed and functioning properly.

2. Insert the Software Kit CD-ROM into your CD-ROM drive.

   AutoRun will cause the CD-ROM to display the Mylex RAID Management Software Installation menu (Figure 4-1).

Figure 4-1. Mylex RAID Management Software Installation Menu

3. Click "Install Global Array Manager." This option is used to install GAM Server.

   Global Array Manager Setup loads the installation wizard (Figure 4-2).
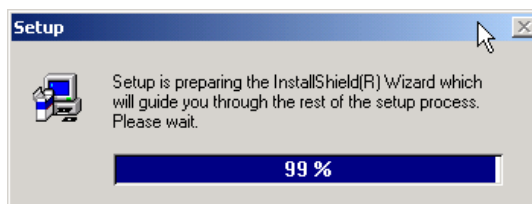
Figure 4-2. Loading the Installation Wizard

4. After a few moments, the Welcome dialog box displays (Figure 4-3). After reading the Welcome information, click Next to proceed with the installation, or click Cancel to end the installation procedure and return to the menu.

Figure 4-3. Welcome Dialog Box

5. When the Mylex Software License Agreement screen appears, click Yes to accept the terms of the agreement and continue.

    If you click No, you will not be allowed to continue GAM Server installation.

The Select Components dialog box is displayed as shown in Figure 4-4. At this point you will select the component(s) you wish to install.
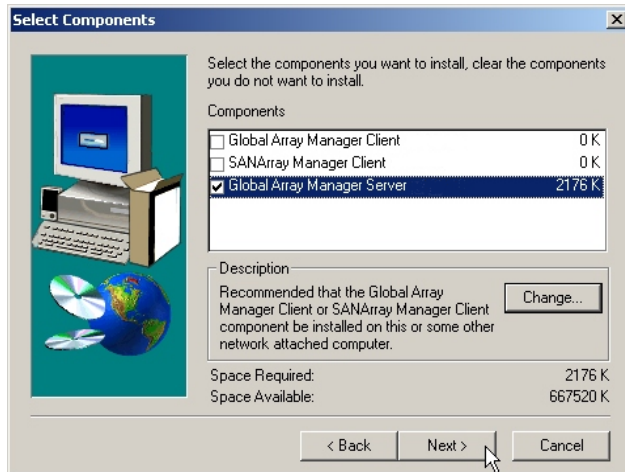
Figure 4-4. Select Components to Install

6. To select Global Array Manager Server for installation, click the box to check the Global Array Manager Server option.

☛ **Note**

> You may also choose to install Global Array Manager Client or SANArray Manager Client at this time. If you wish to install **both** GAM Server **and** GAM Client or SAM Client, please refer to either the *Global Array Manager Client Installation Guide and User Manual* for GAM Client installation instructions or *SANArray Manager Client Installation Guide and User Manual* for SAM Client installation instructions.

7. When you select and highlight the Global Array Manager Server option, the Change button becomes active to allow you to choose a sub-component.

8. Click Change if you want to see the Select Sub-components screen
    (Figure 4-5). The Program Files will normally be selected. DMI and/or
    SNMP may be selected or deselected as needed:

    • If you select DMI, Setup copies the DMI files to the server directory,
       but it does not configure the DMI files. Please refer to "DMI CI
       Manual Configuration" and "Optional DMI CI Parameters" near the
       end of this section.

    • If you select SNMP, the SNMP files are copied to the server
       directory and configured automatically. For more information about
       SNMP and Optional SNMP Parameters support in Mylex products,
       see Appendix A.

       ☛ **Note**

       The DMI and SNMP selections may not be present in
       the Select Sub-components screen. If one or both are
       not displayed, then the setup has detected that your
       system does not support one or both of them.
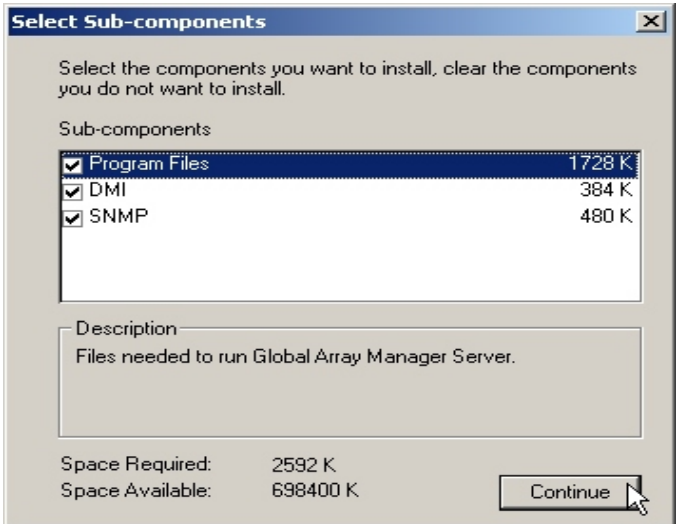
Figure 4-5. Sub-Components List

9. Make your subcomponent selections, then click Continue to return to the "Select Components" dialog box (Figure 4-4).

10. Click Next from the "Select Components" dialog box to continue with the installation.

11. ***Special Condition: GAM Server Installation***

    If setup finds a previous installation of GAM Server software, you will see the following message (Figure 4-6):
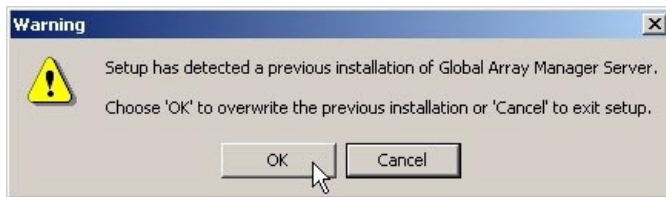
Figure 4-6. Previous GAM Server Found

    Click OK to replace the existing GAM Server and GAM Driver with the new installation, OR

    Click Cancel to retain your existing GAM Server/GAM Driver installation. Since only one GAM Server/GAM Driver can be present on a server system, setup will exit if you click Cancel.

12. The Installation Summary screen (Figure 4-7) summarizes the components and subcomponents you've selected for installation.

Click Next to continue, or click Back to change selected components.
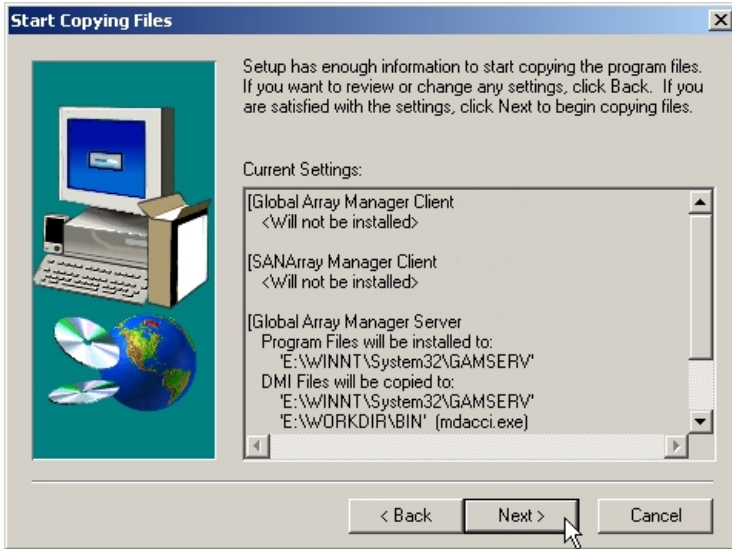
Figure 4-7. Installation Summary Screen

13. *Special Condition: Old PCI Controller Drivers*

If setup finds that an installed PCI driver for any of your Mylex PCI RAID Controllers is older than version 6.90-00, you will see a message of the following type[1] (Figure 4-8):
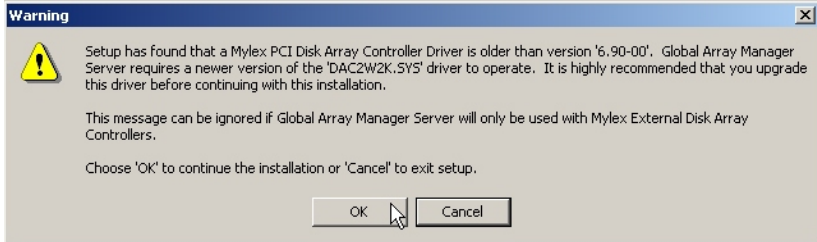
Figure 4-8. Error – PCI Driver Must Be Version 6.90-00 or Higher

If you will use GAM Server only with Mylex *External* RAID Controllers, you should choose to continue installation by clicking OK.

However, if you will use GAM Server with Mylex *PCI* RAID Controllers, your PCI Controller Drivers must be version 6.90-00 or higher in order to install and run GAM Server. Click Cancel and setup will exit.

After clicking Cancel, follow the instructions in the *PCI Disk Array Controller Drivers Installation Guide and User Manual* to update your PCI driver(s). Then rerun GAM Server installation as described herein.

If the above Special Condition does not apply, installation will continue. Go on to Step 14.

---

1. The actual driver identified in the message will depend on which driver is found to be older than version 6.90-00.

14. During installation, files are decompressed and copied from the installation CD-ROM to the destination folder (Figure 4-9).

    Wait for this process to complete.
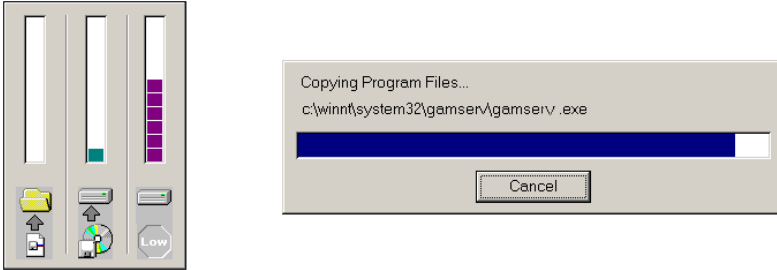
Figure 4-9. Installation Progress Display

15. If the Setup function detects an existing Global Array Manager Server configuration file, the following Configuration File Selection/Modification dialog box opens so that you can select whether or not to modify the existing file (Figure 4-10).
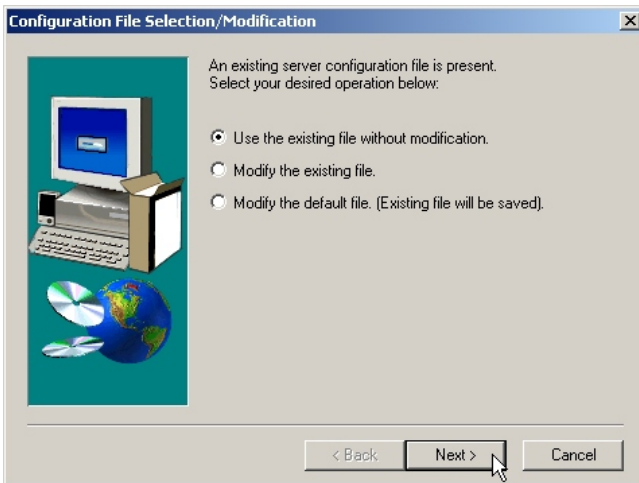
Figure 4-10. Modify Server Configuration File Dialog Box

If no existing configuration file is found, Setup will create one. Proceed to Step 16.

- If you select "Use the existing file without modification" and click Next, your existing configuration file will continue to be used. Skip ahead to Step 17.

- If you select "Modify the existing file" and click Next, your configuration file will be changed to include features new to this version of GAM Server. Proceed to Step 16.

- If you select "Modify the default file. (Existing file will be saved.)" and click Next, a new default configuration file will be used which includes features new to this version of GAM Server. Your original file will also be saved unchanged. Proceed to Step 16.

  "Modify the default file. (Existing file will be saved)." must be selected if you want to use the External Client controllers.

16. The Enter Event Recipients dialog box opens (Figure 4-11). Add IP addresses or node names of client workstations that will receive event notifications from this server. Enter up to 25-50 IP addresses or node names (limit is 1028 bytes) with a space separating each entry.
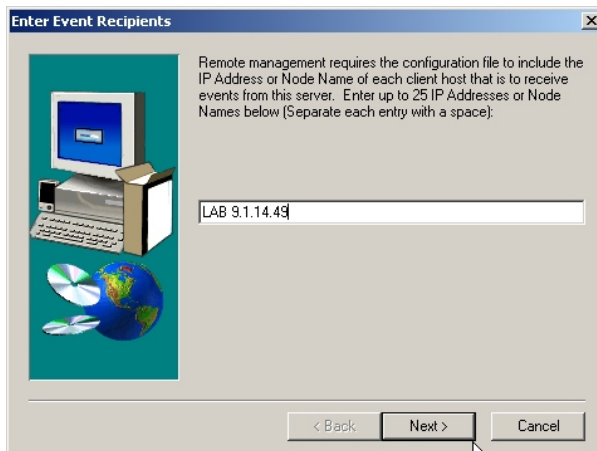
Figure 4-11. Enter Event Recipients Dialog Box

☛ **Note**

> Event notifications cannot be received by a client unless its IP address or node name is identified. You may include additional IP addresses or node names by editing the GAMSCM.INI (configuration file) later. See Appendix B "GAMEVENT."

Click Next. If you did not enter any IP addresses or node names in the Enter Event Recipients dialog box, a message appears asking if you want to continue. Click Yes to continue or No to go back and enter IP Addresses or node names.

When IP addresses or node names are complete and you click Yes, the Server Event Logging dialog box opens (Figure 4-12). Select "Enable event logging on the server machine" and click Next to enable event logging. See Appendix B, "GAMEVENT," to configure event logging.
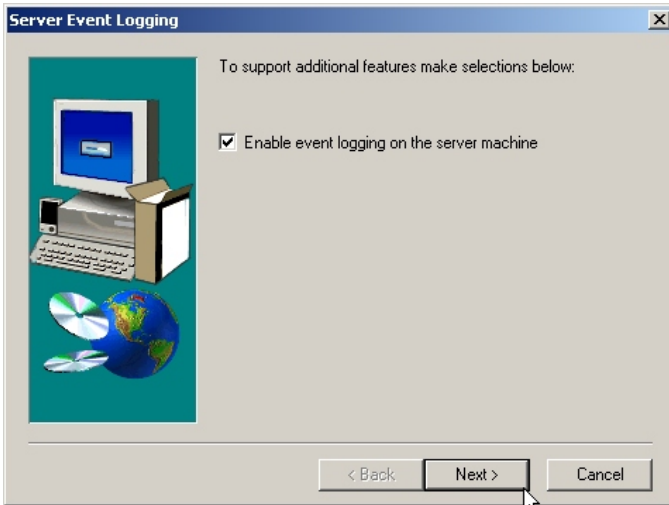
Figure 4-12. Server Event Logging Dialog Box

17. The full path for the configuration file is identified for future reference (Figure 4-13).
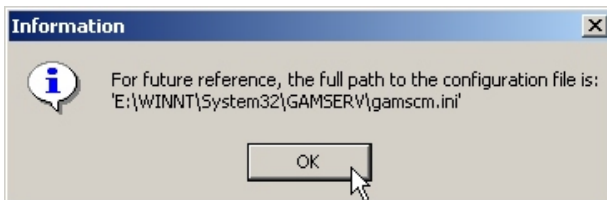
Figure 4-13. Directory Path Information for gamscm.ini File

Click OK.

18. The Setup Complete dialog box displays (Figure 4-14).

Figure 4-14. Setup Complete.

Setup has finished copying files to your computer.

Click Finish.

19. Create a user account called gamroot.

Setup of Global Array Manager Server is complete.

Running Global Array Manager Server

The Global Array Manager Server runs on the server and delivers the following information to the Global Array Manager Client:

- Monitors the controller(s) and disks in the server.
- Manages the controller(s) and associated disk subsystems in the server.

The automatic installation procedure for Windows 2000's Global Array Manager Server loads the GAM Server component as a "service." This service will load automatically at system startup. No special procedure is required to run the GAM for Windows 2000 on the Server.

To verify that this service has started, go to **Start->Settings->Control Panel->Administrative Tools->Services**, then check under Name File, Mylex GAM Server, and Status to see if it has started.

Troubleshooting Server Software Installation

Problem: **The message "Error in connecting selected server" is displayed or an error is encountered when trying to connect to a server.**

Check: Is the Ethernet connection good?

Check: Are the various port numbers set correctly?

Check: Is the IP address of the Server correct?

Check: Is TCP/IP set up correctly? Try Ping to find the server.

Problem: **Global Array Manager Server does not load.**

Check: Did all of the server files load to the destination directories?
Do you have sufficient disk space for the installation?
A list of files needed for operation is given in Chapter 1.
If necessary, reinstall the software.

DMI CI Manual Configuration

DMI CI files (also referred to as DMI files) are available for the Mylex Disk Array Controller running under Windows 2000. The DMI CI will act as a general monitor to locate events such as hard disk status, driver identification, etc.

DMI files must be manually configured after they are copied into the server directory by the GAM server installation.

DMI is selected in the sub-component dialog box during the Global Array Manager Server installation. The DMI subcomponent can also be installed by itself via the server installation utility.

☞ **Note**

> When installation is complete, see "Optional DMI CI Parameters" at the end of this section.

Use the SRVCCFG.EXE utility to configure the DMI files.

You will need to run the following command line from the GAMSERV directory to install the mdacci service manually:

srvccfg MLXDMISRV MYLEXDMI %SystemRoot%\system32\gamserv\mdacci.exe

At this point, you have registered the CI as a service. Now, you need to modify the dependencies of the DMI CI service to make sure the GAM driver and Windows DMI Service Provider can be launched before the DMI CI service at system boot time. This is done by entering the following command line:

srvccfg depend MLXDMISRV gamscm;Win32sl

☞ **Note**

> "gamscm" is the service name of the GAM Server/ Driver. "Win32sl" is the service name of the Windows DMI Service Provider.

DMI Files

There are three DMI files:

- MDAC.MIF
- MDACCI.EXE
- SRVCCFG.EXE

These files will be copied into the appropriate directory path during the GAM Server installation process:

- %SystemRoot%\system32\gamserv\mdac.mif
- %SystemRoot%\system32\gamserv\mdacci.exe
- %SystemRoot%\system32\gamserv\srvccfg.exe

If the GAM Server installation detects the system environment variable (**%win32dmipath%**) created by Intel®'s LANDesk® Server Manager, these files will also be copied into the following locations:

- %win32dmipath%\mifs\mdac.mif
- %win32dmipath%\bin\mdacci.exe

> ☛ **Note**
>
> If you are using Intel LANDesk Service Manager, you do not need to manually configure mdacci.exe. Intel's application will take care of this.

Optional DMI CI Parameters

After the installation of the DMI CI subcomponent, you have the option to install an additional parameter, known as the GAM IPC Port. The default IPC port number for the GAM Server driver and Mylex CI port is 43162; however, this number may be modified.

> ☛ **Note**
>
> The IPC Port number for the GAM Server driver and the Mylex CI port number must match for proper communication. Therefore, if either the GAM Server driver port number or the Mylex CI port number changes, be sure to change the other port number to match.

How to Specify the Parameter

You can specify the parameters in the system registry. After the installation of Mylex CI onto a WIN32 system, you can see the registry key as follows:

`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\MLXDMISRV`

Follow these easy steps to specify the Mylex CI parameter:

1. Access the System Registry, locate the key "MLXDMISRV" according to the above path.

2. Add a key, "Parameters," under "MLXDMISRV".

3. Add a key, "ExtraParameters" under "Parameters."

4. Add a DWORD value, "GamDriverPort," under "ExtraParameters," so you can specify the IPC port number by which the DMI component communicates with GAM driver, as done for -p in the NetWare command line, see "Optional DMI CI Parameters" in Chapter 2.

☛ **Note**

> If "GamIpcPort" is not specified, the default port number will be used.

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UnixWare

Overview

This chapter describes information about the following installation, verification, and startup of the Global Array Manager Server software for UnixWare 7.1. The software is provided on the appropriate Software Kit distribution CD-ROM with a file to create a diskette.

☞ **Note**

This chapter assumes that the network administrator for this site will be performing these installation procedures.

Global Array Manager Server Software for UnixWare 7.1

Creating the Global Array Manager Server Diskette

Before installing the GAM Server for UnixWare, a diskette must be created according to the instructions in Appendix C "Creating a GAM Server Installation Diskette."

This diskette will be used in the next section wherever instructed to insert the "GAM Server diskette for UnixWare."

☛ **Note**

>   After creating this diskette, DOS is not able to read it.

Installing Global Array Manager Server Software

Use *pkgadd* to install the Global Array Manager Server software for UnixWare. Complete the following procedure.

☛ **Note**

>   These instructions assume the installation diskette is in disk drive 1. If a different source is used, substitute that location for "diskette1" in step 3.

1. Log in as root.

2. Insert the GAM Server diskette for UnixWare in the file server's diskette drive.

3. Type the following (match case exactly as shown):

   pkgadd -d diskette1 GAM ↵

4. You are prompted to insert the diskette and confirm installation as shown:

   ```
   Insert diskette into Floppy Drive 1.
   Type [go] when ready.
     or [q] to quit: (default: go)
   ```

   To begin installation, type:

   go ↵

   The files are copied and the Kernel is rebuilt.

5. Installation is complete.

Modify the GAMEVENT and GAMEVLOG lines manually. To do this edit the S99GAM file found in the directory /etc/rc2.d, changing the GAMEVENT line to include (after each -h parameter) the IP addresses of the client systems you will use with this server. Modify the pathname and filename in the $EVENTLOGFILE command line if you wish to. For more information, refer to Appendix B "GAMEVENT."

☛ **Note**

> If you are using SNMP features, you will need to enable /usr/bin/gamagent. For more information, please see "SNMP Installation for UnixWare" in Appendix A.

6. Be sure to remove comment markers (such as the character #) from any command line which you intend to enable.

7. Save the modified S99GAM and exit.

8. Create a user account called `gamroot` and assign Root access privileges to that user account.

9. Reboot the system using the following command from the root directory (match case exactly as shown):

   `shutdown -y -i6 -g0 ↵`

Running Global Array Manager Server

The Global Array Manager Server runs on the server and delivers the following information to the Global Array Manager Client:

- Monitors the controller(s) and disks in the server.
- Manages the controller(s) and associated disk subsystems in the server.

The installation of Global Array Manager Server for UnixWare causes the appropriate drivers to load automatically at system startup. No additional actions are required to start GAM Server beyond a system boot.

Troubleshooting Server Software Installation

Problem: **An error is encountered when trying to connect to a server.**

Check: Is the IP address of the Server correct?

Check: Is the installation complete? Was the software successfully loaded on the server?

Check: Is the Ethernet connection good?

Check: Is TCP/IP installed?

Check: Is TCP/IP set up correctly? Try Ping to find the server.

Problem: **Global Array Manager Server does not load.**

Check: Do you have login rights to the root?

Check: Did all of the server files load to the destination directory? Do you have sufficient disk space for the installation? If necessary, reinstall the software.

Uninstalling the Server Software

To remove the Global Array Manager Server software, complete the following procedures:

1. Type the following command (match case exactly as shown):

   pkgrm GAM ↵

2. You are prompted for confirmation as shown:

   ```
   Do you want to remove this package [yes,no,?,quit]
   ```

   At the prompt, type:

   y ↵

   The files are removed. The Kernel is rebuilt.

3. When you see the following message, removal is complete.

   ```
   Removal of <GAM> was successful.
   ```

4. Reboot the system using the following command from the root directory (match case exactly as shown):

   shutdown -y -i6 -g0 ↵

Overview

This chapter describes information about the following installation, verification, and startup of the Global Array Manager Server software for Solaris 7/8 on x86. The software is provided on the appropriate Software Kit distribution CD-ROM with a file to create a diskette.

The Solaris drivers for the Mylex Disk Array Controller supports disk drives, tape drives, and CD-ROM drives under Solaris 7/8 on x86. The drivers support up to 16 controllers. Also, the drivers support secondary system drives larger than 8GB.

☛ **Note**

This chapter assumes that the network administrator for this site will be performing these installation procedures.

Global Array Manager Server Software for Solaris 7 and Solaris 8

Creating the Global Array Manager Server Diskette

Before installing the GAM Server for Solaris, a diskette must be created according to the instructions below using a DOS or Windows operating system.

This diskette will be used in the next section wherever instructed to insert the "GAM Server diskette for Solaris."

1. Insert a DOS formatted diskette into drive A.

2. Insert the Software Kit CD-ROM into the CD-ROM drive.

3. From the DOS prompt, type:

   ```
   F:\gam\solaris\x86\diskimg\gamssol7 a: ↵
   F:\gam\solaris\x86\diskimg\gamssol8 a: ↵
   ```

   F: identifies the CD-ROM drive.
   \gamssol7: identifies Solaris 7 and \gamssol8: identifies Solaris 8

4. You will get a message asking if you want the disk to be overwritten. To continue, type Y for Yes and press **Enter**.

5. Label this disk "GAM Server diskette for Solaris." Save until needed.

   ☛ **Note**

   After creating this diskette, DOS is not able to read it.

An alternative method to create this diskette is described in Appendix C, "Creating a GAM Server Installation Diskette" .

Installing Global Array Manager Server Software

☛ **Note**

> At this time, there is not an upgrade function. If you
> want to use a current version of GAM Server
> software, first, you will need to uninstall the old file
> on your system and then install the new GAM Server
> Software. The instructions are described in
> "Uninstalling the Server Software" on page 6-6.
>
> Then, please follow the instructions below to install
> your GAM Server.

The installation of Global Array Manager Server for Solaris causes the
appropriate drivers to load automatically at system startup. No additional
actions are required to start GAM Server beyond a system boot.

1. Access the root directory (prompt is #) (commands are case sensitive).

2. Insert the GAM Server diskette for Solaris in the server's disk drive A.

    ☛ **Note**

    > For more information about managing diskettes and
    > drives, see the Solaris System Administration Guide.

3. If GAM is currently installed, you should uninstall it first by typing the
    following commands:

    ```
    # /etc/rc2.d/S99GAM stop
    ```

    ```
    # pkgrm GAM
    ```

4. If Volume Manager is running, temporarily stop it using the steps
    below:

    Get the process id number off of the volume manager, by typing the
    following command lines:

    ```
    # ps -ef | grep vold
    ```

    ```
    # kill xxx (process id)  (xxx replaced by a number
                              like 247)
    ```

    ```
    # pkgadd -d /dev/rdiskette GAM
    ```

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5. Insert the GAM Server diskette, if not already inserted, into the disk drive. You will see the following selections, type **go** after the colon mark:

    ```
    Type [go] when ready,

    or   [e] to eject the diskette

    or   [q] to quit: go and press Enter
    ```

    The following processing message will display:

    ```
    Processing package instance <GAM> from
    </dev/rdiskette>
    ```

6. Type **y** for yes to continue with the GAM installation:

    ```
    Do you want to continue with the installation of
    <GAM> [y, n, ?] y
    ```

    The following installation message will automatically display:

    ```
    Installing Mylex GAM Server/Driver <GAM>

    ## Installing part 1 of 1.

    ## Execution postinstall script

    GAM NOTE: please modify /etc/rc2.d/S99GAM to start
    the gamevent

    Installation of GAM completed

    Installation of <GAM> was successful

    #
    ```

7. Installation of GAM Server is complete. Modify the S99GAM file.

    -   You will need to access the S99GAM file in order to manually modify the GAMEVENT and GAMEVLOG lines.

    -   At the prompt, type the following command to access and modify the directory:

    -   **# vi /etc/rc2.d/S99GAM** and press **Enter**

    -   Search for /gamevent or /gamevlog command lines and uncomment the line(s) you want enabled.

    -   Modify the S99GAM file found in the directory /etc/rc2.d, then change the GAMEVENT line to include (after each $-h$ parameter)

the IP addresses of the client systems you will use with this server. Modify the path and filename in the $EVENTLOGFILE command line if you wish to. For more information, refer to Appendix B, "GAMEVENT."

8. Be sure to remove comment markers (the character #) from any command line which you intend to enable.

9. Save the modified S99GAM and exit.

10. Type the following commands to return to /etc/rc2.d, to view a list of your file, and to start or (restart) GAM.

```
# cd /etc/rc2.d
# ls
# ./S99GAM start
#
```

11. Create a user account called gamroot and assign Root access privileges to that user account.

☛ **Note**

> It is not required to reboot in order to enable GAM when using Software Kit 5.0.

Running Global Array Manager Server

The Global Array Manager Server runs on the server and delivers the following information to the Global Array Manager Client:

- Monitors the controller(s) and disks in the server.
- Manages the controller(s) and associated disk subsystems in the server.

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Troubleshooting Server Software Installation

Problem: **An error is encountered when trying to connect to a server.**

Check: Is the IP address of the Server correct?

Check: Is the installation complete? Was the software successfully loaded on the server?

Check: Is the Ethernet connection good?

Check: Is TCP/IP installed?

Check: Is TCP/IP set up correctly? Try Ping to find the server.

Problem: **Global Array Manager Server does not load.**

Check: Do you have login rights to the root?

Check: Did all of the server files load to the destination directory? Do you have sufficient disk space for the installation? If necessary, reinstall the software.

Uninstalling the Server Software

To remove the Global Array Manager Server software, complete the following procedures:

1. Type the following command (match case exactly as shown):

    pkgrm GAM ↵

2. You are prompted for confirmation as shown:

    ```
    Do you want to remove this package [yes,no,?,quit]
    ```

    At the prompt, type:

    y ↵

    The files are removed. The Kernel is rebuilt.

3. When you see the following message, removal is complete.

    ```
    Removal of <GAM> was successful
    ```

4. Reboot the system using the following command from the root directory (match case exactly as shown):

    shutdown -y -i6 -g0 ↵

Linux

Overview

This chapter describes installation, startup, and troubleshooting of the Global Array Manager Server software for the Linux operating system with the following distributions:

- Red Hat 6.2, 7.0, 7.1 (external products support only 7.1)
- SuSe 6.4, 7.1
- Caldera 2.4
- Turbo Linux 6.0, 6.1

The software is provided on the appropriate Software Kit distribution CD-ROM.

> ☛ **Note**
>
> This chapter assumes that the network administrator for this site will be performing these installation procedures.

Go to the following web sites to download the appropriate Disk Array Controller Drivers:

- For PCI Controllers:

  http://www.dandelion.com/Linux/DAC960.html

- For External Controllers:

  http://www.qlc.com/bbs-html/csg_web/adapter_pages/driver_pages/21xx/21linux.html

For instructions on how to install the disk array controller drivers, see the appropriate instructions on each web site and refer to the appropriate Linux OS distribution reference manual.

7 LINUX

Global Array Manager Server Software for Linux

Installation Overview

This section covers the following for the Global Array Manager (GAM) Server software:

- "Installing Global Array Manager Server Software"
- "Running Global Array Manager Server"
- "Troubleshooting Server Software Installation"
- "Uninstalling the Server Software"

This process assumes that the network administrator for this site will be performing this installation procedure.

Installing Global Array Manager Server Software

1. Log in as root.

2. Mount the CD (commands are case sensitive):

   `mount /dev/cdrom /mnt/cdrom`

   ### ☛ Note

   The mount point for SuSE is `/cdrom`.

Before Installing the GAM Server Software, you need to determine if there is already a version installed (Step 3) and then remove it (Step 4). If you are certain that no other version is installed, skip to Step 5.

3. To query the RPM database for GAM, type:

   `rpm -qa | grep gam`

4. If GAM is listed, remove it, type:

   `rpm -ev <gam release name> (such as .rpm file name)`

5. To install the GAM Server Software, type:

   `rpm -iv /mnt/cdrom/gam/linux/gam.server.x.00 xx.i386.rpm`

☛ **Note**

> To query RPM about the contents of the GAM file,
> type:
>
> ```
> rpm -qpi <gam release name>
> ```

6. Stop the GAM server in order to unmount the CD-ROM, type:

   ```
   /etc/rc.d/init.d/gam stop
   ```

7. Unmount the CD-ROM, type:

   ```
   unmount /mnt/cdrom
   ```

   The GAM server installation is complete.

Editing GAMEVENT and GAMEVLOG

The GAMEVENT and $EVENTLOGFILE will need to be edited so that it
will hold the correct host or IP address to direct the events to the desired
client(s).

1. Access the GAM file for GAMEVENT, type:

   ```
   /etc/rc.d/init.d
   ```

2. Edit gam (replace [-h host1] with an actual—your user—address)

   ```
   #user/bin/gamevent -h host1 &
   ```

For example (remove the # symbol to enable the command line):

```
user/bin/gamevent -h 192.168.0.148 &
```

By default, the Linux client and server are configured to communicate
correctly when using the root login. Please see the note in Appendix B,
"GAMEVENT" for details about root and non-root users and proper port
numbers for event logging.

3. Access the $EVENTLOGFILE file and remove the # symbol to enable
   the command line.

   ```
   user/bin/gamevlog -f /var/log/gamevlog.log &
   ```

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Running Global Array Manager Server

The Global Array Manager Server runs on the server and delivers the following information to the Global Array Manager Client:

- Monitors the controller(s) and disks in the server.

- Manages the controller(s) and associated disk subsystems in the server.

☛ **Note**

> The device driver (e.g., DAC960 or qla2x00) must be loaded prior to starting Global Array Manager Server software.

To run the GAM Server software, follow these steps:

1. Log in as root.

2. Stop the GAM Serve, type:

   `/etc/rc.d/init.d/gam stop`

3. Verify that all GAM Server components are gone:

   `ps -A | grep gam`

4. If you see several process IDs left behind, you will need to remove them by typing:

   `kill -g gamdrvd`

   If necessary, you can also remove process IDs individually by typing:

   `kill -9 <process ID #>`

   ☛ **Note**

   > It is NOT required to reboot in order to enable GAM when using Software Kit 5.0. However, if you need to reboot for any other reason, go to step 5.

5. To restart the GAM Server type:

   `/etc/rc.d/init.d/gam start`

Troubleshooting Server Software Installation

Problem: **An error is encountered when trying to connect to a server.**

Check: Is the HBA device driver loaded?

If the device driver is not loaded manually (via insmod qla2100) or at boot time, the server connection will not be established since "gamdrvd" was started before the HBA device driver was loaded.

Check: Is the IP address of the Server correct?

Check: Is the installation complete? Was the software successfully loaded on the server?

Check: Is the Ethernet connection good?

Check: Is TCP/IP installed?

Check: Is TCP/IP set up correctly? Try Ping to find the server.

Problem: **Client won't detect controller, but events will appear on client event log viewer.**

Check: Is inetd running?

☛ Note

When Red Hat 6.2 is installed on a workstation, inetd is not installed. The inetd may be installed as an rpm, an upgrade, or as part of a custom installation.

Problem: **Global Array Manager Server does not load.**

Check: Do you have login rights to the root?

Check: Did all of the server files load to the destination directory? Do you have sufficient disk space for the installation? If necessary, reinstall the software.

7 L I N U X

Uninstalling the Server Software

1. To query the rpm database for GAM, type:

   ```
   rpm -qa | grep gam
   ```

2. Locate the GAM file name within the list. Type the following to remove GAM:

   ```
   rpm -ev <gam file name>
   ```

SNMP Installation, Operation, and Definition

Introduction

The Global Array Manager includes a Simple Network Management Protocol (SNMP) agent for the RAID controller and connected arrays. An SNMP-based management application (also known as an SNMP manager) can monitor and manage the disk arrays. An example of an SNMP management application is Hewlett-Packard's Open View. The SNMP agent can be used to augment the Global Array Manager Client if you are already running an SNMP management application at your site.

SNMP Installation Overview

The installation of the SNMP agent is accomplished in several phases:

- Installing the agent software on the server

- Placing a copy of the management information base (MIB) in a directory which is accessible to the management application

- Compiling the MIB description file with the management application

SNMP Installation for NetWare

During installation of the Global Array Manager Server, the SNMP file was copied to its appropriate directory as shown in the table below. The file can also be copied to the server directory from a workstation's floppy disk drive (with the appropriate NetWare access rights to the server directory).

Table A-1. NetWare SNMP File

Operating system	Agent filename	Server directory
NetWare	GAMAGENT.NLM	SYS:SYSTEM

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Depending upon the SNMP management application used, the MIB (an ASCII text file named MLXRAID.MIB) must be placed in a specific directory on the network management station running the management application. The MLXRAID.MIB file must be manually copied to this directory. For example:

Table A-2. Location for MIB

SNMP Application	MIB location
OpenView	\OV\MIBS
NetWare NMS	\NMS\SNMPMIBS\CURRENT

☞ **Note**

> Your management application may have a different target directory. Consult the management application's user guide for the correct location.

Using the TRAPTARG.CFG File

The file, TRAPTARG.CFG, is an SNMP file that specifies all managers that are to receive SNMP trap messages generated by the SNMP agent (SNMP.NLM).

You will need to copy and edit TRAPTARG.CFG to direct the events to be logged into the etc/ directory. (See the traptarg.cfg file for more information.) Follow the steps below:

1. Copy TRAPTARG.CFG to this path: etc/traptarg.cfg

2. Edit the TRAPTARG.CFG file by adding either the logical (host) name, IP, or IPX address, which will be directly below Protocol UDP or Protocol IPX.

☞ **Note**

> Leave white space preceding the address name.
> Each address destination must be on a separate line.

For example:

Protocol UDP (logical (host) name or IP address)

ServerN (N is the name or IP address of the server to receive trap data)

In this section, you can put SNMP managers that want to receive traps from the local node over UDP. Use either IP address or logical name. (If you use a logical name, be sure the name and its corresponding IP address appear in the sys:etc/hosts file.)

Protocol IPX (IPX address)

In this section you can put SNMP managers that want to receive traps from the local node over IPX. Managers can be identified by NetWare service name (a NetWare file server name, for example) or by an IPX address. To specify by IPX address, use the following format:

IPX Network Number : MAC Address

c9990111 : 00001B555555

Starting the NetWare Agent

To start the agent, enter the appropriate command from the system console:

```
LOAD GAMAGENT ↵
```

About the NetWare Agent

The GAMAGENT NLM assumes that SNMP support for NetWare servers (SNMP.NLM) is already installed on the server.

The GAMAGENT NLM will attempt to autoload the SNMP.NLM. If the SNMP.NLM file is not present, the agent will not load.

The command to load the agent can be incorporated into the AUTOEXEC.NCF or other operating system startup files as well.

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Optional SNMP Parameters for NetWare

After the installation of the SNMP subcomponent, you have the option to specify an additional parameter, known as the GAM IPC Port. The default IPC port number for the GAM Server driver and Mylex SNMP Agent port is 43162; however, this number may be modified.

☛ **Note**

> The IPC Port number for the GAM Server driver and the Mylex SNMP agent port number must match for proper communication. Therefore, if either the GAM Server driver port number or the Mylex SNMP agent port number is changed, be sure to change the other port number to match.

How to Specify the Parameter

The parameter can be specified directly in the command line, for example:

```
load gamagent[-p <gam ipc port>]
```

☛ **Note**

> If "GamIpcPort" is not specified, the default port number (43162) will be used.

SNMP Installation for Windows NT or Windows 2000

To enable the SNMP agent for Windows NT or Windows 2000, configure Windows NT or Windows 2000 for TCP/IP and SNMP services. The Mylex SNMP Extension Agent file is GAMAGENT.DLL.

Install the SNMP Agent

If the SNMP agent is required, you should make sure that TCP/IP and Windows NT SNMP services are configured correctly.

☛ **Note**

The SNMP option will not be available unless the correct directory paths are configured during installation. See "Installing Global Array Manager Server Software," "DMI CI Files," and "Optional DMI CI Parameters," in Chapter 3 for Windows NT and Chapter 4 for Windows 2000.

Optional SNMP Parameters for Windows NT or Windows 2000

After the installation of the SNMP subcomponent, you have the option to specify an additional parameter, known as the GAM IPC Port. The default IPC port number for the GAM Server driver and Mylex SNMP Agent port is 43162; however, this number may be modified.

☛ **Note**

The IPC Port number for the GAM Server driver and the Mylex SNMP agent port number must match for proper communication. Therefore, if either the GAM Server driver port number or the Mylex SNMP agent port number is changed, be sure to change the other port number to match.

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How to Specify the Parameter

You can specify the parameters in the system registry. A registry value, MLX_GAM, is created and can be found under the path shown below. After the successful installation of Mylex SNMP agent onto a Windows NT or Windows 2000 system, you will see the registry key as follows:

```
"HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\
  Services\SNMP\Parameters\ExtensionAgents"
```

Follow these easy steps to specify the Mylex SNMP agent parameter:

1. Access the system registry and locate MLX_GAM; for example, the value may be:

   ```
   "SOFTWARE\Mylex\Global Array Manager\<CurrentVersion>"
   ```

2. Find the actual file path to the gamagent under the value of "Pathname" in the following path:

   ```
   "HKEY_LOCAL_MACHINE\SOFTWARE\Mylex\Global Array Manager
     \<CurrentVersion>\Pathname"
   ```

3. Add a DWORD value, "GamIpcPort" under the <CurrentVersion> key. Then, you can specify the gam driver ipc port number by which SNMP agent communicates with GAM driver. (See -p in the NetWare command line, as in "Optional SNMP Parameters for NetWare," in the previous section.)

   ☛ **Note**

   > If "GamIpcPort" is not specified, the default port number (43162) will be used.

SNMP Installation for UnixWare

To enable the SNMP agent for UnixWare, you need to configure UnixWare TCP/IP and SNMP services. Do this by enabling the usr/bin/gamagent file in the S99GAM file.

Install the SNMP Agent

If the SNMP agent is required, you need to enable (remove the # symbol) the usr/bin/gamagent file in the S99GAM file. This will send the traps to the SNMP viewer.

Optional SNMP Parameters for UnixWare

After the installation of the SNMP subcomponent, you have the option to specify an additional parameter, known as the GAM IPC Port. The default IPC port number for the GAM Server driver and Mylex SNMP Agent port is 43162; however, this number may be modified.

The IPC Port number for the GAM Server driver and the Mylex SNMP agent port number must match for proper communication. Therefore, if either the GAM Server driver port number or the Mylex SNMP agent port number is changed, be sure to change the other port number to match.

How to Specify the Parameter

The parameter can be specified in the S99GAM script file, which is used to start and stop the GAM server components. For example, in S99GAM file, the user can type:

```
/gamagent[-p <port icp number>] &
```

☛ **Note**

> If "GamIpcPort" is not specified, the default port number (43162) will be used.

MIB Compilation and Definition File Creation

The next step in the installation involves the integration of the MIB into the management application's database of events and status indicator codes. This process is known as *compiling* the MIB into the application. This process is highly vendor-specific and should be well-covered in the User's Guide of your SNMP application. Ensure that the compilation process successfully integrates the contents of the MLXRAID.MIB file (known as the MYLEXRAID_MIB object when viewed from within the SNMP application) into the traps database.

MYLEXRAIDMIB Object Definitions

Traps

All traps are defined under this object according to the following table:

Table A-3. Traps and Trap Numbers

Trap	Trap number
Traps 1–127 are physical device traps	
physicalDeviceOnline	1
physicalDeviceHotspare	2
physicalDeviceHardError	3
physicalDevicePFA	4
physicalDeviceAutoRebuildStarted	5
physicalDeviceManualRebuildStarted	6
physicalDeviceRebuildDone	7
physicalDeviceRebuildCanceled	8
physicalDeviceRebuildError	9
physicalDeviceRebuildNewDeviceFailed	10
physicalDeviceRebuildSystemDeviceFailed	11
physicalDeviceDead	12
physicalDeviceFound	13
physicalDeviceGone	14
physicalDeviceUnconfigured	15
physicalDeviceExpandCapacityStarted	16
physicalDeviceExpandCapacityDone	17
physicalDeviceExpandCapacityError	18
physicalDeviceCommandTimeout	19
physicalDeviceCommandAborted	20
physicalDeviceCommandRetried	21
physicalDeviceParityError	22
physicalDeviceSoftError	23
physicalDeviceMiscellaneousError	24
physicalDeviceReset	25
physicalDeviceActivespare	26
physicalDeviceWarmspare	27
physicalDeviceRequestSense	28
[RESERVED]	29–57
physicalDevicevRebuildStartFailed	58
[RESERVED]	59–127
Traps 128–255 are logical drive (system device) traps	
systemDeviceCheckStarted	128
systemDeviceCheckDone	129
systemDeviceCheckCanceled	130
systemDeviceCheckError	131
systemDeviceCheckSystemDeviceFailed	132

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Table A-3. Traps and Trap Numbers

Trap	Trap number
systemDeviceCheckPhysicalDeviceFailed	133
systemDeviceOffline	134
systemDeviceCritical	135
systemDeviceOnline	136
systemDeviceAutoRebuildStarted	137
systemDeviceManualRebuildStarted	138
systemDeviceRebuildDone	139
systemDeviceRebuildCanceled	140
systemDeviceRebuildError	141
systemDeviceRebuildNewDeviceFailed	142
systemDeviceRebuildSystemDeviceFailed	143
systemDeviceInitializationStarted	144
systemDeviceInitializationDone	145
systemDeviceInitializationCanceled	146
systemDeviceInitializationFailed	147
systemDeviceFound	148
systemDeviceGone	149
systemDeviceExpandCapacityStarted	150
systemDeviceExpandCapacityDone	151
systemDeviceExpandCapacityError	152
systemDeviceBadblock	153
systemDeviceSizeChanged	154
systemDeviceTypeChanged	155
systemDeviceBadDataBlocksFound	156
systemDeviceWriteLUNMap	157
systemDeviceDataReadfromBlockinBDT	158
[RESERVED]	159-255
Traps 256-271 are FMT fan traps	
fmtFanFailed	256
fmtFanOK	257
aemiFanFailed	258
fmtFanNotPresent	259
[RESERVED]	260-271
Traps 272-287 are FMT power traps	
fmtPowerFailed	272
fmtPowerOK	273
aemiPowerSupplyFailed	274
fmtPowerNotPresent	275
[RESERVED]	276-287
Traps 288-303 are FMT temperature traps	
fmtHeatBad	288
fmtHeatCritical	289
fmtHeatOK	290
aemiOverTemperature	291
fmtHeatNotPresent	292

Table A-3. Traps and Trap Numbers

Trap	Trap number
[RESERVED]	293–303
Traps 304–306 are StorageWorks traps	
fmtStorageWorksFailed	304
fmtStorageWorksCritical	305
fmtStorageWorksOK	306
Traps 307–383 are FMT enclosure traps	
[RESERVED]	307–319
fmtEnclosureFanFailed	320
fmtEnclosureFanOK	321
fmtEnclosureFanNotPresent	322
fmtEnclosurePowerFailed	323
fmtEnclosurePowerOK	324
fmtEnclosurePowerNotPresent	325
fmtEnclosureHeatSensorFailed	326
fmtEnclosureHeatSensorCritical	327
fmtEnclosureHeatSensorOK	328
fmtEnclosureHeatSensorNotPresent	329
fmtEnclosureAccessCritical	330
fmtEnclosureAccessOK	331
fmtEnclosureAccessOffline	332
[RESERVED]	333–383
Traps 384–511 are miscellaneous traps	
systemStarted	384
writebackError	385
stateChangeTableFull	386
[NOT USED]	387
adapterDead	388
adapterReset	389
adapterFound	390
adapterGone	391
batteryBackupUnitFound	392
batteryBackupUnitPowerLow	393
batteryBackupUnitPowerOK	394
[RESERVED]	395–403
controllerFirmwareMismatch	404
controllerBBUNotRespond	405
[RESERVED]	406–413
controllerECCEror	414
controllerHardECCError	415
[RESERVED]	416–417
controllerBBUDead	418
[RESERVED]	419–511
Traps 512–640 are system traps	
gamSystemStarted	512
systemSizeTableFull	513

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Table A-3. Traps and Trap Numbers

Trap	Trap number
systemUserLoggedIn	514
systemUserLoggedOut	515
[RESERVED]	516-640
Reserved Traps	641-(16^7)

Controller Information Group

This object is used to find information about any or all of the controllers present in the system.

Table A-4. Controller Information Group

Table object	Data Type	Description		
a2ControllerNumber 1.3.6.1.4.1.1608.1.1.1.2.1.1	Integer	References a particular controller by its controller number		
a2OperationalState 1.3.6.1.4.1.1608.1.1.1.2.1.2	Integer	Operational state of the controller:		
		Value	Meaning	
		1	Functional	
		2	Non-Functional	
		128	Not Present	
a2FirmwareRevision 1.3.6.1.4.1.1608.1.1.1.2.1.3	Display String	A displayable ASCII string containing the firmware version of the controller		
a2ConfiguredChannels 1.3.6.1.4.1.1608.1.1.1.2.1.4	Integer	The maximum number of SCSI channels that can be configured on the controller		
a2ActualChannels 1.3.6.1.4.1.1608.1.1.1.2.1.5	Integer	Actual number of SCSI channels present		
a2MaximumLogicalDrives 1.3.6.1.4.1.1608.1.1.1.2.1.6	Integer	Maximum number of logical drives supported by the controller		
a2MaximumTargetsPerChannel 1.3.6.1.4.1.1608.1.1.1.2.1.7	Integer	The maximum number of targets (SCSI IDs) supported per channel		
a2MaximumTaggedRequests 1.3.6.1.4.1.1608.1.1.1.2.1.8	Integer	The maximum number of tagged requests per target		
a2MaximumDataTransferSizePerIo RequestInK 1.3.6.1.4.1.1608.1.1.1.2.1.9	Integer	The maximum data transfer size supported (in KB)		
a2MaximumConcurrentCommands 1.3.6.1.4.1.1608.1.1.1.2.1.10	Integer	The maximum number of concurrent commands that are supported		
a2RebuildRate 1.3.6.1.4.1.1608.1.1.1.2.1.11	Integer	The priority of rebuild versus system I/Os; Value is 0 to 50; 0 = lowest rebuild priority, 50 = highest rebuild priority		

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Table A-4. Controller Information Group

Table object	Data Type	Description	
a2LogicalSectorSizeInBytes 1.3.6.1.4.1.1608.1,1,1,2,1,12	Integer	The logical sector (block) size in bytes (Default: 512 bytes)	
a2PhysicalSectorSizeInBytes 1.3.6.1.4.1.1608.1.1.1.2.1.13	Integer	The physical sector (block) size in bytes (Default: 512 bytes)	
a2CacheLineSizeInBytes 1.3.6.1.4.1.1608.1.1.1.2.1.14	Integer	The cache line size in bytes	
a2CacheSizeInMb 1.3.6.1.4.1.1608.1.1.1.2.1.15	Integer	The memory size of the controller cache in MB	
a2CacheMemoryType 1.3.6.1.4.1.1608.1.1.1.2.1.16	Integer	Numerical identification of the controller cache memory type:	
		Value	Meaning
		1	DRAM
		2	EDRAM
		3	EDO
		4	SDRAM
		65	DRAM with parity protection
		66	EDRAM with parity protection
		67	EDO with parity protection
		68	SDRAM with parity protection
		129	DRAM with ECC protection
		130	EDRAM with ECC protection
		131	EDO with ECC protection
		132	SDRAM with ECC protection
		255	Unknown
a2EpromSizeInKb 1.3.6.1.4.1.1608.1.1.1.2.1.17	Integer	The flash EPROM size in KB	
a2BusType 1.3.6.1.4.1.1608.1.1.1.2.1.18	Integer	Numerical identification of the controller's bus type:	
		Value	Meaning
		1	EISA
		2	MCA

Table A-4. Controller Information Group

Table object	Data Type	Description	
		3	PCI
		4	VESA
		5	ISA
		255	Unknown
a2ControllerClass 1.3.6.1.4.1.1608.1.1.1.2.1.19	Integer	The class of the controller:	
		Value	Meaning
		1	RAID controller
		96	SCSI-SCSI
		128	HBA controller
		255	Unknown
a2ControllerModel 1.3.6.1.4.1.1608.1.1.1.2.1.20	Integer	Numerical identification of the controller model:	
		Value	Meaning
		1	DAC960E
		8	DAC960M
		16	DAC960PD
		17	DAC960PL
		18	DAC960PDU
		19	DAC960PE
		20	DAC960PG
		21	DAC960PJ
		22	DAC960PTL0
		23	DAC960PR
		24	DAC960PRL
		25	DAC960PT
		26	DAC1164P
		27	DAC960PTL1
		28	EXR2000P
		29	EXR3000P
		30	AR352
		31	AR170
		32	AR160
		96	DAC960S
		97	DAC960SU
		98	DAC960SX
		99	DAC960SF
		100	DAC960SS

Table A-4. Controller Information Group

Table object	Data Type	Description	
a2ControllerModel (continued)		101	DAC960FL
		102	DAC960LL
		103	DAC960FF
		104	FC ARRAY
		105	DAC960MFL
		106	DAC960MFF
		107	DAC960FFX
		255	Unknown
a2SystemBusNumber 1.3.6.1.4.1.1608.1.1.1.2.1.21	Integer	The system bus number for the controller. This value is supplied by the Operating System and may not be defined for all operating systems.	
a2SlotNumber 1.3.6.1.4.1.1608.1.1.1.2.1.22	Integer	The slot number where the controller resides, defined for EISA and MCA controller only	
a2InterruptVectorNumber 1.3.6.1.4.1.1608.1.1.1.2.1.23	Integer	The interrupt vector number being used by the controller. This value is a mapped IRQ supplied by the Operating System and may not be same as the actual Interrupt Vector	
a2InterruptMode 1.3.6.1.4.1.1608.1.1.1.2.1.24	Integer	Numerical identification of the interrupt mode (edge/level):	
		Value	Meaning
		0	EDGE
		1	LEVEL
		255	Unknown
a2NumberOfPhysicalDevices 1.3.6.1.4.1.1608.1.1.1.2.1.25	Integer	The number of SCSI devices detected	
a2NumberOfPhysicalDevicesOffline 1.3.6.1.4.1.1608.1.1.1.2.1.26	Integer	The number of SCSI devices with an operational state of DEAD	
a2NumberOfLogicalDevices 1.3.6.1.4.1.1608.1.1.1.2.1.27	Integer	The number of logical devices currently configured	
a2NumberOfLogicalDevicesCritical 1.3.6.1.4.1.1608.1.1.1.2.1.28	Integer	The number of logical devices in a "critical" state	
a2NumberOfLogicalDevicesOffline 1.3.6.1.4.1.1608.1.1.1.2.1.29	Integer	The number of OFFLINE logical devices	

Table A-4. Controller Information Group

Table object	Data Type	Description
a2FaultManagementType 1.3.6.1.4.1.1608.1.1.1.2.1.30	Integer	The controller's fault management type:

Value	Meaning
1	AEMI
2	OEM1
4	OEM2
8	OEM3
16	CONNER
32	SAFTE
64	SES
0	Not Present

Table object	Data Type	Description
a2ArrayInformation 1.3.6.1.4.1.1608.1.1.1.2.1.31	Display String	A displayable ASCII string containing the array information. The information is of the form: A(ch-targ ch-targ) B(ch-targ), where A,B = Array List, ch = channel number, targ = SCSI target number.
a2LogicalDriveReadRequestsCount 1.3.6.1.4.1.1608.1.1.1.2.1.32	Integer	The total number of read requests to all logical drives
a2DataReadFromLogicalDrivesInMb 1.3.6.1.4.1.1608.1.1.1.2.1.33	Integer	The amount of data that was read from all logical drives in MB
a2LogicalDriveWriteRequestsCount 1.3.6.1.4.1.1608.1.1.1.2.1.34	Integer	The total number of write requests to all logical drives
a2DataWrittenToLogicalDrivesInMb 1.3.6.1.4.1.1608.1.1.1.2.1.35	Integer	The amount of data that was written to all logical drives in MB
a2LogicalDrivesReadCacheHit Percentage 1.3.6.1.4.1.1608.1.1.1.2.1.36	Integer	The percentage rate of read cache hits for all logical drives
a2PhysicalDriveReadRequestsCount 1.3.6.1.4.1.1608.1.1.1.2.1.37	Integer	The total number of read requests to all physical drives
a2DataReadFromPhysicalDrivesInMb 1.3.6.1.4.1.1608.1.1.1.2.1.38	Integer	The amount of data that was read from all physical drives in MB
a2PhysicalWriteRequestsCount 1.3.6.1.4.1.1608.1.1.1.2.1.39	Integer	The total number of write requests to all physical drives

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Table A-4. Controller Information Group

Table object	Data Type	Description	
a2DataWrittenToPhysicalDrivesInMb 1.3.6.1.4.1.1608.1.1.2.1.40	Integer	The amount of data that was written to all physical drives in MB	
a2StorageWorksCabinetStatusOn Channel0 1.3.6.1.4.1.1608.1.1.2.1.41	Integer	StorageWorks cabinet status on channel 0	
		Value	Meaning
		1	Ok
		2	Not Ok
		3	Not Present
a2StorageWorksCabinetStatusOn Channel1 1.3.6.1.4.1.1608.1.1.2.1.42	Integer	StorageWorks cabinet status on channel 1	
		Value	Meaning
		1	Ok
		2	Not Ok
		3	Not Present
a2StorageWorksCabinetStatusOn Channel2 1.3.6.1.4.1.1608.1.1.2.1.43	Integer	StorageWorks cabinet status on channel 2	
		Value	Meaning
		1	Ok
		2	Not Ok
		3	Not Present
a2BatteryBackupUnitStatus 1.3.6.1.4.1.1608.1.1.2.1.44	Integer	BBU status	
		0	Not Present
		1	Present
a2PartnerControllerNumber 1.3.6.1.4.1.1608.1.1.2.1.45	Integer	Dual Active Partner Controller Number	
a2WWName 1.3.6.1.4.1.1608.1.1.2.1.46	Display String	Controller World-Wide Name	

Notes:

- *a2ControllerNumber* is the index for any search operations against this object.
- This is a READ-ONLY object. No SET operations are allowed.
- A GET operation returns information about the object whose MIB ID is in the query.

- A GETNEXT operation returns the object's information which is next to the MIB ID given in the query.
- Controller numbers start at 0.

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Logical Drive Information Group

This object is used to determine information about any or all the logical drives present in the system.

Table A-5. Logical Drive Information Group

Table object	Data Type	Description	
a3ControllerNumber 1.3.6.1.4.1.1608.1.1.1.3.1.1	Integer	References a particular controller by its controller number	
a3LogicalDriveNumber 1.3.6.1.4.1.1608.1.1.1.3.1.2	Integer	The logical drive number	
a3OperationalState 1.3.6.1.4.1.1608.1.1.1.3.1.3	Integer	Numerical identification of the logical drive state:	
		Value	Meaning
		3	ONLINE
		4	CRITICAL
		255	OFFLINE
		128	NotPresent
a3RaidLevel 1.3.6.1.4.1.1608.1.1.1.3.1.4	Integer	The RAID level selected for the logical drive	
		0	RAID0
		1	RAID1
		3	RAID3
		5	RAID5
		6	RAID0+1
		7	JBOD
a3WritePolicy 1.3.6.1.4.1.1608.1.1.1.3.1.5	Integer	Numerical identification of the write policy setting for the logical drive:	
		Value	Meaning
		0	WRITE THRU
		128	WRITE BACK
a3SizeInMb 1.3.6.1.4.1.1608.1.1.1.3.1.6	Integer	The logical drive capacity in MB	
a3PhysicalSizeInMb 1.3.6.1.4.1.1608.1.1.1.3.1.7	Integer	The total physical capacity used by this logical drive in MB	
a3StripeSizeInBytes 1.3.6.1.4.1.1608.1.1.1.3.1.8	Integer	The value of the stripe size in bytes, valid only for RAID levles 0, 5, and 6	

Table A-5. Logical Drive Information Group

Table object	Data Type	Description
a3PhysicalDriveMap 1.3.6.1.4.1.1608.1.1.1.3.1.9	Display String	A displayable ASCII string containing the list of all physical drives that make up the logical drive. This information is provided in Channel Target combination form. For example, (0-1, 0-2, 1-3, 1-11).
a3ArrayList 1.3.6.1.4.1.1608.1.1.1.3.1.10	Display String	The list of arrays across which this logical drive spans. For example, A, B, etc.
a3RaidLevelString 1.3.6.1.4.1.1608.1.1.1.3.1.11	Display String	RAID Level associated with Logical Drive

Notes:

- *a3ControllerNumber* and *a3LogicalDriveNumber* compose the Index for a search operation.

- This is a READ-ONLY object. No SET operations are allowed.

- A GET operation returns information about the object at the address (a3ControllerNumber/a3LogicalDriveNumber) specified in the argument.

- A GETNEXT operation returns information about the next object at the smallest address greater than the address specified in the argument.

- The lowest address of a drive (a3ControllerNumber/ a3LogicalDriveNumber) is defined as 0/0, followed by 0/1... 1/0, 1/1, and so on.

- Controller numbers start at 0. Logical drive numbers start at 0.

Physical Device Information Group

This object is used to find information about any or all of the physical devices present in the system.

Table A-6. Physical Device Information Group

Table object	Data Type	Description
a4ControllerNumber 1.3.6.1.4.1.1608.1.1.1.4.1.1	Integer	References a particular controller by its controller number
a4ScsiBusId 1.3.6.1.4.1.1608.1.1.1.4.1.2	Integer	SCSI channel number
a4ScsiTargetId 1.3.6.1.4.1.1608.1.1.1.4.1.3	Integer	SCSI target number
a4ScsiLunId 1.3.6.1.4.1.1608.1.1.1.4.1.4	Integer	SCSI logical unit number (LUN) of the SCSI device
a4OperationalState 1.3.6.1.4.1.1608.1.1.1.4.1.5	Integer	Numerical identification of the physical device state: | Value	Meaning
---	---
0	UnConfigured
1	ONLINE
3	REBUILDING
4	INSTABORT
6	NOT PRESENT
8	DEAD
33	HOT SPARE
130	REBUILD CANCELLED	
a4VendorId 1.3.6.1.4.1.1608.1.1.1.4.1.6	Display String	The SCSI device vendor ID. This is the vendor ID from the SCSI INQUIRY data.
a4ProductId 1.3.6.1.4.1.1608.1.1.1.4.1.7	Display String	The SCSI device product ID. This is the product ID from the SCSI INQUIRY data.
a4ProductRevisionLevel 1.3.6.1.4.1.1608.1.1.1.4.1.8	Display String	The SCSI device product revision level. This is the revision level from the SCSI INQUIRY data.
a4SizeInMb 1.3.6.1.4.1.1608.1.1.1.4.1.9	Integer	The physical device capacity in MB

Table A-6. Physical Device Information Group

Table object	Data Type	Description
a4DeviceType 1.3.6.1.4.1.1608.1.1.1.4.1.10	Integer	Numerical identification of the SCSI device type. The value matches the device type value of the SCSI INQUIRY data:

		Value	Meaning
		0	FIXED DISK
		1	TAPE
		2	PRINTER
		3	PROCESSOR
		4	WORM
		5	CDROM
		6	SCANNER
		7	MO
		8	CHANGER
		9	COMMUNICATION DEVICE
		10	GRAPHICS-0
		11	GRAPHICS-1
		12-30	Reserved
		31	Unknown
		199	SCSI HOST
		204	Ctrl Channel

Table object	Data Type	Description
a4SoftErrorsCount 1.3.6.1.4.1.1608.1.1.1.4.1.11	Integer	The number of soft errors that occurred
a4HardErrorsCount 1.3.6.1.4.1.1608.1.1.1.4.1.12	Integer	The number of hard errors that occurred
a4ParityErrorsCount 1.3.6.1.4.1.1608.1.1.1.4.1.13	Integer	The number of parity errors that occurred
a4MiscErrorsCount 1.3.6.1.4.1.1608.1.1.1.4.1.14	Integer	The number of miscellaneous errors that occurred
a4ArrayList 1.3.6.1.4.1.1608.1.1.1.4.1.15	Display String	The list of arrays to which this physical drive belongs. For example, A, B, etc.
a4LogicalDriveList 1.3.6.1.4.1.1608.1.1.1.4.1.16	Integer	The list of logical drives that depend on this physical drive. For example, 0, 1, etc.

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Notes:

- *a4ControllerNumber*, *a4ScsiBusId,* and *a4ScsiTargetId* comprise the Index for the search operation.

- This is a READ-ONLY object. No SET operations are allowed.

- A GET operation returns information about the object at the address (a4ControllerNumber/a4ScsiBusId/a4ScsiTargetId) specified in the argument.

- A GETNEXT operation returns information about the next object at the smallest address greater than the address specified in the argument.

- The lowest address of a device (a4ControllerNumber/a4ScsiBusId/a4ScsiTargetId) is defined as 0/0/0, followed by 0/0/1... 0/1/0, 0/1/1... 1/0/0, 1/0/1, and so on.

- Controller numbers start at 0. Channel numbers start at 0. Target IDs start at 0.

RAID Management Software Group

This object contains the build date and version number for the Global Array Manager driver, Disk Array Controller device driver, and SNMP agent.

Table A-7. RAID Management Software Group

Table object	Data Type	Description
a5ManagementSoftwareRevision 1.3.6.1.4.1.1608.1.1.1.5.1.1	Display String	A displayable string that shows the revision level of the SNMP agent
a5ManagementSoftwareBuildDate 1.3.6.1.4.1.1608.1.1.1.5.1.2	Display String	A displayable string that shows the build date for the SNMP agent
a5MylexDacDeviceDriverRevision 1.3.6.1.4.1.1608.1.1.1.5.1.3	Display String	A displayable string that shows the revision level of the controller device driver
a5MylexDacDeviceDriverBuildDate 1.3.6.1.4.1.1608.1.1.1.5.1.4	Display String	A displayable string that shows the build date for the controller device driver
a5GamDriverRevision 1.3.6.1.4.1.1608.1.1.1.5.1.5	Display String	A displayable string that shows the revision level of the Global Array Manager (GAM) driver
a5GamDriverBuildDate 1.3.6.1.4.1.1608.1.1.1.5.1.6	Display String	A displayable string that shows the build date for the Global Array Manager (GAM) driver

Notes:

- This is a READ-ONLY object. No SET operations are allowed.

- A GET operation returns information about the object at the address specified in the argument.

- A GETNEXT operation returns information about the next object at the smallest address greater than the address specified in the argument.

Logical Drive Statistics Group

This object is used to determine statistics about all logical drives configured on a controller.

Table A-8. Logical Drive Statistics Group

Table object	Data Type	Description
a6ControllerNumber 1.3.6.1.4.1.1608.1.1.1.6.1.1	Integer	References a particular controller by its controller number
a6LogicalDriveNumber 1.3.6.1.4.1.1608.1.1.1.6.1.2	Integer	The logical drive number
a6ReadRequestsCount 1.3.6.1.4.1.1608.1.1.1.6.1.3	Integer	The total number of read requests
a6DataReadInMb 1.3.6.1.4.1.1608.1.1.1.6.1.4	Integer	The total amount of data that was read in MB
a6WriteRequestsCount 1.3.6.1.4.1.1608.1.1.1.6.1.5	Integer	The total number of write requests
a6DataWrittenInMb 1.3.6.1.4.1.1608.1.1.1.6.1.6	Integer	The total amount of data that was written in MB
a6ReadCacheHitPercentage 1.3.6.1.4.1.1608.1.1.1.6.1.7	Integer	The percentage rate of read cache hits

Notes:

- *a6ControllerNumber* and *a6LogicalDriveNumber* compose the Index for a search operation.

- This is a READ-ONLY object. No SET operations are allowed.

- A GET operation returns information about the object at the address (a6ControllerNumber/a6LogicalDriveNumber) specified in the argument.

- A GETNEXT operation returns information about the next object at the smallest address greater than the address specified in the argument.

- The lowest address of a drive (a6ControllerNumber/ a6LogicalDriveNumber) is defined as 0/0, followed by 0/1... 1/0, 1/1, and so on.

- Controller numbers start at 0. Logical drive numbers start at 0.

Physical Drive Statistics Group

This object is used to determine statistics about all physical drives configured on a controller.

Table A-9. Physical Drive Statistics Group

Table object	Data Type	Description
a7ControllerNumber 1.3.6.1.4.1.1608.1.1.1.7.1.1	Integer	References a particular controller by its controller number
a7ScsiBusID 1.3.6.1.4.1.1608.1.1.1.7.1.2	Integer	SCSI channel number
a7ScsiTargetId 1.3.6.1.4.1.1608.1.1.1.7.1.3	Integer	SCSI target number
a7ScsiLun 1.3.6.1.4.1.1608.1.1.1.7.1.4	Integer	SCSI logical unit number (LUN) of the SCSI device
a7ReadRequestsCount 1.3.6.1.4.1.1608.1.1.1.7.1.5	Integer	The total number of read requests
a7DataReadInMb 1.3.6.1.4.1.1608.1.1.1.7.1.6	Integer	The total amount of data that was read in MB
a7WriteRequestsCount 1.3.6.1.4.1.1608.1.1.1.7.1.7	Integer	The total number of write requests
a7DataWrittenInMb 1.3.6.1.4.1.1608.1.1.1.7.1.8	Integer	The total amount of data that was written in MB

Notes:

- *a7ControllerNumber*, *a7ScsiBusId,* and *a7ScsiTargetId* comprise the Index for the search operation.

- This is a READ-ONLY object. No SET operations are allowed.

- A GET operation returns information about the object at the address (a7ControllerNumber/a7ScsiBusId/a7ScsiTargetId) specified in the argument.

- A GETNEXT operation returns information about the next object at the smallest address greater than the address specified in the argument.

- The lowest address of a device (a7ControllerNumber/a7ScsiBusId/ a7ScsiTargetId) is defined as 0/0/0, followed by 0/0/1... 0/1/0, 0/1/1... 1/0/0, 1/0/1, and so on.

- Controller numbers start at 0. Channel numbers start at 0. Target IDs start at 0.

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Fault Management Cabinet Information Group

This object is used to obtain information about the fault management cabinet that is in use.

Table A-10. Fault Management Cabinet Information Group

Table object	Data Type	Description	
a8ControllerNumber 1.3.6.1.4.1.1608.1.1.1.8.1.1	Integer	References a particular controller by its controller number	
a8ScsiBusId 1.3.6.1.4.1.1608.1.1.1.8.1.2	Integer	SCSI channel number	
a8CabinetNumber 1.3.6.1.4.1.1608.1.1.1.8.1.3	Integer	The cabinet number	
a8ScsiTargetId 1.3.6.1.4.1.1608.1.1.1.8.1.4	Integer	SCSI target number	
a8ScsiLun 1.3.6.1.4.1.1608.1.1.1.8.1.5	Integer	SCSI logical unit number (LUN) of the SCSI device	
a8CabinetType 1.3.6.1.4.1.1608.1.1.1.8.1.6	Integer	Numerical identification of fault management cabinet type:	
		Value	Meaning
		1	CONNER CR6
		2	CONNER Smart Cabinet
		3	Safte
		32	SAFTE
		64	SES
		255	Unknown
a8NumberOfFans 1.3.6.1.4.1.1608.1.1.1.8.1.7	Integer	The number of fans housed in the cabinet	
a8NumberOfPowerSupplyUnits 1.3.6.1.4.1.1608.1.1.1.8.1.8	Integer	The number of power supply units installed	
a8NumberOfHeatSensors 1.3.6.1.4.1.1608.1.1.1.8.1.9	Integer	The number of heat sensors	
a8NumberOfDriveSlots 1.3.6.1.4.1.1608.1.1.1.8.1.10	Integer	The number of drive slots	
a8NumberOfDoorLocks 1.3.6.1.4.1.1608.1.1.1.8.1.11	Integer	The number of door locks	
a8NumberOfSpeakers 1.3.6.1.4.1.1608.1.1.1.8.1.12	Integer	The number of speakers	
a8NumberOfFansCritical 1.3.6.1.4.1.1608.1.1.1.8.1.13	Integer	The number of fans in a "critical" state	

Table A-10. Fault Management Cabinet Information Group

Table object	Data Type	Description
a8NumberOfPowerSupplyUnitsCritical 1.3.6.1.4.1.1608.1.1.1.8.1.14	Integer	The number of power supply units in a "critical" state
a8NumberOfHeatSensorsCritical 1.3.6.1.4.1.1608.1.1.1.8.1.15	Integer	The number of heat sensors in a "critical" state
a8NumberOfFansFailed 1.3.6.1.4.1.1608.1.1.1.8.1.16	Integer	The number of fans in the "failed" state
a8NumberOfPowerSupplyUnitsFailed 1.3.6.1.4.1.1608.1.1.1.8.1.17	Integer	The number of power supply units in the "failed" state
a8NumberOfHeatSensorsFailed 1.3.6.1.4.1.1608.1.1.1.8.1.18	Integer	The number of heat sensors in the "failed" state

Notes:

- *a8ControllerNumber*, *a8ScsiBusId,* and *a8CabinetNumber* comprise the Index for the search operation.

- This is a READ-ONLY object. No SET operations are allowed.

- A GET operation returns information about the object at the address (a8ControllerNumber/a8ScsiBusId/a8ScsiTargetId) specified in the argument.

- A GETNEXT operation returns information about the next object at the smallest address greater than the address specified in the argument.

- The lowest address of a device (a8ControllerNumber/a8ScsiBusId/ a8CabinetNumber) is defined as 0/0/0, followed by 0/0/1... 0/1/0, 0/1/ 1... 1/0/0,1/0/1, and so on.

- Controller numbers start at 0. Channel numbers start at 0. Target IDs start at 0.

RAID Event Information Group

This object is used to obtain information on events that occur for any or all of the controllers. This group's information is used to send SNMP traps to the SNMP Manager workstation.

Table A-11. RAID Event Information Group

Table object	Data Type	Description
a9EventTableIndex 1.3.6.1.4.1.1608.1.1.1.9.1.1	Integer	The index to the Event Table
a9EventCode 1.3.6.1.4.1.1608.1.1.1.9.1.2	Integer	Numerical identification of the event codes for events. (For event codes, see "Traps" beginning on page A-6.)
a9EventTimeStamp 1.3.6.1.4.1.1608.1.1.1.9.1.3	Integer	The time associated with the event. This is provided as the number of seconds since midnight, January 1, 1970.
a9ControllerNumber 1.3.6.1.4.1.1608.1.1.1.9.1.4	Integer	References a particular controller by its controller number
a9ChannelNumber 1.3.6.1.4.1.1608.1.1.1.9.1.5	Integer	SCSI channel number; valid for physical drive events and fault management events
a9TargetNumber 1.3.6.1.4.1.1608.1.1.1.9.1.6	Integer	SCSI target ID; valid for physical drive events
a9LunNumber 1.3.6.1.4.1.1608.1.1.1.9.1.7	Integer	SCSI logical unit number (LUN) of the physical device; valid for physical drive events
a9LogicalDriveNumber 1.3.6.1.4.1.1608.1.1.1.9.1.8	Integer	The logical drive number; valid for logical drive events
a9FmtCabinetNumber 1.3.6.1.4.1.1608.1.1.1.9.1.9	Integer	The fault management cabinet number; valid for fault management events
a9FanUnitNumber 1.3.6.1.4.1.1608.1.1.1.9.1.10	Integer	The fan unit number in the fault management cabinet; valid for fault management events
a9PowerSupplyUnitNumber 1.3.6.1.4.1.1608.1.1.1.9.1.11	Integer	The power supply unit number in the fault management cabinet; valid for fault management events
a9HeatSensorUnitNumber 1.3.6.1.4.1.1608.1.1.1.9.1.12	Integer	The heat sensor unit number

Notes:

- The value -1 in any of the object fields signifies that the field is not valid for the event being considered.

- This is a READ-ONLY object. No SET operations are allowed.

- A GET operation returns information about the object whose MIB ID is in the query.

- A GETNEXT operation returns the object's information which is next to the MIB ID given in the query.

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Battery Backup Unit Information Group

This object is used to obtain information about the Battery Backup Unit
(BBU).

Table A-12. Battery Backup Unit Information Group

Table object	Data Type	Description	
a10ControllerNumber 1.3.6.1.4.1.1608.1.1.1.10.1.1	Integer	References a particular controller by its controller number	
a10OperationalState 1.3.6.1.4.1.1608.1.1.1.10.1.2	Integer	Operational state of the Battery Backup Unit (BBU)	
		Value	Meaning
	Integer	1	No recondition since power on
	Integer	2	Recondition needed
	Integer	4	First warning on low battery charge
	Integer	8	Last warning on low battery charge
	Integer	16	Reconditioning active
	Integer	32	Discharging
	Integer	64	Fast charging
	Integer	128	Low power alarm
	Integer	255	No battery backup present
a10BatteryType 1.3.6.1.4.1.1608.1.1.1.10.1.3	Integer	The battery type	
	Integer	0	Unknown
	Integer	1	Nickel Cadmium
	Integer	2	NiMh
	Integer	3	Lithium Ion
	Integer	254	No battery backup present
a10CurrentPowerInHours 1.3.6.1.4.1.1608.1.1.1.10.1.4	Integer	Current battery power in hours	
a10MaximumPowerInHours 1.3.6.1.4.1.1608.1.1.1.10.1.5	Integer	Maximum battery power in hours	
a10ThresholdValueInHours 1.3.6.1.4.1.1608.1.1.1.10.1.6	Integer	Battery threshold value in hours	
a10ChargeLevelInPercentage 1.3.6.1.4.1.1608.1.1.1.10.1.7	Integer	Current charge level of the battery (%)	

Table A-12. Battery Backup Unit Information Group

a10Version 1.3.6.1.4.1.1608.1.1.1.10.1.8	Integer	The battery hardware version
a10OperationalStateString 1.3.6.1.4.1.1608.1.1.1.10.1.9	Display String	Operational State of Battery Backup Unit

Notes:

- *a10ControllerNumber* is the index for any search operations against this object.
- This is a READ-ONLY object. No SET operations are allowed.
- A GET operation returns information about the object whose MIB ID is in the query.
- A GETNEXT operation returns the object's information which is next to the MIB ID given in the query.
- Controller numbers start at 0.

Introduction

GAMEVENT refers to the concept of "Event Notification" in Global Array Manager. Event Notification involves the following:

1. The Global Array Manager Server (GAM Server) runs on the server computer to which the Mylex controllers and third-party disk drives or enclosures are installed. When an informational event or error occurs, GAM Server generates an "event." When an informational event, status change, or error occurs, that is deemed significant enough to inform the user, the controller generates a GAM event. That GAM event is then retrieved by the GAM Server.

2. These events can be sent to client workstations running GAM/SAM Client for display in GAM/SAM Client's Log Information Viewer when the particular server is accessed.

    In order to do this, a command line in the GAM Server configuration file must be modified to enable event logging to clients, AND to identify the client workstations by IP address or name.

3. Events generated by GAM Server can also be saved to a log file (GAMEVLOG.LOG, by default), which is stored on the system running GAM Server and can be viewed or printed later.

    In order to do this, another command line in the GAM Server configuration file must be enabled to generate the event log file. The name of the log file or its path can also be changed if desired.

4. In order to access valid parameters and default settings, run gamevent on the DOS command line.

This appendix discusses how GAMEVENT works for various operating systems.

☛ **Note**

> The server and the client must have matching port numbers to generate inpro event logging activity. By default, the Linux client and server are configured to

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communicate correctly when using the root login. If you would like to use any login other than root for the GAM WINE Client, then you will need to modify the server and client event port numbers. This is due to a requirement by non-root users to use a port number above 1000.

☛ **Note**

For example, -i 158 is the default for a root user and -i 1158 needs to be entered for a non-root user.

If necessary, edit the gam file to change these port number values.

NetWare

Enabling Event Notification

To enable event notification to GAM clients, both local and remote, edit the LOAD GAMEVENT command line in the AUTOEXEC.NCF file.

1. Open the AUTOEXEC.NCF configuration file in a text editor.

2. Navigate to the command line of the configuration file called #LOAD GAMEVENT.

   ```
   #LOAD GAMEVENT -h <enter client ip address>
   ```

3. Replace <enter client ip address> with a desired system name or IP address.

   ```
   For example:
   #LOAD GAMEVENT -h 10.97.49.189 -h fabd_test
   ```

   where: -h <address> sets address as a receiver of events.
   Address may be an IP address or a network system name.

   Some systems may already be identified in the LOAD GAMEVENT command line, either because they were previously identified in your existing AUTOEXEC.NCF file, or because they were automatically registered when you entered IP addresses or system names during GAM Server installation.

4. Additional entries require that you extend the command line. Type -h, then an IP address or system name, separated by one space, for each additional entry you need. Additional entries will be read by the system as a continuous string of addresses. Correct spacing is important to avoid confusion of the server names.

   ☛ **Note**

   The argument list is limited to 1028 bytes, allowing a practical maximum of about 50 event notification addresses and provides space for additional addresses.

5. Delete the comment marker "#" from the command line to enable event notification:

   ```
   LOAD GAMEVENT -h 10.97.49.189 -h fabd_test
   ```

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Enabling a GAM Event Log File

1. Navigate to the section of the AUTOEXEC.NCF file called #LOAD GAMEVLOG.

    ```
    #LOAD GAMEVLOG -f sys:\public\gamevlog.log
    ```

2. If necessary, delete the comment marker "#" from the command line to enable event logging to a file:

    ```
    LOAD GAMEVLOG -f sys:\public\gamevlog.log
    ```

3. The file shown (gamevlog.log) is the default file name for the GAM event log. If you want to change this file name, replace "gamevlog" with your desired log file name.

4. The file path shown (sys:\public\) is the default file path for the GAM event log. If you want to change this path, replace "sys:\public\" with your desired file path name.

    The log file will be saved to the appropriate directory.

Saving and Restarting

1. Save the .NCF file in your text editor.

2. Restart your system to start the GAM Server service and activate event notification to the specified IP addresses or system names.

    ☞ **Note**

    To start the event notification and/or logging without restarting the system, type the command with the parameters at the command prompt.

Windows NT and Windows 2000

Enabling Event Notification

To modify or add event notification to GAM clients, both local and remote, edit the GAMEVENT command line in the GAMSCM.INI file.

1. Open the GAMSCM.INI configuration file in a text editor.

2. Navigate to the section of the configuration file called GAMEVENT.

   ```
   gamevent.exe -h host1 -h host2
   ```

3. Replace host1 and host2 with a desired IP address or system name.

   For example:

   ```
   gamevent.exe -h 192.9.11.246 -h host1
   ```

   where: -h <address> sets address as a receiver of events. Address may be an IP address or a network system name.

   Some systems may already be identified in the GAMEVENT command line, either because they were previously identified in your existing GAMSCM.INI file, or because they were automatically registered when you entered IP addresses or system names during GAM Server installation.

4. Additional entries require that you extend the command line. Type -h then an IP address or system name, separated by one space, for each additional entry you need. Additional entries will be read by the system as a continuous string of addresses. Correct spacing is important to avoid confusion of the server names.

   ☛ **Note**

   > The argument list is limited to 1028 bytes, allowing a practical maximum of about 50 event notification addresses and provides space for additional addresses.

5. Delete the comment marker "#" from the command line to enable event notification:

   ```
   gamevent.exe -h 192.9.11.246 -h host1
   ```

B GAMEVT

Enabling a GAM Event Log File

1. Navigate to the section of the GAMSCM.INI file called GAMEVENT LOG.

   ```
   #gamevlog.exe -f .\gamserv\gamevlog.log -s 0
   ```

2. If necessary, delete the comment marker "#" from the command line to enable event logging to a file:

   ```
   gamevlog.exe -f .\gamserv\gamevlog.log -s 0
   ```

3. The file shown (gamevlog.log) is the default file name for the GAM event log. If you want to change this file name, replace "gamevlog" with your desired log file name.

4. The file path shown (.\gamserv\) is the default file path for the GAM event log. If you want to change this path, replace ".\gamserv\" with your desired file path name.

   The log file will be saved to the appropriate directory.

Saving and Restarting

1. Save the .INI file in your text editor.

2. Restart your system to start the GAM Server service and activate event notification to the specified IP addresses or system names.

GAMEVENT LOG Options

The server sends event activity (EVENT LOG) to other hosts computers, which can be another server or a client system. Events can be written to a file and/or to your local terminal screen. There are two options associated with the GAMEVENT LOG, -f and -s.

Usage:

    -f   File   : :   Sets the event log file name

Note: The event log file will be created in the following directory:

    %SystemRoot%\system32\gamserv

☞ Note

> Option **-s** is valid for only Windows NT and Windows 2000. This setting will send the events to the NT/2000 Windows Event Viewer Application Log.

    -s   Value : :   Sets the Severity Level to report.

           Value 0 = Critical

                        1 = Serious

                        2 = Error

                        3 = Warning

                        4 = Information

Note: If a parameter is not specified, no information will be reported.

    gamevlog.exe -f .\gamserv\gamevlog.log -s

B   G A M E V T

UnixWare

Enabling Event Notification

To enable event notification to GAM clients, both local and remote, edit the GAMEVENT command line in the S99GAM file.

1. Open the S99GAM configuration file in a text editor.

2. Navigate to the section of the configuration file called GAMEVENT.

   ```
   #gamevent -h host1 -h host2 -h host3 &
   ```

3. Replace `host1`, `host2`, and `host3` with a desired system name or IP address.
   For example:

   ```
   #gamevent -h 10.97.49.189 -h 10.97.49.190
   -h fabd_test
   ```

   where: -h <address> sets address as a receiver of events.
   Address may be an IP address or a network system name.

4. Additional entries require that you extend the command line. Type -h then an IP address or system name, separated by one space, for each additional entry you need. The system will read additional entries as a continuous string of addresses. Correct spacing is important to avoid confusion of the server names.

   ☞ **Note**

   > The argument list is limited to 1028 bytes, allowing a practical maximum of about 50 event notification addresses and provides space for additional addresses.

5. Delete the comment marker "#" from the command line to enable event notification:

   ```
   gamevent -h 10.97.49.189 -h 10.97.49.190
   -h fabd_test
   ```

Enabling a GAM Event Log File

1. Navigate to the section of the S99GAM file called GAMEVENT LOG.

   ```
   #gamevlog -f $EVENTLOGFILE &
   ```

2. If necessary, delete the comment marker "#" from the command line to enable event logging to a file:

   ```
   gamevlog -f $EVENTLOGFILE &
   ```

Saving and Restarting

1. Save the modified S99GAM file and exit.

2. Reboot the system using the following command from the root directory (match case exactly as shown):

   shutdown -y -i6 -g0 ↵

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Solaris

Enabling Event Notification

To enable event notification to GAM clients, both local and remote, edit the GAMEVENT command line in the S99GAM file.

1. Open the S99GAM configuration file in a text editor using vi.

2. Navigate to the section of the configuration file called GAMEVENT.

   ```
   #gamevent -h host1 -h host2 -h host3 &
   ```

3. Replace `host1`, `host2`, and `host3` with a desired IP address or system name.
   For example:

   ```
   #gamevent -h 10.97.49.189 -h 10.97.49.190
   -h fabd_test
   ```

   where: -h <address> sets address as a receiver of events.
   Address may be an IP address or a network system name.

4. Additional entries require that you extend the command line. Type -h then an IP address or system name, separated by one space, for each additional entry you need. The system will read additional entries as a continuous string of addresses. Correct spacing is important to avoid confusion of the server names.

   ☞ **Note**

   The argument list is limited to 1028 bytes, allowing a practical maximum of about 50 event notification addresses and provides space for additional addresses.

5. Delete the comment marker "#" from the command line to enable event notification:

   ```
   gamevent -h 10.97.49.189 -h 10.97.49.190
   -h fabd_test
   ```

Enabling a GAM Event Log File

1. Navigate to the section of the S99GAM file called GAMEVENT LOG.

```
#gamevlog -f $EVENTLOGFILE &
```

2. If necessary, delete the comment marker "#" from the command line to enable event logging to a file:

```
gamevlog -f $EVENTLOGFILE &
```

Saving and Restarting

1. Save the modified S99GAM file and exit.

2. Reboot the system using the following command from the root directory (match case exactly as shown):

shutdown -y -i6 -g0 ↵

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Linux

Enabling Event Notification

To enable event notification to GAM clients, both local and remote, edit the GAMEVENT command line in the Gam file to remove the initial comment marker.

To enable the Event Comment Line, follow these steps:

1. Log in as root.

2. Stop the GAM Server, type:

   ```
   /etc/rc.d/init.d/Gam stop
   ```

3. Using a text editor such as gnotebook+, open the Gam file located in the following path:

   ```
   /etc/rc.d/init.d/Gam
   ```

4. Navigate to the section of the file called GAMEVENT.

5. Near the bottom of this section you will see a command line such as the following (the command line parameters may differ, especially if IP addresses or node names were previously added):

   ```
   #gamevent -h host1 -h host2 -h host3 &
   ```

6. Replace host1 and host2 with a desired IP address or DNS_NAME.

   For example:

   ```
   #gamevent -h 10.97.49.189 -h 10.97.49.190
   -h fabd_test &
   ```

   where: -h <address> sets address as a receiver of events.
   Address may be an IP address or a network node name.

7. Additional entries require that you extend the command line. Type -h then an IP address or node name, separated by one space, for each additional entry you need. The system will read additional entries as a continuous string of addresses. Correct spacing is important to avoid confusion of the server names.

☛ **Note**

> The argument list is limited to 1028 bytes, allowing a
> practical maximum of about 50 event notification
> addresses and provides space for additional addresses.

8. Save the Gam file in your text editor.

9. Delete the comment marker "#" from the command line to enable event
   notification:

   ```
   gamevent -h 10.97.49.189 -h 10.97.49.190
   -h fabd_test &
   ```

Enable GAM Event Logging

To enable event logging, follow these steps:

1. Navigate to the section of the file called GAMEVENT LOG.

   ```
   #gamevlog -f $EVENTLOGFILE &
   ```

   where: -f sets the event log file name

2. If necessary, delete the comment marker "#" from the command line to
   enable event logging:

   ```
   gamevlog -f $EVENTLOGFILE &
   ```

B GAMEVT

Saving and Restarting

1. Save the modified Gam file and exit.

2. Start the Global Array Manager Server Service and activate event logging and notification to the specified IP addresses or node names:

   `/etc/rc.d/init.d/Gam start`

Appendix C
Creating a GAM Server Installation Diskette

Introduction

The Global Array Manager (GAM) Server Software package provides RAID Management functions for your Mylex Disk Array Controller. You can create your own GAM Server installation diskette from the RAID Management Software Installation menu under Windows. See Table C-1 for information about GAM Server Installation Diskettes.

When to Create a GAM Server Installation Diskette

Table C-1. GAM Server Installation Diskettes

Operating System	GAM Server Diskette Required?
Netware 4.2/5.1/6	**NO**. GAM Server installs from the CD-ROM. See Chapter 2.
Windows NT 4.0 Windows 2000	**NO**. GAM Server installs from the CD-ROM RAID Management Software Installation menu (autorun). See Chapter 3 or Chapter 4.
UnixWare 7.x, Solaris 7 x86, Solaris 8 x86	**YES**. Follow the instructions in this appendix to create a GAM Server diskette.
Linux (all installations)	**NO**. GAM Server installs from the CD-ROM. See Chapter 8.

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Creating a GAM Server Software Installation Diskette

Create a GAM Server installation diskette in six easy steps:

1. Insert the CD-ROM provided in your Mylex package.

2. From the RAID Management Software Installation menu, click Create
    Software Diskettes.

Figure C-1. RAID Management Software Installation Menu
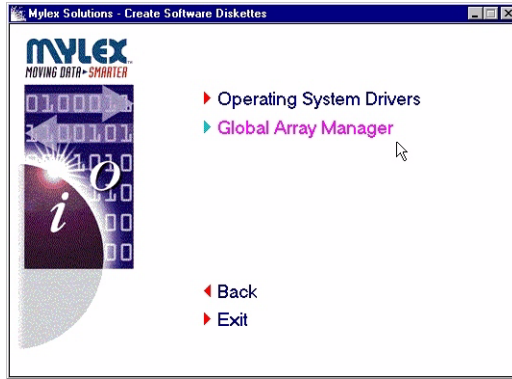
3. Click Global Array Manager.

Figure C-2. Create Software Diskettes Menu

4. Click the appropriate operating system corresponding to the GAM Server installation diskette you wish to create.

Figure C-3. Global Array Manager Menu

5. When the operating system has been selected, you will be prompted with a DOS shell requesting that you insert a blank diskette.

Figure C-4. DOS Shell

6. Insert the blank diskette and press Enter to extract the image onto the diskette.

Use your newly created diskette to install your GAM Server. Refer to the appropriate chapter in this manual.

Installation of GAM Server for Failover or Failback in MSCS

Preparation

When preparing to use Clustering on external products, you need to install GAM Server to utilize the failover or failback in Microsoft Clustering Service™ (MSCS). However, you must first complete the installation of Windows NT 4.0 or Windows 2000 on both servers.

Using Virtual Cluster IP Address

GAM Login fails when using the virtual cluster IP address. This is resolved by starting GAM as a service instead of an application. The Global Array Manager Server should be started as a generic service, and not a generic application. An application does not have NT privileges to use Login call.

Installing GAM Server for Failover or Failback in MSCS

To install GAM Server as a resource for failover or failback in MSCS, use the following procedure.

1. Install GAM Server on both nodes.

2. Disable the GAM Server Services on both nodes.

3. Select **Cluster Administrator** and right-click **Cluster Group**.

4. Create a new resource under Cluster Group called GAM Service with the following properties:

- **Resource type:** Generic Service

- **Group:** Cluster Group

- **Possible Owners:** "Both Nodes"

- **Resource Dependencies:** Cluster IP Address

- **Service Name:** gamscm

- **Startup Parameters:** leave blank

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5. Bring the GAM Service resource online.

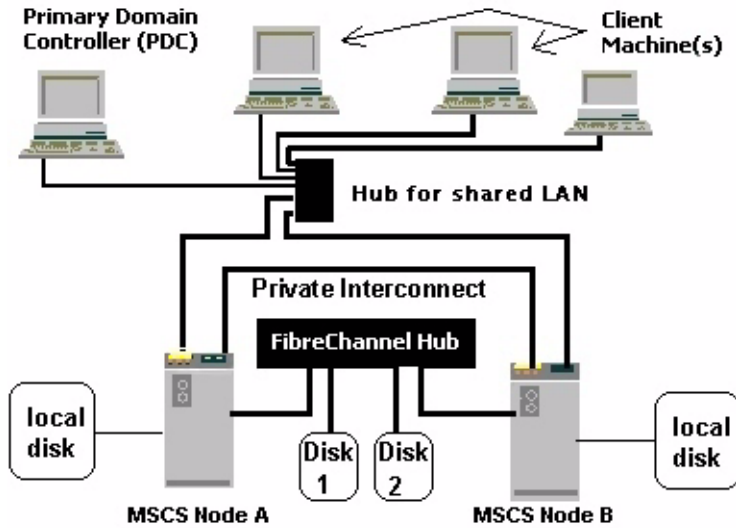6. Go into GAM Client and the following configuration will be seen on the virtual IP.

Figure D-1. GAM Configuration

☞ **Note**

Disk 1 and Disk 2 are connected to an external unit not shown in this illustration.

MYLEX

MOVING DATA ▶ SMARTER