

---

# Installing the Graphical Configuration Manager (GCM)

This chapter describes the Compaq Graphical Configuration Manager (GCM) for OpenVMS that is included in the network kit. This chapter describes how to install the GCM server and the GCM client from the kit, and contains basic instructions for establishing a GCM client/server session. Once you have performed the basic GCM setup, you can get more information about GCM from the GCM client Help menu.

## 1.1 Overview

The Compaq Graphical Configuration Manager (GCM) for OpenVMS is a portable, client/server application that provides a visual means of viewing and controlling the configuration of partitioned AlphaServer systems running OpenVMS. The GCM client is a Java-based application that can run on any operating system that supports the Java run-time environment (JDK V1.2.2 or higher) and a TCP/IP network. A GCM server runs as a detached process on each partitioned OpenVMS instance on one or more AlphaServer systems. You use GCM to configure and manage Galaxy systems in much the same way that you use GCU: the difference is that GCU is a DECwindows Motif application and GCM is a Java-based one.

---

### Note

---

The GCM client is not supported on Java JDK Version 1.3 or higher at this time.

---

All network communication performed by the Compaq OpenVMS Graphical Configuration Manager uses Secure Socket Layer (SSL). The GCM administration database is encrypted.

From a GCM client, an OpenVMS system manager can establish a secure connection to one or more GCM servers, and perform the following functions:

- Display the configuration of partitioned AlphaServers
- Utilize hotswap characteristics of the current hardware platform
- Execute distributed commands among partitioned instances
- Reassign resources among soft-partitioned instances
- View resource-specific characteristics
- Shut down or reboot one or more instances
- Invoke additional management tools
- Create and engage Galaxy configuration models

# Installing the Graphical Configuration Manager (GCM)

## 1.1 Overview

- View online documentation

An **association** is a group of OpenVMS instances, each of which has the GCM server installed and shares a common GCM administration database. By defining associations, system managers can use a wide range of deployment strategies to meet their operational needs. For example, you can create hard partitions on a large system to serve different corporate departments or divisions. Within these hard partitions, you can create soft partitions to further segregate individual work groups or user groups. A complex environment such as this may have many separate system managers, each responsible for a different set of hard and soft partitions. In addition, you can define an overall management function with responsibility for either all or a subset of the partitions. GCM allows you to define specific associations and authorize specific access privileges to individual users.

In the most simple deployment, a single GCM server runs on the single soft partition of a single hard partition. Association records in the administration database identify the hard partition (and its soft partition) as a unique entity that is to be managed as an individual system.

In the most complex deployment, a GCM server runs on each soft partition within each hard partition of many different systems (GS series, ES40, 4100, 8xxx). Association records in the administration database identify the group of systems that form the combined entity to be managed. When an association consists of multiple systems and partitions, each GCM server identifies itself to every other GCM server in the association, thereby establishing a secure communications grid that allows you to perform advanced distributed management functions.

## 1.2 Installation Prerequisites

This section lists the software and hardware requirements for installing and running GCM.

### 1.2.1 Software Requirements

GCM server:

- OpenVMS Alpha Version 7.2-1H1 or greater
- Compaq TCP/IP Services for OpenVMS (shipped with Compaq OpenVMS)

GCM client:

- For OpenVMS
  - OpenVMS Version 7.2 or higher
  - TCP/IP Services for OpenVMS (shipped with Compaq OpenVMS)
  - Java (JDK Version 1.2.2) Run-Time Environment (installed when you install the client)
- For the PC
  - Windows NT or Windows 2000
  - TCP/IP Services for OpenVMS

# Installing the Graphical Configuration Manager (GCM)

## 1.2 Installation Prerequisites

- Java (JDK Version 1.2.2 or higher) Run-Time Environment

---

### Note

---

The GCM client is not supported on Java JDK Version 1.3 or greater at this time.

---

### 1.2.2 Hardware Requirements

The performance of GCM is affected by the size and configuration of the association. A larger, more complex association (one that contains many GCM servers) results in slower network transfers.

Each machine running a GCM client should have a display of at least 800x600 pixels (SVGA).

Each PC running a GCM client should contain at least 128 MB memory.

### 1.3 Installation Procedure

This section describes how to install the components of the GCM. Installation consists of the following steps:

- Installing one GCM server (Section 1.3.2).
- Installing one GCM client (Section 1.3.3).
- Performing GCM server setup tasks to establish a basic configuration, including authorizing initial user with administrator privilege (Section 1.3.4).
- Running the GCM client (with administrator privilege) to finish configuring the association (Section 1.3.4).
- Propagating the GCM administration database (Section 1.3.4).
- Authorizing additional users Section Section 1.3.4).

#### 1.3.1 Kits

You can find the internal test versions of the POLYCENTER Software Installation utility kits for the OpenVMS GCM server and client at the following locations:

```
BULOVA::GCM_KITS:CPQ-AXPVMS-GCM_CLIENT-A0100--1.PCSI-DCX_AXPEXE  
BULOVA::GCM_KITS:CPQ-AXPVMS-GCM_SERVER-A0100--1.PCSI-DCX_AXPEXE
```

You can find the internal test version of the InstallShield kit for the Microsoft Windows GCM client at the following location:

```
BULOVA::GCM_KITS:GCM_CLIENT_A0100.ZIP
```

#### 1.3.2 Installing the GCM Server

The GCM server is preinstalled on OpenVMS Version 7.3-1 and higher versions. On previous versions of OpenVMS (Version 7.2-1H1 or higher), you can install the GCM server with the POLYCENTER Software Installation utility kit (see Section 1.3.1).

Installing the GCM server does the following:

- Installs (or updates) the SYS\$COMMON:[SYSEXEC]GCM\_SERVER.EXE image.
- Installs the SYS\$COMMON:[SYS\$STARTUP]GCMSRV\$STARTUP.COM file.

## Installing the Graphical Configuration Manager (GCM)

### 1.3 Installation Procedure

- Defines the SYSSCOMMON:[SYSSCONFIG] directory with the logical name GCMSRV\$DIR.
- Installs the following files in directory GCMSRV\$DIR:
  - GCM\_RULESET.XML
  - GCM\_CUSTOM.XML
  - GCM\_BANNER.JPG
  - GCM\_NOTICE.HTML
  - GCM\$SETUP.EXE
  - GCM\_CERT.PEM

Example 1–1 shows a sample GCM server installation.

#### Example 1–1 Sample GCM Server Installation

```
$ PRODUCT INSTALL GCM_SERVER
The following product has been selected:
  CPQ AXPVMS GCM_SERVER A1.0          Layered Product
Do you want to continue? [YES]
Configuration phase starting ...
You will be asked to choose options, if any, for each selected product and for
any products that may be installed to satisfy software dependency requirements.
CPQ AXPVMS GCM_SERVER A1.0: Graphical Configuration Manager V1.0
  COPYRIGHT (c) 2002 -- All rights reserved
  Compaq Computer Corporation
  License and Product Authorization Key (PAK) Information
* This product does not have any configuration options.
  Copying GCM Release Notes to SYS$HELP
  Will install the GCM Server V1.0.
  GCM Startup File
Execution phase starting ...
The following product will be installed to destination:
  CPQ AXPVMS GCM_SERVER A1.0          DISK$WFGLX5_X931:[VMS$COMMON.]
Portion done: 0%...10%...20%...30%...90%...100%
The following product has been installed:
  CPQ AXPVMS GCM_SERVER A1.0          Layered Product
$
```

Example 1–2 lists the files in the current directory after the GCM server is installed.

# Installing the Graphical Configuration Manager (GCM)

## 1.3 Installation Procedure

### Example 1–2 Directory of GCM Server Files

```
$ SET DEFAULT SYS$COMMON:[SYS$CONFIG]
$ DIRECTORY

Directory SYS$COMMON:[SYS$CONFIG]

GCM$SETUP.EXE;1      GCM_BANNER.JPG;1      GCM_CERT.PEM;1      GCM_CUSTOM.XML;1
GCM_NOTICE.HTML;1   GCM_RULESET.XML;1      GCM_SERVER.COM;1

Total of 10 files.
```

### 1.3.3 Installing the GCM Client

Section 1.3.3.1 describes how to install the OpenVMS GCM client. Section 1.3.3.2 describes how to install the PC GCM client.

#### 1.3.3.1 OpenVMS GCM Client

Example 1–3 shows a sample OpenVMS GCM client installation.

#### Example 1–3 OpenVMS GCM Client Installation

```
$ PRODUCT INSTALL GCM_CLIENT

The following product has been selected:
  CPQ AXPVMS GCM_CLIENT A1.0          Layered Product

Do you want to continue? [YES]

Configuration phase starting ...

You will be asked to choose options, if any, for each selected product and for
any products that may be installed to satisfy software dependency requirements.

CPQ AXPVMS GCM_CLIENT A1.0: Graphical Configuration Manager V1.0 Client
  COPYRIGHT (c) 2002 -- All rights reserved
  Compaq Computer Corporation
  License and Product Authorization Key (PAK) Information
* This product does not have any configuration options.
  Copying GCM Release Notes to SYS$HELP
  Will install the GCM Java Client V1.0.
  Will install a private copy of the Java JRE V1.2.2-3.
  Will install a private copy of the Java Fast VM V1.2.2-1

Execution phase starting ...

The following product will be installed to destination:
  CPQ AXPVMS GCM_CLIENT A1.0          DISK$WFGLX5_X931:[VMS$COMMON.]

Portion done: 0%...10%...20%...90%...100%

The following product has been installed:
  CPQ AXPVMS GCM_CLIENT A1.0          Layered Product
$
```

Example 1–4 lists the files in the current directory the OpenVMS GCM client is installed in. Note that the OpenVMS GCM client installation installs the Java Run-Time Environment in the JRE.DIR directory.

# Installing the Graphical Configuration Manager (GCM)

## 1.3 Installation Procedure

### Example 1–4 Directory of GCM Client Files

```
$ SET DEFAULT SYS$COMMON:[GCM_CLIENT]
$ DIRECTORY

Directory SYS$COMMON:[GCM_CLIENT]

BIN.DIR;1          GCM_CERT.CRT;1      RUN_GCMCLIENT.COM;1  IMAGES.DIR;1
JRE122.DIR;1      LIB.DIR;1          README.TXT;1

Total of 7 files.
$
```

#### 1.3.3.2 PC GCM Client

To install the PC GCM client, first copy the BULOVA::GCM\_KITS:GCM\_CLIENT\_A0100.ZIP file, and then use a zip utility to install the GCM client.

The installation process allows you to select the Windows directory that will contain the GCM client. Note that to retain any preferences between GCM client sessions, you must start the GCM client from the directory you select during installation. You can accomplish this by clicking the GCM Client icon.

#### 1.3.4 Setting Up the GCM Server

To set up the GCM server, first set default to the SYS\$COMMON:[SYS\$CONFIG] directory, and then run GCM\$SETUP.EXE to perform the following tasks:

- Define the initial configuration of the association.
- Authorize the initial user (username, password, and privileges).
- Choose whether or not to start the GCM server immediately.
- Determine whether or not to automatically start the GCM server when the system boots.

During GCM server setup, you can also choose to authorize additional GCM users.

Running GCM\$SETUP.EXE generates and encrypts the GCM administration database file SYS\$COMMON:[SYS\$CONFIG]GCM\_ADMIN.EDB. Choosing to start the GCM server executes the SYS\$STARTUP:GCMSRV\$STARTUP.COM procedure, which results in the following:

- Creation and execution of GCMSRV\$DIR:GCM\_STARTUP.COM, which starts the GCM server as a detached process with the log file GCMSRV\$DIR:GCM\_SERVER.LOG.
- Starting the GCM server with process name GCM\_SERVER.

---

#### Note

The GCM server automatically restarts after a server fault. If the GCM server hangs, it will time out and restart. You can also enter a RESTART command from a suitably privileged GCM client.

The first time a GCM server restarts, its process name is GCM\_SERVER01. Thereafter, each time the GCM server restarts, its process name is incremented by one, up to GCM\_SERVER99; at that point, subsequent restarts are disabled to prevent the GCM server from entering a restart loop.

You can prevent attempts at automatic restart by defining the system logical name GCMSRV\$ABORT. After you eliminate the cause of the

# Installing the Graphical Configuration Manager (GCM)

## 1.3 Installation Procedure

restart attempts, you must deassign this logical name to enable automatic restart of the GCM server.

---

Example 1–5 is an example of how to set up the initial GCM server configuration.

### Example 1–5 Sample GCM Server Setup

```
$ SET DEFAULT SYS$COMMON:[SYS$CONFIG]
$ DIRECTORY
Directory SYS$COMMON:[SYS$CONFIG]
GCM$SETUP.EXE;1      GCM_BANNER.JPG;1      GCM_CERT.PEM;1      GCM_CUSTOM.XML;1
GCM_NOTICE.HTML;1   GCM_RULESET.XML;1

Total of 6 files.

$ RUN GCM$SETUP

OpenVMS GCM-Server Setup Utility
Copyright (c) 2002, Compaq Computer Corporation

This utility initializes the GCM Administrative Database: GCM_ADMIN.EDB

If you are performing an initial GCM-Server installation, continue.

If you are replacing an existing database, you must delete the current
database files on all GCM-Server instances in your current Association
to allow the new database to be recognized.

CONTINUE (Y/N)? y
DO YOU PREFER FULL TEXT ASSISTANCE (Y/N)? y
STEP 1: SERVER DISCOVERY IP PORT NUMBER
  USE THE DEFAULT PORT NUMBER 4100 (Y/N)? y
STEP 2: CONNECTION BOUNDS
  USE THE DEFAULT CONCURRENT CLIENT LIMIT (Y/N)? y
  USE THE DEFAULT CONCURRENT SERVER LIMIT (Y/N)? y
STEP 3: CONNECTION SECURITY
  USE CLIENT-SERVER SECURITY (Y/N)? y
STEP 4: SERVER ASSOCIATION RECORD
  ENTER THE ASSOCIATION NAME: TEST ASSOCIATION
STEP 5: SYSTEM RECORDS
  ENTER SYSTEM NAME (star.zko.compaq.com) (or 0 when done): WFGLX5.ZKO.DEC.COM
  ENTER SYSTEM IP ADDRESS (or 0 to use DNS): 16.32.112.17
  ENTER SYSTEM NUMBER: 0
  ENTER HARD PARTITION NUMBER: 1
  ENTER SOFT PARTITION NUMBER: 0
  %Define additional system records as needed...
  ENTER SYSTEM NAME (star.zko.compaq.com) (or 0 when done): 0
STEP 6: CLIENT AUTHORIZATION RECORDS
```

(continued on next page)

## Installing the Graphical Configuration Manager (GCM)

### 1.3 Installation Procedure

#### Example 1–5 (Cont.) Sample GCM Server Setup

```
ENTER CLIENT NAME/TITLE (or 0 when done): First Last
ENTER USERNAME: First
ENTER INITIAL PASSWORD FOR First: Last
ENTER EMAIL ADDRESS FOR First: First.Last@compaq.com
GIVE First CONFIG PRIVILEGE (Y/N)? y
GIVE First COMMAND PRIVILEGE (Y/N)? y
GIVE First USER-COMMAND PRIVILEGE (Y/N)? y
GIVE First POWER PRIVILEGE (Y/N)? y
GIVE First ADMIN PRIVILEGE (Y/N)? y
ENABLE First ACCOUNT NOW (Y/N)? y
%Define additional client records as needed...
ENTER CLIENT NAME/TITLE (or 0 when done): 0
STEP 7: SERVER STARTUP OPTIONS
DO YOU WANT THE LOCAL GCM-SERVER TO START ON SYSTEM BOOT (Y/N)? y
You may choose to start the local GCM-Server now, or you can start
it later via $ @SYS$STARTUP:GCMSRV$STARTUP.COM
DO YOU WANT TO START THE LOCAL GCM-SERVER NOW (Y/N)? y
%DCL-I-SUPERSEDE, previous value of GCMSRV$RESTART has been superseded

***** POST SETUP TASKS *****

This completes the GCM Admin Database initialization.
IMPORTANT:
If you are using multiple GCM-Servers, copy the newly created GCM
Admin Database file: SYS$COMMON:[SYS$CONFIG]GCM_ADMIN.EDB, to the
same location on each system you defined in the Association, then
start or restart each server via $ @SYS$STARTUP:GCMSRV$STARTUP.COM

If the database has been properly defined, each server will detect
the presence of the other servers and form the specified Association.
At this point, you can use the GCM Client to establish a connection
and further tune the installation.

For maximum security, you may wish to protect or remove this utility.
$
```

For an example GCM server setup with complete prompting text that explains each entry, see Section 1.12.

#### GCM Administration Database

The GCM\$SETUP utility prompts you for details regarding system configuration, user identification, and startup methods.

To enhance security, you can rename, delete, or otherwise protect the GCM setup utility after you have run it. The setup utility is required again only if you need to rebuild the initial database.



## Installing the Graphical Configuration Manager (GCM)

### 1.3 Installation Procedure

During the initial setup, you must define at least one system to run the GCM server (typically, the system you are logged in to) and authorize one user with administrator privilege. This user can then run the GCM client and connect to the GCM server for further configuration and tuning. During GCM server setup, you can define additional instances in the association, and you can authorize additional GCM users with individual access privileges. You can also perform these tasks from a GCM client at any time.

The GCM setup utility creates the `SYSS$COMMON:[SYSS$CONFIG]GCM_ADMIN.EDB` file, which is the initial GCM administration database. This is an encrypted database that contains information about the association and its users. In normal operation, this database can be interpreted only by the GCM server. (See Section 1.9.) If you have configured the association with more than one instance, you must manually copy the GCM administration database file to the GCM server directory of each additional instance before you start GCM servers on those instances. Failure to copy the database file can prevent the association from being properly created, or can cause the initial GCM administration database to be overwritten.

Note that changing the configuration of the association, such as by adding a new instance or by removing an instance, is a major modification. Whenever you make a major modification to the association, you must manually copy the GCM administration database file to the GCM server directory on that instance before starting the GCM server.

Minor modifications to the database in an active association automatically propagate to all GCM servers; you do not have to restart the GCM servers. Minor modifications include actions such as adding and removing GCM client records or adjusting GCM server parameters.

## 1.4 Starting the GCM Server

You can start the GCM server automatically (Section 1.4.1) or manually (Section 1.4.2).

Note that you should run only one GCM server in an instance.

### 1.4.1 Automatic GCM Server Startup

If you select automatic GCM server startup during server setup (see Section 1.3.4), the setup utility executes the following command:

```
$ MC SYSMAN STARTUP ADD FILE GCMSRV$STARTUP.COM
```

You can also enter this command manually at any time.

The `GCMSRV$STARTUP.COM` procedure performs the following tasks:

- Defines the required system logical names.
- Creates a small worker procedure, `SYSS$COMMON:[SYSS$CONFIG]GCM_SERVER.COM`.
- Runs the GCM server process as a detached process.

To turn off automatic startup, enter the following command:

```
$ MC SYSMAN STARTUP REMOVE FILE GCMSRV$STARTUP.COM
```

# Installing the Graphical Configuration Manager (GCM)

## 1.4 Starting the GCM Server

### 1.4.2 Manual GCM Server Startup

You can manually start the GCM server at any time by entering the following command:

```
$ @SYS$STARTUP:GCMSRV$STARTUP
```

## 1.5 Postinstallation Administrative Tasks

The administrator performs the following tasks from a privileged GCM client:

- Authorizes other GCM users (Section 1.5.1).
- Posts documents to the library (optional) (Section 1.5.2).
- Defines the GCM\_BANNER.JPG login banner (optional) (Section 1.5.3).
- Posts the system notices GCM\_NOTICE.HTML file (optional) (Section 1.5.4).
- Defines custom system and user-level commands (Section 1.5.5).

The following sections and the GCM client help provide more information about these tasks.

### 1.5.1 Authorizing GCM Users and Defining the Subscription Template

You can define, authorize, and enable GCM users during the GCM server setup procedure, or at any time from the GCM client (with admin privilege). During a typical installation, you will define the key users of the system from the setup utility. Additional users can request access to the GCM server association using a subscription process and email request.

As part of the postinstallation setup, the first time the GCM server is started it creates `SYS$COMMON:[SYS$CONFIG]GCM_TEMPLATE.XML`, a subscription template file. This file contains a template to create a subscription form tailored to your specific site. To customize this template, the administrator must connect to a GCM server from a GCM client, and select Edit Subscription Template on the File menu.

When the default subscription template is displayed, complete the form as needed and press OK to return the official template to all active GCM servers. (You can also manually copy this file to the other instances in the configuration if the GCM servers are not yet running.) The subscription form includes fields that allow a potential user to request a user name, password, and access level. As the administrator, you can choose which authorizations to make visible to users. For example, you can disallow users from requesting the Admin privilege if you prefer to keep a single system administrator account.

---

#### Note

GCM user authorization records (user name, password, and so on) are completely independent of any OpenVMS authorization mechanism.

---

Once the subscription form is initialized, users can discover GCM-capable instances (those running a GCM server) and request a subscription form. A user cannot request a subscription form until the administrator has customized the subscription template. When a user completes the subscription form, it is returned to the GCM server and email is sent to the administrator notifying about a new subscription request. To approve a request, the administrator connects to the association from a GCM client, edits the GCM administration

## Installing the Graphical Configuration Manager (GCM)

### 1.5 Postinstallation Administrative Tasks

database, and selects options to approve or disapprove of the request. Optionally, the administrator clicks the Email button to bring up an email response to the user advising of the status of the request. As soon as a subscription request is approved and the account is enabled, the updated GCM administration database is automatically propagated to the other GCM servers and the requesting GCM user is allowed access to the GCM servers in the association.

To revoke a GCM user's access privileges, the administrator deletes the client record or simply disables the account. A client that is currently connected is immediately disconnected.

#### GCM User Privileges

When you authorize a user, you can grant the following privileges:

Privilege	Description
Config	Allows the user to modify the configuration of the association
Command	Allows the user to define commands for self
User Command	Allows the user to define commands for all clients
Admin	Allows the user to edit the GCM administration database (GCM\$ADMIN.EDB)
Power	Allows the user to power systems and components on and off

#### 1.5.2 Managing the Library

The GCM includes a distributed document retrieval system. This system allows you to post documents in directories you specify on individual GCM servers for users to retrieve and view. (To invoke the Library dialog box, select Edit Admin Database on the File menu.) In addition, programs and procedures that run on GCM server systems can produce output files for retrieval and viewing by users.

You can use wildcard characters to search for documents. For example, executing a remote GCM server command procedure may run a performance analysis that generates an Excel spreadsheet output file. Using the GCM, you can invoke this procedure simultaneously on multiple systems in the association. Each system may produce a result file with unique identifying features in its file specification, such as the node name or a timestamp. You can specify the document with wildcards, for example, CFG\_\*\_LOG.CSV. This specification results in a search for matching files on each system. Any matching files are listed in the GCM client's library as documents available for retrieval. Full OpenVMS directory specifications are also allowed.

Whenever a user opens a GCM server library and retrieves a document, a copy of that document is written into the user's GCM client directory. After the user ends GCM client session, these files are still available for viewing in an editor or browser. However, any changes made to the file are not propagated to the library copy on the GCM server. Users must manually delete these outdated files when they no longer need them.

#### 1.5.3 Custom Banners

You can provide a custom banner image for your company or organization by copying your own JPEG file to SYS\$COMMON:[SYS\$CONFIG]GCM\_BANNER.JPG. This file should be a reasonable size to avoid lengthy download delays. This file is displayed in GCM clients as they connect.

## Installing the Graphical Configuration Manager (GCM)

### 1.5 Postinstallation Administrative Tasks

#### 1.5.4 System Notices

You can post general system notices for GCM clients by editing the `SYSS$COMMON:[SYSS$CONFIG]GCM_NOTICE.HTML` file. This file is a simple hypertext document that can contain messages to display when a GCM client connects to the GCM server. Keep edits to this file simple. You can embed links, but do not embed scripts, images, sounds, and so on. The GCM client's built-in browser (the Java default browser) is less sophisticated than most modern browsers and is not intended for general use.

#### 1.5.5 Customizing Commands

You can customize GCM commands in two ways. A user with user command privilege has access to menu items that allow the user to define and save custom DCL commands. These commands can perform any function supported by OpenVMS and DCL. The GCM server does not currently support interactive commands or command procedures.

---

#### Note

---

When authorizing the user command privilege, remember that all commands are executed by the GCM server in system context. GCM makes no attempt to prevent you from executing commands that are detrimental to system performance or operation.

---

You can also create custom commands with extended ruleset definitions. On each GCM server, an option file (`SYSS$COMMON:[SYSS$CONFIG]GCM_CUSTOM.XML`) contains simple menu definition statements in XML format. If this file is present when the GCM server starts up, these additional menu commands will appear in the GCM client for all users with the command privilege. This provides a means for system administrators to define instance-specific commands for their users. A sample file is shipped in the kit and contains instructions for defining additional custom commands. If you do not wish to use this capability, you may delete the custom ruleset file. For more information about using custom commands, see Section 1.7.1.

### 1.6 Configuring the Association

It is critical to specify the correct values of systems and hard and soft partitions for GCM to run properly. Incorrect values will cause command routing to fail. Before installing the GCM and defining the configuration of the association, it can be helpful to define the association on a worksheet.

Table 1–1 is an example of how to define an association for a system with two hard partitions, each of which contains four soft partitions.

**Table 1–1 Sample Worksheet for A Simple Association**

Fully Qualified System Name	IP Address <sup>1</sup>	System	Hard Partition	Soft Partition
<i>sysnam1.zko.dec.com</i>	16.32.112.1	0	0	0

---

<sup>1</sup>A value of zero causes DNS name translation to look up the current IP address.

(continued on next page)

## Installing the Graphical Configuration Manager (GCM)

### 1.6 Configuring the Association

**Table 1–1 (Cont.) Sample Worksheet for A Simple Association**

Fully Qualified System Name	IP Address <sup>1</sup>	System	Hard Partition	Soft Partition
<i>sysnam2.zko.dec.com</i>	16.32.112.2	0	0	1
<i>sysnam3.zko.dec.com</i>	16.32.112.3	0	0	2
<i>sysnam4.zko.dec.com</i>	16.32.112.4	0	0	3
<i>sysnam5.zko.dec.com</i>	16.32.112.5	0	1	0
<i>sysnam6.zko.dec.com</i>	16.32.112.6	0	1	1
<i>sysnam7.zko.dec.com</i>	16.32.112.7	0	1	2
<i>sysnam8.zko.dec.com</i>	16.32.112.8	0	1	3

<sup>1</sup>A value of zero causes DNS name translation to look up the current IP address.

#### 1.6.1 Consideration

An association can be a single system, a combination of hard and soft partitions within a single system, or multiple systems with any combination of hard and soft partitions. Typically, the GCM is used within a single system, including all soft partitions that exist in that system. Although you can extend a GCM association to span multiple systems, including older AlphaServer systems, be aware of the performance impact of creating large associations.

A burst of network traffic is created by the GCM in response to a configuration change. If your association spans many systems and partitions, the volume of data may become excessive. Although Compaq is continually improving the operation of the GCM, you can define associations that become unmanageable. It is difficult to set limits on association size because of the number of factors that affect performance, such as network speed and load, and GCM client system resources. Note that the design goal for the initial release of the GCM is a maximum of eight partitions (an AlphaServer GS320 can contain up to eight soft partitions). Typical customer installations contain far fewer partitions.

#### 1.6.2 Adding Systems to An Association

A **system** is a physical machine cabinet. You can add systems to an association with the GCM Setup utility (which requires you to define at least one local system; see Section 1.3.4) or at any time using the GCM client. As you add new systems to the association, you must specify identifying details and, if necessary, adjust GCM server limits.

You must assign a unique system number to each system. For example, a GS320 may have up to eight partitions, all within the same system. System numbers are assigned sequentially starting with zero. Each system number results in the creation of a separate branch of the configuration display.

For each hard partition within each system, you must define a hard partition number. This must be the actual hard partition number. For example, if you partition a GS320 into four hard partitions, you must be aware of which partitions are numbered zero through three.

## Installing the Graphical Configuration Manager (GCM)

### 1.6 Configuring the Association

For each soft partition within each hard partition, you must define a soft partition number. This must be the actual soft partition number. For example, if you split hard partition number 0 into soft partitions 0 and 1, you must specify the appropriate partition number for each system. Table 1–1 shows a system configured in this way.

Note that all partitions reside within system 0. If you extend your association to include another system with its own set of partitions, those partitions will have system 1 designations.

---

#### Note

---

It is critical that you set these values correctly. If you fail to provide proper values, GCM will be unable to form the desired association, or will be unable to properly route command traffic through the association. At times you may need to invoke the native Graphical Configuration Utility (GCU) utility with the CONFIGURE GALAXY command to determine the proper identifiers for the GCM.

---

Note that the GCM server maintains limits over the number of concurrent GCM clients and GCM servers it will support. The defaults are four concurrent GCM clients and eight concurrent GCM servers. When these limits are reached, additional GCM client or GCM server connection requests are denied. You can alter these values by editing the GCM administration database from a privileged GCM client.

Remember to manually propagate the modified GCM administration database file GCM\_ADMIN.EDB to all instances that are new to the association. If a GCM server was running previously but is new to this association, stop all GCM servers, manually copy the GCM administration database file, and then restart all GCM servers. Once you get your association set up and functioning, it is best not to alter it more than necessary. Once stability has been achieved, the GCM should remain stable and usable.

### 1.7 Customizing GCM

You can customize GCM in the following ways:

- Customize the GCM client application geometry.  
This includes window colors, sizes, and placement. This is accomplished using GCM client menu functions. See the GCM client help for more information.
- Customize connection attributes.  
These include the IP port assignment, whether to retrieve notices or banners upon connection, and various limits and diagnostic attributes. You can modify all these attributes from the GCM client. Note that if you change the IP port assignment, you must restart the GCM servers.
- Define custom commands.  
For a description, see Section 1.7.1.



### 1.7.1 Defining and Using Commands

The GCM supports distributed execution of OpenVMS DCL commands and command procedures. However, at this time, the GCM does not support interactive commands and procedures. A DCL command that is a good candidate for execution using GCM has the following characteristics:

- It is immediately executed.
- It produces its output upon execution.
- It returns immediately.

Many DCL commands require a response from the user or do not return immediately. Such commands are not good candidates for use with GCM. For example, the RUN command does not always return immediately. The GCM server executes each command request within a subprocess but does not return any response to you; nor does the subprocess terminate if the program does not terminate. Therefore, to stop the subprocess you must enter a SHOW SYSTEM command to identify the associated subprocess to stop manually.

All GCM server commands are assigned subprocess names in the form GCM\_<node name>\_CMDnnnn, where *nnnn* is a command sequence number. Typically, these subprocesses run to completion, delivering an AST to the GCM server to let it know that related output can be found in a temporary log file of the same name as the subprocess. After returning the result file, the subprocess and its related file are deleted. If the subprocess is executing a command that does not complete or that is waiting for input, the GCM server never sees command completion and never returns results. This does not prevent the GCM server from performing other duties, but it can lead to unexpected command behavior.

Future releases of GCM should provide additional command functionality. However, there will always be a class of command functionality that cannot be supported. Launching applications with graphical interfaces or complex interaction is beyond the intended use of GCM. In many cases, you can create a simple command procedure wrapper to allow an application to manage its own display redirection.

## 1.8 GCM Server Log Files

Several log files are generated as part of normal GCM server execution. Some of these log files are useful for GCM server troubleshooting (see Section 1.9). Log files may include the system node name as part of the file specification as a means of isolating log files from individual system roots if the system disk is a cluster common system disk.

The following log files are generated:

- Run-time log files

When a GCM server process is started, it creates the SYSSCOMMON:[SYSSCONFIG]GCM\_<nodename>\_SERVER.LOG log file. This log file may contain details to help troubleshoot GCM server faults.

- Command log files

An additional log file is created for each GCM server command that is executed. These log files have names in the following form:

GCM\_<nodename>\_CMD<sequence\_number>.LOG

## Installing the Graphical Configuration Manager (GCM)

### 1.8 GCM Server Log Files

When a command executes successfully, the related log file is deleted. In rare cases, a GCM server fault may orphan one of these log files. At GCM server startup, any residual log files are deleted.

- Connection log files

During run time, the GCM servers can be set to generate a connection log file. This optional file, SYSSCOMMON:[SYSSCONFIG]GCM\_<nodename>\_CONNECT.LOG, contains a timestamped history of successful and failed GCM client connections.

During run time, the GCM servers can be set to generate a GCM server event log. This optional file, SYSSCOMMON:[SYSSCONFIG]GCM\_<nodename>\_EVENT.LOG, contains a wide variety of information that may help with GCM server troubleshooting. The content of this event log varies based on GCM server diagnostic flags. Event log entries typically are disabled to avoid generating excessively large files.

### 1.9 Troubleshooting the GCM Server

Any time that the GCM server is started using the normal startup procedure, it is running in a mode that supports automatic restart behavior. When run in its normal mode, the GCM server produces its run-time log file, but offers little additional information for troubleshooting possible GCM server problems.

The following sections contain information to assist you in troubleshooting possible GCM server problems.

#### 1.9.1 Obtaining Diagnostic Information

At times it may be beneficial to run the GCM server in a mode that allows some diagnosis to occur. Diagnostics produce procedural trace information that is either written to the GCM server event log, if enabled, or output to the screen, if enabled. Typically, diagnostic output is directed to the screen; however, the event log output is useful if you need to forward it to Compaq support personnel for help.

To get diagnostic screen output from the GCM server, you must run the GCM server interactively rather than as a detached process. To do this, stop the GCM server if it is currently running, and restart it from a DECterm window by entering the following command:

```
$ RUN SYSSSYSTEM:GCM_SERVER.EXE
```

Once the GCM server is running, connect to it from a GCM client with administrative privileges, and edit the GCM administration database as follows:

1. Select Edit Admin Database from the File menu.
2. Select the Server Init page.
3. Locate the Diagnostic text field and note the buttons for selecting the desired output.
4. Click the Screen output button and enter the appropriate diagnostic code or codes, according to the following table. You can set more than one flag at a time.



## Installing the Graphical Configuration Manager (GCM)

### 1.9 Troubleshooting the GCM Server

Code (decimal)	Code (hex)	Function	Action
0	0	DIAGNOSTIC_DISABLE	
1	1	HEARTBEAT_TRACE	(servers disconnecting)
2	2	TRANSACTION_TRACE	(general troubleshooting)
4	4	XML_TRACE	(general troubleshooting)
8	8	LOCK_TRACE	(server hangs)
16	10	COMMAND_TRACE	(disables execution and dumps packet)
32	20	CRYPTO_DISABLE	(GCM administration database troubleshooting)

---

#### Note

By default, regardless of whether the GCM client-server communications is using security (SSL), the GCM administration database is always encrypted. On rare occasions, you may want to disable encryption of the GCM administration database GCM administration database file. By setting the CRYPTO\_DISABLE flag, GCM servers will no longer encrypt and update the GCM\_ADMIN.EDB file. Instead, they will output plain ASCII XML to GCM\_ADMIN.DAT, and will accept input on startup from GCM\_ADMIN.DAT. This allows you to directly edit the XML structures within the GCM administration database and to review modifications made by the GCM client and server.

---

#### Caution

Run the GCM servers with the CRYPTO\_DISABLE flag set only for troubleshooting, because running the servers with the CRYPTO\_DISABLE flag set exposes GCM user authorization records in simple ASCII (unencrypted) form.

Remember to disable diagnostics before returning a GCM server to service. If you fail to disable logging, the related GCM server log files can grow very large, and GCM server performance will suffer.

### 1.9.2 Potential Problem Areas

Heartbeats are a potential problem area for heavily loaded systems. For GCM servers to detect the presence and loss of GCM clients and GCM servers in other instances, periodic heartbeat transactions are issued. The GCM server is smart enough to optimize the heartbeat process, altering the rate based upon usage, and requiring only one-way heartbeats. At times, GCM server or network activity delays the issuance of a heartbeat. The GCM server is designed to tolerate a number of missed heartbeats before assuming disconnection.

## Installing the Graphical Configuration Manager (GCM)

### 1.9 Troubleshooting the GCM Server

You can tune heartbeat values to suit specific needs by using the GCM client to edit the GCM administration database. Three values apply: the Client Pulse, Server Pulse, and Flat Line. The Pulse values are the number of seconds between heartbeat transactions. The Flat Line value is how many heartbeats can be missed before disconnection. These are preset to values that yield good behavior without undue traffic. Under special circumstances, you can alter these values if you find your sessions are being disconnected. These values have no effect on the overall responsiveness of the GCM with regard to command and event processing.

#### 1.9.3 Timeout Detection

The GCM client contains a debug hook to turn off timeout detection entirely. To enter a debug mode, press Ctrl+Alt+D+B. A TEST menu item indicates this mode is active. In this mode the GCM client remains connected regardless of how long it takes to get a response back from a slow GCM server (such as one that is being debugged).

### 1.10 Performance

Because GCM is a client/server application, it is slower to respond to commands and configuration events than its native counterpart, the Galaxy Configuration Utility (GCU). While a Galaxy CPU assignment takes only a few milliseconds and is reflected immediately by the GCU, the GCM may take several seconds to update its display. For real-time response, run the GCU (and possibly multiple instances of the GCU if you have multiple hard partitions).

PC systems running Microsoft Windows require substantially more physical memory than may be present in a typical desktop PC. For best performance, your PC should have at least 128 MB (and preferably more). Disk space is seldom a concern.

The native OpenVMS GCM client does not perform quite as well as the Windows GCM client. On OpenVMS, user accounts must have substantial pagefile quota to run the GCM client. Compaq suggests that you set the PGFLQUO parameter to 350000 or more. (This is true of all Java applications on OpenVMS.)

Performance of GCM servers is typically a function of network behavior. GCM servers sit idle the majority of time, waking up every so often to issue a heartbeat transaction to other GCM servers or clients. The GCM server responds to configuration change events by reencoding the AlphaServer Configuration Tree structure in memory and then transmitting an XML- encoded representation to all active GCM servers and clients. This typically creates a burst of approximately 100 KB of network traffic. In an association that contains multiple GCM servers, with each server actively supporting GCM clients, the GCM servers must merge these bursts of data into a single configuration model, and then forward that model to each GCM client. The new model can require a megabyte or more.

To ensure optimal GCM performance, remember the following:

- Large configuration changes usually occur when GCM servers join or leave the association. Simple command processing produces far less traffic.
- The best way to ensure good GCM server performance is to limit the number of GCM servers in your association.
- You can define multiple associations to keep the size of any one association from growing excessively large.

## 1.11 Maintaining the GCM Server

In general, you do not need to perform maintenance tasks on the GCM server. However, if you have enabled some of the extended logging capabilities, the respective log files may grow quite large over time, and you may need to check these files periodically if you require such auditing. All such log files are found in the SYS\$COMMON:[SYS\$CONFIG] directory. The normal mode of operation disables logging.

The GCM client requires only the occasional cleanup of any library files that have been retrieved by the user. Each time a library file is retrieved, a copy is stored on the local GCM client system.

## 1.12 Sample Verbose GCM Server Setup

This section contains a sample verbose GCM server setup.

```
$ SET DEFAULT SYS$COMMON:[SYS$CONFIG]
$ DIRECTORY
Directory SYS$COMMON:[SYS$CONFIG]
GCM$SETUP.EXE;1      GCM_BANNER.JPG;1      GCM_CERT.PEM;1      GCM_CUSTOM.XML;1
GCM_NOTICE.HTML;1    GCM_RULESET.XML;1

Total of 6 files.

$ RUN GCM$SETUP

OpenVMS GCM-Server Setup Utility
Copyright 2002, Compaq Computer Corporation

This utility initializes the GCM Administrative Database: GCM_ADMIN.EDB
If you are performing an initial GCM-Server installation, continue.

If you are replacing an existing database, you must delete the current
database files on all GCM-Server instances in your current Association
to allow the new database to be recognized.

CONTINUE (Y/N)? y
DO YOU PREFER FULL TEXT ASSISTANCE (Y/N)? y
STEP 1: SERVER DISCOVERY IP PORT NUMBER

By default, the GCM-Servers listen for client connections on
IP Port 4100. This can be changed, but each server will need
to be restarted, and each client will need to specify the new
port number in their "Server Connection Preferences" settings.

USE THE DEFAULT PORT NUMBER 4100 (Y/N)? y
STEP 2: CONNECTION BOUNDS

By default, the GCM-Servers support up to 4 concurrent clients
and 8 concurrent servers. This can be changed, but each server
will need to be restarted. Be advised that GCM performance may
suffer as these values are increased.

USE THE DEFAULT CONCURRENT CLIENT LIMIT (Y/N)? y
USE THE DEFAULT CONCURRENT SERVER LIMIT (Y/N)? y
STEP 3: CONNECTION SECURITY

By default, the GCM-Servers expect that their clients will be
using secure connections (SSL). This can be disabled, but the
servers will need to be restarted, and each client will need
to change their "Server Connection Preferences" settings.
```

# Installing the Graphical Configuration Manager (GCM)

## 1.12 Sample Verbose GCM Server Setup

USE CLIENT-SERVER SECURITY (Y/N)? y

### STEP 4: SERVER ASSOCIATION RECORD

Multiple GCM-Servers can form an "Association" of systems, providing a wide management scope. This Association may include one server per soft-partition on one or more hard-partition on one or more physical system. Regardless of how many servers are in the Association, you need to define an Association Name that describes the involved systems. Choose a simple descriptive string such as "Engineering Lab Systems".

ENTER THE ASSOCIATION NAME: TEST ASSOCIATION

### STEP 5: SYSTEM RECORDS

Each system in the Association must be uniquely identified by its IP Address, System Number, Hard-Partition Number, and Soft Partition Number. At least one system must be defined. You may define multiple systems now, or define additional systems after establishing your first client connection.

Enter a fully qualified name for the system running a GCM-Server. For example: star.zko.compaq.com. When you are done entering system records, enter 0 at the following prompt.

ENTER SYSTEM NAME (star.zko.compaq.com) (or 0 when done): WFGLX5.ZKO.DEC.COM

Enter a fully qualified IP Address for the system running a GCM-Server. For example: 16.32.112.16  
If you prefer to use DNS to lookup the address, enter 0

ENTER SYSTEM IP ADDRESS (or 0 to use DNS): 16.32.112.17

The SYSTEM NUMBER is a simple numeric value that uniquely identifies soft and hard partitions that reside in a common partitionable computer. For example, if you have two separate partitionable computers in your Association, each having its own hard and soft partitioned instances, enter a SYSTEM NUMBER of 0 for all hard and soft partitions in the first computer, and enter 1 for those in the second computer.

ENTER SYSTEM NUMBER: 0

The HARD PARTITION NUMBER is a numeric value that uniquely identifies which HARD Partition a GCM-Server resides within. If a system has only a single HARD Partition, enter 0. If a system has multiple HARD Partitions, use the appropriate Hard Partition ID. These are sequential numeric values which were used when creating the system partitions. You can also obtain these values by running the Galaxy Configuration Utility via \$ CONFIG GALAXY command.

ENTER HARD PARTITION NUMBER: 1

The SOFT PARTITION NUMBER is a numeric value that uniquely identifies which SOFT Partition a GCM-Server resides within. If a system has only a single SOFT Partition, enter 0. If a system has multiple SOFT Partitions, use the appropriate Soft Partition ID. These are sequential numeric values which were used when creating the system partitions. You can also obtain these values by running the Galaxy Configuration Utility via \$ CONFIG GALAXY command.

ENTER SOFT PARTITION NUMBER: 0

%Define additional system records as needed...

Enter a fully qualified name for the system running a GCM-Server. For example: star.zko.compaq.com. When you are done entering system records, enter 0 at the following prompt.

ENTER SYSTEM NAME (star.zko.compaq.com) (or 0 when done): 0

### STEP 6: CLIENT AUTHORIZATION RECORDS

## Installing the Graphical Configuration Manager (GCM)

### 1.12 Sample Verbose GCM Server Setup

At least one client must be defined in order to allow an initial client-server connection to be established. Additional clients may be defined now, or at any point using the client application and the GCM Subscription Procedure. This initial client record must provide fully privileged access for the specified user so that subsequent GCM administration functions can be performed.

Enter a string which describes this client.  
The string can be the users full name, or job title, etc.

ENTER CLIENT NAME/TITLE (or 0 when done): First Last

Enter the clients USER name. This is a single word that identifies the user, such as their last name.

ENTER USERNAME: First

Enter the clients PASSWORD. This is a unique GCM password, unrelated to any system authorization function.  
Note: Passwords can be changed by any GCM Client with Admin privilege.

ENTER INITIAL PASSWORD FOR First: Last

Enter the clients EMAIL Address. This is particularly important for the client that is serving the role of GCM Administrator as they will receive email subscription requests.

ENTER EMAIL ADDRESS FOR First: First.Last@compaq.com

CONFIG privilege allows a user to issue commands that alter a system configuration (if they also have the COMMAND privilege) and to load and save configuration models.

GIVE First CONFIG PRIVILEGE (Y/N)? y

COMMAND privilege allows a user to issue DCL commands.

GIVE First COMMAND PRIVILEGE (Y/N)? y

USER-COMMAND privilege allows a user to create their own command menu entries. Commands are executed in a privileged context so use discretion when authorizing this privilege.

GIVE First USER-COMMAND PRIVILEGE (Y/N)? y

POWER privilege allows a user to issue commands that power on or off system components for systems that support such operations.

GIVE First POWER PRIVILEGE (Y/N)? y

ADMIN privilege allows a user to modify the GCM-Server Administration Database. Use discretion when authorizing this privilege.

GIVE First ADMIN PRIVILEGE (Y/N)? y

You may choose to ENABLE this client immediately, or enable the client later once the GCM is fully configured.

IMPORTANT: Be sure to enable the initial administrator client!

ENABLE First ACCOUNT NOW (Y/N)? y

%Define additional client records as needed...

Enter a string which describes this client.  
The string can be the users full name, or job title, etc.

ENTER CLIENT NAME/TITLE (or 0 when done): 0

#### STEP 7: SERVER STARTUP OPTIONS

You may choose to have the local GCM-Server started automatically upon system boot. If you choose this option, the server will be started during the next system boot. To accomplish this, the startup file SYS\$STARTUP:GCMSRV\$STARTUP.COM will be added to the Layered Product startup database.

## Installing the Graphical Configuration Manager (GCM)

### 1.12 Sample Verbose GCM Server Setup

```
DO YOU WANT THE LOCAL GCM-SERVER TO START ON SYSTEM BOOT (Y/N)? y
You may choose to start the local GCM-Server now, or you can start
it later via $ @SYS$STARTUP:GCMSRV$STARTUP.COM

DO YOU WANT TO START THE LOCAL GCM-SERVER NOW (Y/N)? y
%DCL-I-SUPERSEDE, previous value of GCMSRV$RESTART has been superseded

***** POST SETUP TASKS *****

This completes the GCM Admin Database initialization.

IMPORTANT:

If you are using multiple GCM-Servers, copy the newly created GCM
Admin Database file: SYS$COMMON:[SYS$CONFIG]GCM ADMIN.EDB, to the
same location on each system you defined in the Association, then
start or restart each server via $ @SYS$STARTUP:GCMSRV$STARTUP.COM

If the database has been properly defined, each server will detect
the presence of the other servers and form the specified Association.
At this point, you can use the GCM Client to establish a connection
and further tune the installation.

For maximum security, you may wish to protect or remove this utility.

$
```