HP Advanced Server for OpenVMS

Guide to Managing Advanced Server Licenses

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This guide describes the types of Advanced Server licenses, license management software, and how to configure your system as a License Server.

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Contents

Preface ix

1 How to Use Advanced Server License Software

1.1 The Advanced Server Licensing System 1–1
1.1.1 Advanced Server Licensing System Components 1–3
1.1.2 Configuring License Services 1–4
1.1.2.1 Configuring Standalone License Servers 1–5
1.1.2.2 PWLIC and PWLicense Shares 1–6
1.1.2.3 Configuring LANs and WANs 1–6
1.1.3 PATHWORKS Client Licensing Software 1–6
1.1.4 Upgrading the License Server 1–7
1.2 License Management Models 1–8
1.2.1 Server-Based License Management 1–9
1.2.1.1 When to Use Server-Based License Management 1–9
1.2.1.2 How Server-Based License Management Operates 1–9
1.2.1.3 Server-Based License Management in an OpenVMS Cluster 1–10
1.2.2 Client-Based License Management 1–10
1.2.2.1 How Client-Based License Management Operates 1–11
1.2.3 Combining Server-Based and Client-Based License Management 1–11
1.2.3.1 How Combined License Management Operates 1–11
1.3 License Management Tasks 1–11

2 Setting Up License Management

2.1 Setting Up Server-Based License Management 2–2
2.1.1 Setting Up Server-Based Licensing Only, for Performance Gains 2–2
2.2 Setting Up Client-Based License Management 2–3
2.3 Setting Up Combined Client-Based and Server-Based License Management 2–5

2.4 Examples of Advanced Server License Management 2–6
2.4.1 Setting Up Client-Based Licensing in a LAN 2–6
2.4.2 Setting Up Combined Client-Based and Server-Based Licensing in a WAN 2–7
2.4.3 Setting up a V6 Server to Allow Clients to Request PATHWORKS V5 for OpenVMS (LAN Manager) Licenses . . . 2–8
2.4.4 Using Server-Based Licensing in a LAN or WAN 2–9
2.5 Upgrading Client Licenses 2–10
2.5.1 Configuring Client License Upgrades Individually 2–11
2.5.2 Replacing All Licenses 2–11
2.5.3 Upgrading Client Licenses Automatically 2–12
2.5.4 Virtual Licenses 2–14
2.6 License Server and License Registrar Configuration Parameters 2–15
2.6.1 Dynamic Configuration Parameters 2–16

3 Configuring License Servers

3.1 License Server State Files 3–1
3.1.1 License Server Name 3–2
3.1.2 Creating a New License Server State File 3–2
3.2 Moving a License Server to a Different System 3–4
3.2.1 Moving the License Server and Retaining the License Server Name 3–4
3.2.2 Moving the License Server and Changing the License Server Name 3–5
3.3 Controlling License Version Lookup 3–6
3.3.1 Acquiring a Different Client-Based License than Requested 3–7
3.4 Controlling Where the License Server Runs in an OpenVMS Cluster 3–8
3.4.1 How to Specify Where License Servers Run in a Cluster 3–10
3.5 Synchronizing the License Server Database with the LMF Database 3–12
3.5.1 How License Database Changes Impact the License Server 3–12
3.5.2 Scheduling the LMF Synchronization 3–13

4 Managing Licenses on the OpenVMS Platform

4.1 Getting Started with the License Manager 4–2
4.1.1 Starting the License Manager 4–2
4.1.2 Getting Help with the License Manager 4–4
4.1.3 Exiting the License Manager 4–4
4.2 Configuring the License Server 4–5
4.3 Navigating in the License Manager 4–6
4.3.1 Navigating Fields in a Dialog Box 4–7
4.4 Performing License Server Tasks 4–7
4.4.1 Disabling and Enabling the License Server 4–8
4.4.2 Performing Log File Tasks 4–9
4.4.2.1 Enabling Events for Logging 4–9
4.4.2.2 Selecting Events for Logging 4–10
4.4.2.3 Creating a New Version of the Log File 4–11
4.5 Performing License Product Tasks 4–11
4.5.1 Adding Product Licenses 4–12
4.5.2 Removing Product Licenses 4–12
4.5.3 Listing Product Allocations 4–13
4.5.4 Sorting Product Displays 4–14
4.5.5 Setting the Alert Level for Product Licenses 4–14
4.5.6 Generating Product Reports 4–15
4.6 Performing License Group Tasks 4–15
4.6.1 Creating License Groups 4–16
4.6.2 Listing Licenses in a Group 4–17
4.6.3 Sorting Group Displays 4–17
4.6.4 Allocating Licenses to a Group 4–18
4.6.5 Reallocating Licenses to Another Group 4–20
4.6.6 Removing Groups 4–21
4.6.7 Setting the Alert Levels for Groups 4–22
4.6.8 Generating Group Reports 4–22
4.7 Performing Client License Tasks 4–23
4.7.1 Revoking Client Licenses 4–23
4.7.2 Showing Client Details 4–25
4.7.3 Sorting Client License Lists 4–26
4.7.4 Generating Client License Reports 4–27

5 Client Licensing Software

5.1 Client Licensing Software Components and When to Install Them 5–1
5.2 How to Obtain the Client Licensing Software 5–2
5.3 Enabling Wide Area Network (WAN) Operations 5–3
5.3.1 Configuring the WAN Protocol Stack for WAN Licensing 5–4
5.3.2 Configuring the License Server Name 5–5

A Server Messages

A.1 License Component Log Files A–1
A.1.1 License Processing-Related Log Files A–2
A.1.2 License Component Program Log Files A–2
A.2 License Server Events A–3
A.3 License Registrar Events A–8
A.3.1 Monitoring Consumption of Server-Based Licenses A–12
A.4 Event Logger (ADMIN/ANALYZE) Messages A–13

Index

Figures

1–1 Advanced Server Licensing System 1–2
3–1 License Server Startup Error Message 3–10
4–1 Main Menu Screen 4–2
4–2 Main Menu with View Menu Displayed 4–4
4–3 License Server Error Message 4–5
4–4 License Server Startup Error Message 4–5
4–5 Server Enable/Disable Screen 4–8
4–6 Log File Options Screen 4–10
4–7 Add License Product Screen 4–12
4–8 Sort Options for Products Screen 4–14
4–9 Add New Group Screen 4–16
4–10 Products Screen for Products in a Group 4–17
4–11 Sort Options for Groups Screen 4–18
4–12 Modify License Product Allocation Screen 4–19
4–13 List of Client Licenses Screen 4–24
4–14 Confirm Revocation of Client License Screen 4–24
4–15 Client Details Screen 4–26

4–16 Sort Options for Licenses Screen 4–26
4–17 File Name for Report Dialog Box 4–27

Tables

1–1 File Server Licenses 1–8
2–1 Virtual License Names 2–14
4–1 Keys for Navigating Screens 4–6
4–2 Confirmation Box Selections 4–7
4–3 Buttons for Navigating Screens 4–7
4–4 Allocation and Alert Field Descriptions 4–20
4–5 Client Details Field Description 4–25

Preface

This guide describes:

- Types of Advanced Server licenses
- Step-by-step instructions for using the Advanced Server license management software
- How to use the Advanced Server License Manager
- How to troubleshoot licensing problems

This guide contains information about licensing requirements for both PATHWORKS V6.1 for OpenVMS (Advanced Server) and Advanced Server V7.3B for OpenVMS. The term "Advanced Server license" applies to the license required to access the specific version of the file server.

About This Guide

This guide is written for system administrators who need to:

- Gain a basic understanding of Advanced Server licensing concepts.
- Ensure that valid clients receive licenses.
- Manage licenses.
- Solve and eliminate license management problems.

This guide assumes you are familiar with basic license management software provided with the HP *OpenVMS* operating system.

Organization of This Guide

This guide contains the following sections:

Chapter	Description
Chapter 1	Provides an overview of the License Server software and the license management tasks you perform
Chapter 2	Describes how you configure and manage the License Server software in your network environment
Chapter 3	Describes how to configure the License Server software components on OpenVMS systems
Chapter 4	Describes how to use the License Manager
Chapter 5	Describes client software components that might be used with the License Server and how to obtain them, if necessary
Appendix A	Lists and describes the messages that are generated in response to server events

Related Documents

The following table lists related Advanced Server for OpenVMS documents:

Document	Description
HP Advanced Server for OpenVMS Server Installation and Configuration Guide	Explains how to install and configure Advanced Server software
HP Advanced Server for OpenVMS Concepts and Planning Guide	Provides an overview of and introduction to the Advanced Server software and associated networking concepts for system administrators and operators
HP Advanced Server for OpenVMS Server Administrator's Guide	Explains how to manage and customize the Advanced Server software
HP Advanced Server for OpenVMS Commands Reference Manual	Provides command syntax descriptions for all ADMINISTER commands and NET command equivalents

The following table lists related PATHWORKS for OpenVMS (Advanced Server) documents:

Document	Description
Compaq PATHWORKS for OpenVMS Server Migration Guide	Explains how to upgrade a PATHWORKS (LAN Manager) server to PATHWORKS V6 for OpenVMS (Advanced Server)
Compaq PATHWORKS for OpenVMS (Advanced Server) Server Installation and Configuration Guide	Explains how to install and configure PATHWORKS for OpenVMS software
HP Advanced Server for OpenVMS Concepts and Planning Guide	Provides an overview of and introduction to the PATHWORKS for OpenVMS (Advanced Server) software and associated networking concepts for system administrators and operators
Compaq PATHWORKS for OpenVMS (Advanced Server) Server Administrator's Guide	Explains how to manage and customize the PATHWORKS for OpenVMS (Advanced Server) software
HP Advanced Server for OpenVMS Commands Reference Manual	Provides command syntax descriptions for all ADMINISTER commands and NET command equivalents

The following table lists related OpenVMS documents:

OpenVMS Document	Description
HP OpenVMS Version 8.3 Upgrade and Installation Manual	Describes how to install the OpenVMS Alpha Version 8.3 system software
OpenVMS VAX Version 7.1 Upgrade and Installation Manual	Describes how to install the OpenVMS VAX Version 7.1 system software
OpenVMS VAX Version 7.2 Upgrade and Installation Manual	Describes how to install the OpenVMS VAX Version 7.2 system software
HP OpenVMS System Manager's Manual	A task-oriented guide (in two volumes) to managing an OpenVMS system; describes how to set up the required system services
HP OpenVMS System Management Utilities Reference Manual	A reference guide (in two volumes) to the utilities and tools used in managing an OpenVMS system
HP OpenVMS License Management Utility Manual	Explains how to load and manage license Product Authorization Keys (PAKs)

For additional information about the OpenVMS products and services, access the following OpenVMS World Wide Web address:

`http://h71000.www7.hp.com/openvms`

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`http://www.hp.com/go/openvms/doc`

If you need help deciding which documentation best meets your needs, call 800-282-6672.

Conventions

The following conventions are used in the Advanced Server documentation set:

Convention	Meaning
Advanced Server	Advanced Server refers to the PATHWORKS for OpenVMS (Advanced Server) as well as Advanced Server for OpenVMS file server.
Italic	Italics text indicates a place holder for information or parameters that you must provide. For example, if the procedure asks you to type *file-name*, you must type the actual name of a file. Italic text also indicates path names, new terms, and the titles of other documents.
`monospace`	Monospace text indicates the actual commands, words, or characters that you type in a dialog box or at a command prompt or system output.
Note	The use of **Note** provides information of special importance.
Caution	The use of **Caution** provides information to avoid damaging the software or hardware.
Warning	The use of **Warning** provides information that is essential to people's safety.
/	A forward slash in command descriptions indicates that a command qualifier follows.
. . .	A horizontal ellipsis following an entry in a command line indicates that the entry or a similar entry can be repeated any number of times. An ellipsis following a file name indicates that additional parameters, values, or information can be entered.
. . .	A vertical ellipsis in an example indicates that not all the data is shown.
Ctrl/*x*	While you hold down the Ctrl key, press another key or a pointing device button.
Return or Enter	The use of Return or Enter in text indicates where you should press the Return or Enter key to execute a command or terminate a sequence. This key is labeled Return or Enter, depending on your keyboard.

Convention	Meaning
Tab	In examples, a key name enclosed in a box indicates that you press a key on the keyboard. (In text, a key name is not enclosed in a box.) In the HTML version of this document, this convention appears as brackets, rather than a box.
PF1 *x*	A sequence such as PF1 *x* indicates that you must first press and release the key labeled PF1 and then press and release another key or a pointing device button.

1

How to Use Advanced Server License Software

Any client accessing an Advanced Server must be sufficiently licensed. This chapter describes how the license software works, the licenses required to access the server, and how license management works. The following topics are discussed:

- Section 1.1, The Advanced Server Licensing System, describes the different components of the licensing system and describes how licensing works.
- Section 1.2, License Management Models, describes the different license management approaches to providing access to the Advanced Server.
- Section 1.3, License Management Tasks, describes the tasks involved in managing Advanced Server licenses and the features of the License Manager that allow you to perform these tasks.

1.1 The Advanced Server Licensing System

The Advanced Server license software on the server runs on the OpenVMS operating system and includes the following components:

- **License Server** – A software program that assigns and verifies client-based licenses and performs license management tasks.
- **License Manager**—A management interface between the system administrator and the Advanced Server License Server.
- **License Registrar**—A program that runs on every Advanced Server node and validates that client access to the file server is licensed. The License Registrar also grants server-based licenses.

The licensing software that runs on the client includes the following components:

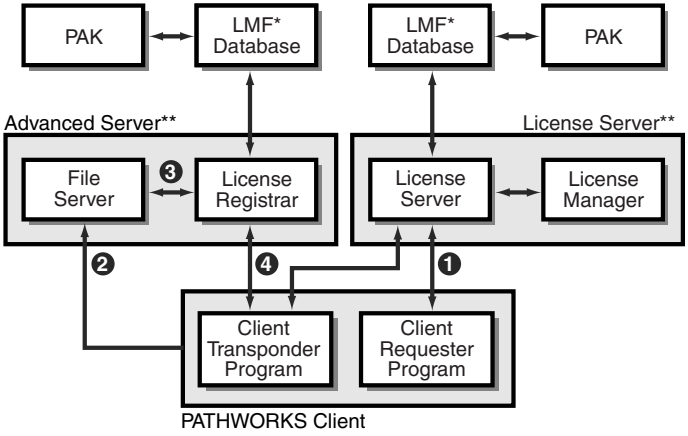
- **Client License Requester**—A program that runs on the client and requests licenses from the License Server.

- **Client License Transponder**—A program that runs on the client and communicates information about the client's license to the License Registrar.

See Chapter 5, Client Licensing Software, for more information about the client licensing software.

The organization of these components is shown in Figure 1–1, Advanced Server Licensing System.

Figure 1–1 Advanced Server Licensing System



Legend:

* Could be the same database
** Could be the same node

VM-0192A-AI

❶ Client requests license assignment or verification.

❷ Client establishes new session with file server.

❸ File server requests to validate that the client is licensed for access to file server resources.

❹ License Registrar validates a client's license or assigns a server-based license.

1.1.1 Advanced Server Licensing System Components

The following list summarizes how the components of the licensing system interact:

- The Advanced Server License Server is installed and configured on an OpenVMS system. This can be a standalone system or an OpenVMS Cluster and does not necessarily have to be on the same system as the Advanced Server. The Advanced Server License Server is an interface between the LMF database and the client licensing software. It services requests for client-based licenses.
- The License Registrar runs on every Advanced Server system and determines if a client is licensed to use the Advanced Server resources. The License Registrar validates client-based licenses and grants server-based licenses when they are needed and available.

  For server-based licensing, Advanced Server licenses are loaded and registered on the file server system. The License Registrar also maintains information about the licenses and periodically interfaces to LMF to determine changes to licenses, such as the addition of new licenses and the removal of licenses.

  When unlicensed clients access the Advanced Server resources, they are granted server-based licenses by the License Registrar, if they are available. These licenses must be available to the License Registrar for such server-based use ahead of time.
- The License Manager:
  - Manages client-based licenses
  - Specifies how many licenses will be used as client-based licenses and how many licenses will be used as server-based licenses
  - Organizes client-based licenses into license groups
  - Generates reports of licensing activities
  - Displays lists of clients that have been granted licenses
  - Revokes licenses
- Clients use the client license requester (CLR) and the client license transponder (CLT) programs to request and verify licenses. The CLR program requests client-based licenses from the License Server. When the License Server assigns a license to the client, the client provides license information to the CLT program. Each time the client establishes a session with Advanced Server resources, the CLT program presents this license information to the License Registrar so that the license can be validated.

For a system to be an Advanced Server License Server, no special attributes are required. However, make sure that the system is configured for, and running, all of the transports used by clients requesting licenses.

A small amount of disk storage space on the server, less than 500 bytes per license managed, is also required.

HP recommends that you use a single License Server to provide client-based licenses to all clients requiring a client-based license in a local area network (LAN). There is no technical reason why you could not use a single License Server per wide area network (WAN) or multiple License Servers per LAN; these models are also supported. However, using a single License Server per LAN, at least to start, provides a good degree of local control while keeping the administrative activity to a minimum. Also, operating too many License Servers within a single LAN can result in performance degradation.

For increased availability, a License Server can be run in an OpenVMS Cluster. Alternatively, two or more License Servers can be run, although any given PAK can only be loaded on one OpenVMS system at a time.

When registering and loading a new Advanced Server license PAK on an OpenVMS Cluster, use the LICENSE REGISTER command on one node of the cluster to register the PAK and then use the LICENSE LOAD command on each cluster member to load the licenses on that cluster member. This ensures that Advanced Server license components running on any member of the cluster will be able to detect the new licenses. Failure to load the licenses on each cluster member may cause failures due to the Advanced Server licenses components' inability to detect licenses that are not loaded.

1.1.2 Configuring License Services

When you install the Advanced Server, the License Registrar is automatically installed to ensure that access to the server resources is validated. The License Server, however, is an optional component that is installed only if you answer YES to the appropriate prompt in the initial configuration dialog, PWRK$CONFIG, described in the *Server Installation and Configuration Guide* for your Advanced Server product.

The License Server manages client-based licenses, including assignment of licenses to clients and allocation of licenses to license groups.

If you choose not to configure the License Server to run, the License Registrar takes its licenses directly from LMF (the License Management Facility) and uses them exclusively as server-based licenses. Simply load the licenses as described in the *HP OpenVMS License Management Utility Manual*.

If you choose to configure the License Server, use the procedures described in this guide to allocate and manage licenses. For more information on choosing client-based versus server-based licensing, see Chapter 2, Setting Up License Management.

When the Advanced Server is started, the License Server (if configured) and the License Registrar are started using the following command procedures:

- SYS$STARTUP:PWRK$LICENSE_S_START.COM
- SYS$STARTUP:PWRK$LICENSE_R_START.COM

These command procedures contain complete descriptions of the configuration parameters used by each process when it runs. For more information about these parameters, see Section 2.6, License Server and License Registrar Configuration Parameters. In addition, Section A.2, License Server Events, includes information about parameters that control the reporting of events that are logged to the License Server log file. Section A.3, License Registrar Events, includes information about parameters that control the reporting of events that are logged to the License Registrar log file.

1.1.2.1 Configuring Standalone License Servers

The License Server can run on a different system than the one that is running the file server (such as the Advanced Server or the PATHWORKS Advanced Server). HP recommends this configuration for the best performance of the file server system. The system running the License Server without a file server is referred to as a "standalone License Server."

To configure a system to run the standalone License Server, install the file server software as described in the *Server Installation and Configuration Guide* for your Advanced Server product. During the product installation procedure, you should answer NO to the question about installing the Advanced Server, and answer YES to the question, "Do you want to install only the Advanced Server License Server?" When the procedure completes, configure and start the License Server as described in the *Server Installation and Configuration Guide* for your Advanced Server product.

When you install the file server on another system in the local area network (LAN), configure the server so that the License Server is not started on the same system with the file server.

1.1.2.2 PWLIC and PWLicense Shares

The Advanced Server includes a copy of the Windows client software necessary to implement client-based licensing. If you have or plan to implement server-based licensing only, this software is not required on the Windows clients.

The Windows client licensing software may already exist in the Advanced Server shares PWLIC and PWLICENSE. For more information about how to create these shares, please refer to the *Server Installation and Configuration Guide*

For more information about License Server configuration, see Chapter 3, Configuring License Servers.

Note

Wherever the PWLIC or PWLICENSE shares are referred to in this document, it is assumed these shares exist. Note that, on PATHWORKS V6.1 PWLIC and PWLICENSE shares are installed by default.

1.1.2.3 Configuring LANs and WANs

HP recommends that the License Server be installed and running in the same LAN as the file server that the clients need to access, if you are using client-based license management. Clients on computers outside of the LAN can obtain licenses for access to the file server, if the License Server is configured for wide area network access. For more information about how to provide WAN access to the License Server, see Section 5.3, Enabling Wide Area Network (WAN) Operations,

1.1.3 PATHWORKS Client Licensing Software

If the file server offers server-based licensing, and a sufficient number of server-based licenses are available, the client computer needs no special software for requesting and storing the Advanced Server license. However, if the licenses are managed as client-based licenses, the client computer must have PATHWORKS client licensing software to request and store Advanced Server licenses.

The PATHWORKS client licensing software is automatically installed and configured as part of the PATHWORKS client software installation procedure. Therefore, if the client is running HP PATHWORKS 32, no additional client licensing software is needed.

If the client computer is not running PATHWORKS client software (for example, on a retail Windows XP workstation), the PATHWORKS client licensing software components (Client License Requester and Client License Transponder) must be loaded and set up on the client computer to request and store Advanced Server client-based licenses.

These client components are available on the file server system after you install the file server software. For information about loading and customizing the client software for client-based licensing, refer to the README.TXT file provided with the Advanced Server PWLICENSE share on the file server.

Note

The PATHWORKS 32 system license PWXXWINAT07.*nn*:

- Grants the right to run the PATHWORKS 32 software on a client system
- Is not required and does not grant the right to access a PATHWORKS for OpenVMS (Advanced Server) or Advanced Server for OpenVMS server
- Can be served to clients using the License Server, for administrative purposes only

Note

The License Server included with the Advanced Server will not issue or manage PATHWORKS for OpenVMS (NetWare) licenses. If you have clients using NetWare networking software, maintain the existing version of the License Server on a different system from the one that is running Advanced Server.

1.1.4 Upgrading the License Server

No special upgrading procedures are required for installing a new version of the License Server.

- If the system is running the integrated License Server, it is automatically upgraded when you configure the new version of the file server.

- If the system is running the standalone License Server, you can install the new version of the License Server. You need not upgrade the file server. Upgrade the License Server by simply installing and configuring it as described in the *Server Installation and Configuration Guide* for your Advanced Server product. No additional upgrade procedures are required for standalone License Servers.

1.2 License Management Models

The file server requires that clients accessing file and print services be appropriately licensed. To meet this requirement, one of the following must be true:

- The client must have acquired a client-based license previous to establishing a session with the file server.
- A server-based license must be available for each client establishing a session with a file server without a client-based license.

In either case, the license required to access each version of the file server is listed in Table 1–1, File Server Licenses.

Table 1–1 File Server Licenses

To access this file server . . .	The client needs this Client Access license . . .
PATHWORKS for OpenVMS (Advanced Server)	One of the following: PWLMXXXCA06.00 PWLMXXXCA07.02 PWLMXXXCA07.03
Advanced Server V7.2 for OpenVMS	One of the following: PWLMXXXCA07.02 PWLMXXXCA07.03
Advanced Server V7.3B for OpenVMS	PWLMXXXCA07.03

These licenses can be configured to be used as either client-based licenses, as server-based licenses, or as a combination of both.

Clients currently using client-based licenses to access PATHWORKS V6 for OpenVMS (Advanced Server) servers need not be changed. These clients will continue to access PATHWORKS for OpenVMS (Advanced Server) servers using their client-based license. However, to access the Advanced Server for OpenVMS, they must obtain a new client-based license or a server-based license must be available for them on the file server system.

1.2.1 Server-Based License Management

Server-based licensing grants a specific number of clients connected to a file server (on a first-come, first-served basis) the right to use server software on a single server and allows clients access to file and print services resident on the server.

1.2.1.1 When to Use Server-Based License Management

Server-based licensing is best suited for clients that need access to file and print services on a single server, or for a large number of clients that need occasional access to file and print services. Server-based licenses:

- Are consumed only for the duration of the session
- Are consumed only by clients without appropriate client-based licenses
- Require no license software on the client
- Use one server-based license for each server session

1.2.1.2 How Server-Based License Management Operates

On a file server that is not running the License Server, Client Access licenses loaded into LMF are automatically used as server-based licenses. From a license management point of view, this is the simplest form of management and does not require use of the PATHWORKS client licensing software, or performing management tasks with the License Manager. License management consists of loading the appropriate Client Access PAKs information into LMF on the file server node.

When a client connects to the file server, one server-based license is consumed and the client is granted access to the file server. If there are no server-based licenses available when the client requests a connection to the file server, the connection request is denied.

After a server-based license has been used to grant a client access to a file server, the client is licensed to access resources on that server until the client disconnects from the file server.

When the client disconnects from the file server, the license assigned to that client is released (except with Windows clients, as noted below), the number of available server-based licenses is incremented, and the license becomes available for another client.

Note

In addition to the session that the client establishes when a share is initially mapped, Windows client systems typically establish a second session with the file server. This session uses a null (blank) user name and connects to the IPC$ share. While this second session will not cause the client to consume two server-based licenses, it might prevent the client from releasing the server-based license when the user disconnects all mapped drives. Use the ADMINISTER SHOW SESSIONS command to view client sessions on the file server. If necessary, terminate the client session, using the following ADMINISTER command, where *computer-name* is the computer name of the Windows NT client:

```
CLOSE SESSION computer-name
```

1.2.1.3 Server-Based License Management in an OpenVMS Cluster

When using server-based licenses for access to file and print services in an OpenVMS Cluster environment, HP recommends that clients connect to the cluster using the Advanced Server cluster alias, if this option is available. Clients connecting using the alias consume one server-based license. Clients connecting directly to specific cluster members consume one server-based license for each connection to a different cluster member.

A client can map multiple drives and printers to a single server while consuming a single server-based license.

1.2.2 Client-Based License Management

A client-based license is assigned on a per-workstation basis. A client-based license for accessing OpenVMS file servers allows a client to access multiple file servers with the single license. Client-based licenses are managed using LMF, the License Server, and the License Manager.

After a client-based license has been assigned to a client, the license applies only to that client until it is revoked or released. After a license has been revoked, it is available for assignment by the License Server. To revoke a client license, use the License Manager.

A license PAK is loaded in the LMF database on the system running the License Server. The License Server assigns a client-based license upon request for a license by a client. After the client receives the license, it is stored on the client.

1.2.2.1 How Client-Based License Management Operates

License management for client-based licenses consists of these types of client activities:

- Obtaining licenses from a License Server when first started after configuring Advanced Server license management
- Verifying licenses with the License Server each time the client boots after the license has been assigned
- Presenting license information during the process of accessing file servers

These interactions require no specific actions on the part of a user once a client is configured to use client-based license management.

1.2.3 Combining Server-Based and Client-Based License Management

You can use both server-based and client-based license management together on one file server, allowing you greater flexibility.

Appropriate client-based licensing assures access to file servers. Clients that do not have client-based licenses may access a file server if sufficient server-based license capacity exists.

1.2.3.1 How Combined License Management Operates

In a combined-license environment, licenses are loaded in the LMF database on the system running the file server and the License Server. Client Access licenses loaded into LMF are automatically loaded by the License Server. When the licenses are first loaded by the License Server, they are allocated to the Default license group to be used as client-based licenses. The License Manager allows you to allocate any number of these licenses to the Server-Based license group so that they can be used for server-based licensing. The remaining licenses, those in the Default group, or allocated to other license groups, are managed as client-based licenses.

1.3 License Management Tasks

The Advanced Server licensing software includes the License Manager. This software provides a user interface for system administrators to manage licenses.

If the licensing environment consists of only server-based licensing, it is not necessary to use the License Manager. When the licensing environment includes client-based licensing, or a combination of client-based and server based licensing, the License Manager is an invaluable tool for managing the licensing software.

1.3 License Management Tasks

The tasks you perform with the License Manager include:

- Manage PATHWORKS client software licenses, as well as Advanced Server client-based licenses.
- Create and manage license groups that allow you to organize client-based licenses into subsets called license groups, or simply *groups*. After you organize licenses into separate groups, licenses in a particular group are provided only to clients that identify themselves as members of the designated groups.

  For example, you could define three groups called Finance, Engineering, and Sales. You could then place the number of licenses issued to a specific organization into the groups bearing the organization's name. This ensures that their members can always acquire the licenses issued to them.

  Note

  To organize client-based licenses into groups, you must take additional steps when configuring your client software. Specifically, you must configure your clients to request a license from a particular license group. See Chapter 5, Configuring Client Software, for more information.

- Set alert levels that provide log entries in the License Server log file when your supply of available client-based licenses goes below the set level. Use this feature on a per-product basis and/or per-group basis.
- View the status of the client-based licenses that have been assigned.
- Revoke client licenses.
- Specify which License Server events to log in the License Server log file so that you can obtain a better understanding of client license related activity.
- Add and remove product licenses from the license services database.
- Enable and disable the License Server.
- Generate reports of licenses assigned to clients.

2

Setting Up License Management

License management can be nearly transparent to both system administrators and users. However, the License Manager provides optional capabilities that allow you to configure your server in a way that best supports your computing environment. This configuration may include client-based licensing, or a combination of client-based and server-based licensing.

This chapter describes how to set up the Advanced Server for server-based licensing, for client-based licensing, and for a combination of client-based and server-based licensing. It also provides a set of examples of licensing setup. In addition, this chapter includes information about configuration parameter values in effect when the License Server and License Registrar are running. All this information is presented in the following sections:

- Section 2.1, Setting Up Server-Based License Management, describes how to configure server-based licensing.
- Section 2.2, Setting Up Client-Based License Management, describes how to configure client-based licensing.
- Section 2.3, Setting Up Combined Client-Based and Server-Based License Management, describes how to configure the license management to support both server-based and client-based licensing.
- Section 2.4, Examples of Advanced Server License Management, provides examples of license management configurations.
- Section 2.5, Upgrading Client Licenses, describes procedures for upgrading client licenses.
- Section 2.6, License Server and License Registrar Configuration Parameters, describes the License Server and License Registrar configuration parameters.

2.1 Setting Up Server-Based License Management

The simplest form of license management is a configuration that supports only server-based licenses. Use the following steps to configure your Advanced Server to support server-based licensing:

1. Acquire the appropriate license PAK — PWLMXXXCA06.00 or later for PATHWORKS for OpenVMS (Advanced Server), or PWLMXXXCA07.03 for Advanced Server for OpenVMS.
2. Register and load the license PAKs using the License Management Facility (LMF) on the system where you will also be installing and running the file server software. For information on the LMF database, refer to the *HP OpenVMS License Management Utility Manual*.
3. Install, configure, and run the file server software. When you configure the file server software, do not configure the file server to run the License Server. In other words, follow these steps:
   a. When you run the initial configuration procedure (PWRK$CONFIG.COM), do not configure the Advanced Server to run the License Server.
   b. Start the Advanced Server.

When the License Server is not configured to run with your file server, the file server assumes that any Client Access licenses found on the system are to be used as server-based licenses for licensing client access. After you start the file server, unlicensed clients connecting to the file server will be licensed without any further setup or configuration.

2.1.1 Setting Up Server-Based Licensing Only, for Performance Gains

Optionally, you can configure server-based licensing only, for performance purposes. To do so, uncomment the following line in the `PWRK$LICENSE_R_START.COM` file if it is commented as:

```
$! Define_sys   PWRK$Lr_Disable_Client_Ping   1    ! Disable Client
license checking
```

If this logical is not defined or given the default value of 0, even if only server-based licensing is configured, the License Registrar first checks whether a client attempting to connect to the file server has a valid client-based license. Defining this logical with a nonzero value, as in the example, prevents the License Registrar from checking for a client-based license. Instead, it attempts immediately to assign a server-based license. This can improve performance.

This logical does not affect or change the number of licenses assigned to the server-based group, the default client-based license group, or any user-defined license groups.

Note

With this setup the client-based license of any connecting client is ignored. If you do not use client-based license on your network, then the above setup is the preferred configuration.

2.2 Setting Up Client-Based License Management

For a configuration that supports client-based licensing, there are additional steps required for setting up the system. This configuration requires the use of the License Server and loading client software. If you decide to configure the OpenVMS system to run the License Server, the default is to allocate all Client Access licenses on the system as client-based licenses.

Follow these steps to support client-based licenses:

1. Acquire the appropriate license PAK — PWLMXXXCA06.00 or later for PATHWORKS for OpenVMS (Advanced Server), or PWLMXXXCA07.03 for Advanced Server for OpenVMS.
2. Identify the system to be used as the License Server system.
3. Register and load the related PAKs in the LMF database on any License Server on the network. For information on the LMF database, refer to the *HP OpenVMS License Management Utility Manual*.
4. Install and configure the License Server software using the normal installation and configuration process for the server. You can install the License Server software on the same system as a file server, or you can install it as a standalone License Server on a different system. The License Server normally puts only a very small additional load on a system. For more information on how to load and configure License Servers, refer to the *Server Installation and Configuration Guide* for your Advanced Server product.
5. Start the License Server. (If your License Server is configured on the same system where your file server is configured, the License Server starts when you start the file server.) For information about how to enable the License Server to start when the file server starts, refer to the *Server Installation and Configuration Guide* for your Advanced Server product.

6. Invoke the new License Manager user interface using the following command:

   ```
   $ ADMINISTER/LICENSE
   ```

   Using the License Manager, create any desired user-defined license groups and allocate licenses to these license groups. (For information about using License Manager to perform these tasks, see Section 4.6, Performing License Group Tasks.) By default, all Client Access licenses will be client-based licenses in the Default group.

   Allocate the number of licenses you want to use as server-based licenses to the Server-Based group. This reserves the specified number of licenses for use by the file server as server-based licenses. The number you allocate to the Server-Based license group will not be available as client-based licenses.

7. Install and configure the PATHWORKS client licensing software on clients that will be using client-based licenses:

   - For clients using PATHWORKS client software (for example, PATHWORKS 32), the client configuration procedure includes all the software and components necessary for clients to fully participate in the Advanced Server license management process.

     Depending on configuration or licensing needs, additional configuration steps might be required. Refer to your PATHWORKS client product documentation for more information.

   - For non-PATHWORKS clients using client-based licensing, the PATHWORKS client licensing software must be loaded on the client before it can participate in the license management process. For details, refer to the README.TXT file provided in the PWLICENSE share on the file server.

8. Restart the client. During the restart, the client searches for a License Server to acquire the required license.

2.3 Setting Up Combined Client-Based and Server-Based License Management

For a configuration that supports both client-based and server-based licensing, you must use the License Manager to specify how many licenses are to be used as server-based and how many are to be used as client-based.

Follow these steps to configure the License Server to support both client-based and server-based licensing:

1. Identify the file server system to be used as the License Server.
2. Register and load the related PAKs in the LMF database on the system chosen as the License Server. For more information about how to load PAKs in the LMF database, refer to the *HP OpenVMS License Management Utility Manual*.
3. Install and configure the Advanced Server software using the normal installation and configuration process for the server. For more information about how to install and configure License Servers, refer to the *Server Installation and Configuration Guide* for your Advanced Server product.
4. Start the file server. For information about how to start the server, refer to the *Server Installation and Configuration Guide* for your Advanced Server product. By default, all licenses will be client-based licenses.
5. Use the License Manager to configure the server-based licenses required. Use the License Manager to allocate the desired number of server-based licenses from the Default group to the Server-Based group. Licenses allocated to the Server-Based license group are reserved for use as server-based licenses and cannot be assigned to clients by the License Server.

   For more information on how to configure server-based licenses, see Section 4.6, Performing License Group Tasks.
6. Install and configure the client software on clients that will be using client-based licenses:

   - For clients using PATHWORKS client software (for example, PATHWORKS 32), the client configuration procedure includes all the software and components necessary for clients to fully participate in the license management process.

     Depending on configuration or licensing needs, additional configuration steps might be required. Refer to your PATHWORKS client product documentation for information.

- For non-PATHWORKS clients, license management software must be loaded on the client before it can participate in the Advanced Server license management process. For details, refer to the README.TXT file provided in the Advanced Server PWLICENSE share on the file server.

2.4 Examples of Advanced Server License Management

The following examples provide step-by-step instructions for using Advanced Server licensing software and PAKs.

2.4.1 Setting Up Client-Based Licensing in a LAN

Configuration:

- The file server is running the Advanced Server in a LAN. The License Server is on the file server system.
- Clients have supported version of Microsoft Windows software already installed.

Components:

- Advanced Server for OpenVMS media and documentation kit.
- A PAK for 750 Advanced Server for OpenVMS Client Access (CA) licenses (PWLMXXXCA07.03).

Procedure:

Step	Action
1.	Register and load PAKs into the License Management Facility (LMF) on the system that will run the License Server. Follow the instructions provided in the *HP OpenVMS License Management Utility Manual*.
2.	Install and configure Advanced Server for OpenVMS software on one or more systems following the instructions found in the *HP Advanced Server for OpenVMS Server Installation and Configuration Guide*. Make sure you enable the License Server when configuring the Advanced Server for OpenVMS on the node that will run the License Server.
3.	Start the Advanced Server on the node where the License Server is enabled. Using the License Manager, optionally create license groups and allocate licenses to each client group as described in Chapter 4, Managing Licenses on the OpenVMS Platform.

Step	Action
4.	Load PATHWORKS client license software on the clients and configure them as described in the README.TXT file provided with the Advanced Server PWLICENSE share on the file server. Clients are running Microsoft LAN Manager software and can access the file servers.
5.	Restart the newly configured clients.

2.4.2 Setting Up Combined Client-Based and Server-Based Licensing in a WAN

The following example demonstrates how to set up a License Server to support client-based and server-based licensing in a WAN.

Configuration:

- The file server is running the Advanced Server for OpenVMS product, and the License Server is running on the file server system.
- Some clients are running Windows 2000 and Windows XP client software.
- Some clients are running PATHWORKS 32 client software.
- Some clients have client licensing software and will request client-based licenses.
- Some clients do not have client license software; they will require server-based licensing.

Components:

- Advanced Server for OpenVMS media kit and documentation.
- PATHWORKS 32 media kit and documentation.
- A PAK for 125 Advanced Server for OpenVMS Client Access (CA) licenses (PWLMXXXCA07.03).
- A PAK for PATHWORKS 32 client software (PWXXWINAT07.01), to grant the right to run the PATHWORKS 32 client software.

Procedure:

Step	Action
1.	Choose a system to run the License Server. On the License Server system, register and load PAKs into the License Management Facility (LMF). Follow the instructions provided by the *HP OpenVMS License Management Utility Manual*.
2.	Install and configure Advanced Server for OpenVMS software on the file server system following the instructions found in the *HP Advanced Server for OpenVMS Server Installation and Configuration Guide*. Make sure you run the License Server when configuring the Advanced Server for OpenVMS software on the node that will run the License Server.
3.	Start the License Server and the file server.
4.	Appropriately install and configure the client software. For information about procedures, refer to the README.TXT file provided with the Advanced Server PWLICENSE share on the file server.
5.	Restart the newly configured clients.
6.	Use the License Manager to allocate sufficient licenses to the Server-Based group to support server-based licensing.

Clients requesting assignment of a client-based license will obtain client-based licenses and others will use server-based licenses.

2.4.3 Setting up a V6 Server to Allow Clients to Request PATHWORKS V5 for OpenVMS (LAN Manager) Licenses

The following example demonstrates how to configure the License Server so that clients can use PATHWORKS V5 for OpenVMS (LAN Manager) licenses.

Configuration:

- The file server is already running PATHWORKS V5 for OpenVMS (LAN Manager). The License Server is not running on the file server system.
- A License Server is running standalone using PATHWORKS V5 for OpenVMS (LAN Manager) software, which will be upgraded to use PATHWORKS V6.1 for OpenVMS (Advanced Server) software.
- Clients are using PATHWORKS V6.0 for DOS and Windows software. They have PATHWORKS V6.0 for DOS and Windows CCS licenses (PWLMDOSCC06.00).

Components:

- PATHWORKS V5 for OpenVMS (LAN Manager) media and documentation kit (already installed on both the file server system and the standalone License Server system).
- PATHWORKS V6.1 for OpenVMS (Advanced Server) media and documentation kit.
- PATHWORKS V6.0 for DOS and Windows media and documentation kit.
- A PAK for 500 PATHWORKS V6.0 for DOS and Windows (LAN Manager) CCS licenses (PWLMDOSCC06.00) already registered and loaded on the standalone License Server system.

Procedure:

Step	Action
1.	Upgrade the standalone License Server software by installing and configuring the PATHWORKS V6.1 for OpenVMS (Advanced Server) software on the License Server system. During the installation procedure, specify that you do not want to install the PATHWORKS V6.1 for OpenVMS (Advanced Server). Then specify that you do want to install the standalone License Server software.
2.	Start the License Server. Licenses that were previously served by the License Server running the PATHWORKS V5 for OpenVMS (LAN Manager) software will continue to be available and be served using the PATHWORKS V6.1 for OpenVMS (Advanced Server) software. In addition, if the client access licenses (PWLMXXXCA06.00) are purchased, they can be registered and loaded on the License Server system and be served to clients requesting them.

2.4.4 Using Server-Based Licensing in a LAN or WAN

The following example demonstrates how to set up server-based licensing in a LAN or WAN.

Configuration:

- The file server is running Advanced Server for OpenVMS.
- The License Server is **not** running on the same system that the file server is running on.
- Clients have Microsoft Redirector software already installed.
- All clients use Advanced Server for OpenVMS Client Access (CA) licenses (PWLMXXXCA07.03) as server-based licenses.

Components:

- Advanced Server for OpenVMS media and documentation kit.
- A PAK for 180 Advanced Server for OpenVMS Client Access (CA) licenses (PWLMXXXCA07.03).

Procedure:

Step	Action
1.	Register and load the PAKs in the License Management Facility (LMF) on the system where the Advanced Server will be used.
2.	Install, configure, and run the Advanced Server for OpenVMS software. Do not configure the License Server software for this system.

2.5 Upgrading Client Licenses

If you are upgrading the file server from one version to the next, note the following:

1. Any client accessing a new version of the file server must be sufficiently licensed for access; unlicensed clients or clients without a sufficient level of licensing will not be allowed access.
2. A higher-level license is required to access the new file server than is required to access the previous version of the file server.

The license required depends on the version of the server that the clients need to access, as listed in Table 1–1, File Server Licenses.

Note

If you use Advanced Server for OpenVMS licenses (PWLMXXXCA07.03), clients can access both Advanced Server for OpenVMS servers and PATHWORKS V6 for OpenVMS (Advanced Server) servers.

When you plan the migration of the file server, assess the environment and decide the best procedure to ensure that clients who need to access the file server are sufficiently licensed. Upgrade procedures for client-based licenses are described in the following sections:

- Section 2.5.1, Configuring Client License Upgrades Individually
- Section 2.5.2, Replacing All Licenses
- Section 2.5.3, Upgrading Client Licenses Automatically

2.5.1 Configuring Client License Upgrades Individually

Individually configuring specific clients to request a new license requires modifying the client configuration for the licenses the client requests. This procedure works best when:

- There are very few clients that will access the new version of the file server.
- Migration of clients to using the new version of the file server will be slow and done over a long period of time.

The procedure for configuring clients individually is described in the README.TXT file provided with the Advanced Server PWLICENSE share on the file server.

2.5.2 Replacing All Licenses

This procedure works best if you choose to remove all the old licenses from the License Server system. If some old licenses are still needed on the License Server system, in addition to new Client Access licenses, set up automatic license upgrading, as described in Section 2.5.3, Upgrading Client Licenses Automatically.

If new licenses have been loaded onto the License Server system, the License Server, through normal license version look-up procedures, will not find an old license, but will find a new license and assign it to the client instead. For a discussion of how license lookup works, see Section 3.3, Controlling License Version Lookup.

If the old license PAKs are removed from the License Server system, all clients that had previously been assigned licenses by this server will automatically have their licenses revoked. The next time these clients attempt to verify their licenses, they will be informed that their previously assigned license is now invalid. The client license requester will automatically attempt to acquire a new license. (Some older client license requesters may need to be manually run again to request a new license.)

2.5.3 Upgrading Client Licenses Automatically

By default, the License Server will not perform license upgrades. You can configure a License Server to upgrade licenses automatically. For example, if configured appropriately, the License Server will automatically upgrade a PATHWORKS V5 for OpenVMS (LAN Manager) client license request or a PATHWORKS V6 Advanced Server license request to an Advanced Server for OpenVMS (PWLMXXXCA07.03) license. Follow this procedure to enable the License Server to upgrade licenses automatically:

1. Load new license PAKs on the License Server.
2. Edit the License Server start-up command file SYS$STARTUP:PWRK$LICENSE_S_START.COM to include the appropriate logical name definition, depending on which licenses will be available:

License PAK	Logical Name Definition
PWLMXXXCA06.00	
	`$ DEFINE/SYSTEM PWRK$LS_V6_ACCESS_UPGRADE 1`
PWLMXXXCA07.03	
	`$ DEFINE/SYSTEM PWRK$LS_V7_ACCESS_UPGRADE 1`

Be sure to define the logicals before the following RUN command:

```
$ RUN SYS$SYSTEM:PWRK$LICENSE_SERVER
```

If a logical name is disabled (undefined or defined to be zero), the License Server will not automatically upgrade licenses to the appropriate new license. If the logical name is defined to the value 1 (or any numeric value other than zero), clients requesting assignment or verification of licenses will have their licenses upgraded automatically to new licenses, if sufficient new licenses exist.

Note

The PWLMXXXCA07.02 and PWLMXXXCA07.03 licenses are recognized by PATHWORKS (LAN Manager) V5.0F servers and later versions of V5. Clients presenting this license to an earlier version of PATHWORKS (LAN Manager) will be denied access.

If you define the PATHWORKS V6 Advanced Server logical PWRK$LS_V6_ACCESS_UPGRADE, read the documentation in the License Server startup file about the interaction between this logical and the PWRK$LS_V7_ACCESS_UPGRADE logical.

If you only define the V6 logical, PWLMXXXCA06.00 licenses are assigned before assigning PWLMXXXCA07.02 or PWLMXXXCA07.03 licenses.

If you want to remove all PWLMXXXCA06.00 and PWLMXXXCA07.02 licenses so that you only have PWLMXXXCA07.03 licenses, or if all units of a PWLMXXXCA06.00 license are consumed, the License Server will assign a PWLMXXXCA07.02 license first, if available. If no PWLMXXXCA07.02 licenses are available, then it will assign a PWLMXXXCA07.03 license, if available. Remember that to access the Advanced Server V7.3B for OpenVMS, a PWLMXXXCA07.03 license is required.

The first time the License Server is started after an upgrade, the License Server state file will be modified to remove all old licenses from the Server-Based license group that do not provide access to the current file server. (The state file keeps track of licenses that are loaded, groups that are created, and licenses assigned to each group.) The Advanced Server License Server still assigns and verifies client-based licenses.

When an upgrade operation occurs, the License Server logs both the assignment of the new license and the name of the license returned to the client in the License Server log file PWRK$LOGS:PWRK$LICENSE_SERVER_*node-name*.LOG. This license returned to the client is called a *virtual license*, as described in Section 2.5.4, Virtual Licenses.

Configuring the License Server to automatically upgrade old license requests affects all clients requesting or verifying a license. If the License Server is configured to automatically upgrade licenses, client-based licenses are upgraded to new licenses when either of the following occurs:

- A client requests assignment of an old license.
- A client requests verification of a previously assigned license.

The License Server automatically assigns the client a new license (even if it has requested assignment or verification of an old license), and returns an equivalent new license to the client.

2.5.4 Virtual Licenses

Before the introduction of Client Access (CA) licenses, the file server required older style licenses (such as FP or CC licenses). Requests for these older style licenses will be upgraded properly. However, the client will only accept licenses of the type requested with the requested version number or higher. To get the client to accept a Client Access license, the License Server returns a different name than that assigned.

If a client requests an earlier form of the PATHWORKS license (such as FP or CC licenses), the upgrade returns a "virtual license," that is, an equivalent Client Access license with a name that does not match the name of the license assigned to the client.

For example, if a client requests assignment of a PWLMXXXFP05.00 license from the License Server, the License Server upgrades the request to a Client Access license and assigns a new license (if one is available).

From the client's perspective, the license assigned is PWLMXXXFP*mm.nn* and the client will accept that. The symbols *mm.nn* represent any valid license version number. From the License Server's perspective (as displayed by the License Manager), the client was assigned a PWLMXXXCA*mm.nn* license. Table 2–1, Virtual License Names, lists the names of the licenses returned to clients due to upgrade operations.

Table 2–1 Virtual License Names

License Requested	License Assigned by PATHWORKS for OpenVMS (Advanced Server) or Advanced Server for OpenVMS	License Returned by PATHWORKS for OpenVMS (Advanced Server) or Advanced Server for OpenVMS
PWLMDOSCC*nn.mm*	PWLMXXXCA06.00	PWLMDOSCC07.00
PWLMDOSCC*nn.mm*	PWLMXXXCA07.02	PWLMDOSCC07.02

(continued on next page)

Table 2–1 (Cont.) Virtual License Names

License Requested	License Assigned by PATHWORKS for OpenVMS (Advanced Server) or Advanced Server for OpenVMS	License Returned by PATHWORKS for OpenVMS (Advanced Server) or Advanced Server for OpenVMS
PWLMDOSCC*nn.mm*	PWLMXXXCA07.03	PWLMDOSCC07.03
PWLMWNTCC*nn.mm*	PWLMXXXCA06.00	PWLMWNTCC07.00
PWLMWNTCC*nn.mm*	PWLMXXXCA07.02	PWLMWNTCC07.02
PWLMWNTCC*nn.mm*	PWLMXXXCA07.03	PWLMWNTCC07.03
PWLMXXXFP*nn.mm*	PWLMXXXCA*nn.mm*	PWLMXXXFP*nn.mm*

When the license assigned is different from the license returned to the client, the License Server log file contains two messages:

- One message indicates the name of the license assigned to the client.
- The other message indicates the name of the license returned to the client.

2.6 License Server and License Registrar Configuration Parameters

When the License Server and License Registrar run, complete descriptions of the configuration parameters used by these processes are contained in the following command procedures:

- SYS$STARTUP:PWRK$LICENSE_S_START.COM
- SYS$STARTUP:PWRK$LICENSE_R_START.COM

For descriptions of the License Registrar configuration parameters and the logicals that determine their values, see Section A.3, License Registrar Events.

As part of their startup sequence and announcement, the License Server and License Registrar place tables of their configuration parameters in their respective log files related to license processing:

- PWRK$LOGS:PWRK$LICENSE_SERVER_*servername*.LOG, where *servername* is usually the OpenVMS Cluster alias or the node name of the system on which the License Server runs
- PWRK$LOGS:PWRK$LICENSE_REGISTRAR_*nodename*.LOG, where *nodename* is the node name of the system (the file server) on which the License Registrar runs

For each parameter in the table, the following information is recorded:

- Parameter name
- Parameter type
- Whether the parameter is dynamic
- The current value being used
- Whether that value is the default value for the parameter

2.6.1 Dynamic Configuration Parameters

Dynamic configuration parameters allow the value of a parameter to be changed using a system logical, without having to restart the Advanced Server for OpenVMS. The license component that uses the parameter obtains the changed value while the component is running.

When the value of a dynamic configuration parameter is changed by redefining the control logical associated with the configuration parameter, the change might not take effect immediately. The license components periodically check the values of their dynamic configuration parameters to see if the value of any parameter has changed. When the license component detects a change to the value of a dynamic configuration parameter, a message is recorded in the component's log file when the new value is put into use. By default, the components check for changes to dynamic parameter values every 10 minutes.

3
Configuring License Servers

This chapter explains some License Server configuration changes you may need to make and the impact of those changes on the client(s). The License Server configuration information is explained in the following sections:

- Section 3.1, License Server State Files, describes the contents of the License Server state file and describes how to create a new one.
- Section 3.2, Moving a License Server to a Different System, describes the options available to you when you move the License Server to a different node.
- Section 3.3, Controlling License Version Lookup, describes how to control the "look-ahead" function of the License Server.
- Section 3.4, Controlling Where the License Server Runs in an OpenVMS Cluster, describes different configuration options that are available to control which system the License Server runs on in an OpenVMS Cluster environment.
- Section 3.5, Synchronizing the License Server Database with the LMF Database, describes how the database is synchronized with the LMF database updates that have occurred.

3.1 License Server State Files

The License Server stores information in a database called the License Server state file, which exists on the system as:

```
PWRK$LICENSE:PWRK$LICENSE_SERVER_STATE.DAT
```

The information that is stored in the License Server state file includes the following:

- The name used by the License Server that enable clients to access it
- Information about the types and quantities of client-based licenses that are available to assign to clients

- License group information
- A record of the licenses the License Server has assigned to clients

The following sections provide information about the License Server state file and describe the procedure for recreating it.

3.1.1 License Server Name

The License Server state file stores the name of the License Server. This name is used to facilitate communication between the License Server and clients. When a client is assigned a license, part of the license information saved by the client is the name of the License Server that issued the license. This name is used to contact the License Server when the client attempts to verify its licenses. The name is defined in the following format:

`PWRK$L`*name*

When the License Server is started for the first time, the template License Server state file provided during installation does not contain the License Server name. The License Server determines its name as follows:

- On a node in an OpenVMS Cluster, where an equivalence-name is defined for the logical SYS$CLUSTER_NODE, the node name portion of the value of the equivalence-name is used as the *name* portion of the License Server name.
- On a standalone node, where the logical SYS$CLUSTER_NODE is not defined, the License Server uses the value of the SYSGEN SCSNODE parameter as the *name* portion of the License Server name.

In either case, the value chosen as the *name* portion of the License Server name is used to form the License Server name, which is then stored in the License Server state file. Once established, the License Server uses the name stored in the state file, even if the SYS$CLUSTER_NODE or SCSNODE values should change.

3.1.2 Creating a New License Server State File

If the License Server state file is rendered unusable, the License Server will not run. You must create a new License Server state file if this happens. Follow these steps to create a new License Server state file:

1. Shut down the License Server.

   In a cluster, shut down the License Server on all nodes.

2. If the License Server state file exists, delete the current License Server state file, or rename it to another filename.

In a cluster, do this on only one node because the state file is common to all nodes.

3. Restart the License Server.

   When the License Server starts and does not find a License Server state file, it creates a new state file and logs a message to the License Server log file stating that a new state file has been created and that the License Server has disabled itself.

4. To enable the License Server:

   a. Invoke the License Manager.

   b. From the Main menu, choose Options.

   c. From the Options menu, choose Server Enable/Disable.

   d. Choose Enable Server.

   e. Choose OK.

Once enabled, the License Server determines its name and initializes the License Server state file before it responds to any client requests. See Chapter 4, Managing Licenses on the OpenVMS Platform, for information about using the License Manager.

Because the License Server begins running with a new License Server state file, all information from any previous License Server state file is lost, including the License Server name, any group information, and all records of client licenses that were previously assigned. If license groups were being used, you must recreate the groups and allocate licenses to them.

When the License Server starts with the new state file and determines its name, two possible problems can occur:

- The License Server name is the same name as was previously used, but license groups are not defined.

  In this case, any client that was previously assigned a license by the License Server fails on its next attempt to verify the license, because the assignment information stored in the previous state file was lost and the client's license is marked as invalid. In this case, the client should attempt to acquire a new license after you recreate the licensing groups.

- The License Server name is different than the name previously used, but the client license data file is not updated.

In this case, clients cannot locate the License Server to verify their license because they are attempting to contact the License Server using the License Server's old name. You should delete the license data file on the client and reboot it so that it attempts to acquire a new license. If the licensing configuration template file specifies a License Server name, the configuration file must be changed. Then, when the client looks for a new license, it finds its new name, and it can acquire a new license.

3.2 Moving a License Server to a Different System

There are two recommended methods for changing the system on which the License Server is run. You can move the License Server and retain the same server name or you can move the License Server and change the server name.

When you move the License Server and retain the server name, it is transparent to users. Clients will not notice that the License Server has moved.

When you move the License Server and change the server name, there is an impact on both server administration and clients:

- You must reenter all license group information on the new system using the License Manager and you must allocate licenses to each of the groups.
- You must keep the original License Server running (even though it does not have any licenses it can assign) until all the clients find the new License Server.
- The original License Server revokes client licenses so clients can request assigned licenses from the new server.

Use the following procedures for moving the License Server and retaining the server name or moving the License Server and changing the server name.

3.2.1 Moving the License Server and Retaining the License Server Name

For the purposes of this example, the License Server is currently running on a system called SYS1, and the License Server is to be moved to a system called SYS2, which is not currently running a License Server.

1. Shut down the License Server on SYS1.
2. Reconfigure the file server on SYS1 so that the License Server is not started when the file server is started.
3. Unload and delete all the client-based license PAKs from LMF on SYS1.

4. Register and load all the client-based license PAKs that were deleted from LMF on SYS1 into LMF on SYS2.
5. Install the file server software on SYS2, if not already done.
6. Configure the file server on SYS2 to run the License Server, but do not start the License Server.
7. Delete any template License Server state files on SYS2. For more information, see Section 3.1, License Server State Files.
8. Copy the License Server state file from the PWRK$LICENSE directory on SYS1 to the PWRK$LICENSE directory on SYS2.
9. Start the License Server on SYS2. The License Server finds and reads the License Server name it was previously using on SYS1 in the state file and continues to use them while running on system SYS2.

   Clients that were assigned licenses by the License Server running on SYS1 continue to verify their licenses (or get new licenses) from the License Server named "SYS1" running on system SYS2.

3.2.2 Moving the License Server and Changing the License Server Name

For the purposes of this example, the License Server is currently running on a system called SYS1, and the License Server is to be moved to a system called SYS2, which is not currently running a License Server.

1. Install the file server on SYS2, if not already done.
2. Configure the file server on SYS2 to run the License Server, but do not start the License Server.
3. Shut down the License Server on SYS1.
4. Unload and delete all the client-based license PAKs from LMF on SYS1.
5. Register and load all the client-based license PAKs that were deleted from LMF on SYS1 into LMF on SYS2.
6. Start the License Server on SYS2, causing the License Server on SYS2 to form the License Server name using "SYS2" as the *node* portion of the License Server name. The new name is stored in the License Server state file on SYS2.
7. Using the License Manager, load the licenses into the License Server and define any groups that were defined for the License Server on SYS1. This recreates a similar License Server state file on SYS2 as was on SYS1, with the exception of the client licenses assigned on SYS1. See Chapter 4,

Managing Licenses on the OpenVMS Platform, for information about how to use the License Manager.

8. Start the License Server on SYS1, causing the License Server on SYS1 to synchronize the count of assignable licenses with LMF. Because all the client-based licenses have been removed from LMF, all licenses previously assigned by the License Server on SYS1 are automatically revoked.

9. Leave the License Server on SYS1 running until all clients who were issued licenses by the License Server on SYS1 discover their licenses have been revoked. Notification that the license has been revoked and is invalid occurs when clients boot and attempt to verify their license. After a client's license is revoked, the SYS2 License Server can assign a new license.

   It may be necessary to modify the client configuration if the License Server name SYS1 was specified.

3.3 Controlling License Version Lookup

If there are no available licenses for the version of the server that the client requests, the licensing software looks for a license for a higher version.

By default, the software looks for licenses for subsequent major and minor releases up to 4.3 versions beyond the requested version.

For example, if the request is for Version 5.1, and no licenses are available, the License Server looks for the following license versions in the LMF database:

5.2, 5.3, 5.4
6.0, 6.1, ..., 6.4
7.0, 7.1, ..., 7.4
8.0, 8.1, ..., 8.4
9.0, 9.1, ..., 9.4

You control the version limits by defining the following logical name in the systemwide logical name table before starting the licensing software:

```
PWRK$LICENSE_VERSION_LIMIT
```

You can define the logical name in two different formats:

"+*MM.mm*"
"*MM.mm*"

For *MM* substitute the major release number; for *mm* substitute the minor release number. The + means that the version is incremental. For example, the highest version searched is the current version *plus* the incremental version. Without the +, the release number is the absolute value and the search ends at the specified version.

Example 1:

```
$ DEFINE/SYSTEM PWRK$LICENSE_VERSION_LIMIT "+1.3"
```

In this example, the license software looks for licenses for one major release beyond the requested version, and for licenses for three point releases beyond the requested minor release version. If the request is for Version 5.1, and no licenses are available, the License Server or License Registrar looks for licenses in the LMF for the following versions:

5.2, 5.3, 5.4
6.0, 6.1, 6.2, 6.3, 6.4

Example 2:

```
$ DEFINE/SYSTEM PWRK$LICENSE_VERSION_LIMIT "6.2"
```

In this example, the license software looks for licenses for major software versions up to and including Version 6, and for licenses for point releases up to and including .2. If the request is for Version 5.1, and no licenses are available, the License Server or License Registrar looks for licenses in the LMF for the following versions:

5.2
6.0, 6.1, 6.2

3.3.1 Acquiring a Different Client-Based License than Requested

In the case where a client is attempting to acquire a client-based PATHWORKS for OpenVMS (Advanced Server) license and no PATHWORKS for OpenVMS (Advanced Server) licenses are available on the local system, the license lookup function may find an Advanced Server for OpenVMS license for the client if one is available. (Advanced Server for OpenVMS licenses are valid for accessing both PATHWORKS for OpenVMS (Advanced Server) servers and Advanced Server for OpenVMS servers.)

- If the License Server determines that no PATHWORKS for OpenVMS (Advanced Server) licenses are available, the License Server will begin the lookup process again, looking for Advanced Server licenses (PWLMXXXCA*nn.mm*).
- If the License Server finds an available Advanced Server license, it is assigned to the client and a virtual license is returned to the client.

3.4 Controlling Where the License Server Runs in an OpenVMS Cluster

Installing the License Server in an OpenVMS Cluster environment provides license service failover in the event that license services terminate on the node running the active License Server.

Normally, the License Server process (PWRK$LICENSE_S) is started on every node of the OpenVMS Cluster that starts the file server, but only one License Server process is active at any one time. The other License Server processes remain dormant until an event, such as system shutdown or a system failure, causes the active License Server process to stop. When the active License Server stops, one of the dormant License Servers becomes active and continues to provide license services to clients.

In most cases, HP recommends that you run the License Server on all nodes of the cluster that run the file server, for maximum availability. The exception is the case where the License Server will serve licenses to WAN clients. Then you will want to limit the License Server to running on one node of the cluster.

In an OpenVMS Cluster environment, the License Server state file is maintained cluster-wide. The file server directory tree starting at PWRK$ROOT must be on a disk that is common to all nodes on the OpenVMS Cluster.

There are a number of ways to determine which node is running the active License Server:

- Use the SHOW SYSTEM command.

  This command displays status information about current processes running on your system. The active License Server process is listed as PWRK$LICENSE_S with the state listed as HIB as shown in the following example:

```
$ SHOW SYSTEM
Pid      Process Name    State    Pri     I/O       CPU        Page
   .
   .
   .
00000230 PWRK$LICENSE_S  HIB      6      191   0 00:00:01.67   777
   .
   .
   .
```

This example shows only the License Server process. A dormant License Server is shown with its state indicated as LEF. When you enter the SHOW SYSTEM command, all of the currently running processes on the system are displayed.

- Use the PWSHOW command.

  This is one of many commands that provide shortcuts for invoking certain server management commands and procedures. You can see a list of these commands by examining the contents of the file SYS$STARTUP:PWRK$DEFINE_COMMANDS.COM. To define these commands so that you can use them at login, refer to the *Server Installation and Configuration Guide* for your Advanced Server product.

  The PWSHOW command displays information about file server processes that are running on the system. The information is displayed in the same format that the SHOW SYSTEM command produces.

  The PWSHOW command accepts arguments to show processes on a specific node in a cluster and to show all nodes in a cluster as follows:

  – The PWSHOW CLUSTER command shows all file server processes running on each node in the OpenVMS Cluster.

  – The PWSHOW NODE *nodename* command shows the Advanced Server processes running on system *nodename* in the OpenVMS Cluster.

  This command is available after you invoke the PWRK$DEFINE_ COMMANDS command procedure. To invoke this command procedure, enter the following command:

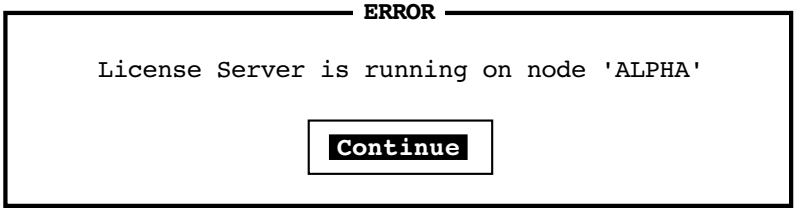
  ```
  @SYS$STARTUP:PWRK$DEFINE_COMMANDS.COM
  ```

- Start the License Manager on a node that is not running the License Server and an error message states that the server is running on the *nodename* system. The License Manager must be run on the same node as the active License Server.

  For example, enter the command ADMIN/LICENSE. If the License Server is not running on that node, the message shown in Figure 3–1, License Server Startup Error Message, appears.

- Look in PWRK$LOGS.

Figure 3–1 License Server Startup Error Message



VM-0023A-AI

The latest file that matches PWRK$LICENSE_SERVER_*OpenVMS-cluster-name*.LOG is produced by the active License Server and displays the message:

```
License Server cluster-alias is now processing LAN Manager
license requests on node active-node
```

(The *OpenVMS-cluster-name* may not be a cluster name, although it most likely is one.)

You use the TYPE or SEARCH commands to examine the file while it is still open.

3.4.1 How to Specify Where License Servers Run in a Cluster

To prevent the License Server from running on a particular node, you can add the following logical name definition to that node's startup command procedure:

```
$ DEFINE/SYSTEM PWRK$LICENSE_SERVER_INHIBIT 1
```

Note

In a cluster environment where all nodes use the same startup procedure, check the node name before executing the DEFINE command.

The SYS$STARTUP:PWRK$LICENSE_S_START.COM file has information about this logical. The initial value of this logical (and its only value, as it does not define a dynamic parameter) is logged in the License Server log file PWRK$LOGS:PWRK$LICENSE_SERVER_*servername*.LOG.

Note

The Advanced Server for OpenVMS License Server interprets the value associated with the PWRK$LICENSE_SERVER_INHIBIT configuration parameter in the same manner as does the PATHWORKS V6 for OpenVMS server.

This is different from the way a PATHWORKS V5 for OpenVMS server interprets it. Under PATHWORKS V5 for OpenVMS, a value of zero for this parameter indicates that the License Server will be prevented from running on the local node. With Advanced Server for OpenVMS, the configuration parameter value is interpreted as follows:

- A value of one means TRUE, which prevents the License Server from running.
- A value of zero means FALSE, which allows the License Server to run.

The following example shows how to prevent the License Server from running on node SPOT:

```
$ IF F$TRNLNM("SYS$NODE") .EQS. "SPOT::" THEN -
DEFINE/SYSTEM PWRK$LICENSE_SERVER_INHIBIT 1
```

The next example shows how to allow the License Server to run only on node ROVER:

```
$ IF F$TRNLNM("SYS$NODE") .NES. "ROVER::" THEN -
DEFINE/SYSTEM PWRK$LICENSE_SERVER_INHIBIT 1
```

You can specify the following logical name definition to define which nodes you want the License Server to run on. By default, if this logical is not defined, the License Server will run on all nodes.

```
$ DEFINE/SYSTEM PWRK$LS_LICENSE_NODES "node1, node2, node3"
```

Each node name that you add to this comma-separated list is a node that is allowed to run the License Server. Any node in your OpenVMS Cluster that is not specified in the list when the logical is defined, will not run the License Server.

Note

If you define PWRK$LS_LICENSE_NODES, and define PWRK$LICENSE_SERVER_INHIBIT (described above), the settings you define with PWRK$LS_LICENSE_NODES supersede any settings defined with PWRK$LICENSE_SERVER_INHIBIT.

3.5 Synchronizing the License Server Database with the LMF Database

The number of client-based licenses available for a product may change because additional product licenses are added to the LMF database, or existing licenses are unloaded, disabled, deleted, or expired from the LMF database.

The License Server must check the LMF database to verify license counts for products currently in the License Server database. The License Server database is updated to reflect LMF database changes at the following times:

- When the License Server is restarted.
- Automatically, once every 24 hours, typically at 00:01 (system time). See Section 3.5.2, Scheduling the LMF Synchronization, for more information.
- When requested by the License Manager for individual license types.

You can change the time at which the synchronization occurs by defining the logical PWRK$LSLMFSYNCHMINUTES, as described in Section 3.5.2, Scheduling the LMF Synchronization.

3.5.1 How License Database Changes Impact the License Server

After a license database update occurs, the new numbers you see in the License Manager screens may indicate that you must make some adjustments to your group license allocations.

Changes made to the number of available client-based licenses impact the License Server and clients in the following ways:

- If you add client-based licenses to the License Server database, the License Server automatically adds them to the Default group.
- If you remove client-based licenses, the License Server checks the Default group and each of the other groups and automatically removes unassigned licenses from the groups to match the number of licenses lost.

- When the number of licenses removed is greater than the number of unassigned licenses, the License Server revokes one or more assigned licenses to satisfy the count. The selection of which licenses to remove is completely arbitrary. Clients with their licenses revoked have to request new ones.

When licenses have been unloaded or deleted, use one of the following strategies to accommodate client needs:

- Redistribute license allocations among the groups.

  If, after an LMF database synchronization, some groups still have extra licenses, consider moving the licenses to groups that need additional licenses to cover client needs.

- Redirect clients to other groups.

  If you do not want to change the license allocation for a group, consider redirecting some clients to a group that has available licenses.

- Obtain additional licenses.

  If the overall number of licenses is no longer equal to or greater than the number of clients, purchase additional licenses and enter them into the LMF database. You can then allocate them where needed.

3.5.2 Scheduling the LMF Synchronization

LMF synchronization occurs when the License Server database is updated to reflect the system's LMF database. You can schedule the LMF synchronization to occur when it is most convenient for your system. By default, the synchronization operation occurs at 00:01 system time. To specify a different time for the synchronization to occur, define the logical name PWRK$LSLMFSYNCHMINUTES in the system logical name table equal to the number of minutes past midnight that the LMF synchronization occurs.

For example, if you want the LMF synchronization to occur at 4:15 A.M., compute the number of minutes after midnight:

```
4:15 AM = (4 hours x 60 minutes/hour) + 15 minutes
        = 255 minutes past midnight
```

Then add the following line to the system's startup command procedure:

```
$ DEFINE/SYSTEM PWRK$LSLMFSYNCHMINUTES 255
```

New synchronization times take effect only after the file server is restarted after the new value is established.

4

Managing Licenses on the OpenVMS Platform

This chapter describes how to configure, start up, and use the License Manager to manage client licenses from an OpenVMS server. It discusses the following topics:

- Section 4.1, Getting Started with the License Manager, describes the privileges required to run the License Manager and the command used to start the License Manager.
- Section 4.2, Configuring the License Server, describes the errors that occur when the License Server is not configured, or when you attempt to run the License Manager on a node that is not running the License Server.
- Section 4.3, Navigating in the License Manager, describes how to navigate, with a mouse or keyboard, in the License Manager screens.
- Section 4.4, Performing License Server Tasks, describes how to start and stop the License Server and how to manage the License Server log files.
- Section 4.5, Performing License Product Tasks, describes tasks you perform to manage license products.
- Section 4.6, Performing License Group Tasks, describes tasks you perform to manage license groups.
- Section 4.7, Performing Client License Tasks, describes tasks you perform to manage client licenses.

4.1 Getting Started with the License Manager

The OpenVMS account used to run the License Manager must have the following privileges:

- SYSLCK
- TMPMBX
- NETMBX

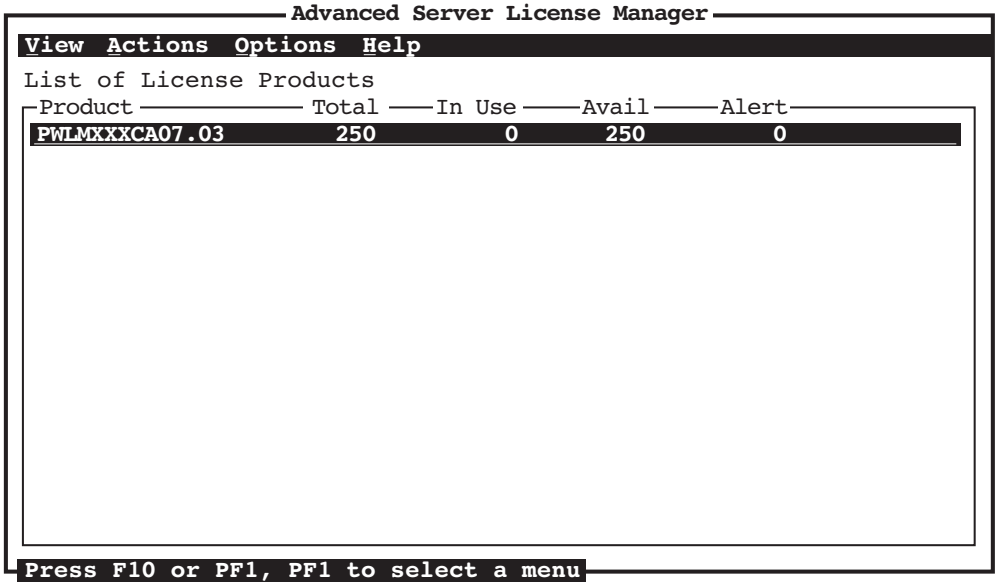
4.1.1 Starting the License Manager

To start the License Manager, enter the following command from the system where the License Server is running:

```
$ ADMINISTER/LICENSE_MANAGER
```

When you start the License Manager, the screen shown in Figure 4–1, Main Menu Screen, appears.

Figure 4–1 Main Menu Screen



VM-0187A-AI

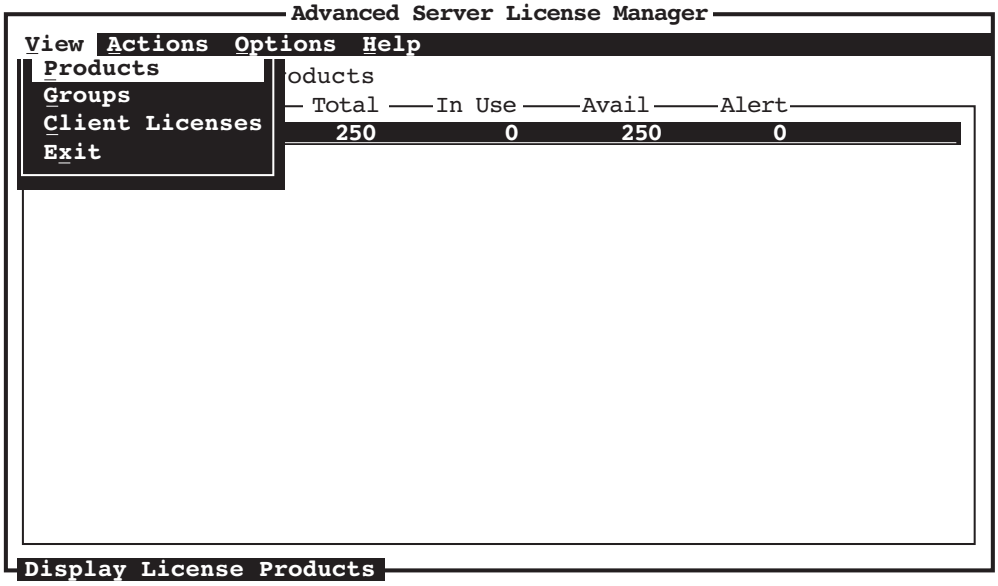
The menu toolbar contains the following menu items:

- View menu—allows you to select the item you will manipulate with the License Manager:
  - Products
  - Groups
  - Client Licenses

  To perform management functions on a product, you choose Products from the View menu, and then you choose the function you want to perform from the Actions menu. The same process is used when performing management functions on Groups or Client Licenses.
- Actions menu—provides functions that you perform on Products, Groups, or Client Licenses depending upon the view you selected.
- Options menu—allows you to enable and disable the License Server and to perform Log File options.
- Help menu—provides information about using the License Manager.

To select a menu, press F10 or PF1 and PF1 again. The system displays the View menu as shown in Figure 4–2, Main Menu with View Menu Displayed.

Figure 4–2 Main Menu with View Menu Displayed



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If you want to display one of the other menus, use the arrow key to move the cursor to that menu, or use your mouse.

4.1.2 Getting Help with the License Manager

To display information about using the License Manager, choose Help from the menu bar. The Help menu displays two options:

- General Help
- Help with this screen

Select the appropriate help option. To exit the help screen, press Return. To exit the list of topics, press F10.

4.1.3 Exiting the License Manager

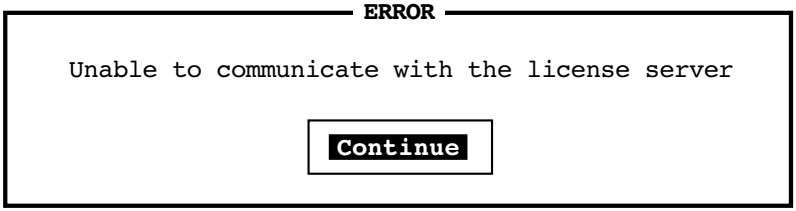
To exit from the License Manager, follow these steps:

1. From the menu bar, choose View.
2. From the View menu, choose Exit.

4.2 Configuring the License Server

If you attempt to start the License Manager when the License Server is not running on the system, the message shown in Figure 4–3, License Server Error Message, appears.

Figure 4–3 License Server Error Message



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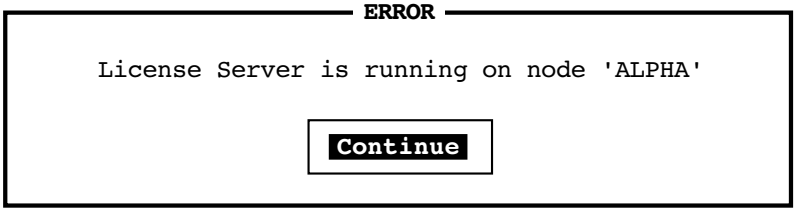
If the License Server has not been configured to run, you must reconfigure the file server. Run the initial configuration procedure (PWRK$CONFIG.COM) and specify that you want to run the License Server. For information about configuring the file server, and additional information about the PWRK$CONFIG.COM command procedure, refer to the *Server Installation and Configuration Guide* for your Advanced Server product.

In an OpenVMS Cluster, if you attempt to start the License Manager on a node that is not running on the active License Server and the License Server is active on another member of the cluster, the error message in Figure 4–4, License Server Startup Error Message, appears.

Figure 4–4 License Server Startup Error Message



VM-0023A-AI

To run the License Manager, issue the ADMINISTER/LICENSE_MANAGER command on the node that is running the active License Server (defined as ALPHA in the License Server Startup Error Message).

4.3 Navigating in the License Manager

The following tables describe the keys and buttons you use to navigate within and between the License Manager screens. You can control the License Manager using a mouse or using keys on the keyboard. Using the mouse, you can navigate through the License Manager screens by pointing and clicking on the desired item to select (highlight) items in the menus, scroll boxes, or dialog boxes. This discussion assumes you are using a DECterm window or an equivalent emulator.

Table 4–1 Keys for Navigating Screens

Use this key...	To...
Arrow keys	Navigate up and down lists and input fields, and across menu options and buttons.
F10	Select a menu.
Comma (keypad)	Enable and disable selection of multiple lines in a scroll region. When you perform an action on multiple lines (for example, removing a group), a confirmation box is displayed. For information on confirmation box options, see Table 4–2, Confirmation Box Selections.
Space bar	Enable or disable the item selection. Selected items are highlighted.
Tab	Move the cursor from field to field in a screen or dialog box.
Return	Display the screen or dialog box associated after selecting a task and remove the message window after an error message has been displayed.
Hot key	Select the menu item list or input field whose hot key is highlighted. Used with PF1, they are the letters in the menu items that are underlined. For example, press PF1 G at the View menu for a list of server groups.

Enter . . .	To select . . .
PF1, V	View Menu
PF1, A	Actions Menu
PF1, O	Options Menu
PF1, H	Help

Table 4–2 Confirmation Box Selections

Select . . .	To . . .
YES	Confirm the action for each item selected.
YES TO ALL	Perform the action on all selected items.
CANCEL	Cancel the action.

Table 4–3 Buttons for Navigating Screens

Use this button . . .	To . . .
OK	Confirm the actions you performed on a particular screen. After choosing this button in a dialog box associated with a screen, you are returned to the screen. After choosing this button at the bottom of a screen, you are returned to the previous screen.
Help	Display help text. To exit the screen, press Return. To exit the list of topics, press F10.
Cancel	Cancel the actions you just performed.

4.3.1 Navigating Fields in a Dialog Box

When you enter values in a dialog box that has several fields, use the up and down arrow keys to navigate back and forth between the fields. You can back up through the fields in this way to change a value as long as you have not pressed Return to commit the values.

4.4 Performing License Server Tasks

License Server tasks include managing the License Server log files and enabling and disabling the License Server. These tasks are performed through the following Options menu items:

- Log File Options . . .
- Server Enable/Disable . . .

4.4.1 Disabling and Enabling the License Server

In most cases, invoking the License Manager enables the License Server. HP recommends that you disable the License Server before you use the License Manager to add, move, or remove any licenses within license groups. However, it is not necessary to disable the License Server before performing other operations. If the License Server is enabled while you manage licenses, it can assign the same licenses you are managing, causing unpredictable results.

Whenever you exit the License Manager, the License Server is automatically reenabled.

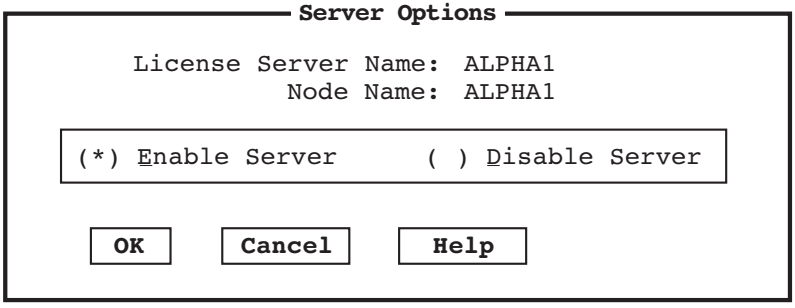
In certain circumstances, if the License Server finds no License Server state file in the PWRK$LICENSE: directory, the License Server disables itself, logs a message in the License Server log file and operator console, creates the default License Server state file, and remains disabled until the License Manager enables it. For additional information about the License Server state file, see Section 3.1, License Server State Files.

To disable or enable a License Server, follow these steps:

1. From the Main menu bar, choose Options.
2. From the Options menu, choose Server Enable/Disable ...

   The screen shown in Figure 4–5, Server Enable/Disable Screen, appears.

Figure 4–5 Server Enable/Disable Screen



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3. Choose either Enable Server or Disable Server. An asterisk next to the option means that the option is selected.
4. Press Return or choose the OK button to complete the operation and return to the Main menu.

4.4.2 Performing Log File Tasks

You can perform the following log file tasks using the License Manager:

- Choose which License Server events to record in the License Server log file.
- Create a new version of the server log file.

You can read or purge old versions of the server log file as you would any OpenVMS file. The file name and location is:

```
PWRK$LOGS:PWRK$LICENSE_SERVER_servername.LOG
```

PWRK$LOGS is defined in the system logical name table when the License Server is started. The *servername* is usually the OpenVMS Cluster alias or the node name of the system the License Server is running on. For example, if your node is NASCAR, the file name and location is:

```
PWRK$LOGS:PWRK$LICENSE_SERVER_NASCAR.LOG
```

4.4.2.1 Enabling Events for Logging

You can enable logging for events associated with the following operations:

- Successful license requests
- Failed license requests[1]
- License verifications
- Verification requests denied[1]
- Licenses released
- Server startup[1] (Note that you cannot change this.)
- License alert event[1]
- Client address changes[1]
- Client ID changes[1]
- Server enable/disable actions
- Licenses revoked[1]
- Fatal server error[1] (Note that you cannot change this.)

You can disable the logging of all events except server startup and fatal server errors.

[1] These events have logging enabled by default when the License Server is first started.

If you are experiencing any problems with the license management software, HP recommends that you enable the logging of all types of License Server events. This will provide you with a comprehensive log file that provides information to assist in troubleshooting licensing problems.

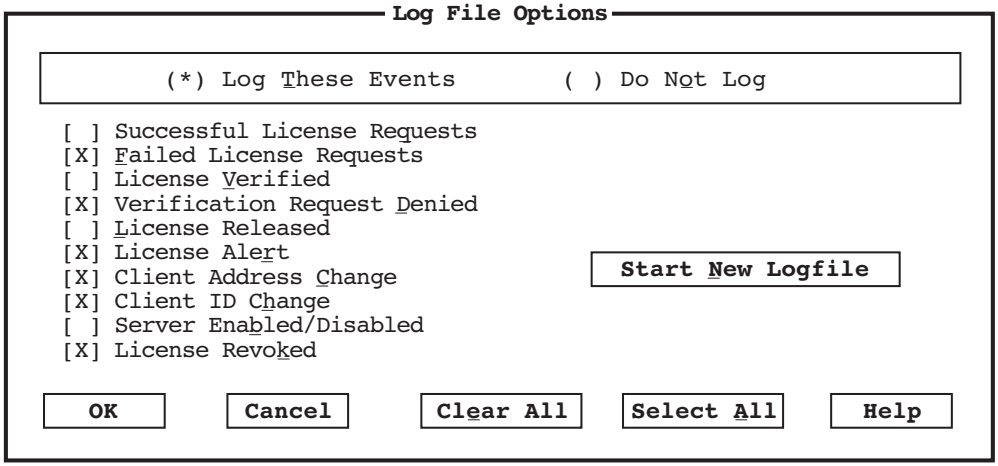
4.4.2.2 Selecting Events for Logging

To select the events you want to log, follow these steps:

1. From the Main menu bar, choose Options.
2. From the Options menu, choose Log File Options . . .

   A screen similar to the one shown in Figure 4–6, Log File Options Screen, appears.

Figure 4–6 Log File Options Screen



VM-0028A-AI

3. Select the events for which you want to enable or disable logging.

   Using the space bar or the mouse, toggle the event to either enabled or disabled. A mark (X) next to the event indicates that the event is enabled. You cannot disable server startup events or fatal server error events.
4. Choose OK to confirm or one of the following options:

Option	Description
Cancel	Cancel your selections.
Clear All	Clear all settings.
Select All	Select all settings.
Help	Get help on log file options.
Start New Logfile	Create a new log file instead of continuing to append information to the existing log file. The log file can become long. This option allows you to start a log file from today.

4.4.2.3 Creating a New Version of the Log File

A log file can grow quickly when tracking many events. When a log file becomes too large, you can create a new version of the file.

To create a new version of the log file, follow these steps:

1. From the Main menu bar, choose Options.
2. From the Options menu, choose Log File Options . . .
3. From the Log File Options screen, choose Start New Logfile.
4. Choose OK in the Confirmation screen.
5. Choose OK in the Log File Options screen.

4.5 Performing License Product Tasks

You can use the License Manager to perform the following product license tasks:

- Add product licenses to the License Server
- Remove product licenses from the License Server
- Display the groups that have licenses allocated from a specific product
- Set alert levels for product licenses
- Generate product reports
- Sort the display of products in the License Manager

4.5.1 Adding Product Licenses

To add new or additional product licenses to the License Server, follow these steps:

1. From the View menu, choose Products.
2. From the Main menu bar, choose Actions.
3. From the Actions menu, choose Add . . .

   The screen shown in Figure 4–7, Add License Product Screen, appears.

Figure 4–7 Add License Product Screen

VM-0189A-AI

4. Enter the license product name in the text entry field, for example, PWLMXXXCA07.03.
5. Choose OK.

You can use the same procedure to add additional product licenses later.

4.5.2 Removing Product Licenses

When a product is no longer needed, remove its licenses. You cannot remove a single license for the product with the License Manager; you must remove the product, which in turn removes all licenses.

Note

When removing the product licenses from the License Manager, first remove them from the LMF database as described in the *HP OpenVMS License Management Utility Manual*. If you do not remove the licenses from the LMF database, they may continue to be assigned to clients.

Removing all licenses for a product from the License Manager and the LMF database prevents clients from acquiring a license the next time they try. If removed licenses are currently assigned to clients, those licenses are revoked and the client is informed that the license was revoked the next time the client attempts to verify the license.

To remove all licenses for a product, follow these steps:

1. Remove the licenses from the LMF database as described in the *HP OpenVMS License Management Utility Manual*.
2. From the View menu, choose Products.
3. From the List of License Products screen, choose the product you want to remove.
4. From the Actions menu, choose Remove.

   A dialog box appears in which you can confirm or cancel the removal.
5. Choose Yes to confirm the removal.

4.5.3 Listing Product Allocations

To display the groups that have licenses allocated from a specific product, perform the following steps:

1. From the View menu, choose Products.
2. From the List of License Products screen, choose the product you want to display allocation details for.
3. From the Actions menu, choose Show Details (or double-click on the product).

   The system displays a list of groups that have allocations of the selected product.
4. Choose OK to confirm and return to the Main menu.

4.5.4 Sorting Product Displays

You can sort the display of the products in the List of License Products screen. You can sort by:

- Product name
- Licenses available
- Licenses in use

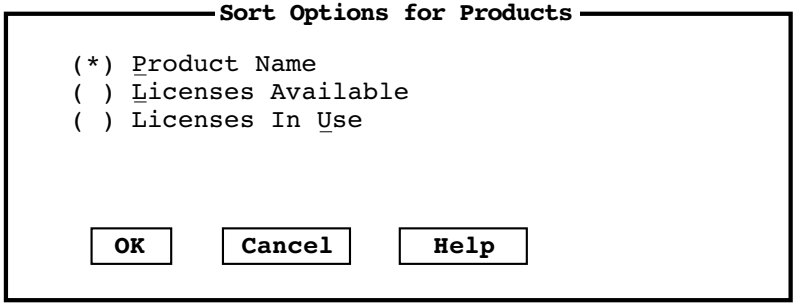
By default, the list of products are displayed by product name. Perform the following steps to specify a different sort option:

1. From the View menu, choose Products.
2. From the Actions menu, choose Sort By . . .

   The screen shown in Figure 4–8, Sort Options for Products Screen, appears.
3. Choose the sort option you want.
4. Choose OK.

The selected sort option also effects the sort order for any product reports generated. (See Section 4.5.6, Generating Product Reports.)

Figure 4–8 Sort Options for Products Screen



VM-0034A-AI

4.5.5 Setting the Alert Level for Product Licenses

To set the alert level for product licenses, perform the following steps:

1. From the View menu, choose Products.
2. From the List of License Products screen, choose the product you want to set the alert level for.

3. From the Actions menu, choose Modify.
4. Set the alert level. If the alert level is set to zero (0), you will not receive an alert when no licenses are available. The maximum value you can set the alert level to is the total number of licenses. As you manage licenses, you want to set the alert level to the number that makes most sense in your environment. When the number of licenses drops to this level, you receive an alert.

   When the number of assigned licenses reaches this value, an entry is added to the License Server log file. For more information, see Appendix A, Server Messages.
5. Choose OK to confirm and return to the Main menu.

4.5.6 Generating Product Reports

To generate a product report, follow these steps:

1. From the View menu, choose Products.
2. From the List of License Products screen, choose the product you want to generate a report for.
3. From the Actions menu, choose Generate Product Report.

   The system displays the File Name dialog box.
4. Enter the name for the report in the File Name dialog box.
5. Choose OK to confirm and return to the Main menu.

By default, the report is written to the current default directory, unless another directory is specified in the File Name dialog box. By default, the list of products are listed by product name. You can also have the report sorted by licenses available or licenses in use, as explained in Section 4.5.4, Sorting Product Displays.

4.6 Performing License Group Tasks

You can use the License Manager to perform the following license group tasks:

- Create license groups
- Allocate licenses for a product to a group
- List the clients in a license group
- List the product licenses that a group has licenses allocated from, and how many such licenses are in use
- Move or remove licenses from a group

- Remove a group
- Set the alert level for licenses in a group
- Generate group reports
- Sort the display of groups in the License Manager

4.6.1 Creating License Groups

When the file server software is initially installed, the Default group and the Server-Based group are created automatically. Any license products that are loaded onto the system are automatically placed in the Default group. To enable server-based licensing, you must allocate licenses from the Default group to the Server-Based group.

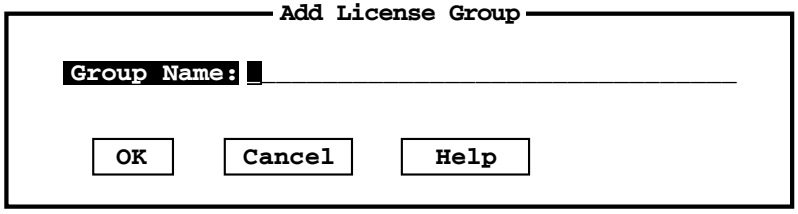
You can create user-defined license groups. These additional groups are for client-based licensing and are used to organize the distribution of licenses. The groups you create typically reflect the organizations that you support. For example, you may create the groups Engineering, Finance, and Marketing because these are the organizations you support. To utilize these groups, client software is configured so that a license is requested from that group.

To create a group, follow these steps:

1. From the Main menu bar, choose View.
2. From the View menu, choose Groups.
3. From the Actions menu, choose Add.

   The dialog box shown in Figure 4–9, Add New Group Screen, appears.

Figure 4–9 Add New Group Screen



VM-0222A-AI

4. Enter the name of the group you wish to create.
5. Choose OK.

When you create a group, the license allocation is set to zero. You must use the Modify Group function to allocate licenses to the new group.

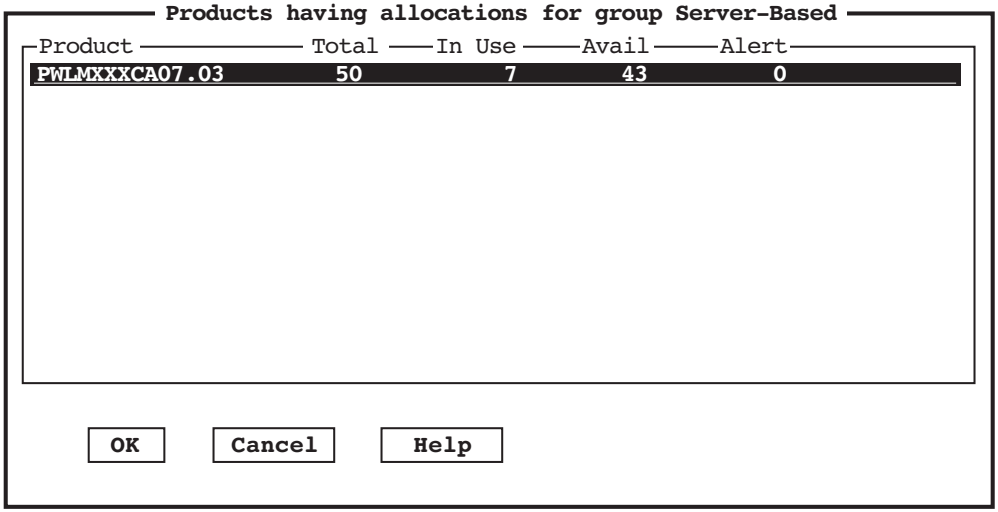
4.6.2 Listing Licenses in a Group

You can use the License Manager to determine how many licenses from each product have been assigned to each group. To list how many licenses have been assigned to a specific group, follow these steps:

1. From the View menu, choose Groups.
2. From the List of License Groups screen, choose a Group.
3. From the Actions menu, choose Show Details (or double-click on the group).

   A Products screen similar to the one shown in Figure 4–10, Products Screen for Products in a Group, appears.

Figure 4–10 Products Screen for Products in a Group



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4.6.3 Sorting Group Displays

You can sort the display of the groups by:

- Product name
- Licenses available

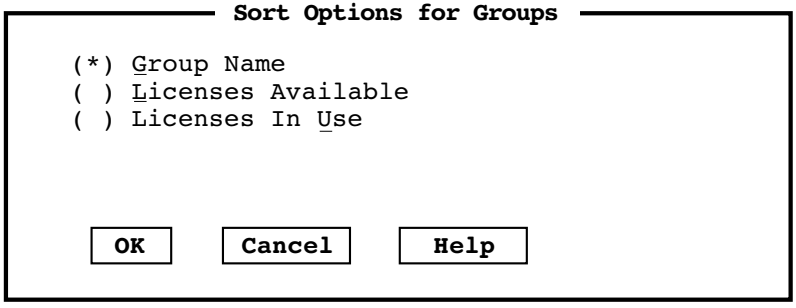
- Licenses in use

To specify a sort option, follow these steps:

1. From the View menu, choose Groups.
2. From the Actions menu, choose Sort By . . .

   The screen shown in Figure 4–11, Sort Options for Groups Screen, appears.

Figure 4–11 Sort Options for Groups Screen



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3. Choose the sort option you want.
4. Choose OK.

The selected sort option also effects the sort order for any group reports generated. (See Section 4.6.8, Generating Group Reports.)

4.6.4 Allocating Licenses to a Group

When you create a group, no licenses are automatically allocated to it. To allocate licenses to a group, you move them from the Default group to the group you want them in. You can allocate licenses at any time to any group except the Default group.

Note

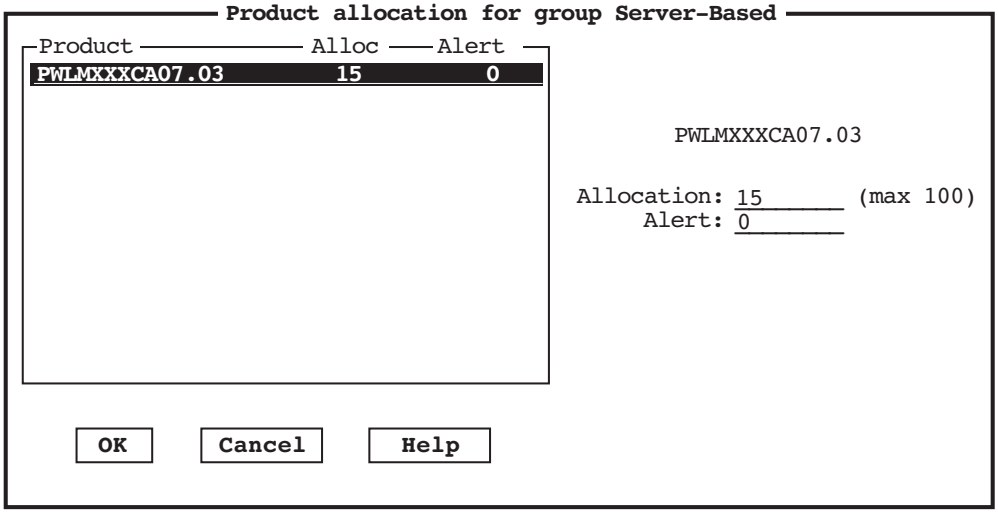
You cannot allocate licenses to the Default group. If you specify a product under the Default group, you can set only its alert level in this dialog box.

To allocate licenses to a group, follow these steps:

1. From the View menu, choose Groups.
2. From the List of License Groups screen, choose the group that you want to allocate licenses to.
3. From the Actions menu, choose Modify . . .

   The dialog box shown in Figure 4–12, Modify License Product Allocation Screen, appears.

Figure 4–12 Modify License Product Allocation Screen



VM-0033A-AI

   Each field in the dialog box is displayed with a value. You can change the allocation and alert fields.

4. Enter your value changes in the Allocation and Alert fields.
5. Press Return or choose OK.

Table 4–4, Allocation and Alert Field Descriptions, describes the fields in the Modify License Product Allocation Screen.

Table 4–4 Allocation and Alert Field Descriptions

Field	Description
Product	The name of the product you chose. You cannot alter this field.
Max	The number of licenses in the Default group that are available for you to allocate to the group. If there are no available licenses for the product, the value of this field is 0. You cannot alter this field.
Alert	The number of licenses of this product allocated to this group that triggers a message warning you that the licenses used have reached this level. For example, if you have 100 product licenses allocated to the Services Group and have set the alert level to 90, when you have used the 90th license of this product in the Service Group, you receive a warning message.
Allocation	The number of licenses you want to allocate to the group. If licenses have been previously allocated, the value displayed for this field tells you how many. If no licenses have been previously issued, the value displayed is 0. You can change this number to any number from 0 to the number indicated in the maximum field. If you decrease the number, the difference is returned to the Default group. If you increase the number, the increment is deducted from the Default group. To allocate licenses, add a number to the value displayed for this field that is equal to or less than the value of the maximum "Licenses available to issue" field. You cannot allocate more licenses to the group than are available from the Default group.

4.6.5 Reallocating Licenses to Another Group

If you have excess licenses in one group and not enough in another, you may want to change license allocations. To reallocate licenses, you decrease the number of allocated licenses from one group, which automatically assigns them to the Default group, and then you allocate the available licenses to another group.

To reallocate licenses to another group, follow these steps:

1. From the Main menu bar, choose View.
2. From the View menu, choose Groups.
3. From the list of groups displayed in the Main screen, choose the group that you want to remove licenses from.
4. From the Main menu bar, choose Actions.
5. From the Actions menu, choose Modify . . .

   The system displays the Product Allocation screen.

6. Modify the license allocation.
7. Choose OK.

   The licenses that you remove are returned to the Default group. The List of License Groups screen is displayed.
8. From the List of License Groups screen, choose the group that you want to increase the number of licenses allocated to.
9. From the Actions menu, choose Modify . . .
10. In the Product Allocation screen, increase the number of licenses allocated to the group.

    The reallocated licenses are deducted from the Default group.
11. Choose OK.

4.6.6 Removing Groups

Removing a group deletes the group and causes the following actions:

- Assigned licenses held by clients from that group are revoked.
- All licenses allocated to that group return to the Default group.
- Clients can no longer be assigned licenses from that group.

Note

Clients that request licenses from this group must be reconfigured to request licenses from a different group. For more information, refer to the appropriate client licensing software configuration help utility.

To remove a group, follow these steps:

1. From the View menu, choose Groups.
2. From the List of License Groups screen, choose the group you want to remove.
3. From the Actions menu, choose Remove.

   The system displays the Confirm Group Removal dialog box.
4. Choose Yes to remove the group.

Note

Any user-defined license group can be removed; the predefined Default group and the Server-Based license group cannot be removed. Removing a license group has the following consequences:

- Any licenses from the selected group that have been assigned to clients are revoked.
- All licenses allocated to the group you are removing are reassigned back to the Default license group.

4.6.7 Setting the Alert Levels for Groups

To set the alert levels, follow these steps:

1. From the View menu, choose Groups.
2. From the List of License Groups screen, choose the group you want to set the alert level for.
3. From the Actions menu, choose Modify . . .
4. Set the alert level.
5. Choose OK to confirm and return to the Main menu.

Note

You cannot set the alert level for the Server-Based group of licenses.

4.6.8 Generating Group Reports

To generate group reports, follow these steps:

1. From the View menu, choose Groups.
2. From the List of License Groups screen, choose the group you want to generate a report for.
3. From the Actions menu, choose Generate Group Report.

   The system displays the File Name dialog box.
4. Enter the name for the report in the File Name dialog box.
5. Choose OK to confirm and return to the Main menu.

By default, the report is written to the current default directory, unless another directory is specified in the File Name dialog box. By default, the list of groups are listed by product name. You can also have the report sorted by licenses available or licenses in use, as explained in Section 4.6.3, Sorting Group Displays.

4.7 Performing Client License Tasks

Details about a client are available to the License Manager when the client is assigned a license or when an existing license is verified. If a client does not have a user name as configured by the PATHWORKS Client Configuration utility (PWSETUP), the client appears as <noname>.

You can perform the following client-related tasks:

- Revoke a client license
- Show details about a client
- Sort the display of current clients
- Generate a client report

4.7.1 Revoking Client Licenses

When you revoke a client's license, you can reassign the license to another client or to the same client the next time the client requests a license from that group. When a client's license is revoked, the client must request a new one to access the file server again.

You may want to revoke a client's license for any of the following reasons:

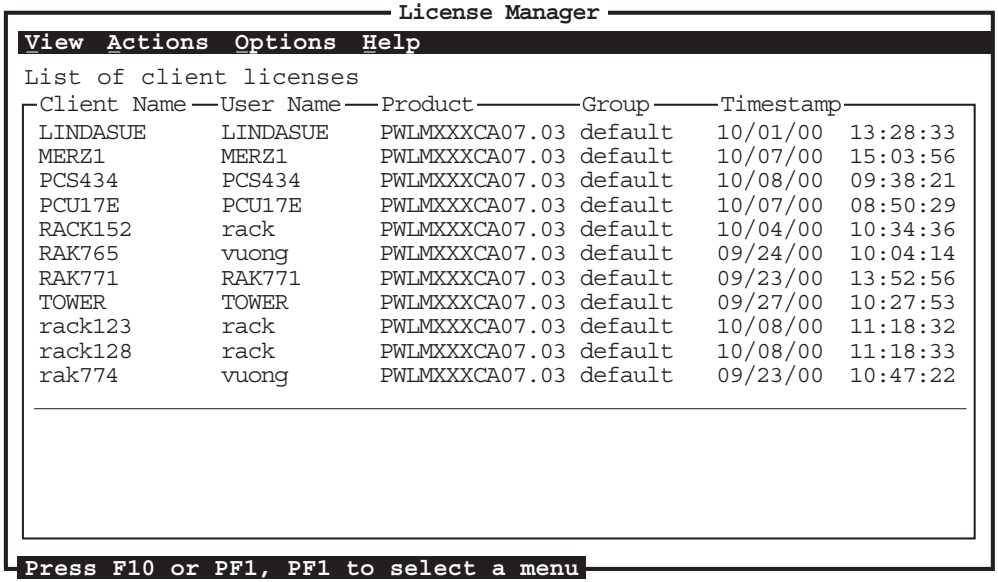
- The client moved to a new organization.
- The client was assigned a license from the wrong group.
- The client's hardware configuration has changed.

To revoke a license assigned to a client, follow these steps:

1. From the View menu, choose Client Licenses.

   The screen shown in Figure 4–13, List of Client Licenses Screen, appears.

Figure 4–13 List of Client Licenses Screen



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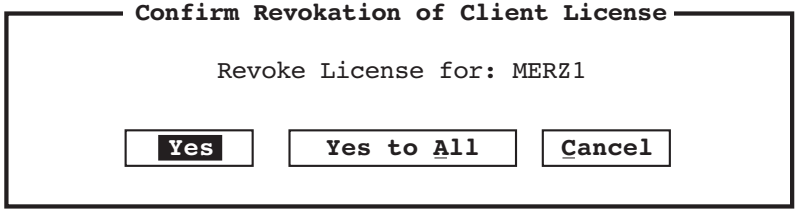
2. Select the client license you want to revoke. Make sure the client with the desired product is selected (highlighted).
3. From the Actions menu, choose Revoke.

   The dialog box shown in Figure 4–14, Confirm Revocation of Client License Screen, appears.

Figure 4–14 Confirm Revocation of Client License Screen



VM-0036A-AI

4. Choose Yes to revoke the license.

4.7.2 Showing Client Details

You can show the following detailed information about each client. These details are gathered when the client workstation requests a license from the License Server.

Table 4–5 Client Details Field Description

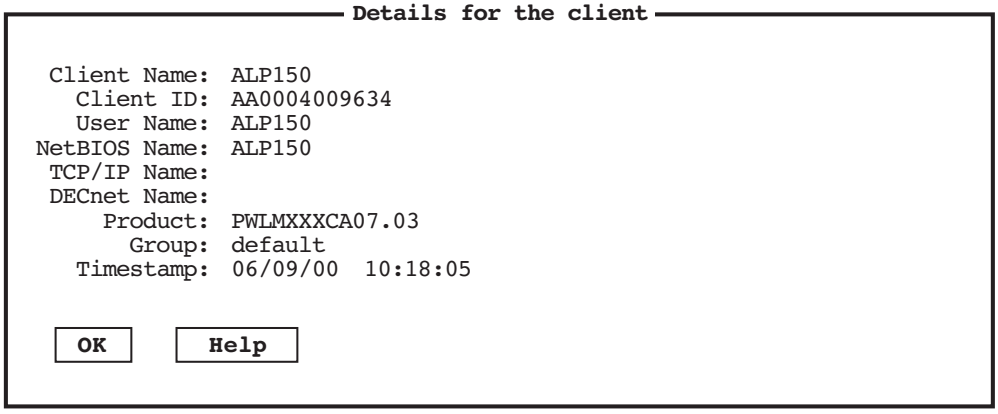
Name	Meaning
Client Name	The name of the client.
Client ID	The unique client identifier (most often the address from a network adapter card in the client system).
User name	The user name configured with the PATHWORKS Client Configuration utility.
NetBIOS name	The machine name of the workstation.
TCP/IP host	The name of the TCP/IP client node.
DECnet node	The name of the DECnet client.
Product	The license product assigned to the client.
Group	The group name from which the license was assigned.
Timestamp	The date and time the license was issued.

To show details for a client, follow these steps:

1. From the View menu, choose Client Licenses.
2. From the List of Client Licenses screen, choose the client for which you want to show details.
3. From the Actions menu, choose Show Details (or double-click on the client).

   Detailed information for that client, similar to that shown in Figure 4–15, Client Details Screen, appears.

Figure 4–15 Client Details Screen



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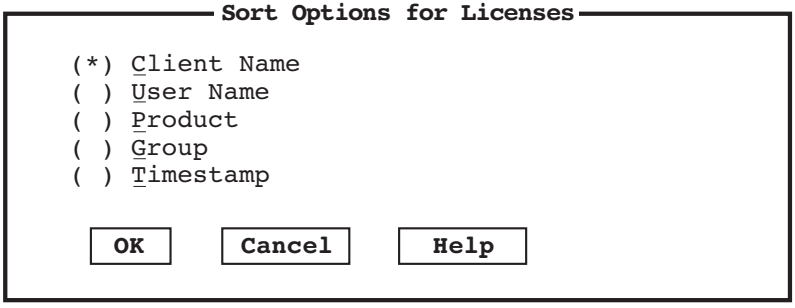
4.7.3 Sorting Client License Lists

You can sort the order in which clients are displayed in the List of Client Licenses screen. To specify a sort order, follow these steps:

1. From the View menu, choose Client Licenses.
2. From the Actions menu, choose Sort By . . .

   The dialog box shown in Figure 4–16, Sort Options for Licenses Screen, appears.

Figure 4–16 Sort Options for Licenses Screen



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3. Choose the sort option you want.

4. Choose OK.

The selected sort option also effects the sort order for any client license reports generated. (See Section 4.7.4, Generating Client License Reports.)

4.7.4 Generating Client License Reports

You can generate client license reports showing all client licenses that are currently in use, including the following information:

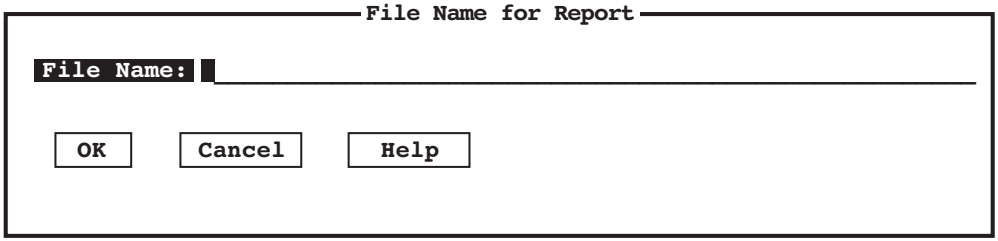
- Client name
- User name
- Product
- Group
- Timestamp

You can change the order of the client license information by using the Sort option as described in the Section 4.7.3, Sorting Client License Lists. To generate a client license report, follow these steps:

1. From the View menu, choose Client Licenses.
2. From the Actions menu, choose Generate Client Report.

   The dialog box shown in Figure 4–17, File Name for Report Dialog Box, appears.

Figure 4–17 File Name for Report Dialog Box



VM-0039A-AI

3. Enter the name for the report in the dialog box.
4. Choose OK.

   Unless a directory is included in the file name, the report is placed in the current default directory.

5
Client Licensing Software

This chapter briefly describes the licensing components that run on the client computer and how to obtain them. These components communicate with the licensing software components (License Registrar and License Server). (The licensing software components are described in Chapter 1, How to Use Advanced Server License Software.) This chapter also explains how to enable client computers to obtain licenses over a wide area network (WAN).

This chapter includes the following topics:

- Section 5.1, Client Licensing Software Components and When to Install Them, describes when and what client licensing components are required by the client computer.
- Section 5.2, How to Obtain the Client Licensing Software, describes how to obtain the licensing software components.
- Section 5.3, Enabling Wide Area Network (WAN) Operations, describes how to configure the client computer to access a License Server that is not in the same local area network (LAN).

5.1 Client Licensing Software Components and When to Install Them

To obtain a client-based license from the License Server, the client computer must be running the software for license acquisition — the client licensing software. This software enables the client computer to request and store license information for access to the file server.

Note

If you plan to use server-based licensing only, the software components described in this chapter are not required.

The client license components include:

- Client License Requester (CLR)
- Client License Transponder (CLT)

The CLR works with the License Server to assign licenses to your client system. It also checks with the License Server at startup time to see if the license has been revoked by the network administrator. The CLT stores assigned licenses and presents them to the file server when asked.

For information on client licensing messages, such as the system error message you receive when you attempt to access the file server without a license, or the messages you receive when you run the Client Transponder or Client Requester software, see the appropriate client online help utilities.

Clients use the same transports to obtain and use their license keys as they do to access their file services. For clients connecting to the server using a dial-up connection, or from a local area network (LAN) other than the server's LAN, extra steps may be required to obtain a license. Procedures for dial-up connections are described in the README.TXT file provided with the Advanced Server PWLICENSE share on the file server. Procedures for connections from a LAN other than the server's LAN are described in Section 5.3, Enabling Wide Area Network (WAN) Operations.

5.2 How to Obtain the Client Licensing Software

You can obtain client licensing software from the following sources:

- If the client computer is not running PATHWORKS client software (such as PATHWORKS 32), the client licensing software can be obtained from the PWLICENSE share that is created when the Advanced Server for OpenVMS software kit is installed and configured. This is the preferred source, because the client licensing software obtained from there will request a license appropriate for accessing the current Advanced Server for OpenVMS product. You will not have to update the default license name.

Note

Windows 2000 and Windows 2003 clients can obtain client license software from the PATHWORKS 32 distribution kit. Ensure that server-based licensing is enabled so that clients can access the PWLICENSE share and install the client licensing software.

- If the client computer is already running PATHWORKS client software, the client licensing components may be automatically installed as part of the default client software installation. If you do not have PATHWORKS client software running, you can still obtain the client licensing components from the PATHWORKS client software distribution kit (for Windows 2000 clients, you need to obtain the licensing software from the PATHWORKS 32 Version 7.4 distribution kit, the PWLICENSE share, or from HP customer support.). In either case, you might have to update license component information to ensure access to the current Advanced Server for OpenVMS.

Note

To connect to the PWLICENSE share from a client that has not yet obtained a client-based license, a server-based license must be available to assign to the client. If necessary, use the License Manager to allocate a license to the Server-Based license group.

For information about installing the client licensing software, refer to the README.TXT file provided in the Advanced Server PWLICENSE share provided on the file server.

5.3 Enabling Wide Area Network (WAN) Operations

This section provides the basic information you need to configure licensing software on client computers that are not in the same LAN as the License Server and that must acquire client-based licenses.

When the License Server that is to provide client-based licenses is not in the same LAN as the client system, the following two steps are required to set up the client system:

1. Configure the WAN protocol stack (DECnet or TCP/IP) to map the License Server's NetBIOS name (usually the node or host name with the prefix "PWRK$L") to the WAN address of the License Server system, as explained in Section 5.3.1, Configuring the WAN Protocol Stack for WAN Licensing.
2. Configure the licensing software components with the name of the License Server, as explained in Section 5.3.2, Configuring the License Server Name.

5.3.1 Configuring the WAN Protocol Stack for WAN Licensing

For the CLR to communicate with a License Server, the client system must be able to resolve the NetBIOS name of the License Server. Client computers on the same LAN as the License Server can use broadcasts to locate the License Server. However, client computers outside the local area network where the License Server is running must use one of the following methods to resolve the NetBIOS name of the License Server:

- Using TCP/IP
  - WINS (Windows Internet Name Service)

    If the License Server is configured as a WINS client, the License Server name will be registered on the WINS server. Clients can then use WINS to resolve the License Server name. For more information about configuring the License Server as a WINS client, refer to the *Server Administrator's Guide* for your Advanced Server product. This configuration is supported in Microsoft TCP/IP network environments on Windows NT 4.0, Windows 2000, Windows XP and Windows 2003.
  - LMHOSTS file

    If the client is using Microsoft TCP/IP, an LMHOSTS file may be used to map TCP/IP addresses to NetBIOS names.

    Search for the file LMHOSTS. If it does not exist, search for the file LMHOSTS.SAM and make a copy in the same directory, naming the copy "LMHOSTS."

    Edit LMHOSTS using whatever text editor you like and add the following line:

    ```
    tcp-address PWRK$Lname #PRE
    ```

    For example, if the License Server system has a TCP/IP address of 12.34.56.78, and the License Server is running on node "ZIPHED", add the following line:

    ```
    12.34.56.78 PWRK$LZIPHED #PRE
    ```

- Using DECnet

  If the client computer is running DECnet, a Remote Adapter Name can be defined to translate the License Server name to a DECnet address.

  At the command prompt, issue the following command:

  ```
  NCP DEFINE REMOTE-ADAPTER-NAME PWRK$Lname NODE decnet-address
  ```

For example, if the License Server system has a DECnet address of 12.345, and the License Server is running on node “ZIPHED”, enter the following line:

```
NCP DEFINE REMOTE-ADAPTER-NAME PWRK$LZIPHED NODE 12.345
```

5.3.2 Configuring the License Server Name

Once the WAN protocol stack has been configured to map the NetBIOS name of the License Server to the WAN address of the License Server system, configure the licensing software on the client, specifying the NetBIOS name of the License Server. On Windows NT 4.0, Windows 2000, Windows XP and Windows 2003 clients, run the program PNLCFG.EXE and add the License Server to the list of “Remote License Servers” in the dialog box.

A

Server Messages

This appendix explains the event messages that are logged to the License Server and License Registrar log files as well as the Event Logger (ADMIN/ANALYZE). It provides the License Server and License Registrar messages, an explanation of these messages, and corrective action if appropriate. It includes the following topics:

- Section A.1, License Component Log Files, describes the types of log files.
- Section A.2, License Server Events, describes events logged to the OpenVMS License Server log file.
- Section A.3, License Registrar Events, describes events logged to the License Registrar log file.
- Section A.4, Event Logger (ADMIN/ANALYZE) Messages, describes how to check the events logged to the Event Logger (ADMIN/ANALYZE) during file server operations.

For information on client licensing messages, such as the system error message you receive when you attempt to access the file server without a license, or the messages you receive when you run the Client Transponder or Client Requester software, see the appropriate client online help utilities.

A.1 License Component Log Files

Log files are stored in a directory defined by the PWRK$LOGS logical name. The two types of log files are:

- License processing-related log files
- License component program log files

A.1.1 License Processing-Related Log Files

The names of the license processing-related log files are as follows:

- License Server log file:

  PWRK$LOGS:PWRK$LICENSE_SERVER_*name1*.LOG

  where *name1* is either the OpenVMS Cluster alias name or the name of the node on which the License Server is running.

  In most cases, *name1* is also used to form the License Server name on the local system:

  PWRK$L*name2*

  where *name2* is the same as *name1*.

- License Registrar log file:

  PWRK$LOGS:PWRK$LICENSE_REGISTRAR_*name*.LOG

  The *name* is the system name.

A.1.2 License Component Program Log Files

The names of the license component program log files are as follows:

- License Server process:

  PWRK$LOGS:PWRK$LICENSE_S_*name1*.LOG

  where *name1* is either the OpenVMS Cluster alias name or the name of the node on which the License Server is running.

  In most cases, *name1* is also used to form the License Server name on the local system:

  PWRK$L*name2*

  where *name2* is the same as *name1*.

- License Registrar process:

  PWRK$LOGS:PWRK$LICENSE_R_*name*.LOG

  The *name* is the system name.

A.2 License Server Events

This section describes events logged to the License Server log file (PWRKS$LOGS:PWRK$LICENSE_SERVER_*name*.LOG). Note that all the messages posted to the log file begin with a date/timestamp. Use the License Manager to control what events are logged. The types of events that the License Server posts to the License Server log file include:

- INIT_LOGFILE
- CLIENT_LICENSE_VALID
- CLIENT_LICENSE_INVALID
- CLIENT_ADDRESS_CHANGE
- SERVER_LICENSE_ASSIGNED
- SERVER_LICENSE_RELEASED
- MESSAGE
- FATAL_ERROR

ALERT_LEVEL_REACHED:
Product = *product-name*
Group = *group-name*
Alert Level = *alert-level-number*
Allocation = *number-of-licenses-allocated*

Explanation: The number of licenses currently in use for this product exceeds the alert level. If the *group-name* is <none>, the alert level for all the product's licenses has been exceeded. Otherwise, the alert level for the licenses in the specific group has been exceeded.

User Action: Review the current license distribution. Remove licenses from clients that no longer use the product, redistribute the available product licenses, or add new product licenses.

CLIENT_ADDRESS_CHANGE:
Client Id = *client-id-number*
Old Client Addr = *old-address*
New Client Addr = *new-address*

Explanation: The current client's address is different from when the license was assigned. Typically, this message indicates a license has been moved from one client to another.

User Action: Make sure that the change of client ID is valid.

CLIENT_ID_CHANGE:
Client Id = *client-id-number*
Old Client ID = *old-id*
New Client ID = *new-id*
Old Client Addr = *old-address*
New Client Addr = *new-address*

Explanation: The current ID of the client is different from the ID it had when the license was assigned. The client ID is the address of the Ethernet adapter. Typically, this message indicates that a license has been reassigned from one client to another.

User Action: Make sure that the Ethernet address change is valid.

CLIENT_LICENSE_ASSIGNED:
Client ID = *client-id-number*
Client Addr = *client-address*
Transport = *transport-name*
Product = *product-name*
Group = *group-name*

Explanation: A product license was granted to the client from the group specified.

User Action: None required.

CLIENT_LICENSE_DENIED:
Client ID = *client-id-number*
Client Addr = *client-address*
Transport = *transport-name*
Product = *product-name*
Group = *group-name*
Reason = *explanation-string*

Explanation: The client's request for assignment of a license could not be processed as requested.

User Action: If the reason is an incorrect product or group, check to be sure the license type exists and reconfigure the client to obtain a valid license. If there are not enough licenses, the administrator must add, reallocate, or revoke licenses to create available ones.

CLIENT_LICENSE_INVALID:
Client ID = *client-id-number*
Client Addr = *client-address*
Transport = *transport-name*
Product = *product-name*
Group = *group-name*
Reason = *explanation-string*

Explanation: The license presented for verification to the License Server by the client is no longer valid.

User Action: If the reason is an incorrect product, group, or license, the data on the client may no longer be valid (for example, the group may have been deleted), or the license may have been revoked. Reboot the client to obtain a valid license. If the license is in use by another client, this may be a case of illegal copying of license data between clients and should be investigated.

CLIENT_LICENSE_RELEASED:
Client ID = *client-id-number*
Client Addr = *client-address*
Transport = *transport-name*
Product = *product-name*
Group = *group-name*

Explanation: The system manager released the product license from the specified group.

User Action: None required.

CLIENT_LICENSE_REVOKED:
Client ID = *client-id-number*
Client Addr = *client-address*
Product = *product-name*
Group = *group-name*
Reason = *explanation-string*

Explanation: The product license from the specified group was revoked or removed. The reason string indicates whether it was due to an action taken by the License Manager, or due to changes in the OpenVMS License Management Facility (LMF) database. This action can explain why a client's license is considered invalid in a later log event.

User Action: You may have to add, reallocate, or revoke currently allocated licenses to allow this client to use the file server in the future.

CLIENT_LICENSE_UPGRADE_ON_ASSIGN:
Client Id = *client-id-number*
Client Addr = *client-address*
Transport = *transport-name*
Group = *group-name*
Current Product = *version-product-name*, for example PWLMDOSCC06.00, PWLMXXCA06.00
Upgrade Product = *product-name*, for example, PWLMXXXCA06.00

Explanation: The client requested a PWLMDOSCC06.00 license and the License Server has defined the logical so the License Server upgraded and assigned the PWLMXXXCA06.00 license. The license returned to the client will be a virtual license. (See the description under *Explanation* for message, VIRTUAL_CLIENT_LICENSE_RETURNED_ON_ASSIGN.)

User Action: None required.

CLIENT_LICENSE_VALID:
Client ID = *client-id-number*
Client Addr = *client-address*
Transport = *transport-name*
Product = *product-name*
Group = *group-name*
Reason = *explanation-string*

Explanation: The license presented for verification to the License Server by the client is valid.

User Action: None required.

FATAL_ERROR:
module-name: *module-name* and *explanation-string*

Explanation: An irrecoverable error has occurred that will cause the License Server to terminate. The message may return the name of the module in which the error occurred and an explanation of the possible cause.

User Action: Notify your HP service representative or local authorized reseller. Please save the log file so that it may be used to help diagnose the problem.

INIT_LOGFILE:
Reason = *explanation-string*

Explanation: A new version of the log file was created. The reason string indicates whether it was done because the server started, or because of a License Manager request.

User Action: None required.

MESSAGE: *message-text*

Explanation: The message displayed describes diagnostic log event information.

User Action: None required.

SERVER_STATE_CHANGE:
Old State = *previous-state-name*
New State = *new-state-name*
Reason = *explanation-string*

Explanation: The License Server has been either enabled to serve the client requests or disabled. The reason always indicates that it was at the request of the License Manager.

User Action: None required.

VIRTUAL_CLIENT_LICENSE_RETURNED_ON_ASSIGN:
Client ID = *client-id-number*
Client Addr = *client-address*
Group = *group-name*
Product = *product-name*
Virtual Product = *virtual-product*

Explanation: The license requested by the client was a LAN Manager license, for example, PWLMDOSCC06.00. The license software looks for a higher version of the product than requested either through license version lookup (described in Section 3.3, Controlling License Version Lookup) or license upgrade (described in Section 2.5, Upgrading Client Licenses). A license was assigned to that client, for example, PWLMXXXCA06.00. Because the client will only accept a license name in the format of the license requested, the License Server returns a “virtual license” to the client that conforms to the original format requested. So the virtual license returned is in the form, PWLMDOSCC07.00. The client will accept it as simply a higher version of the PWLMDOSCC06.00 that it requested.

User Action: None required.

A.3 License Registrar Events

This section describes the various events that can be logged to the License Registrar log file (PWRK$LOGS:PWRK$LICENSE_REGISTRAR_*nodename*.LOG) and the control logicals available to control the posting of events to the log file.

The types of events that the License Registrar posts to the License Registrar log file include:

- INIT_LOGFILE
- CLIENT_LICENSE_VALID
- CLIENT_LICENSE_INVALID
- CLIENT_ADDRESS_CHANGE
- SERVER_LICENSE_ASSIGNED
- SERVER_LICENSE_RELEASED
- CLIENT_NOT_LICENSED
- MESSAGE
- FATAL_ERROR

By default, the License Registrar logs only the most significant events to prevent the log file from growing too rapidly. If no control logicals are used to indicate that additional events should be logged, the default behavior is to post only the following types of events to the License Registrar log file:

- INIT_LOGFILE
- CLIENT_ADDRESS_CHANGE
- MESSAGE
- FATAL_ERROR

On occasion, it may be necessary to reconfigure the License Registrar to post more detail about requests being processed. Should this become necessary, use the following control logicals to control the type of events posted to the License Registrar log file. These logicals determine the License Registrar's configuration parameter values while it is running.

- PWRK$LrLogVerbose

  Turning this control logical on for the License Registrar causes messages for all event types to be posted to the License Registrar log file.

If the PWRK$LrLogVerbose control logical is not turned on, the following logging control logicals may be used to enable specific types of additional logging.

- PWRK$LR_Log_ClientBased_Activity

  Turning this control logical on will enable the posting of messages related to the result of querying a client for a client-based license appropriate for accessing the file server (CLIENT_LICENSE_VALID and CLIENT_LICENSE_INVALID events).

- PWRK$LR_Log_ClientBased_Successes

  Turning this control logical on will enable the posting of messages when the License Registrar successfully validates a client-based license (CLIENT_ LICENSE_VALID events).

- PWRK$LR_Log_ClientBased_Failures

  Turning this control logical on will enable the posting of messages when the License Registrar does not receive a client-based license appropriate for accessing the file server after querying a client running client licensing software (CLIENT_LICENSE_INVALID events). In this case, the client may not have returned any license or none of the licenses returned by the client are valid for accessing the file server.

- PWRK$LR_Log_ServerBased_Activity

  Turning this control logical on will enable the posting of messages related to the assignment and release of server-based licenses by the License Registrar (SERVER_LICENSE_ASSIGNED, SERVER_LICENSE_RELEASED and CLIENT_NOT_LICENSED events).

- PWRK$Lr_License_Report_Interval

  Setting this logical determines how often a license report is generated and posted in the License Registrar log file. Set the logical by specifying a numerical value, representing the intervals in seconds that reports are generated. Each report lists all the clients currently connected to the file server using server-based licenses. By default, no license report is generated. For more information about setting this logical, see Section A.3.1, Monitoring Consumption of Server-Based Licenses.

Each of these control logicals can be turned on by defining the logical to a value of one (1). They can be turned off by leaving them undefined or defining them to a value of zero (0). If the logical is defined, the logical name must be defined in such a way as to make the definition available to the License Registrar process (by defining a system logical or defining the control logical in the License Registrar startup command

procedure SYS$STARTUP:PWRK$LICENSE_R_START.COM). For example, to always log events related to server-based licensing, turn on the PWRK$LR_Log_ServerBased_Activity by defining the following system logical:

```
$ DEFINE/SYSTEM PWRK$LR_Log_ServerBased_Activity  1
```

Note that these parameters affect reporting of individual events as they happen. For example, when a client takes or releases a license, an event message is logged reporting that activity. To generate reports that provide statistics such as the number of server-based licenses currently in use, see Section A.3.1, Monitoring Consumption of Server-Based Licenses.

CLIENT_ADDRESS_CHANGE:
Old Client Addr = *old-address-name*
New Client Addr = *new-address-name*

Explanation: The current network address of the client is different from the one it had when the license was granted. This change may be valid, or it may indicate the illegal copying of license data from the old client to the new client.

User Action: Make sure that the change of address is valid.

CLIENT_LICENSE_INVALID:
Client ID = *client-id-number*
Client Addr = *client-address*
Product = *product-name*
Group = *group-name*
Reason = *explanation-string*

Explanation: The product license specified is no longer valid for the client.

User Action: If the reason is an incorrect product, group, or license, the data on the client may no longer be valid (for example, the group may have been deleted). Reconfigure the client to obtain a valid license. If the license is in use by another client, this may be a case of illegal copying of license data between clients and should be investigated.

CLIENT_LICENSE_VALID:
Client ID = *client-id-number*
Client Addr = *client-address*
Product = *product-name*
Group = *group-name*
Reason = *explanation-string*

Explanation: The product license from the group specified is still valid. The reason string indicates whether the client license was actually inspected or whether there was a cache entry match.

User Action: None required.

CLIENT_NOT_LICENSED:
Client ID = *client-id-number*
Client Addr = *client-address*
Transport = *transport-name*
Reason = *explanation-string*

Explanation: The client is not licensed to access the file server. The client does not have a client-based license that grants it the right to access the services provided by the file server and there are no server-based licenses available for the License Registrar to assign to the client to give the client access rights to the file server.

User Action: Either configure the client to acquire a client-based license to access the file server or make server-based licenses available on the file server system, which can then be used to license the client.

FATAL_ERROR: *module-name*: *module-name* and *explanation-string*

Explanation: An irrecoverable error has occurred that will cause the License Registrar to terminate.

User Action: Notify your HP service representative or local authorized reseller.

INIT_LOGFILE:
Reason = *explanation-string*

Explanation: A new version of the log file was created. The reason string always indicates that it was done when the License Registrar started.

User Action: None required.

MESSAGE: *message-text*

Explanation: The message displayed describes diagnostic event information.

User Action: None required.

SERVER_LICENSE_ASSIGNED:
Product = *product-name*
Client Addr = *client-address*
Client ID = *client-id-number*
Allocation = *total-number-of-server-based-licenses-assigned*

Explanation: The client indicated did not have a client-based license sufficient to access the local file server and was assigned a server-based product license, granting the client the right to access the local file server. The allocation indicates the number of server-based licenses in use after assigning the license.

User Action: None required.

SERVER_LICENSE_RELEASED:
Product = *product-name*
Client Addr = *client-address*
Client ID = *client-id-number*
Allocation = *total-number-of-server-based-licenses-assigned*

Explanation: A client, previously assigned a server-based product license, has disconnected from the file server. The server-based license previously assigned to this client has been released. The allocation indicates the current number of server-based licenses in use after the release of the license.

User Action: None required.

A.3.1 Monitoring Consumption of Server-Based Licenses

To generate reports in the License Registrar log file that provide the number of server-based licenses in use at any instant and a list of the clients using these licenses, you can set the PWRK$LR_LICENSE_REPORT_INTERVAL parameter. The value you assign to the parameter determines how frequently these reports are generated. By default, no license report is generated.

Note

The value you specify determines the intervals in **seconds** that the reports are generated. For example, if you want a report generated every hour, specify a value of 3600. If you specify a value of 1, reports are generated every second, which could cause the log file to grow rapidly, using up an inordinate amount of disk space.

The name of the License Registrar log file is:

PWRK$LOGS:PWRK$LICENSE_REGISTRAR_*nodename*.LOG

where *nodename* is the node name of the file server on which the License Registrar runs. The PWRK$LR_LICENSE_REPORT_INTERVAL parameter should be defined as a system logical so that you can change the value and have the change take effect immediately (within 10 minutes) without having to restart the server. The following example shows how to define the system logical to generate reports every 30 minutes (30 x 60 seconds = 1800).

```
$ DEFINE/SYSTEM PWRK$LR_LICENSE_REPORT_INTERVAL 1800
```

The following is a sample report:

```
21-Sep-2000 08:34:54 MESSAGE:
        ------------------------------------------------
        License Registrar Server Based License Report

                License:            PWLMXXXCA07.03
                Total:              99
                Used this node:     1
                Used Cluster Wide:  1
                Available:          98

                Client Address     ClientId     License Name
                --------------     --------     ------------
                "WALNGY           " 62316936     PWLMXXXCA07.03
```

Note

Each node in an OpenVMS Cluster will have its own list of clients using server-based licenses. To see what clients are connected to the cluster, check all the cluster License Registrar log files.

A.4 Event Logger (ADMIN/ANALYZE) Messages

The Event Logger (ADMIN/ANALYZE) logs events during file server operation. If a client is denied access to the file server, an entry is posted to the event log. To check the event log, enter the following command:

```
$ ADMIN/ANALYZE
```

Look through the events displayed for access denied messages. For example:

No server license for client—access denied.

Explanation: The client is not licensed and no server licenses are available; therefore, the client is denied access.

User Action: Obtain additional client-based or server-based licenses.

Index

A

Add Advanced Server License Product screen, 4–12
Advanced Server license management
  examples of, 2–6
Advanced Server Licensing System, 1–1
  components, 1–1, 1–3
  diagram, 1–2
Alert level, 1–12
  setting for groups, 4–22
  setting for product licenses, 4–14
Allocating licenses
  to a group, 4–18
  to a license group, 4–18
  to a license group, entering values for, 4–20
Allocation and alert field descriptions, 4–19

B

Buttons
  for navigating screens, 4–6

C

Client-based and server-based licensing combined
  setting up, 2–5
  setting up, examples, 2–7
Client-based license
  acquiring a different one than requested, 3–7
  location of, 1–10
Client-based license (cont'd)
  management, 1–10
    planning, 2–3
    setting up, 2–3
Client-based licenses
  obtaining over WANs, 5–3
Client-based licensing
  setting up, examples, 2–6
Client details
  field description, table of, 4–25
  screen, 4–25
Client information
  displaying, 4–25
Client license lists
  sorting in displays, 4–26
Client license requester, 1–1
Client license tasks, 4–23
Client license transponder, 1–2
Client license upgrades, 2–11
Client licensing messages, 5–2
Client licensing software
  installing, 5–2
  obtaining, 5–2
  when to install, 5–1
Clients in a Group screen, 4–17
Client software
  configuring, 5–1
Combined license
  management, 1–11
    operations, 1–11
    planning, 2–5
    setting up, 2–5
Configuration parameters
  configuration of, License Server and License Registrar, 2–15

Configuration parameters (cont'd)
dynamic, 2–16
Configuring
client software, 5–1
LANs and WANs, 1–6
license services, 1–4
standalone License Servers, 1–5
the License Server, 4–5
the License Server name, 5–5
the WAN protocol stack, 5–4
Confirm Revocation of Client screen, 4–24

D

Database changes, 3–12
Default group, 4–21
Dial-up connection, 5–2
Disabling
the License Server, 4–8
Dynamic configuration parameters, 2–16

E

Enabling
events for logging, 4–9
the License Server, 4–8
WAN operations, 5–3
Error messages
client, 5–2
server, A–1
Event Logger, A–13
Events
logging, 4–9
selecting for logging, 4–10
Examples
of license management, 2–6
setting up a server that allows clients to request V5 licenses, 2–8
setting up client-based licensing in a LAN, 2–6
setting up combined licensing in a WAN, 2–7
using server-based licensing in a LAN or WAN, 2–9

F

File Name for Report dialog box, 4–27

G

Generating reports
for groups, 4–22
Groups
allocating licenses, 4–18
generating reports, 4–22
reallocating licenses, 4–20
removing, 4–21
setting the alert level, 4–22
sorting displays, 4–17

I

Install
how to install licensing software, 5–2
when to install client licensing software, 5–1

K

keys
for navigating screens, 4–6

L

LANs
configuring, 1–6
License groups
allocating licenses to, 4–18
creating, 4–16
listing clients, 4–17
moving licenses from one group to another, 4–20
removing, 4–21
tasks, 4–15
License management
client-based, 1–10
how it operates, 1–11
combined
how it operates, 1–11

License management (cont'd)
examples, 2–6
models, 1–8
server-based, 1–9
how it operates, 1–9
in clusters, 1–10
with client-based, 1–11
server-based, when to use, 1–9
tasks, 1–11
upgrading, 2–10
upgrading automatically, 2–12
License Manager, 1–1
exiting, 4–4
getting help, 4–4
list of menus, 4–3
messages, A–1, A–13
navigating screens, 4–6
prerequisites, 4–2
starting, 4–2
License Registrar, 1–1
configuration parameters, 1–5, 2–15, A–8
events, A–8
getting more detail, A–8
log, A–8
startup, 1–5
Licenses
adding product licenses, 4–12
allocating to a group, 4–18
component program log files, A–2
moving to another group, 4–20
process-related log files, A–2
removing all licenses for a product, 4–12
replacing, 2–11
revoking a client's license, 4–23
upgrading, 2–10, 2–11
upgrading automatically, 2–12
version lookup, 3–6
License Server, 1–1
adding product licenses, 4–12
configuration parameters, 1–5, 2–15, A–8
configuring, 4–5
controlling the node it runs on, 3–8
creating a new version of the log file, 4–11
creating license groups, 4–16
License Server (cont'd)
creating state files, 3–2
disabling and enabling, 4–8
enabling events for logging, 4–9
generating product reports, 4–15
license group tasks, 4–15
license product tasks, 4–11
listing licenses in a group, 4–17
listing product allocations, 4–13
log file tasks, 4–9
moving and changing the name, 3–5
moving and retaining the same name, 3–4
moving to a different system, 3–4
name, 3–2
selecting events for logging, 4–10
setting the alert level for product licenses, 4–14
sorting product displays, 4–14
specifying when it runs in a cluster, 3–10
standalone, configuring, 1–5
startup, 1–5
state files, 3–1
synchronizing the database with, 3–12
upgrading, 1–7
using, 4–7
License Server Startup Error Message screen, 4–5
License services
configuring, 1–4
License updates
post update tasks, 3–13
results of, 3–12
Licensing
general discussion, 1–1
Licensing configuration parameters
dynamic, 2–16
logged values, 2–15
Licensing messages
client, 5–2
server, A–1, A–13
Licensing system components, 1–3
LMF synchronization, 3–13

Log events
enabling and disabling, 4–9
Log File Options screen, 4–10
Log files
component program log files, A–2
creating a new version, 4–11
location, 4–9
process-related log files, A–2
selecting events for logging, 4–10
Logging
events, 4–9
selecting events, 4–10

M

Main menu screen, 4–2
with View menu displayed, 4–4
Messages, 5–2, A–1
client, 5–2
server, A–1
Modify License Product Allocation screen, 4–19
Monitoring consumption of server-based licenses, A–12

N

NETMBX privilege, 4–2
New Group or Product screen, 4–16

O

OpenVMS Clusters, 1–4
Operations
for client-based license management, 1–11
for server-based license management, 1–9

P

PATHWORKS client licensing software, 1–6
Planning
client-based license management, 2–3
server-based license management, 2–2
Product allocations
listing, 4–13
Product displays
sorting, 4–14
Product licenses
See also Licenses
adding to the license manager, 4–12
removing, 4–12
tasks related to, 4–11
Product reports
generating, 4–15
PWLICENSE share
client licensing software, 5–2
information about client license software installations, 2–4, 5–3
Windows 2000 client licensing software, 5–2
PWRK$LICENSE_R_START.COM, 1–5
PWRK$LICENSE_S_START.COM, 1–5
PWRK$LrLogVerbose, A–8
PWRK$Lr_License_Report_Interval, A–9
PWRK$LR_LICENSE_REPORT_INTERVAL, A–12
PWRK$LR_Log_ClientBased_Activity, A–9
PWRK$LR_Log_ClientBased_Failures, A–9
PWRK$LR_Log_ClientBased_Successes, A–9
PWRK$LR_Log_ServerBased_Activity, A–9
PWRK$LsLmfSynchMinutes, 3–12
PWSHOW command, 3–9
PWXXWINAT07 license, 1–7

R

Reallocating licenses, 4–20
Removing
groups, 4–21
Reports
for client licenses, generating, 4–27
for groups, 4–22
generating for products, 4–15
Revoking client licenses, 4–23

S

Scheduling LMF synchronization, 3–13
Server-based license management
  in an OpenVMS Cluster, 1–10
  model, 1–9
  operations, 1–9
  planning, 2–2
  setting up, 2–2
  setting up for performance gains, 2–2
  when to use, 1–9
Server-based licenses
  monitoring consumption of, A–12
  reporting, A–9
Server-based licensing
  setting up, examples, 2–9
Server Enable/Disable screen, 4–8
Server licensing messages, A–1, A–13
Showing client details, 4–25
Standalone license server
  configuring, 1–5
Starting
  License Manager, 4–2
State files, 3–1
  creating, 3–2
Synchronizing
  License Server database with LMF, 3–12
SYSLCK privilege, 4–2

T

TMPMBX privilege, 4–2

U

Upgrading
  License Server, 1–7
Upgrading licenses
  automatic license upgrades, 2–12
  client licenses, 2–10, 2–11

V

Version lookup, 3–6
Virtual licenses, 2–14

W

WANs
  configuring, 1–6
  enabling operations, 5–3
Windows 2000 clients
  obtaining client license software, 5–2