Rational Suite®

License Management Guide

VERSION: 2002.05.00

PART NUMBER: 800-025080-000

WINDOWS

Rational®
the software development company

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PATENT

U.S. Patent Nos. 5,193,180 and 5,335,344 and 5,535,329 and 5,835,701. Additional patents pending.

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Preface

The *Rational Suite License Management Guide* provides comprehensive information about Rational Common Licensing for Rational's Windows products. It provides you with the technical information you need to install floating and node-locked license keys, install and configure the Rational license server software, and troubleshoot problems related to licensing Rational Software products.

This manual is divided into two sections: client user tasks and administrator tasks. If you are licensing Rational products on a client, refer to the client licensing section. If you are the license administrator or a user who manages the license keys, refer to the license administrator section to order permanent license keys, set up the license server (if your company has purchased floating licenses), and advanced features.

Rational Suite delivers a comprehensive set of integrated tools that embody software engineering best practices and span the entire software development lifecycle. Rational Suite's unparalleled level of integration improves communication both within teams and across team boundaries, reducing development time and improving software quality.

Audience

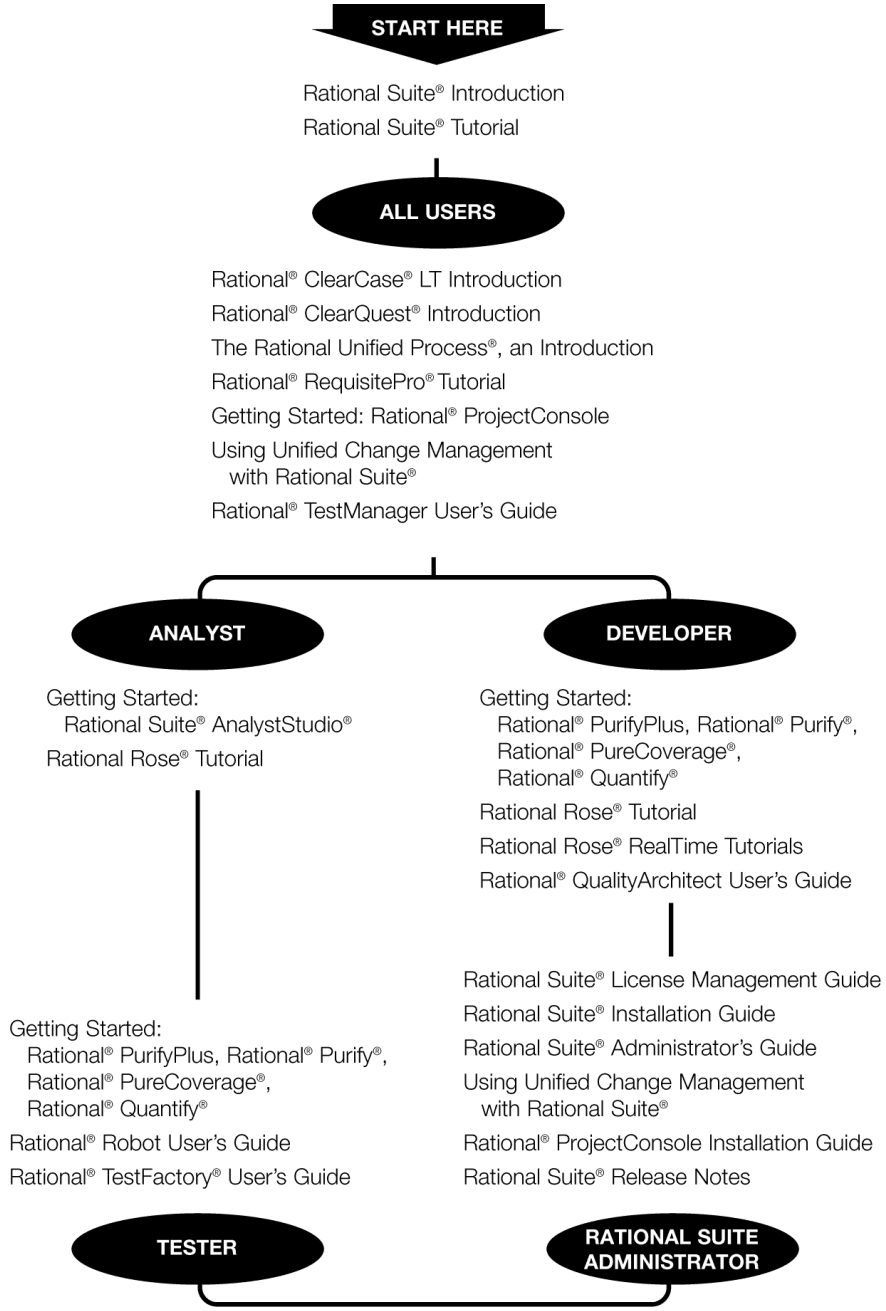
This guide is intended for client users and system administrators. This book assumes knowledge of Microsoft Windows and its conventions and experience with client-server environments.

Other Resources

- All manuals are available online, either in HTML or PDF format. The online manuals are on the Rational Solutions for Windows Online Documentation CD.
- To send feedback about documentation for Rational products, please send e-mail to `techpubs@rational.com`.
- For more information about Rational Software technical publications, see: `http://www.rational.com/documentation`.

- For more information on training opportunities, see the Rational University Web site: http://www.rational.com/university.
- For articles, discussion forums, and Web-based training courses on developing software with Rational Suite products, join the Rational Developer Network by selecting **Start > Programs > Rational Suite > Logon to the Rational Developer Network**.

Rational Suite Documentation Roadmap



Rational Technical Support

When you contact Rational Technical Support, please be prepared to supply the following information:

- Your name, company name, telephone number, and e-mail address
- Your operating system, version number, and any service packs or patches you have applied
- Product name and release number
- Your case ID number (if you are following up on a previously reported problem)

Contacting Rational Technical Support

If you have questions about installing, using, or maintaining this product, contact Rational Technical Support as follows:

Your Location	Telephone	Facsimile	E-mail
North America	(800) 433-5444 (toll free) (408) 863-4000 Cupertino, CA	(781) 676-2460 Lexington, MA	support@rational.com
Europe, Middle East, Africa	+31 (0) 20-4546-200 Netherlands	+31 (0) 20-4546-201 Netherlands	support@europe.rational.com
Asia Pacific	+61-2-9419-0111 Australia	+61-2-9419-0123 Australia	support@apac.rational.com

Contacting Rational Licensing Technical Support

If you have questions about acquiring license keys for your Rational Software products, contact Rational Licensing Technical Support as follows:

Your Location	Telephone	Facsimile	E-mail
Asia Pacific	+61-2-9419-0111	+61-2-9419-0123	license@apac.rational.com
Asia Pacific (Japan)	+61-2-9419-0111	+61-2-9419-0123	license@japan.rational.com
Asia Pacific (Korea)	+82-2-556-9420	+82-2-556-9426	license@apac.rational.com

Your Location	Telephone	Facsimile	E-mail
Asia Pacific (Mainland China, Hong Kong, and Taiwan)	+61-2-9419-0111	+61-2-9419-0123	license@china.rational.com
Europe Middle East Africa	+31 20 4546 200	+31 20 4546 202	license@europe.rational.com
North American (East Coast) and South America	800-433-5444 (toll free, USA only) +1 (408) 863 4000	781-676-2460	license@rational.com
North America (West Coast) and Central America	800-433-5444 (toll free, USA only) +1 (408) 863 4000	408-863-4001	license@rational.com

Client

Before Installing License Keys

1

This chapter describes the Rational License Key Administrator (LKAD), license key upgrades and removal, and basic Common Licensing terms. Although much of the information in this chapter is similiar to information in *Before Requesting License Keys* on page 41, this chapter is intended for client users.

The LKAD helps you, the user, perform all of your client licensing tasks. If you are familiar with the LKAD and already have permanent license keys installed on your system, see *Upgrading Licenses* on page 22 to find out whether you need updated license keys.

To find definitions of additional Rational Common Licensing terms, see the *Licensing Glossary* on page 99.

Table 1 helps you find procedures for client licensing tasks.

Table 1 Roadmap for Client Tasks

To	See
Understand the Rational License Key Administrator features	*Using the Rational License Key Administrator (LKAD)* on page 20
Understand basic Rational Common Licensing terms, such as node-locked and floating	*License Types and License Key Types* on page 23
Configure the clients to use floating license keys	*Configuring Clients to Use Floating Licenses* on page 33
Install node-locked license keys on a client	*Installing Node-Locked Licenses* on page 29
Enter a temporary key for evaluating a Rational product	*Installing Node-Locked Licenses* on page 29 *Installing Floating and Named-User Licenses* on page 55
Upgrading licenses or adding products to licenses	*Upgrading Licenses* on page 22
Change the order in which Rational products use licenses	*Changing License Usage Order* on page 37
Move or return license keys	*Removing or Moving License Keys* on page 22
Change port values	*Changing the lmgrd Port* on page 76

Using the Rational License Key Administrator (LKAD)

The Rational License Key Administrator (LKAD) is installed with your Rational software and with your Rational license server software. This Rational program provides an interface to Rational Common Licensing features. Use the LKAD to enter or import license keys and change your license configuration.

- To access the LKAD on a client system, click **Start > Programs > Rational *product name* > Rational License Key Administrator.**
- To access the LKAD on a license server system, click **Start > Programs > Rational License Server > Rational License Key Administrator.**

The Help explains how to use the LKAD to review and modify your license configuration. The LKAD Help also provides information about configuring the license server software. To access the Help, click **Help** in the License Key Administrator's main menu or open *<Install Path>*\Rational\Common\licadmin.hlp.

Using the LKAD During the Rational Software Setup Program

To take care of licensing tasks before you install a product, open the Rational License Key Administrator from the Rational Software Setup program. The Rational Software Setup offers a **Configure Licenses** button in the **Choose Product** dialog box. When you see the License Key Administrator appear, import a node-locked license key, enter an evaluation license key, and specify a license server. After you configure product licensing, return to the Rational Software Setup program and install the product.

Reviewing Your License Information in the LKAD

By default, you should see complete information about your license keys in the main window of the License Key Administrator. If you do not see this information in the window, use the **View > Show** menu to display information about your licenses.

Table 2 defines each of the options in the **View > Show** menu.

Table 2 Show Licenses

License	Shows
Invalid and Expired Licenses	All expired node-locked, floating, and served licenses on the system that you are using
Floating Licenses	All floating licenses on the system that you are using
Node Locked Licenses	All node-locked licenses on the system that you are using
Served Licenses	All floating licenses that Rational software on your system could request from the license server

Administrator Privileges for the LKAD

The Rational License Key Administrator (LKAD) is installed with every Rational product and with the Rational license server software. What you can do in the LKAD depends on the privileges that you have. Grayed out menu options in the LKAD Wizard, menu bar, or button bar indicate limited privileges.

1 To see which privileges are missing, select **Help > About Rational License Key Administrator**. You will see one or more of the following statements

Statement	Explanation
Cannot write to HKEY_LOCAL_MACHINE in the Windows Registry.	You cannot specify a license server.
Cannot Start and Stop a Windows Service.	You cannot start the license server.
Cannot create a file.	You cannot import a license key file on to your system.
Cannot modify a file.	You cannot enter a temporary license key in your system.

2 Request the missing NT administrator privileges from your system administrator.

Upgrading Licenses

If you are upgrading from an earlier version of a Rational Suite or point product, reuse your current Rational Suite and point-product license keys.

Adding Rational Suites or Point Products to Licenses

This section describes the conditions under which you must order new license keys.

- If you have purchased a different type of Rational Suite from the one you are currently using, request a new license file that includes the new Rational Suite key.
- If you are adding a new product to your system, request a new license file that includes the new point product license key.

If any of the above applies to your system, ask your administrator to perform the required node-locked license transactions in AccountLink. See *Removing or Moving License Keys* on page 22 for the tasks you must perform on the client after each license transaction. If you must perform the transactions yourself, see *Requesting License Keys* on page 49.

Removing or Moving License Keys

The following instructions assume that a license administrator performs licensing transactions in AccountLink, and you, as the client user, import the license keys on your system.

Removing License Keys

When you need new node-locked license keys, return the old license keys to your company's Rational account in AccountLink before you or your license administrator orders new ones.

To return a license key:

1. Your license administrator performs the return transaction in AccountLink.
2. When you receive the update file from AccountLink, import the file on your system. For more information, see *Importing Permanent or Term License Agreement (TLA) Keys* on page 29.

Moving License Keys

Moving a node-locked license key from one system to another requires a return transaction and a new license key transaction in Rational AccountLink. To help prevent you from confusing the license key update file for the old system with the license key file for the new system, ask your license administrator to order license keys for the new system after you complete the return process on the old client.

To move a license key from one system to another:

1. Your license administrator performs the return transaction in AccountLink.
2. When you receive the update file from AccountLink, import the file on your system. For more information, see *Importing Permanent or Term License Agreement (TLA) Keys* on page 29. Importing the update file completes the return transaction.
3. Install the Rational software on the new system.
4. The license administrator orders a new license key file for the new system in AccountLink.
5. Import the license key file on the new system. For more information, see *Importing Permanent or Term License Agreement (TLA) Keys* on page 29.

License Types and License Key Types

What Are Node-Locked and Floating Licenses?

Rational supports both node-locked and floating licenses. Node-locked licenses are created only for a specific system. Floating licenses can be shared by multiple users on multiple systems. A Rational license server controls use of the floating licenses.

When users install Rational products on their systems, the Rational Software Setup program automatically installs the Rational licensing software (Rational *license server* software is not installed automatically). The licensing software lets these systems use either node-locked or floating licenses.

Note: Users need floating license keys from a Web server to run Rational ClearQuest Web and Rational RequisiteWeb on Web clients.

The following table explains the types of licenses in detail.

Table 3 License Types

License Type	Description	Notes
Node-locked	▪ A node-locked license is configured for a specific system. It allows a user to run a Rational product only on that specified system. ▪ Rational supports *uncounted* node-locked licenses for Windows products. Rational refers to uncounted node-locked license keys for Windows products as *node-locked license keys*. ▪ Because these license keys do not use a Rational license server, the user may run multiple sessions of a Rational product concurrently using a single license key. ▪ To move a node-locked license to another system, you must *return* the license key from the old system and request a new license key for the new system. For a more detailed explanation, see *Returning or Moving License Keys* on page 69.	Rational also issues node-locked licenses for Rational products that run on UNIX platforms. Node-locked Rational products on UNIX (that use Rational Common Licensing) are licensed with *counted* node-locked license keys. You manage counted node-locked licenses with a license server. Clients connect to the Rational license server and acquire a counted node-locked license specific to their system. This process is the same as the one used to acquire floating license keys. Essentially, a counted node-locked license key is a floating license key that can only be used on a specific host.

Table 3 License Types (continued)

License Type	Description	Notes
Floating	▪ A system administrator installs the Rational license server software on one or redundant systems. The administrator then installs the floating licenses on the license server. ▪ The pool of floating licenses are shared among all users of Rational products. ▪ Client systems obtain licenses from the license server system when they need to run a copy of Rational software. One license is granted per client per product ▪ To move a floating license to another license server, you must "return" the license key from the old license server and request a new license key for the new license server. For a more detailed explanation, see *Returning or Moving License Keys* on page 69.	Rational also supports Named-User floating licenses for Rational Purify, Quantify, and PureCoverage. This configuration assigns licenses to specific users. That is, only specific users can request floating license keys from the license server. For more information, see *Importing Named-User and Floating License Keys* on page 61.

Using Multiple Floating or Node-Locked License Keys

A client system can check out *multiple* floating or node-locked licenses.

What Are Permanent and Temporary License Keys?

When you register Rational products to a system (license server or client) in AccountLink, Rational generates license keys for that system. These permanent license keys are sent through e-mail in a license file to you. The permanent keys let you use the Rational products for an indefinite period of time. However, Rational assigns an expiration date to the license keys if your company has negotiated a Term License Agreement (TLA). Technically, TLA keys are not permanent, but Rational groups TLA licenses in the permanent license key category.

To use Rational products for an evaluation period or if you expect a delay in receiving your permanent keys, you can install the temporary license key provided in your Rational License Key Certificate. Because Rational has not generated the temporary key for a specific system, you can use it on any system until the specified expiration date.

Permanent and temporary license keys can be floating or node-locked. The difference is that a temporary key is *not* generated for a specific system and a permanent key is generated for a specific system.

The following table defines the types of license keys used by Rational licensing.

Table 4 License Key Types

License Key Type	Description	Notes
Permanent	▪ A license issued to a customer for running Rational products. Permanent licenses are keyed to a specific Rational product and specific system. ▪ Permanent license keys can be node-locked or floating. The user installs a node-locked permanent key on a system on which the user runs Rational software. Floating permanent keys are installed on a Rational license server.	Rational issues permanent node-locked or floating keys upon request. Use AccountLink at www.rational.com /accountlink to acquire your license keys.
Temporary	▪ A time-limited license issued to a customer for running Rational products. Temporary licenses are not keyed to a specific system. ▪ Temporary license keys can be node-locked or floating. The user installs a node-locked temporary key on a system on which the user runs Rational software. Floating temporary keys are installed on a Rational license server.	The expiration date for a temporary key is noted on the License Key Certificate included with the Rational product shipment.
TLA (Term License Agreement)	▪ Variation of a Permanent Key. TLAs are issued to allow users access to Rational software for a negotiated period of time.	TLAs are issued by the Rational Sales Team. To obtain TLAs for your organization, contact your local Rational Sales Team.

What Are Emergency and Evaluation License Keys?

Emergency and evaluation license keys are temporary license keys. They can be floating or node-locked. They are short-term licenses that are not generated for a specific system.

What Are Suite Licenses and Point-Product Licenses?

A Rational license key indicates whether it is a Rational Suite license, such as Rational Suite Enterprise, or a point-product license, such as Rational Purify. A node-locked or floating Rational license file can contain multiple suite and point-product license keys.

Using Suite License Keys

A Rational Suite license key lets you run all of the products contained within a Rational Suite at the same time on a single system. The Rational Suite checks out a *single* floating or node-locked suite license key.

Using a Different Suite License from the Suite Edition Installed

You can install a Rational Suite on a client and specify that products within the Suite check out a different type of Rational Suite license. For example, you can install Rational Suite Enterprise on the client and have the point products within the Rational Suite check out a Rational Suite AnalystStudio license from the Rational license server.

To select a different license for a product, use the License Key Administrator's License Usage Mapper. See *Changing License Usage Order* on page 37 for more information.

Installing Node-Locked Licenses 2

A node-locked license key is created for a specific client. You cannot use Rational software on any other client with that node-locked key. A node-locked key does not require a license server; you simply install license keys on the client. This license type allows for portability, especially for customers who have isolated systems or laptops.

This chapter describes how to install permanent or temporary node-locked license keys on clients.

If you are using floating license keys, see *Configuring Clients to Use Floating Licenses* on page 33.

Importing Permanent or Term License Agreement (TLA) Keys

After your license administrator requests your permanent license keys from AccountLink, Rational sends you a permanent node-locked license file. This file contains license keys for the client that your license administrator specified in AccountLink. Use the Rational License Key Administrator (LKAD) to import the license key file on the client before or after you install the Rational product.

- To open the LKAD during the Rational Software Setup program (before you install the product), click **Configure Licenses** in the **Choose Product to Install** dialog box. The License Key Administrator main window and the License Key Administrator Wizard dialog box appear.
- To open the LKAD after you have installed the Rational product, click **Start > Programs > Rational *product name* > Rational License Key Administrator**. The License Key Administrator main window and the License Key Administrator Wizard dialog box appear.

To import a license key file:

1. Select **License > Import License Key(s)** on the menu bar.
2. In the **Import License Key(s)** dialog box, find the .upd or .txt file (license key file) and highlight it.
3. Click **Open**. The default location for the license key file is <*Install Path*>\Rational\common.

4 The **Restart License Server** dialog box will ask you whether you want to restart the license server. Stop and restart the license server to make the latest license key available for license requests.

Other Methods

- If your e-mail program supports launching programs from file attachments, double-click the .upd or .txt attachment in the e-mail notification you received from Rational Software. Select **Open it** in the **Opening Mail Attachment** dialog box. Click the **Import** button in the **Confirm Import** dialog box.
- Save the file attachment to any folder and double-click the license file.

Entering Temporary or Evaluation License Keys

Use the temporary license key if you are evaluating the product or AccountLink is unavailable. The temporary or evaluation license key information, including the expiration date, is on your License Key Certificate. The License Key Certificate is enclosed in a large green envelope in your Rational Software product shipment.

Use the Rational License Key Administrator (LKAD) to enter the temporary license key information on the client before or after you install the Rational product.

- To open the LKAD during the Rational Software Setup program (before you install the product), click **Configure Licenses** in the **Choose Product to Install** dialog box. The License Key Administrator main window and the License Key Administrator Wizard dialog box appear.
- To open the LKAD after you have installed the Rational product, click **Start > Programs > Rational *product name* > Rational License Key Administrator**. The License Key Administrator main window and the License Key Administrator Wizard dialog box appear.

To enter temporary license information:

1 Select **License > Enter a License** in the menu bar of the License Key Administrator.

2 Choose the type of license you are installing: a **Node-Locked License Key** or a **Floating License Key**.

3 In the next dialog box, enter the following information from your License Key Certificate:

   - Product
   - Expiration Date
   - License Key
   - Quantity (if you are installing a floating license key)

4 Click **Finish**. The License Key Administrator creates a `*.dat` file for the license key in <*Install Path*>\Rational\common.

Configuring Clients to Use Floating Licenses 3

Rational products on client systems can check out floating licenses, including named-user floating licenses, from a floating license server.

This chapter explains how to specify a license server in your client's License Key Administrator after your license administrator has set up the Rational license server. If you are using node-locked licenses, see *Installing Node-Locked Licenses* on page 29.

Configuring Clients to Use Rational License Servers

Enter the license server's host name in the License Key Administrator (LKAD) of the client before or after you install the Rational product. Your license administrator should tell you whether the Rational license server is ready to use before you specify the license server.

Note: In the case of ClearQuest Web and RequisiteWeb, the Web server is the client of the license server. When a user opens these applications on a Web client, the ClearQuest Web server or the RequisiteWeb Requirements server, on behalf of the user, requests the floating license from the license server.

- To open the LKAD during the Rational Software Setup program (before you install the product), click **Configure Licenses** in the **Choose Product to Install** dialog box. The License Key Administrator main window and the License Key Administrator Wizard dialog box appear.
- To open the LKAD when you have installed the Rational product, click **Start > Programs > Rational *product name* > Rational License Key Administrator**. The License Key Administrator main window and the License Key Administrator Wizard dialog box appear.

Configuring Clients to Use Single or Multiple License Servers

The following procedure lets you specify one or two license servers in your client. Do not use the following procedure to enter redundant servers in the client LKAD.

To enter the license server(s) on a client:

1 Select **Settings > Service Configuration**.

2 Click the **Servers** tab.

3 Select the **Use License Server** box.

4 Select **Single Server**.

5 Enter the hostname of the license server.

Use Additional Server

If your system administator has given you the hostname of an additional license server, your client can request license keys from that system by selecting **Use Additional Server** and entering the name of that server.

Note: Do not use Additional Server for a redundant server environment.

6 Click **OK**.

Configuring Clients to Use Redundant License Servers

Redundant servers are a system of three servers that work as a team to manage a single pool of floating license keys. If one of the server systems goes down, the other two license servers automatically continue managing the license pool.

To enter the redundant license servers on a client:

1 Click **Settings > Service Configuration**.

2 Select **Use License Server**.

3 Click the **Servers** tab and select **Redundant servers**.

4 Enter the Primary, Secondary, and Tertiary (Backup) license server hostnames *in the order* in which the license administrator requested them in AccountLink.

5 Click **OK**.

Entering a Port Value to Support a Firewall

Assigning a value to the port in your License Key Administrator is necessary in firewall situations. Do not assign a value to this port unless your administrator instructs you. To learn more about Rational licensing and firewalls, see *Using Floating Licenses with a Firewall* on page 74. The following procedure assumes the license administrator has given you the Rational Vendor port value.

To enter a port value on a client:

1 Select **Settings > Service Configuration**.

2 Click the **Servers** tab.

3 Enter the value in the Port (Optional) field next to the **Single Server** hostname.

4 Enter the value in the Port (Optional) field next to the **Additional Server** hostname, if applicable.

5 Enter the value in the Port (Optional) field under the hostnames of the redundant servers, if applicable.

6 Click **OK**.

Changing License Usage Order

4

Rational products request licenses in a specific order. If you have a combination of node-locked, floating, suite, or point-product license keys in your environment, you need to understand this order and how you can change it.

A Rational product, whether it is installed as part of a Rational Suite or installed as a point product, requests licenses in this order, by default:

1. Node-locked before floating license.
2. Suite license of the last Rational Suite installed.
3. Suite license of the Rational Suite installed before the last Rational Suite installed.
4. Point-product license.

A Rational product requests a node-locked license before a floating license, regardless of whether it is a suite or point-product license. Then the product requests a suite license before a point-product license from a group of floating or node-locked licenses. For example, Rational Purify is sold as part of a Rational Suite and as a stand-alone product. It will request the Rational Suite license before it requests a Rational Purify license.

Rational RequisiteWeb and ClearQuest Web

Rational RequisiteWeb and ClearQuest Web require floating licenses. Unlike other Rational products, they request the point-product license before the suite license.

Examples

To get a better understanding of how Rational products use licenses, read the following examples. If you would like to change how your Rational products use Suite and point-product licenses, see *Changing License Usage on Your System (License Usage Mapper)* on page 38.

Rational Suite and Point-Product Floating Licenses

A customer installs several Rational Suite Enterprise licenses and Rational ClearQuest licenses on its license server. A user installs Rational Suite Enterprise on a client system. When this user starts ClearQuest, which is a part of Rational Suite Enterprise, the product requests the Rational Suite Enterprise license before the ClearQuest license.

Multiple Rational Suite Floating Licenses

A customer installs several Rational Suite DevelopmentStudio and TestStudio licenses on its license server. Then installs TestStudio and then DevelopmentStudio on clients. Because DevelopmentStudio was installed last on the client systems, a product common to both Rational Suites requests the DevelopmentStudio suite license first.

Changing License Usage on Your System (License Usage Mapper)

To change the order in which a product on your system requests suite and point-product licenses, use the License Key Administrator's License Usage Mapper.

Note: You can change license usage order on each client. You cannot use the Rational license server to change license usage order for all clients.

To change the license usage order on a desktop:

1. Select **Settings > License Usage Mapper** in the menu bar.
2. In the **License Usage Mapping** dialog box, make sure the correct product is highlighted in the **Installed Products** box.
3. Move the product license above the suite license in the **License Usage Order** box.
4. Click **OK**.

Administrator

Before Requesting License Keys

5

This chapter describes the Rational Common Licensing model, basic Common Licensing terms, and supported configurations. This information will help you understand Rational Common Licensing and plan the licensing configuration for your environment. If you already have license keys installed on your Rational license server, see *Upgrading Licenses* on page 46 to find out whether these license keys need to be replaced.

To find definitions of additional Rational Common Licensing terms, see the *Licensing Glossary* on page 99.

Table 5 helps you find procedures for administrator licensing tasks.

Table 5 Roadmap for Administrator Tasks

To	See
Understand basic Rational Common Licensing terms, such as node-locked and floating	*Before Requesting License Keys* on page 41
Find out which licensing configurations Rational supports	*Before Requesting License Keys* on page 41
Request and receive permanent (floating or node-locked) license keys	*Requesting License Keys* on page 49
Set up the floating license server and install floating and floating named-user license keys	*Installing Floating and Named-User Licenses* on page 55
Install named-user floating license keys	*Installing Floating and Named-User Licenses* on page 55
Enter a temporary floating key for evaluating a Rational product	*Installing Floating and Named-User Licenses* on page 55
Configure redundant Rational license servers	*Installing Floating and Named-User Licenses* on page 55
Remove the Rational license server software	*Installing Floating and Named-User Licenses* on page 55

Table 5 Roadmap for Administrator Tasks (continued)

To	See
Use other supported Rational licensing features and configurations, such as setting up a UNIX license server for Windows clients	*Using Other License Configurations* on page 71
Understand license installation problems and error messages	*Troubleshooting Licenses* on page 89
Understand the mechanics of Rational Licensing	*Understanding Rational Licensing Components* on page 79

The Rational Common Licensing Model

Rational Software uses a software-based license management tool from GLOBEtrotter, Inc. FLEXlm provides users with a powerful and flexible mechanism for managing licensing. This allows vendors, such as Rational Software, to build a customized licensing model by implementing the FLEXlm features that best meets their business needs.

License Types and License Key Types

What Are Node-Locked and Floating Licenses?

Rational supports both node-locked and floating licenses. Node-locked licenses are created only for a specific system. Floating licenses can be shared by multiple users on multiple systems. A Rational license server controls use of the floating licenses.

When users install Rational products on their systems, the Rational Software Setup program automatically installs the Rational licensing software (Rational *license server* software is not installed automatically). The licensing software lets these systems use either node-locked or floating licenses.

Note: Users need floating license keys from a Web server to run Rational ClearQuest Web and Rational RequisiteWeb on Web clients.

The following table explains the types of licenses in detail.

Table 6 License Types

License Type	Description	Notes
Node-locked	▪ A node-locked license is configured for a specific system. It allows a user to run a Rational product only on that specified system. ▪ Rational supports *uncounted* node-locked licenses for Windows products. Rational refers to uncounted node-locked license keys for Windows products as *node-locked license keys*. ▪ Because these license keys do not use a Rational license server, the user may run multiple sessions of a Rational product concurrently using a single license key. ▪ To move a node-locked license to another system, you must *return* the license key from the old system and request a new license key for the new system. For a more detailed explanation, see *Returning or Moving License Keys* on page 69.	Rational also issues node-locked licenses for Rational products that run on UNIX platforms. Node-locked Rational products on UNIX (that use Rational Common Licensing) are licensed with *counted* node-locked license keys. You manage counted node-locked licenses with a license server. Clients connect to the Rational license server and acquire a counted node-locked license specific to their system. This process is the same as the one used to acquire floating license keys. Essentially, a counted node-locked license key is a floating license key that can only be used on a specific host.

Table 6 License Types (continued)

License Type	Description	Notes
Floating	▪ A system administrator installs the Rational license server software on one or redundant systems. The administrator then installs the floating licenses on the license server. ▪ The pool of floating licenses are shared among all users of Rational products. ▪ Client systems obtain licenses from the license server system when they need to run a copy of Rational software. One license is granted per client per product ▪ To move a floating license to another license server, you must "return" the license key from the old license server and request a new license key for the new license server. For a more detailed explanation, see *Returning or Moving License Keys* on page 69.	Rational also supports Named-User floating licenses for Rational Purify, Quantify, and PureCoverage. This configuration assigns licenses to specific users. That is, only specific users can request floating license keys from the license server. For more information, see *Importing Named-User and Floating License Keys* on page 61.

Using Multiple Floating or Node-Locked License Keys

A client system can check out *multiple* floating or node-locked licenses.

What Are Permanent and Temporary License Keys?

When you register Rational products to a system (license server or client) in AccountLink, Rational generates license keys for that system. These permanent license keys are sent through e-mail in a license file to you. The permanent keys let you use the Rational products for an indefinite period of time. However, Rational assigns an expiration date to the license keys if your company has negotiated a Term License Agreement (TLA). Technically, TLA keys are not permanent, but Rational groups TLA licenses in the permanent license key category.

To use Rational products for an evaluation period or if you expect a delay in receiving your permanent keys, you can install the temporary license key provided in your Rational License Key Certificate. Because Rational has not generated the temporary key for a specific system, you can use it on any system until the specified expiration date.

Permanent and temporary license keys can be floating or node-locked. The difference is that a temporary key is *not* generated for a specific system and a permanent key is generated for a specific system.

The following table defines the types of license keys used by Rational licensing.

Table 7 License Key Types

License Key Type	Description	Notes
Permanent	▪ A license issued to a customer for running Rational products. Permanent licenses are keyed to a specific Rational product and specific system. ▪ Permanent license keys can be node-locked or floating. The user installs a node-locked permanent key on a system on which the user runs Rational software. Floating permanent keys are installed on a Rational license server.	Rational issues permanent node-locked or floating keys upon request. Use AccountLink at www.rational.com /accountlink to acquire your license keys.
Temporary	▪ A time-limited license issued to a customer for running Rational products. Temporary licenses are not keyed to a specific system. ▪ Temporary license keys can be node-locked or floating. The user installs a node-locked temporary key on a system on which the user runs Rational software. Floating temporary keys are installed on a Rational license server.	The expiration date for a temporary key is noted on the License Key Certificate included with the Rational product shipment.
TLA (Term License Agreement)	▪ Variation of a Permanent Key. TLAs are issued to allow users access to Rational software for a negotiated period of time.	TLAs are issued by the Rational Sales Team. To obtain TLAs for your organization, contact your local Rational Sales Team.

What Are Emergency and Evaluation License Keys?

Emergency and evaluation license keys are temporary license keys. They can be floating or node-locked. They are short-term licenses that are not generated for a specific system.

What Are Suite Licenses and Point-Product Licenses?

A Rational license key indicates whether it is a Rational Suite license, such as Rational Suite Enterprise, or a point-product license, such as Rational Purify. A node-locked or floating Rational license file can contain multiple suite and point-product license keys.

Using Suite License Keys

A Rational Suite license key lets you run all of the products contained within a Rational Suite at the same time on a single system. The Rational Suite checks out a *single* floating or node-locked suite license key.

Using a Different Suite License from the Suite Edition Installed

You can install a Rational Suite on a client and specify that products within the Suite check out a different type of Rational Suite license. For example, you can install Rational Suite Enterprise on the client and have the point products within the Rational Suite check out a Rational Suite AnalystStudio license from the Rational license server.

To select a different license for a product, use the License Key Administrator's License Usage Mapper. See *Changing License Usage Order* on page 37 for more information.

Upgrading Licenses

If you are upgrading from an earlier version of a Rational Suite or point product, reuse your current Rational Suite and point-product license keys.

Adding Rational Suites or Point Products to Licenses

This section describes the conditions under which you must order new license keys.

- If you have purchased a different type of Rational Suite from the one you are currently using, request a new license file that includes the new Rational Suite key.
- If you are adding a new product to your system, request a new license file that includes the new point product license key.

Rational Licensing Configurations

This section describes licensing configurations supported by Rational Software. The term *supported* refers to a licensing configuration that Rational has tested and guarantees will work under normal operating conditions. This applies to configurations that the software was designed to handle. This also applies to configurations for which the software was not specifically designed, but with which it will work with some manual intervention.

Table 8 lists license configurations that Rational does support.

Table 8 Rational Licensing Configurations

Configuration	Supported Platforms	Notes
Node-locked license key in a file	Windows	This configuration is fully supported starting with Rational Common Licensing 1.0.
Node-locked license key in a file	UNIX	This configuration is fully supported starting with Rational Common Licensing 1.0.
Rational license server and Rational Windows products installed on a single system	Windows	This configuration is fully supported starting with Rational Common Licensing 1.5.
Rational license server and Rational UNIX products installed on a single system	UNIX	This configuration is fully supported starting with Rational Common Licensing 1.0.
Floating licenses for Windows products.	UNIX system serving licenses to Windows clients	This configuration is supported starting with Rational Common Licensing 1.5.
Floating licenses with redundant license servers	Windows system serving licenses to UNIX clients	This configuration is not yet officially supported by Rational.
Floating licenses with redundant license servers	UNIX system serving licenses to UNIX clients	This configuration is not yet fully supported by Rational Common Licensing.

Requesting License Keys 6

Permanent (or Term License Agreement) license keys are managed through the Web tool AccountLink (https://www.rational.com/accountlink). You, as the license administrator, order or return permanent license keys in AccountLink.

The information in this chapter is intended for system administrators or users who manage licenses. It provides information about the following license administrator tasks:

- Requesting and receiving permanent license keys from AccountLink
- Upgrading permanent license keys
- Adding products to permanent license keys

Setting up the Rational license server and importing the license keys on the server are covered in *Installing Floating and Named-User Licenses* on page 55.

Using AccountLink to Request Permanent License Keys

To use AccountLink, you need the *License Key Certificate* that Rational includes in your product shipment. This certificate, enclosed in a large green envelope, provides your license information. The Rational Account Number on this certificate verifies your company has purchased licenses to run Rational products.

In AccountLink, you can order and return permanent license keys for Windows and UNIX products. AccountLink supports all license types: floating, named-user floating, and node-locked licenses. For more information about license types, see *License Types and License Key Types* on page 42.

Note: AccountLink does not support temporary license key transactions.

AccountLink's interface offers three license transactions:

1 **Get License Key(s)** – Order your permanent license key by registering your Rational software to a specific system. To order a permanent license key, you need your Rational License Key Certificate and the hostname or ethernet address of the license server or client system.

   You can register:

- Rational Windows or UNIX products that will be served from a Rational license server.
- Single, multiple, or redundant Rational license servers on Windows or UNIX systems.
- Remote Windows or UNIX systems; you do not need to sit at the system you are requesting license keys for.

To find out more about the host ID, see *Finding the HOST ID* on page 50. To order permanent license keys for a redundant server environment, specify the redundant servers' host IDs in the following order:

a Primary license server

b Secondary license server

c Tertiary (Backup) license server

The client systems communicate with the redundant servers in that order.

2 **Return License Key(s)** – *Return* the existing license key to your Rational account and then order a license key for the new system. This adjusts the count of registered products in your account and allows you to get the license key for the new system. To learn more about returning license keys, see *Returning or Moving License Keys* on page 69.

3 **Request a Copy of a License File** – Get a copy of a license key file for any system that has license keys already registered to it. You will need this transaction when your hard disk is reformatted, you need to restore the software on your system, or your license keys become corrupt. It does not require you to return or add license keys.

Using Getting Started

The *Getting Started* Web pages provide step-by-step instructions, examples, and graphics for obtaining and installing Rational license keys. Click the **Getting Started** link on the AccountLink Web page.

Finding the HOST ID

The term *host ID* is a generic term that is used to signify to specify the host or system's disk serial number or ethernet address.

The HOST ID field is used to associate the key with other entities; the most common are the system's DISK_SERIAL_NUM (disk serial number) or the ethernet address (network id).

With Rational Common Licensing, the default HOST ID value on Windows systems is the disk serial number of the user's boot drive. In this case the HOST ID field appears as: `DISK_SERIAL_NUM=nnnnnnn`. Example: `DISK_SERIAL_NUM=12345678`.

The default HOST ID value on UNIX systems is the ethernet address of the system written in the format `HOSTID=nnnnnnnnnnnn`. Do not confuse the format `HOSTID=nnnnnnnnnnnn` with the disk serial number format `DISK_SERIAL_NUM=nnnnnnnn` that is referred to in Rational Software documentation, online Help, and AccountLink as the host ID.

Rational does not allow for multiple values of HOST ID to be defined within a single key.

Finding the Host ID on a Windows System

To get the hostname, host ID, or ethernet address of a Windows system, select **License > Host Data** in the Rational License Key Administrator's menu bar.

Note: If Rational software is not installed on the license server or client, Rational AccountLink provides a tool to help you find this information.

What if the Host ID on My System Changes Frequently?

Registering the host ID of the boot drive may not be optimal if you have dual boot systems, you frequently reformat your disks, or you ghost your disk images because these processes change the host ID of the boot drive. Because the products and license keys are registered to a specific host ID, you cannot use your Rational products if the host ID changes.

To avoid this situation, use one of the following approaches:

- Use floating licenses served by a license server with a constant host ID.
- Use the address of the ethernet card in the system as a host ID instead.
  - **a** To find the ethernet address, see *Finding the Ethernet Address on a UNIX System* on page 52 and *Using the Ethernet Address on a Windows System* on page 52.
  - **b** If you are using a Rational product release earlier than 2001 on a Windows system, you also need to change a registry setting. To change the setting, see *Using the Ethernet Address on a Windows System* on page 52.
- Make sure that when images are created to refresh the system you keep the disk serial number of the boot drive constant.

Using the Ethernet Address on a Windows System

On Windows systems, the License Key Administrator (LKAD) can be forced to use the ethernet address instead of the disk serial number. This will allow the LKAD to import the license key file correctly. Add the registry setting "`UseNIC=TRUE`" to HKEY_LOCAL_MACHINE\SOFTWARE\Rational Software\Licensing\1.0.

Note: You do not need to add this setting if you have installed Release 2001 of Rational software and of the Rational license server.

Finding the Ethernet Address on a UNIX System

On UNIX systems, use GLOBEtrotter's `lmhostid` command to find the ethernet address of the system. On Sun systems, `lmhostid` returns the value of the Sun `hostid` command.

Requesting License Keys (Without an Internet Connection)

This section summarizes the steps for getting a node-locked or floating permanent license key when you do not have an internet connection or when Rational AccountLink is unavailable.

1 Find your License Key Certificate in your Rational product shipment.

Print the license request form. To print the form, either install the Rational product that you purchased and open the license request form in the Rational common directory or open the file in the Rational Solutions for Windows installation CD-ROM. The Chinese, French, German, and Japanese versions of this fax form are in the same location.

- <*Rational_directory*>\common\License Fax Form - English.htm
- <*cd_drive*>\common\License Fax Form - English.htm
- <*Rational_directory*>\common\License Fax Form - Chinese.htm
- <*cd_drive*>\common\License Fax Form - Chinese.htm
- <*Rational_directory*>\common\License Fax Form - French.htm
- <*cd_drive*>\common\License Fax Form - French.htm
- <*Rational_directory*>\common\License Fax Form - German.htm
- <*cd_drive*>\common\License Fax Form - German.htm
- <*Rational_directory*>\common\License Fax Form - Japanese.htm
- <*cd_drive*>\common\License Fax Form - Japanese.htm

2 Use the License Key Certificate to fill out the form. Make sure that the contact, Rational account number, product, licensing, and host information are correct. Any errors will cause delays in receiving your license keys.

3 Fax the request to Rational. See *Contacting Rational Licensing Technical Support* on page xiv for phone and fax numbers.

Call Rational Licensing Support if you cannot use Rational AccountLink or the fax form to order your permanent license keys. See *Contacting Rational Licensing Technical Support* on page xiv for phone numbers.

Receiving Permanent License Keys

After you register your Rational products to a specific system in AccountLink, Rational generates a license file that contains the license key(s). The file is sent through e-mail to the contact e-mail address that you designate in AccountLink's License Contact page.

If you request a permanent license key by fax and you have specified an e-mail address in your contact information, you will receive a license key file through e-mail. You can copy the permanent license file from the e-mail enabled system and install it on the system that is not e-mail enabled.

If you cannot provide an e-mail address, contact Rational Licensing Support. See *Contacting Rational Licensing Technical Support* on page xiv for the phone numbers.

After you receive the license key file:

- Import the *floating* license key file on the license server that you specified, or
- Send the node-locked license key file to the client system you specified.

For more information about importing a license key file on a license server, see *Installing Floating and Named-User Licenses* on page 55.

Installing Floating and Named-User Licenses 7

Floating licenses, including named-user floating licenses, let you manage and maintain licenses on a single license server or redundant license servers.

This chapter describes how to set up and run Rational's floating license services. The information in this chapter is intended for system administrators or users who manage licenses. If you are using node-locked licenses, see *Installing Node-Locked Licenses* on page 29.

Setting Up Floating and Named-User Floating Licenses

The steps required to set up floating (temporary or permanent) licenses are described in Table 9.

Table 9 Guide to Setting Up Floating Licenses

To	Procedures
Set up floating licenses	1 Make sure your license server and clients can work with the network configuration that you have set up. See *Working with a Supported Network Configuration* on page 56. 2 Install the Rational license server software on the license server system. See *Installing the Rational License Server Software* on page 57. 3 Install the evaluation or permanent floating license keys on the license server system. See *Importing Named-User and Floating License Keys* on page 61. 4 Start the license server software. See *Starting the License Server* on page 63. 5 Tell client users to specify the Rational license server in their clients.

Table 9 Guide to Setting Up Floating Licenses (continued)

To	Procedures
Set up named-user floating licenses (only applies to Rational Purify, Quantify, and PureCoverage)	1 Make sure your license server and clients can work with the network configuration that you have set up. See *Working with a Supported Network Configuration* on page 56. 2 Install the Rational license server software on the license server system. See *Installing the Rational License Server Software* on page 57. 3 Install the named-user floating license keys on the license server system. See *Importing Named-User and Floating License Keys* on page 61. 4 Edit the rational.opt file with the names of specific users. See *Editing the Options File (rational.opt)* on page 63. 5 Start the license server software. See *Starting the License Server* on page 63. 6 Tell client users to specify the Rational license servers in their clients.
Configure redundant license servers	See *Setting Up Rational Redundant Servers* on page 65.
Modify the time-out period	See *Modifying the Floating License Time-Out Period* on page 64.
Remove the license server software	See *Removing the Rational License Server Software* on page 66.

Working with a Supported Network Configuration

This section provides important information about network configurations.

Dial-Up Support

You can use floating licenses with a dial-up network connection that supports a constant TCP/IP connection to the Rational license server. Any client must have a constant TCP/IP connection to the license server.

If the dial-up connection is lost while a client has checked out a floating license, the server will automatically reclaim the floating license. When the connection is lost, the client cannot periodically “talk” to the license server to refresh its license. Because the client cannot refresh its license, the Rational product will run for a limited period of time. This time period is product dependent.

WAN Support

Rational floating licenses can be used over a wide area network if this is in compliance with the geographical allowance of the License Agreement.

If you choose to run licenses over a WAN, be aware of how your systems resolve hostnames. Rational recommends, but does not require, that you always use the fully qualified domain names in the SERVER line and on the clients. This technique tends to reduce the number of issues with hostname resolution.

Novell Support

Rational’s licensing implementation does not support Novell Netware 5.0 or later directly with floating licenses. Rational floating licenses can be used in a Novell 5.0 environment that is configured with TCP / IP and / or IPX.

Node-locked licenses with Novell 5.0 are supported.

Installing the Rational License Server Software

This section describes how to use the Rational Software Setup program to install the license server software, software that allows you to flexibly install and manage license keys. You do not have to have a license key to operate the Rational license server software.

Before You Install the License Server Software

The following sections provide requirements for installing the license server.

Installation Requirements

Table 10 lists the system and software requirements for installing the Rational license server software.

Table 10 Rational License Server Requirements

Item	Requirement
Operating System	Microsoft Windows NT 4.0, Service Pack 2 or greater Microsoft Windows 2000 The Windows systems must have a C drive. On UNIX systems, the Rational license server is available on all platforms that support Rational's products.
Processor	133 MHz or greater
Memory	64 MB
Disk space	73 MB
Privileges	Windows administrator privileges on the local system

Note: Make sure that you have a current backup of your Registry and system directories before running the Rational Software Setup program.

Default Installation Path

The Rational Software Setup program uses C:\Program Files\Rational as the default installation path. If your C:\ drive lacks sufficient free disk space, you may either specify another drive or make space available on the default drive.

Warning: Interrupting an installation that is in progress may leave your system in an indeterminate state. If you try to close the Rational Software Setup window while the installation is in progress, the Setup program asks you to confirm that you want to exit from the incomplete installation.

Using the Rational Software Setup Procedure

This section describes a Typical installation of the Rational license server software.

1 Insert one of the Rational Solutions for Windows Discs into your system's CD-ROM drive.

The Rational Software Setup program starts automatically.

If autorun is disabled on your system, click **Start > Run** and enter *drive*: \Setup.exe where *drive* is the letter of the CD-ROM drive.

2 The **Rational Software Setup** dialog box provides general information about the software installation.

3 On the **Choose Product** dialog box, choose **Rational FLEXlm License Server**.

4 Choose to accept or not accept the Rational Software license agreement in the **License Agreement** dialog box.

- If you accept the license agreement, the Setup program continues.
- If you do not accept the license agreement, you cannot continue with the Setup program. Exit the Setup program by clicking **Finish** or **Cancel**. The Setup program exits and makes no changes to the system.

5 The **Select Configuration** dialog box displays the setup options for the software. The only choice available for the license server is **Typical**.

6 The **Upgrade Compatibility** dialog box appears if you have earlier versions of Rational products already installed on the system. When you have earlier versions of Rational products installed on your system, ensure that all Rational products on that system are upgraded to the same version. Because Rational tools share files and components, a new installation can cause the older Rational products to stop working.

For each of the Rational products listed in the **Upgrade Compatibility** dialog box, we strongly recommend that you do one of the following:

- **Upgrade it:** Complete the installation, and then restart the Setup program to upgrade the earlier versions of Rational products. For example, if you have stand-alone installations of Rational point products on your system, upgrade each product. If you have a Rational Suite and a point product on the same system, upgrade both Rational products to the same version. Upgrading each product updates all necessary files, registry entries, startup menu items, and shared components on your system.
- **Remove it:** Complete this installation, and then see the *Rational Suite Installation Guide* for the removal procedure.

7 The **Confirmation** dialog box displays the product features that will be installed.

8 The **Error Summary** dialog box displays errors from the first part of the Setup program. If the installation is successful, you do not see this dialog box.

The Rational Software Setup program writes a log of installation activities. The log file is located in <*Install Path*>\Rational\RSSetup\RSsetup.log.

Possible Reboot Required

If files required for the installation are in use during the Rational Software Setup program, and if the program needs to install shared components on your system, the Setup program may need to reboot your system. After rebooting, do the following:

1 Log on as the same administrator to complete the installation procedure. If you do not log on as the same administrator, the installation does not complete correctly.

   The installation process completes on your system.

2 Click **Finish**.

Note: Install the floating license keys on the license server before you start the license server.

Using the Rational License Key Administrator (LKAD)

The Rational License Key Administrator (LKAD) is installed with your Rational software and with your Rational license server software. This Rational program provides an interface to Rational Common Licensing features. Use the LKAD to enter or import license keys and change your license configuration.

- To access the LKAD on a client system, click **Start > Programs > Rational *product name* > Rational License Key Administrator.**
- To access the LKAD on a license server system, click **Start > Programs > Rational License Server > Rational License Key Administrator.**

The Help explains how to use the LKAD to review and modify your license configuration. The LKAD Help also provides information about configuring the license server software. To access the Help, click **Help** in the License Key Administrator's main menu or open <*Install Path*>\Rational\Common\licadmin.hlp.

Using the LKAD During the Rational Software Setup Program

To take care of licensing tasks before you install a product, open the Rational License Key Administrator from the Rational Software Setup program. The Rational Software Setup offers a **Configure Licenses** button in the **Choose Product** dialog box. When you see the License Key Administrator appear, import a node-locked license key, enter an evaluation license key, and specify a license server. After you configure product licensing, return to the Rational Software Setup program and install the product.

Reviewing Your License Information in the LKAD

By default, you should see complete information about your license keys in the main window of the License Key Administrator. If you do not see this information in the window, use the **View > Show** menu to display information about your licenses.

Table 11 defines each of the options in the **View > Show** menu.

Table 11 Show Licenses

License	Shows
Invalid and Expired Licenses	All expired node-locked, floating, and served licenses on the system that you are using
Floating Licenses	All floating licenses on the system that you are using
Node Locked Licenses	All node-locked licenses on the system that you are using
Served Licenses	All floating licenses that Rational software on your system could request from the license server

Importing Named-User and Floating License Keys

This section describes how to install permanent or evaluation license keys on the Rational license server.

Importing Permanent or Term License Agreement (TLA) License Keys

Import the permanent license key file on the license server by using the Rational License Key Administrator (LKAD).

To import a license key file:

1. Select **License > Import License Key(s)** on the menu bar.
2. In the **Import License Key(s)** dialog box, find the .upd or .txt file (license key file) and highlight it.
3. Click **Open**. The default location for the license key file is *<Install Path>*\Rational\common.
4. The **Restart License Server** dialog box will ask you whether you want to restart the license server. Stop and restart the license server to make the latest license key available for license requests.

Other Methods

- If your e-mail program supports launching programs from file attachments, double-click the .upd or .txt attachment in the e-mail notification you received from Rational Software. Select **Open it** in the **Opening Mail Attachment** dialog box. Click the **Import** button in the **Confirm Import** dialog box.
- Save the file attachment to any folder and double-click the license file.

Entering Temporary or Evaluation License Keys

You may enter a temporary or evaluation license key on the license server if you are evaluating the product or AccountLink is unavailable.

The temporary or evaluation license key information, including the expiration date, is on your License Key Certificate. The License Key Certificate is enclosed in a large green envelope in your Rational Software product shipment.

Enter the temporary license key information on the license server by using the Rational License Key Administrator (LKAD).

- To open the LKAD during the Rational Software Setup program (before you install the product), click **Configure Licenses** in the **Choose Product to Install** dialog box. The License Key Administrator main window and the License Key Administrator Wizard dialog box appear.
- To open the LKAD after you have installed the Rational product, click **Start > Programs > Rational *product name* > Rational License Key Administrator**. The License Key Administrator main window and the License Key Administrator Wizard dialog box appear.

To enter temporary license information:

1. Select **License > Enter a License** in the menu bar of the License Key Administrator.
2. Choose the type of license you are installing: a **Node-Locked License Key** or a **Floating License Key**.
3. In the next dialog box, enter the following information from your License Key Certificate:
   - Product
   - Expiration Date
   - License Key
   - Quantity (if you are installing a floating license key)

4 Click **Finish**. The License Key Administrator creates a `*.dat` file for the license key in <*Install Path*>\Rational\common.

Importing Named-User Floating License Keys

Named-user license keys behave like floating license keys except the License Key Administrator (LKAD) offers you the opportunity to specify a user for each license key. You assign a user to a key by editing the rational.opt file. The options file locks the floating license key to the user; allowing the user to run Rational Purify, Quantify, or PureCoverage on multiple systems.

Editing the Options File (rational.opt)

Beginning with Release 2002.05, the LKAD provides an options file in which you can assign named-user license keys. As soon as you import the license key file, the **Edit Options File** dialog box appears. If you choose to edit the file:

1 The options file automatically appears in a text editor. Follow the instructions in the file for the correct syntax in assigning user ids to license keys.

2 After you edit the file, save it, and then close the file.

Note: You can edit the options file while the license server is running, but stop and restart the license server after you have edited the file. See *Starting the License Server* on page 63 for the **Stop** and **Start** buttons.

Starting the License Server

Start the Rational license server after you have imported or entered the floating license keys.

Note: The Rational license server will not start until floating license keys are installed.

Starting the License Server on Windows 2000

1 Click **Start** and select **Settings > Control Panel > Administrative Tools > Services > FLEXlm License Manager**.

2 In the **General** tab, click the **Start** button under **Service Status**.

Starting the License Server on Windows NT

1. Click **Start** and select **Settings > Control Panel > Services**.
2. Select the **FLEXlm License Manager** in the **Services** dialog box and click the **Start** button.

Note: Although the control panel applet may still appear on your system from an earlier release of Rational server software, version 2001 does not use the FLEXlm control panel applet.

Switching to Manual Startup

The Rational license server software is automatically set as a Windows NT service. The default Startup type is automatic, which means the license server starts automatically each time you start the system. If you prefer to manually start the license server, switch the startup type.

Switching Startup Type on Windows 2000

1. Click **Start** and select **Settings > Control Panel > Administrative Tools > Services > FLEXlm License Manager**.
2. In the **General** tab, select **manual** under **Startup type.**

Switching Startup Type on Windows NT

1. Click **Start** and select **Settings > Control Panel > Services > FLEXlm License Manager**.
2. In the dialog box, select **manual** under **Startup type**.

Modifying the Floating License Time-Out Period

The Rational license server will reclaim a floating license when the product has not been used for a default period of 120 minutes. If you use the product again after the server has reclaimed its license, the product will check out the license again from the server.

To change the time-out period, create a text file called rational.opt in the <rational flexlm dir>\common directory. Enter one of the following two commands in the text file:

1. `TIMEOUT feature seconds` directs the license server to reclaim the `feature` (the product as it is listed in your license key file) after the number of seconds that you enter into the file.
2. `TIMEOUTALL seconds` directs the license server to reclaim all products after the number of seconds that you enter into the file.

The value for each of these options must be greater than 7200 seconds (or 120 minutes).

Modifying the Time-Out Period to Stop Disconnected Mode

The disconnected mode lets you use Rational software at home within a 3 day period of acquiring a license key and disconnecting from the network at work. However, if you have a slow network at work, your software automatically goes into disconnected use mode if it does not receive a response from the Rational license server within 5 seconds. You then see a dialog box that states you are in disconnected use mode after the 5 seconds.

Starting with release 2001A, you can change the time-out period before your Rational application goes into disconnected use mode. The default setting is 5 seconds. To change the setting:

1. Create a DWORD key: HKEY_LOCAL_MACHINE\SOFTWARE\Rational Software\Licensing\1.0\DisconnectTimeout
2. Modify the value (decimal) to be larger than 5 seconds.

Setting Up Rational Redundant Servers

Rational license servers can be set up to run in a fault-tolerant configuration known as *redundant servers*. Redundant servers are a system of three servers that work as a team to manage a single pool of floating license keys. If one of the server systems goes down, the other two license servers automatically continue managing the license pool.

Example

You have purchased 25 floating licenses of Enterprise Suite and wish to set up a redundant server configuration on three Windows systems. You request permanent keys for the redundant servers using AccountLink. You install the Rational license server software on each of the three redundant server partners; servers A, B, and C. When you receive the license file of 25 permanent floating keys, you install the license file on each server.

The three servers work as a team to manage all 25 floating licenses in unison. When you have 20 license keys checked out to your users and server A crashes, servers B and C continue to manage the 25 licenses.

Warning: It is a common misperception that separating redundant servers across multiple sites (for example, one in US, one in Europe, one in Asia) provides maximum fault tolerance. This is not the case. Redundant servers should always be at the same site and on the same subnet.

To configure redundant license servers:

1. Install license server software on three systems. See *Working with a Supported Network Configuration* on page 56 and *Installing the Rational License Server Software* on page 57.
2. Import a license file that you receive from Rational on each license server. See *Importing Named-User and Floating License Keys* on page 61 for more information.
3. Start the license servers. The sequence is unimportant, but you should start the servers soon after one another. See *Starting the License Server* on page 63 for instructions.
4. Give users the Primary, Secondary, and Tertiary (Backup) license server hostnames *in the order* in which you requested them in AccountLink.

Removing the Rational License Server Software

This section describes how to remove the license server software from the system.

Before You Remove the License Server Software

1. Make sure that no one is using the license server or any associated files. You cannot remove files that are in use.
2. Return the license keys to your Rational Account through AccountLink (www.rational.com/accountlink), the online license management tool. For more information about moving or returning licenses, see *Returning or Moving License Keys* on page 69.
3. To remove the software from a Windows NT system, you must have Windows NT administrator privileges on the local system.

Removing the License Server Software

Use the Windows **Add/Remove Programs** control panel to select and remove the license server software. The Rational Software Setup program removes the files from your system. It does not remove directories that contain files that you created while you were using the software. It also does **not** remove the license key files from the system.

Returning or Moving License Keys

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You may need to replace an old system or decide another system should act as the new Rational license server. Because permanent license keys are tied to a system's host ID, Rational products will not work on another system until you register the products to the new system.

Returning or Removing License Keys

When you return a license key from a registered system, you do not physically give the license key back to Rational. Instead, you use the return transaction in AccountLink. This transaction updates Rational's records to indicate that you are no longer using a Rational product on that system. This adjusts the count of registered products in your account.

After AccountLink makes the adjustments to your account, Rational sends you a license key file that contains updated license keys. If you have returned all the license keys for a system, the updated license file is empty. To comply with your License Agreement, import this updated license file (whether it is empty or not) on the system.

To return a license key:

1. Use AccountLink to return the license keys to your Rational account.
2. To complete the return process, import the license key update file that you receive from AccountLink on the license server or node-locked system from which you returned the license key.

Moving License Keys

If you want to move Rational software to a new system, *return* the existing license keys from the old system to your Rational account. Then order license keys for the new system.

To move license keys from one system to another:

1. Use AccountLink to return the license keys to your Rational account.

   Note: To help prevent you from confusing the license key update file for the old system with the license key file for the new system, you may want to complete the return process before you order license keys for the new system.

2. Import the updated license key file that you receive from AccountLink on the old system.

3. Remove the Rational software or license server software from the old system. See the *Rational Suite Installation Guide* for the removal procedures.

4. Install the Rational software or license server software on the new system.

5. Request new license keys for the new system in AccountLink.

6. Import the license key file on the new system.

7. If you moved the license keys to a new license server, give users the name of the new license server.

Using Other License Configurations

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This chapter describes additional configurations that Rational Common Licensing supports. The first section provides additional procedures for license server configurations. The second section explains additional license file options. A table in the beginning of each section provides pointers to specific topics.

Many of the tasks in this chapter are not recommended for the casual or novice user. Attempt them only if you are familiar with your operating system and Rational Common Licensing.

Other License Server Configurations

Table 12 provides pointers to information in this chapter about additional license server configurations.

Table 12 License Server Configurations

For more information about	See
Monitoring Rational license server activity	*License Monitoring* on page 71
Windows clients using a UNIX server	*Windows Clients Using a UNIX License Server* on page 72
Running multiple license servers on the same system	Rational and GLOBEtrotter recommend running a separate `lmgrd` instance for each vendor daemon and keeping license keys in separate files.
Using floating licenses with a firewall	*Using Floating Licenses with a Firewall* on page 74
Changing the `lmgrd` port	*Changing the lmgrd Port* on page 76

License Monitoring

You may need to monitor and report on license usage. GLOBEtrotter offers a robust solution for license usage reporting called SAMreport. SAMreport is designed specifically for reporting on license server activity. SAMreport offers a full set of administrative tools that generates reports, graphs, high-water marks, and even sets

alarms to notify individuals when a server has gone down or the license pool is nearly exhausted. SAMreport works with any vendor's FLEXlm server. It is available only through GLOBEtrotter. Detailed information on SAMreport can be found at: http://www.globetrotter.com/samreport.htm.

Windows Clients Using a UNIX License Server

You can set up a UNIX license server to serve floating licenses to Windows clients. If you have purchased DevelopmentStudio for UNIX in addition to the Rational Windows products, see the Rational Suite UNIX installation manual or a UNIX point-product installation manual for information about configuring a UNIX Rational license server. You can also find UNIX installation manuals at www.rational.com. Select **Support > Documentation**. Click on **Install Guides** under **Documentation**.

If you do not have access to a Rational UNIX installation manual, read the following overview.

1. Go to AccountLink (http://www.rational.com/accountlink) to get license keys for the products on your Windows clients. Use the **Getting Started** link to help you order the license keys.
2. You need FLEXlm 6.0 or higher software and the Rational daemon to set up the Rational license server on a UNIX system. If you not purchased Rational UNIX products, you can download the Rational licensing executables and files from our ftp site at:

   ftp://ftp.rational.com/public/tools/flexlm

   When you decompress and expand the TAR files on your UNIX system, they create this directory:

   flexlm.<version>/<arch_os>

   You should see the following executables in the FLEXlm directory:

Name	Description
`lmgrd`	FLEXlm license server executable
`rational`	Rational's license vendor daemon executable

The rest of the files correspond to system-administrator commands, which the license manager (`lmgrd`) supports.

Command	Description
`lmdiag`	Allows you to diagnose problems when you cannot checkout a license
`lmdown`	Shuts down license and vendor daemons
`lmhostid`	Reports license manager host ID of workstation
`lmremove`	Returns specific licenses to license pool (for example, after a system crashes)
`lmreread`	Rereads license file, starts new vendor daemons
`lmstat`	Reports status on daemons and feature usage
`exinstal`	Reports on licenses in license file you specify on the command line

3 After you install the Rational license server software and files on the UNIX system, save the license file that you receive from AccountLink as a license.dat in a directory (where you would like to maintain your licensing information). Ensure that you do not overwrite any existing license.dat files that you may currently have in this directory.

The default location is:

/usr/local/flexlm/licenses/license.dat

We strongly recommend that you do not set LM_LICENSE_FILE. You will not typically need to set the LM_LICENSE_FILE variable to use Rational software products.

4 Start the Rational license server by using the command:

```
lmgrd -c <licenseFileList> -l <logfile>
```

- `lmgrd` is the license manager that you downloaded from our ftp site to the Rational license server host.
- `licenseFileList` is the path to the license file or a list of license files.
- `logfile` is the path to a log file.

If you already have a UNIX Rational license server set up, use the `lmreread` command to restart the server.

5 For convenience, you probably want to augment a system initialization script on your license server to automatically start the license daemon each time the license server boots.

   The names, locations, organization, and contents of system initialization scripts varies from UNIX system to UNIX system.

6 To verify that your license manager is operational, enter these commands on your license server to see if its daemons are running:

```
% ps axw | grep -v grep | egrep "lmgrd|rational"
```

   or

```
% ps -e | grep -v grep | egrep "lmgrd|rational"
```

7 Install the Rational products on the Windows clients and configure them to acquire license keys from the UNIX server.

Using Floating Licenses with a Firewall

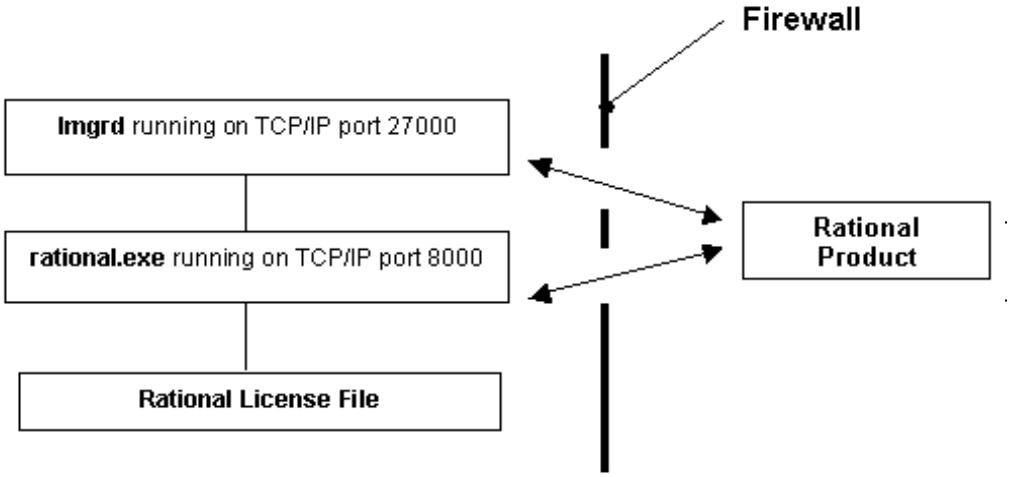
Rational's licensing implementation supports a firewall. To configure licensing with a firewall, give the `lmgrd` daemon (license manager) and the vendor daemon (Rational vendor or rational.exe) TCP/IP port numbers. The TCP/IP port is used for client/server communication for floating licenses.

In a non-firewall situation, the `lmgrd` daemon starts on TCP/IP port 27000 when you start the server. (You will have to change this number if another application is using this port number.) The `lmgrd` daemon assigns a random TCP/IP port number to the vendor daemon.

In a firewall situation, the client cannot communicate with the daemons on the license server because the ports on which they are running are blocked. To allow license requests to pass through the firewall, assign numbers to the vendor and `lmgrd` ports. The vendor daemon and `lmgrd` daemon must start on the same ports each time a client makes a license request and checks out a floating license from the server. The specified ports or connections remain open until the client returns the license to the server.

Note: The vendor daemon and the `lmgrd` daemon cannot be set to the same port number.

The following diagram displays a sample firewall situation. The Rational product on the right-hand side can communicate with the `lmgrd` daemon and rational.exe (vendor daemon) on the license server through the firewall because the numbers 27000 and 8000 have been assigned to the ports.



When you specify the port information, the Rational License Key Administrator stores the port information in the rational_redirect.dat file, located by default in \Program Files\Rational\Common.

The following procedures let you change the `lmgrd` and vendor ports in single, multiple server, or redundant server environments. They assume that you have already started the license server(s) and entered the hostname(s) of the license server(s) in the License Key Administrator of each client.

Assigning Port Numbers in the Rational License Server

To allow clients to communicate with the license server, enter values in the `lmgrd` port and the Rational Vendor port.

To enter port numbers on a license server or redundant license servers:

1. Select **Settings > Service Configuration** in the Rational License Key Administrator.
2. In the **Service Configuration** dialog box, click the **Ports** tab.
3. Enter values in the `lmgrd` port and the Rational Vendor port, but do not set them to the same value.
4. Click **OK**.
5. If the server is a redundant server, enter the same port values in the other license servers by repeating Steps 1–4.
6. Give users the Rational Vendor Port value to enter into the License Key Administrators of their systems.

Changing the lmgrd Port

When another application is using the TCP/IP port 27000 that is used by `lmgrd` (license manager daemon), change the `lmgrd` port. You do not need to enter a value in the Rational Vendor because it runs on a random TCP/IP port.

The following procedures let you change the lmgrd port in single, multiple, or redundant server environments. They assume that you have already started the license server(s) and entered the hostname(s) of the license server(s) in the License Key Administrator of each client.

To change the `lmgrd` port value on a license server or redundant license server:

1. Select **Settings > Service Configuration** in the Rational License Key Administrator.
2. In the **Service Configuration** dialog box, click the **Ports** tab.
3. Enter a value in the `lmgrd` port.
4. Click **OK**.
5. If the server is a redundant server, enter the same `lmgrd` port value in the other license servers by repeating Steps 1–4.

Note: Do not enter a port value in each client.

Other License File Options

Table 13 provides information about additional license file configurations.

Table 13 License File Configurations and Options

For more information about	See
Combining license files	Rational and GLOBEtrotter recommend keeping the license keys in separate files.
Home use or travel	▪ Rational recommends that you contact a Technical Support Engineer about the disconnected use of floating licenses. See *Contacting Rational Licensing Technical Support* on page xiv for phone numbers. Or ▪ *Installing Node-Locked Licenses* on page 29 ▪ *Modifying the Time-Out Period to Stop Disconnected Mode* on page 65
Disconnected use of floating licenses on Windows systems	*Contacting Rational Licensing Technical Support* on page xiv. Rational supports this feature, but recommends that you contact a Technical Support Engineer for instructions.

Understanding Rational Licensing Components 10

This chapter describes how Rational Software has implemented FLEXlm features and options in Rational Common Licensing.

Locating the Licensing Components

All Rational software files and Rational license key files are installed in *<Install Path>*\Rational\Common\ unless otherwise noted.

Understanding the Rational License Server Process

The following sections provide information about the Rational license server, including descriptions of the license daemons running on the server systems.

License Server Components

The Rational license configuration includes these major components, which are described in the following sections:

- License key file
- License manager daemon (`lmgrd`)
- Vendor daemon

License Key File

License key definitions are stored in a text file called the *license key file*. Rational creates the license key file based on the data that you provided in Rational AccountLink. The license file can contain license key data for several Rational products and is created for a specific host. The Rational License Key Administrator that is installed with every Rational product edits and installs the license key file.

The license key definition contains information about the server nodes and vendor daemons, and at least one line of data (called FEATURE or INCREMENT lines) for each licensed product. Each FEATURE line contains a license key based on the data in that line, the *host IDs* specified in the SERVER lines, and other vendor-specific data.

License File Names

Table 14 describes the types of Rational license key files.

Table 14 License Key Files

File Name	Description	Notes
rational_temp.dat	Contains all node-locked temporary license keys.	You must obtain a permanent license key to continue to use your Rational Software product past the temporary key expiration date.
rational_perm.dat	Contains all node-locked permanent license keys.	Go to Rational AccountLink to request permanent keys.
rational_redirect.dat	Used on a client to specify the name of the license server system that manages floating licenses. The Rational License Key Administrator creates or updates this file when you specify a license server name on the client.	This file is initially empty. The Rational License Key Administrator updates this file with the name of your license server(s) when you select server-based licensing.
rational_server_temp.dat	Contains all temporary floating license keys on a license server.	You must obtain a permanent license key to continue to use your Rational Software product.
rational_server_perm.dat	Contains all permanent floating license keys on a license server.	Go to Rational AccountLink to request new permanent license keys.

The Floating License Server Line

This section explains the line used to set up a license server in the license key file.

A typical Rational SERVER line is similar to the following example:

```
SERVER   curley   DISK_SERIAL_NUM=12345678
```

Item in SERVER Line	Description
SERVER	Tells the server that the license file will be used for floating or counted node-locked licenses. This is needed in a floating license file along with a VENDOR or DAEMON line.
curley	The **hostname** of the license server system. Allows the license server's hostname or IP address to populate the hostname field in the SERVER line. Rational also allows both values. The hostname value is not encrypted into floating license keys.
12345678	The **host ID** of the license server system. The default value is the disk serial number (DISK_SERIAL_NUM) of the user's boot drive. The HOST ID value is encrypted into floating license keys.

Entering the License Server Name on the Client

When you enter the name of the license server in the License Key Administrator (LKAD) of the client, the LKAD writes the hostname of the license server to an empty license file in the <rational>\common directory on the client.

License Manager Daemon (lmgrd)

Rational uses two daemons (or processes) to manage floating licenses:

- `lmgrd`, the license manager daemon
- vendor daemon

The `lmgrd` daemon and the vendor daemon work together to manage the license keys. The `lmgrd` handles the initial contact with the client application programs, passing the connection on to the appropriate vendor daemon. It also starts and restarts vendor daemons.

By default, the `lmgrd` on Windows is a Windows NT *service*.

The `lmgrd` daemon starts on TCP/IP port 27000 (default) when you start the server. The `lmgrd` daemon will assign a random vendor TCP/IP port number (unless you set up a firewall) to the vendor daemon and start the vendor daemon on that port.

License Manager Version

Rational currently ships `lmgrd` version 7.0 or later with Rational Common Licensing on Windows and version 6.0 or later with UNIX products.

Vendor Daemon

The vendor daemon is a program developed by Rational implementing FLEXlm. The vendor daemon keeps track of how many licenses are checked out and who has them. Rational's vendor daemon (rational.exe) is customized to behave in a specific manner.

Rational specifies the path to the rational.exe vendor daemon using the DAEMON line in the license key file. Rational also supports specifying the path to the options file on the DAEMON line after the path to the vendor daemon.

A typical Rational DAEMON line for Windows appears as:

`DAEMON rational` D:\Rational\common\rational.exe

Where:

Item in DAEMON Line	Description
DAEMON	Rational's license daemon name and path are specified in this line.
rational	The name of the Rational license server daemon. Both floating and node-locked licenses have this value defined in the DAEMON string.
<*install path*>\ Rational\common\rational.exe	The path to Rational's license server executable.

Licenses are granted by running processes(unless they're node-locked, uncounted, in which case they only need to read the license key file to run). There is one process or vendor daemon for Rational which has a licensed product on the network.

If the vendor daemon terminates for any reason, all users lose their licenses (They do not see a warning dialog box that the vendor daemon has terminated). However, this does not mean the applications suddenly stop running. Users can continue working, save their work, and exit safely, because the `lmgrd` (license manager) automatically restarts the vendor daemon.

The application program communicates with the vendor daemon, usually through TCP/IP network communications. The application program and the daemon processes (the license server) can run on separate nodes on your network, across any size wide-area network.

The format of the traffic between the client and the vendor daemon is system-independent, allowing for heterogeneous networks. This means the license server and the system running an application can use different hardware platforms or even different operating systems (for example, Windows NT as a server system and Windows 98 as a client).

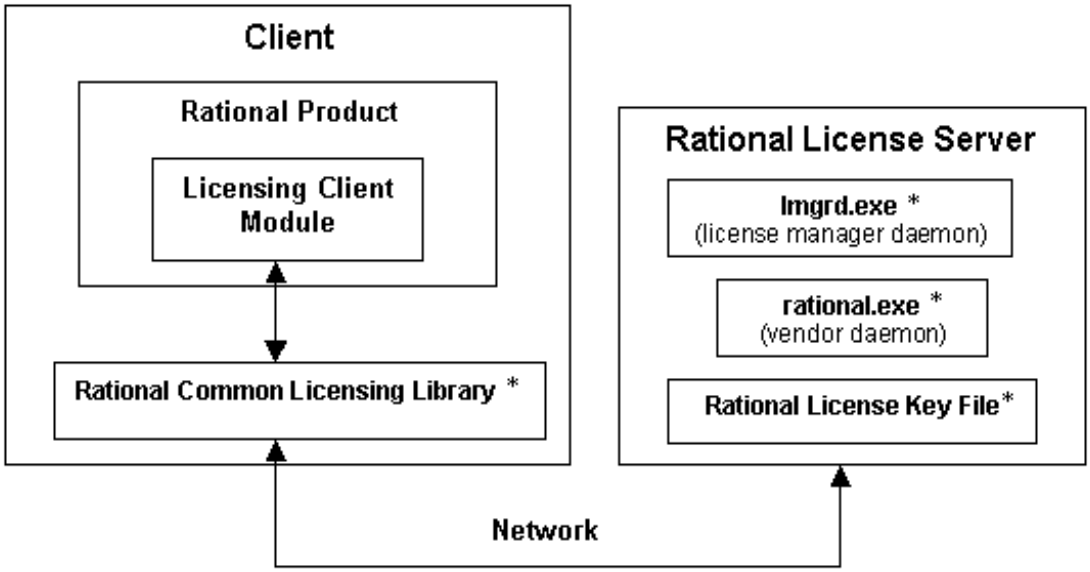
License Server Process

When you run a *counted* licensed application, such as a Rational Suite product that uses a floating license, the following occurs:

1. The license module in the client application finds the license key file on the license server, which lists the hostname of the license server and the port number of the license manager daemon (lmgrd.exe).
2. The client establishes a connection with the license manager daemon (lmgrd.exe) and specifies the vendor daemon (rational.exe).
3. The lmgrd.exe determines which system and port correspond to rational.exe and returns that information to the client.
4. The client establishes a connection with rational.exe and sends its license request.
5. The vendor daemon (rational.exe) checks in its memory to see if any licenses are available and sends a grant or denial back to the client.
6. The license module in the application grants or denies use of the feature, as appropriate.

Uncounted features, where the number of licenses is 0 (zero), do not require a server and the Rational common licensing library in the client grant or deny usage based solely upon the license contents. Node-locked licenses, for example, set the license number to 0 (zero).

The following diagram provides an overview of the interaction between the Rational Common Licensing Library on the client and lmgrd.exe, rational.exe, and the license key file on the Rational license server.



* Components installed in <*install path*>\Rational\common

The Options File for Floating Licenses

Rational provides the least restrictive licensing environment possible. By default, the server does not restrict access to any client requesting a license key. This configuration works best for most customers.

If you want a more controlled floating license environment, you can use the options file to reserve or deny licenses for certain users, hosts, displays, groups, or IP addresses. You can also limit the number of licenses each user or group can access.

Setting Up the Options File

Create a text file, rational.opt, in the <*rational flexlm dir*>\common directory.

Note: For the server to recognize the file or any changes made to it, restart the license server. You will have to stop and then start the license server. The `lmreread` diagnostic tool will not work.

Enter the following commands in the file. See examples 1 and 2 for the correct syntax.

Options File Commands	Description
RESERVE	Tells the server to reserve a license
1	Is the number of licenses to reserve
ClearQuest	Is the name of the license to reserve
USER	Tells the licensing software to reserve a license for a specific user id
greg	Is the userid for which the license will be reserved

Example 1

You may have 10 floating licenses of Rational ClearQuest. You want to ensure that users Greg and Peter always have a license of ClearQuest available for their use. Set up the options file as follows:

```
RESERVE    1  ClearQuest    USER greg
RESERVE    1  ClearQuest    USER peter
```

Example 2

You have 10 floating licenses of Rational ClearQuest. You want to ensure that user Bob does not have access to a ClearQuest license. Set up the options file as follows:

```
EXCLUDE    ClearQuest    USER bob
```

Diagnostic Tools

lmtools

The `lmtools` application is designed to help diagnose licensing problems. It is available on Windows only. Rational installs this application with all products in the <rational>\common directory. If the license server is installed, you can use the License Tools **Start** menu shortcut to the `lmtools` GUI.

lmutil

By default, Rational installs the `lmutil` program in the <rational>\common directory. `lmutil` is fully supported with Rational's implementation and has a number of useful options. More information can be found at http://www.globetrotter.com/chap7.htm.

lmreread

The `lmutil lmreread` command is a supported option that forces the server to source the license file without having to shut down the server. This allows systems administrators to make changes to the license file without stopping and restarting the server.

Note: The `lmutil lmreread` command does not detect changes to the Options File on page 84.

Windows Registry Information

This section describes the Windows Registry settings for Rational Software licensing.

Warning: Use extreme caution when editing the Windows Registry! Incorrect edits can render your system unusable!

Windows Registry entries are located in:

HKEY_LOCAL_MACHINE\SOFTWARE\Rational Software\Licensing\1.0

The *<Install Path>* in Table 15 refers to the path specified during installation. The default value is C:\Program Files\Rational.

Table 15 Rational Licensing Registry Entries

Key and Description	Default Value
UseLicense Server Is this system using a license server to obtain its license keys?	FALSE
LicenseRequest Path of license request file	<Install Path>\common\rational_request.dat
LicenseTemp Path of temporary license key file	<Install Path>\common\rational_temp.dat
LicensePerm Path of permanent license key file	<Install Path>\common\rational_perm.dat

Table 15 Rational Licensing Registry Entries (continued)

Key and Description	Default Value
LicenseServer Path of file containing name of license server	<Install Path>\common\rational_redirect.dat
LicenseServerName Name of system used as a license server	This registry entry appears when the system points to a license server.
ClientInstalled Does this system have client software installed?	TRUE
ServerInstalled Is this system a license server?	FALSE

Troubleshooting Licenses 11

This chapter provides possible solutions based on commonly asked questions and error messages.

The commonly asked questions are sorted into the following topics:

- *Node-Locked Licenses* on page 89.
- *License Server and Floating Licenses* on page 90.
- *Requesting a License Key* on page 91.
- *Moving License Keys* on page 92.
- *AccountLink Data Entry* on page 92.
- *Host ID* on page 93.
- *Upgrades* on page 93.

A short list of error messages and possible solutions are in Table 16 on page 94.

Node-Locked Licenses

What exactly is a node-locked license? How many users does it support at one time? Does each additional user cost as much as the first?

A node-locked license supports a single user on a single system. For more information, see *What Are Node-Locked and Floating Licenses?* on page 23.

Contact your Rational Sales office for information about pricing for node-locked licenses.

Does a change in the IP address and internet address affect the node-locked license?

Node-locked licenses use the host ID or disk_serial_num of the licensed system. Therefore, a change in the IP address or a change in Internet address does not affect your Rational Software license. However, you should notify Rational Licensing Support if the e-mail address of the license contact has changed.

License Server and Floating Licenses

How do I identify who checked out a license?

It is possible to find out who used which license and when the user did so. If the license server is installed, click **Start > Programs > Rational FLEXlm License Server > License Tools**. License Tools starts the `lmtools` GUI.

1. Select **Configuration using Services** in the **Mode** menu.
2. Click the **Server Status** tab and the **Perform Status Enquiry** button in the **Server Status** dialog box.

How do I set up the license server?

Set up a server by installing license server software on a system. Then request and install permanent floating license keys. See *Using AccountLink to Request Permanent License Keys* on page 49 and *Receiving Permanent License Keys* on page 53.

Can ClearQuest on a client in one NT domain obtain licenses from a license server that is on a different NT domain?

Yes, it is possible. If the client can *see* the license server by hostname, the request will work. Rational licensing also supports using the fully qualified domain name or using the IP address of the license server instead of the hostname.

How do I install licensed software on a second disk? I have a second disk on my system and I have requested a floating license for <*product*>.

As long as you have provided the correct hostname and hostid for the second disk on which you will install the software, you will receive a license key for the software from AccountLink.

How do I restart my master license server? I have redundant servers and I cannot restart my master server.

To restart a server in a redundant server configuration, restart all the servers in no particular order. You cannot just restart the server that has gone down.

Requesting a License Key

How do I submit fax requests for license keys? Please give me the fax number to which I can send my request for permanent node-locked licenses. Not all team members have internet or e-mail so requests need to be centrally controlled.

See *Contacting Rational Licensing Technical Support* on page xiv for the appropriate fax number.

Can we request permanent license keys without entering a temporary key?

Yes, you can use AccountLink (http://www.rational.com/accountlink) to request permanent license keys without first installing your temporary license key.

How long does it take to obtain the permanent license key?

Rational AccountLink (http://www.rational.com/accountlink) will send you the license keys through e-mail after you submit your transaction. The speed and reliability of your internet connection will affect when you will receive your permanent keys.

Moving License Keys

How do we move or transfer a license to another system?

To move a license (floating or node-locked) from one system to another, see *Returning or Moving License Keys* on page 69.

How long does it take to move a license key to another system?

The requests for returning and getting a new license key usually take no longer than your initial license request.

What would happen if I did a clean installation of the operating system on my system (which would wipe out all the license keys currently on it) without deleting the license key first? Would it be easy to obtain a new license key or a replacement for this key?

If you install a new version of the operating system or initialize the disk where your license keys are stored, you can request a replacement license key from Rational. To request a replacement, go to Rational AccountLink (http://www.rational.com/accountlink) and select **Request Copy of a License File**. This transaction does not require you to return the license key that was deleted from your system.

How do I move a node-locked license mistakenly installed on a database/repository server to a client system? We purchased two node-locked licenses for two client systems. I made a mistake and requested and installed one of the licenses on the database/repository server. I cannot install this license on the second client because it is system-specific.

To move and return license keys, see *Returning or Moving License Keys* on page 69.

AccountLink Data Entry

What is my Rational Account Number? I just downloaded the upgrade to <product>. I am now unable to run the software. I do not know my "Rational Account Number" which is a required field in AccountLink.

Use the Rational Account number specified on your License Key Certificate.

Host ID

Why isn’t host ID ffffffff valid? ffffffff is the value listed in the host ID field in the License Manager.

When you initialized your disk, your disk did not receive a disk_serial_num. Although the software accepted this entry, Rational's licensing services regards this value as invalid.

You can reset your host ID by using third-party disk utility tools such as those by Norton. Another option is to use the Ethernet card address instead of the host ID.

I changed my file system from FAT to NTFS, which changed my host ID. Could you please change my key to make it work again? I changed my system disk and the licenses no longer work.

The license keys are generated for a specific hostname and host ID. You have to return the license keys to your Rational account and then request license keys for the new host ID. To perform these transactions, go to AccountLink (http://www.rational.com/accountlink).

Upgrades

We received two upgrade packets but chose not to upgrade immediately because we were in the middle of pre-release testing. The License Key Certificate says, however, that the key expires on <date>.

Contact your Rational Sales Office to obtain temporary license keys that will work until you are ready to upgrade your system.

Error Messages

Table 16 lists licensing error messages and their solutions.

Table 16 Licensing Error Messages

Message or Description	Action
▪ Cannot find SERVER hostname ▪ Cannot find SERVER hostname in network database ▪ Cannot connect to SERVER ▪ NO SUCH FEATURE EXISTS ▪ Failed to check out a <product-name> key	***Floating Licenses*** Confirm on the client: ▪ You have entered the correct name for the license server (in the Service Configuration dialog box of the License Key Administrator). For more information, see *Checking Client Licensing Set Up* on page 95. ▪ You have entered the correct Rational vendor port number if there is a firewall between the client and the license server. For more information, see *Using Floating Licenses with a Firewall* on page 74. ▪ Your system is connected to the license server (that you specified in the Service Configuration dialog box of the License Key Administrator). See *Checking the Network Connection* on page 96. Confirm on the Rational license server: ▪ The license server (`lmgrd`) and the rational.exe or vendor daemon are running. See *Checking the License Server* on page 97. ▪ There are numbers assigned to the `lmgrd` and vendor ports on the license server (if there is a firewall between the license server and the client). For more information, see *Using Floating Licenses with a Firewall* on page 74. ***Floating and Node-Locked Licenses*** In all cases, if you do not see any problems with the network connection or the license file, yet applications cannot acquire license keys, stop and start the license server from the FLEXlm License Manager (*Starting the License Server* on page 63). It may also be helpful to reboot the server, particularly if the license manager is running as an NT service. If all else fails, contact Rational Technical Support.

Table 16 Licensing Error Messages (continued)

Message or Description	Action
The license was not intended for this server. License keys are not for this machine.	▪ You are installing the license key on a system other than the one for which the license key was generated. The license.upd file specifies the system name and host ID that you entered in the license key request to Rational (AccountLink). Import the file on the correct system. ▪ Confirm that the license key file you received contains the correct hostid and hostname of the license server or client system. To find this information, use a text editor to view the license key (*.dat) file in *<Install Path>*\Rational\Common\. Compare the Disk Volume Serial Number found in **License Tools > System Settings**, with what appears in the `Server` line in the license key file. These two numbers should match. Occasionally a 0 or a dash will be found in the license file.
The license for this product will expire…	Your temporary or Term License Agreement (TLA) license key is nearing its expiration date. To continue using the product, contact your Rational Software sales representative to purchase the product or extend your TLA. Click **OK** to run the product. This warning message appears each time you start the application until you install a permanent license key or another TLA license key. You can turn off the warning by clicking **Settings > Display Expiration Warnings** in the Rational License Key Administrator.

Checking Client Licensing Set Up

The following list lets you check whether your client is correctly configured for Rational Common Licensing.

- Check the entry or entries for the license server(s) in the **Service Configuration** dialog box of the LKAD. If you are unsure about the format in which the server hostname should be entered, go to your Rational license server and click **Rational FLEXlm License Server > License Tools**. This brings up LMTools, a FLEXlm utility that is a GUI version of the command line utility **`lmutil`**.

  Click the **System Settings** tab in the **LMTools** dialog box. Check the entry next to **Computer/Hostname** under **Hostid Settings**.

- In *install_directory*\Rational\common look for the file rational_redirect.dat. Make sure that the contents of the file are:

  SERVER *server_hostname* ANY

  USE_SERVER

- In the Windows registry, look under HKEY_LOCAL_MACHINE\SOFTWARE\Rational Software\Licensing\1.0. The value "LicenseServer" should be set to the complete path to rational_redirect.dat.

  Example: *install_ directory*\Rational\common\rational_redirect.dat

Checking the Network Connection

The following procedures lets you check the network connection between the license server and the client system.

1. On the client, bring up an MS-DOS window by clicking **Start > Run** and typing `cmd` in the **Open** text box.
2. Type `ping server_hostname` at the command prompt.

   If you see an IP address appear, a system of that hostname has responded. There may be more than one system on the network with the same hostname. To make sure the IP address that you see in the Window is the license server's IP address, check the IP address of the server.

   To find the IP address of the license server:

   a. Go to your Rational license server and click **Rational FLEXlm License Server > License Tools**.

   b. Click the **System Settings** tab in the **LMTools** dialog box.

   c. Check the IP address under **Hostid Settings**.

   If you cannot ping the license server by hostname, ping it by its IP address. If this is successful, you will have to either correct the name resolution problem on your network or replace the hostname with the IP address in the license key file.

   To replace the hostname in the license key file:

   a. In *install_directory*\Rational\common of the license server, look for the file rational_server_perm.dat.

   b. Replace the hostname with the IP address in the line that begins with SERVER:

      SERVER *server_hostname server_hostid...*

Do not change the *server_hostid* and the vendor daemon information on this line.

c Enter the IP address of the server in the LKAD's **Service Configuration** dialog box.

Checking the License Server

Use the following procedure to determine whether one or both of the license daemons, lmgrd.exe and rational.exe, on the license server are not running.

1 Click **Start > Programs > Rational FLEXlm License Server > License Tools**. This brings up lmtools, a FLEXlm utility that is a GUI version of the command line utility lmutil.

2 In the **Service/License File** tab, select **Configuration using License File** and enter the complete path (including drive letter) to the license file on the license server in the text box.

3 Go to the **Server Status** tab. Select **Display Everything** and click **Perform Status Inquiry** button.

a If the license server is running, you will see the following lines in the status output window:

```
server_hostname: license server UP (MASTER) v_number

Vendor daemon status (on server_hostname):
rational: UP v_number
```

The first line refers to the status of lmgrd.exe, the second line to the status of rational.exe.

Since the Rational license server software is running, the problem may be the network communication between client and server. See *Checking the Network Connection* on page 96.

b If lmgrd.exe is running, but rational.exe is not, the following lines will appear in the status output window:

```
server_hostname: license server UP (MASTER) v_number

Vendor daemon status (on server_hostname):
rational: The desired vendor daemon is down.
```

Use the following methods to start the rational.exe:

- The daemon rational was unexpectedly terminated and `lmgrd` has not yet restarted it. Select the **Stop/Reread** tab in the **License Tools** utility. Expand the **Remote Server List** and select **rational**. Click the **Reread License File** button.
- The license file does not correctly specify the path to rational.exe in the line: `DAEMON rational` [complete path to rational.exe, including drive letter].
- The version of lmgrd.exe may be incompatible with rational.exe. You already have FLEXlm (lmgrd.exe) installed on the license server system. Confirm that the date and size of the file *install_directory*\common\lmgrd.exe matches the lmgrd.exe found on the Rational Solutions for Windows CD-ROM in \common.

c If both lmgrd.exe and rational.exe are not running, the resulting status output window will contain the lines:

`lmgrd is not running: Cannot connect to server` and `FLEXlm error: -15.10`.

Use the following methods to start the lmgrd.exe and the rational.exe:

- Review the setup and start instructions for the Rational license server.
- There may be a phantom "rational" process running. This occurs when the `lmgrd` process is terminated unexpectedly. Press `CTRL-ALT-DEL` to bring up the **Task Manager**. On the **Processes** tab, look for rational.exe and / or lmgrd.exe. Terminate these processes. Start the license server (see *Starting the License Server* on page 63) and check the Server Status in **Rational FLEXlm License Server > License Tools**. If the license server is still not running, and it is configured to run as an NT service, restart the system twice.
- The FLEXlm License Manager application may be out of date or corrupted.

Technical Notes

The Rational Web site contains Technical Notes about licensing issues. For example, you can use a Technical Note to find out how to:

- Use the options file to exclude certain users.
- Troubleshoot the license server functions.

New Technical Notes appear on a regular basis. Go to http://www.rational.com. Click **Support > Technical Notes > Licensing (Technical Notes Index)** to see the Technical Notes about Rational Common Licensing.

For more technical notes related to licensing Rational Suite, click **General** or **Rational Suite Enterprise**, under **Rational Suite (Technical Notes Index)**.

Licensing Glossary

AccountLink. The Rational Web-based license management tool. Customers can use this tool to request and return licenses to their Rational accounts.

ANY-HOST. A license key issued for ANY-HOST will run on any system, and is not tied to the customer's system ID. Startup, Evaluation, and Emergency Keys must be configured to run on any system, since the Back Office won't yet have the necessary information to encrypt into a specific key.

Emergency Key. A temporary key that lets a customer use Rational software for a fixed period of time if they cannot use their own license for some reason. The duration of the Emergency Key is five days. Emergency Keys can be node-locked or floating. Emergency Keys are distributed by the Licensing Support Group and run on any host.

Evaluation Key. A temporary key that lets a customer use and evaluate Rational software for a fixed period of time. Rational Software determines the duration of the Evaluation Key. Evaluation Keys can be node-locked or floating. Evaluation Keys are distributed by the Sales team and run on any host.

Floating License. A license type that links products to a license server system. Client systems obtain licenses from the license server when they need to run a copy of Rational software. Multiple clients can share the pool of floating licenses; one license is granted per client per product. Floating licenses on license servers are typically administered by system administrators.

Key Type. Node-locked and floating licenses can be enforced by different types of license keys. The types of license keys are Startup and Permanent. Evaluation and Emergency keys are variations of Startup keys, and Term License Agreements (TLAs) are a variation of Permanent keys. Each type of key has different business rules and policies.

License. A legal right to use a product. A customer receives a license when they purchase the product. However, they need a license key to actually associate the product and the system on which it is running with a license.

License Key. Generic term used in this document to describe keys that enable licenses on a customer system. The types of license keys are: permanent, temporary, evaluation, emergency, and Term License Agreement (TLA).

License Key Administrator. A program written by Rational Software which provides a customer interface to Rational's Licensing system. The License Key Administrator is installed whenever a Rational software product is installed on a Windows system. For hosting floating licenses, the License Key Administrator is installed when the Rational license server software is installed on a system.

License Key Code. An encrypted code used to enforce a license agreement.

License Type. The valid types of licenses are node-locked licenses and floating licenses. See also **Key Type**.

LKAD. Abbreviation for License Key Administrator.

Node-Locked License. A type of license that links a product to a system. Typically, one node-locked license is issued for each software copy.

Permanent Key. A license that lets customers run Rational products indefinitely. Permanent Keys can be node-locked or floating. Node-locked Permanent Keys are installed on a client system. Floating Permanent Keys are installed on a license server. Obtain Permanent Keys from the Rational Back Office. Note: A Term License Agreement, a variation of a permanent key, does have an expiration date. See *Term License Agreement*.

Permanent Key Code. The encrypted code that lets a customer run a particular Rational product using a Permanent Key.

Temporary Key. A short-term license key that lets a customer run Rational software products. Temporary licenses are not keyed to a specific system. Temporary Keys can be node-locked or floating. Node-locked Temporary Keys are installed on a client system. Floating Temporary Keys are installed on a license server. Temporary Keys are issued by the Rational Back Office and run on any host until the specified expiration date.

Temporary Key Code. The encrypted code that lets a customer run a particular Rational product using a Temporary Key.

Temporary License Key Certificate. A piece of paper or an electronic file that contains information a customer needs to begin using Rational software with a license. The temporary License Key Certificate is shipped to the customer with the software installation media.

Term License Agreements (TLAs). Variation of a Permanent Key. TLAs are issued to a site to let their employees use Rational software for a negotiated period of time. TLAs are issued by Rational Sales and have an expiration date.

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