



Installation Guide

Installation Guide

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IBM Rational SDL and TTCN Suite 6.3 Installation Guide

This edition applies to IBM Rational SDL Suite 6.3 and IBM Rational TTCN Suite 6.3 and to all subsequent releases and modifications until otherwise indicated in new editions.

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Introduction

About this Manual

This volume, [Installation Guide](#), contains all the information that is needed to install the IBM Rational software and license on your computer system. This includes:

- information on system prerequisites before you start the installation.
- information on how to setup your system for using SDL Suite and TTCN Suite.
- a primer on licensing with trouble-shooting advice and a list of licensing management procedures.

Documentation Overview

A general description of the documentation can be found in [“Documentation” on page viii in the Release Guide](#).

Typographic Conventions

The typographic conventions that are used in the documentation are described in [“Typographic Conventions” on page x in the Release Guide](#).

How to Contact Customer Support

Detailed contact information for IBM Rational Customer Support can be found in [“How to Contact Customer Support” on page iv in the Release Guide](#).

Platforms and Products

This chapter lists the hardware and software prerequisites that must be fulfilled for a successful installation of the components in SDL Suite and TTCN Suite.

Compatibility information for platforms and products is also included in this chapter.

Hardware Prerequisites

This section describes the hardware requirements for SDL Suite and TTCN Suite.

Supported Architectures

- Sun SPARC
- Linux
- PC's running Microsoft Windows Vista/XP.

UNIX Installation Prerequisites

SDL Suite and TTCN Suite on UNIX includes binaries for several different computer architectures, examples and on-line help files.

Windows Installation Prerequisites

SDL Suite and TTCN Suite for Windows includes binaries for the computer architectures Windows Vista/XP, examples and on-line help files.

SDL Suite and TTCN Suite files can be installed once on a network server for all users, or locally on each user's PC.

Run-time Prerequisites

To run the SDL Suite and TTCN Suite tools properly you need a certain amount of main memory and swap size; see [“Operating System” on page 2](#).

Software Prerequisites

This section describes the software requirements for SDL Suite and TTCN Suite.

Operating System

Architecture	OS Version	Minimum Main Memory	Virtual Memory (swap) Size
Sun SPARC	Solaris 8/9/10	256 MB	512 MB

Software Prerequisites

Architecture	OS Version	Minimum Main Memory	Virtual Memory (swap) Size
Linux	Redhat Enterprise 4	256	512
PC	Windows Vista, Windows XP	256 ^a	512 ^b

- a. Although the exact memory needs for a high-performance installation (meaning execution with little swap page faults) on a given PC are impossible to tell, the following memory requirements could be expected:
- 128 MB for Windows Vista/XP systems
 - 40 MB for the SDL Suite and TTCN Suite graphical applications + 1 kB / line of SDL/PR input to the Analyzer.
 - Add memory requirements for other applications that you want to run in the session (Compilers, Microsoft Word, Explorer, etc.)
- b. To double the main memory size is a good starting point.

UNIX Graphical Environment

On UNIX, SDL Suite and TTCN Suite are X Window System applications to be executed under the Motif Window Manager (Mwm).

SDL Suite and TTCN Suite require the X Window System, version R5 or later. The X Window System is provided by your workstation supplier.

Required HTML Viewers

SDL Suite and TTCN Suite on-line help **on UNIX** requires an HTML viewer. SDL Suite and TTCN Suite supports Firefox, Internet Explorer and Netscape.

Additional required tools and utilities

Some features of SDL Suite and TTCN Suite require access to external tools and utilities not included in the installation. Therefore you may need to provide your system with the following tools.

- Archivers **gzip** (version 1.2.4 or later) and **tar** (version 1.11.2 or later) are used to perform “[Pack Archive](#)” and “[Unpack Archive](#)” com-

mands. On Windows when using later Cygwin versions of these tools it might be needed to set the environment variable CYGWIN to “nontsec” to avoid permissions problems.

- **Diff** tool (version 2.7 or later) is used to compare textual files.
- **Indent** tool (version 1.9.1 or later) is used to format generated C code.

On UNIX systems these utilities are usually a part of standart environment and on Windows system there are free implementations available for download.

Build and Certification Matrices

The SDL Suite Compiler Environment

A C/C++ compiler is required for the TTCN Link, the SDL Suite simulation and validation features, and for SDL to C compilers for host and target environments.

For information regarding installation, see the compiler documentation.

The libraries included in the distribution of the TTCN Link, the simulation and validation features were built and tested using the compilers listed in the matrices. **You are advised to install and use the same compilers**, or closely compatible ones. It may be possible to use other compilers, but this is not tested or supported.

Table legend:

- The software will execute on the platforms defined in the table header.
- The **Build** environment is the compiler/s and OS environment used to build the software.
- **Precompiled kernels and Postmaster objects/lib** indicate which compiler/s that have been used to build the libraries, and which compiler/s that should be compatible. Any of these compilers can be used to build the generated code and the kernel source files.
- **Word processors** indicate which word processors that can be used for editing and which word processors that can handle the printed information.
- **Version Control and Configuration Management** indicates versions used during certification.

SDL Suite 6.3 (UNIX)

SDL Suite	Redhat Enterprise Linux 4	Solaris 8/9/10
Build		
Build environment	gcc / g++ 3.4.6 compiler	cc / CC SUNWspro v5.0 compiler
Precompiled kernels and postmaster object/lib		
C/C++	gcc 3.4.6 (build & test)	cc SUNWspro v5.0 (build & test) gcc 2.95.2 (build & test) gcc 3.2.3 (test)
Word processors		
Editing	GNU emacs 19.31 or later	GNU emacs 19.31 or later
Printing	—	FrameMaker 6.0
Version Control and Configuration Management		
Synergy	6.5	6.5
Clearcase	6.0	6.0
RCS	5 or later	5 or later
Licensing		
FLEXnet	11.5	11.5

Build and Certification Matrices

SDL Suite 6.3 (Windows)

SDL Suite ^a	Windows XP	Windows Vista
Build		
Build environment	Visual C++ 6	
Precompiled kernels and postmaster object/lib		
C/C++	Visual C++ 6 (build)	
	Visual Studio .NET (test)	
	Visual Studio 2005 (test)	Visual Studio 2005 SP1 (test)
	Visual Studio 2008 and Express (test)	Visual Studio 2008 and Express (test)
Word processors		
Editing and Printing	MS Word 2000	MS Word 2000
Version Control and Configuration Management		
Synergy	6.5	6.5
Clearcase	6.0	6.0
RCS	5 or later	5 or later
Licensing		
FLEXnet	11.5	11.5

- a. SDL Suite Japanese version is supported for Japanese versions of Windows Vista/XP.

RTOS integrations

The following tables define the host and target environments where the integration types have been developed and tested.

Please see [chapter 64, *Integration with Operating Systems, in the User's Manual*](#) for important information about support for OS integrations.

Threaded Integrations

	OSE	VxWorks	Solaris	Win32
Version	4.4	VxWorks 6.0	Solaris 8	
OS	Solaris	Windows XP	Solaris	Windows XP, Windows Vista
Environment	gcc 2.95.7	gnu tool chain	Solaris Workshop 4.2	MS Visual Studio 2008
Simulation (soft-kernel)	SoftKernel on Solaris	VxSim on Windows XP	Like target	Like target
Target			Sun Sparc with Solaris /8/9/10	x86-PC with XP, Vista

Posix Support in Threaded Integrations

The generic POSIX integration is developed on Solaris and uses the following basic POSIX primitives:

- pthreads,
- semaphores,
- message-queues.

The generic POSIX integration is available and tested on the following Host/Target platforms:

	Solaris Host/ Solaris Target	Linux Host/ Linux Target
Threaded (default signaling model)	Supported	Supported
Threaded (alternative signaling model)	Supported	—

The TTCN Suite Compiler Environment

An ANSI-C compiler is required for the SDL and TTCN Integrated Simulation feature and for C code generation for host and target environments. A C++ compiler is required for building TTCN Access applications.

For information regarding installation, see the compiler documentation.

The binaries included in the distribution of the SDL and TTCN Integrated Simulator were built using the C compilers listed below, and the TTCN Access libraries were built using the C++ compilers listed below. **You are advised to install and use the same compilers**, or closely compatible ones. It may be possible to use other compilers, but this is not tested or supported.

For table legend, see [“SDL Suite 6.3 \(UNIX\)” on page 6](#).

TTCN Suite 6.3 (UNIX)

TTCN Suite	Solaris 8/10	Linux Red hat 4
Build		
Build environment	cc SUNWspro v5.0 compiler	gcc 3.4.6
Precompiled kernels and postmaster object/lib		
C	cc SUNWspro v5.0 (build & test) gcc 2.95.2 (build & test) gcc 3.2.3 (test)	gcc 3.4.6 (build & test)

TTCN Suite 6.3 (Windows)

TTCN Suite	Windows XP	Windows Vista
Build		
Build environment	Visual C++ 6	—
Precompiled kernels and postmaster object/lib		
C	Visual C++ 6 (build) Visual Studio .NET (test) Visual Studio 2005 (test) Visual Studio 2008 and Express (test)	Visual Studio 2005 (test) Visual Studio 2008 and Express (test)

Installation Procedure for UNIX

This chapter contains step-wise instructions for installing SDL Suite and TTCN Suite on UNIX systems, including the software licenses.

For instructions on installing the SDL and TTCN Suites for Windows, see [chapter 3, *Installation Procedure for Windows*](#).

In case you encounter problems, contact IBM Rational Customer Support, see [“How to Contact Customer Support” on page iv in the *Release Guide*](#).

Overview

This chapter's installation procedure will help you install the SDL Suite and the TTCN Suite on your UNIX system. You can do a full installation or customize it to meet your needs.

The process involves installing the actual software, as well as installing and activating your licenses.

Before You Start

Before starting your installation, determine which UNIX system(s) your installation will run on (Linux or Sun).

Have the license materials at hand before starting the installation. Your SDL Suite and TTCN Suite delivery should contain a hardcopy of your FLEXnet license key.

If you have not yet received a FLEXnet license key, see the box marked [Important! on page 14](#).

For general information on licensing, see [chapter 6, *Understanding IBM Rational Licenses*](#).

Installation Options

When installing the software the following components will be installed:

- The SDL Suite application for the supported UNIX systems. See [“Operating System” on page 2 in chapter 1, *Platforms and Products*](#).
- The SDL Suite collection of example files. Using these files, you will be able to follow the SDL Suite tutorials and other complete examples in the documentation
- The TTCN Suite application and example files, for the supported UNIX systems. See [“Operating System” on page 2 in chapter 1, *Platforms and Products*](#).
- The TTCN Suite collection of example files. Using these files, you will be able to follow the TTCN Suite tutorials and other complete examples in the documentation

Overview

- On-line help files in HTML format.

Note: PDF documentation

The complete user documentation is also available in PDF format on the IBM Rational Support web.

Installation Procedure

The flowchart below shows the basic steps of the installation procedure.

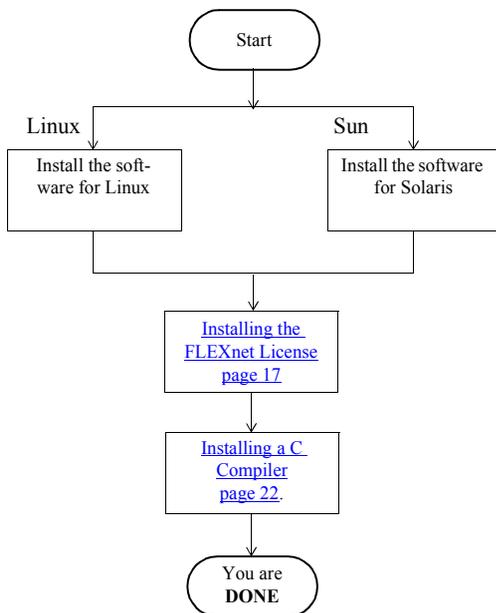


Figure 1: Flowchart for installation

Important!

If you have not received a FLEXnet license key, you will not be able to use SDL Suite and TTCN Suite.

To obtain a license key you have to provide IBM Rational Customer Support with the **hostname** and **hostID** of the machine on which the license server will run. To obtain this information please refer to the IBM Rational Lifecycle Solutions Licensing Guide on the IBM Rational Support web.

Installing the Software

Before starting the installation script, you should find a location in your file system where to store the installation. This directory is called the *installation directory*.

`/appl/telelogic` will be used as an **example installation directory** for this installation.

Note:

SDL Suite and TTCN Suite cannot be installed in the same directory as an older version of SDL Suite and TTCN Suite.

When you receive the `license.dat` file, this license file can be used to run both the current version and any prior version (from the 3.02 version).

Installation Steps

Perform **all** the steps below:

1. Decide upon an installation directory. Also, check the amount of available disk space and verify it against the required space (see [“UNIX Installation Prerequisites” on page 2 in chapter 1, *Platforms and Products*](#)).
2. Start the installation script `tauinst.cd`, which will guide you through the installation. The script will also print some information during the installation procedure.
3. Specify the installation directory:

```
Specify the root-directory for your IBM Rational products?
```

```
>> Enter path-name: [x]: /appl/telelogic
```

4. Confirm that you want to install SDL and TTCN suite:

```
>> Install IBM Rational SDL Suite and TTCN Suite for <platform>? (y/n) [
```

```
- Enter y or press <Return> if the selection is correct.
```

5. Now you will be prompted with information about what you will install and how much disk space it will require and where the installation will be placed. Confirm this by entering **y** or press <Return> if the selection is correct.

6. Now you will be asked which license server to use.

```
>>      Enter license server name: [servername]:
```

- [Enter the name of the license server and press <Return> to continue the installation procedure.

7. After specifying the license server, the port should be specified.

```
>>      Enter license server port number: [19353]:
```

- [Enter the port number and press <Return> to continue the installation procedure. Default port number is 19353.

8. After the message “No further questions will be asked”, information is displayed regarding the progress of the installation procedure.

9. The message “Completed...” is displayed when the installation script has finished executing.

10. To check that the installation was successful, do a `ls /appl/telelogic` (where `/appl/telelogic` is your installation directory). You should at least see:

```
bin/ bitmaps/ examples/ fontinfo/ include/ itex/  
lib/ license.dat sdt/ X11/
```

There can be other files and directories visible, depending on the platform.

Installing the FLEXnet License

Follow the directions below to install your textual FLEXnet license file. The license file contains the license key you have received from IBM Rational Customer Support.

If you have not yet received a FLEXnet license key, contact IBM Rational Customer Support (see [“How to Contact Customer Support” on page iv in the Release Guide](#)).

Caution!

All information in the `license.dat` file is **case significant**, so be careful not to accidentally invalidate any of the encryption codes. Otherwise you will not be able to start the SDL Suite and TTCN Suite tools.

You have two options in installing your FLEXnet license:

- In a **shared license file**, which is shared with other FLEXnet licensed software, see [“Using a Shared License File” on page 17](#). You may consider this option if you have other software products that make use of FLEXnet licensing.
- As an **IBM Rational specific license**, which only handles licenses for SDL Suite and TTCN Suite, see [“Using a telelogic Specific License File” on page 20](#). This is the default option if you only will use FLEXnet for the licenses.

Using a Shared License File

If you have other products that make use of FLEXnet you may wish to install your IBM Rational license features into the existing FLEXnet

`license.dat` file. Make sure the global installation is FLEXnet 11.5 or higher. To install the license key:

1. Copy the following lines from the license key you received from IBM Rational Customer Support into the existing `license.dat` file:
 - the **VENDOR** line; **make sure to change the path** to the `/flex/{arch}` subdirectory in your installation directory (where `{arch}` is the architecture of your server, i.e. “solaris”)
 - the **FEATURE** line(s)

You must do this since your existing license server’s “lmgrd” daemon is not in the same directory as the “telelogic” daemon (for information, see [“Common problems” on page 74 in chapter 6, Understanding IBM Rational Licenses](#)).

2. Set the environment variable `TELELOGIC_LICENSE_FILE` or `LM_LICENSE_FILE` to point to the location of the existing `license.dat` file.

It can also be a `<port>@<hostname>` setting, where `<port>` and `<hostname>` are the port number and hostname from the **SERVER** line in the license file, e.g. `19353@server`.

If you run	Type
C shell-compatible shell (e.g. <code>csh</code> or <code>tcsh</code>)	<code>setenv LM_LICENSE_FILE /your/directory/license.dat</code> or <code>setenv LM_LICENSE_FILE <port>@<hostname></code>
Bourne shell-compatible shell (e.g. <code>sh</code> , <code>ksh</code> , <code>zsh</code> or <code>bash</code>)	<code>LM_LICENSE_FILE=/your/directory/license.dat</code> <code>export LM_LICENSE_FILE</code> or <code>LM_LICENSE_FILE=<port>@<hostname></code> <code>export LM_LICENSE_FILE</code>

3. There must not be a `license.dat` file in the top level of the installation directory. If there is, remove or rename the file `$telelogic/license.dat`
4. When you have changed any information in the `license.dat` file, you **must** update the license server to let it know about the changes. To do this, run the following script:

Installation Procedure

```
$telelogic/bin/updatelcd
```

The license installation is finished. Continue with [“Installing a C Compiler” on page 22](#).

Using a telelogic Specific License File

If you will only use FLEXnet for licenses using the vendor telelogic, or wish to run a separate FLEXnet license server for products using the telelogic vendor, do the following:

1. Log in on the computer where the license server is to run.
2. Save or copy the FLEXnet license key you received from IBM Rational Customer Support into a text file called `license.dat`, and store the file in the default location, which is the installation directory (`$telelogic/license.dat`).
3. If you wish to place this file in another location, you must set the environment variable `LM_LICENSE_FILE` to point to this location.

It can also be a `<port>@<hostname>` setting, where `<port>` and `<hostname>` are the port number and hostname from the `SERVER` line in the license file, e.g. `19353@server`.

If you run	Type
C shell-compatible shell (e.g. <code>csh</code> or <code>tsh</code>)	<code>setenv LM_LICENSE_FILE /your/directory/license.dat</code> or <code>setenv LM_LICENSE_FILE <port>@<hostname></code>
Bourne shell-compatible shell (e.g. <code>sh</code> , <code>ksh</code> , <code>zsh</code> or <code>bash</code>)	<code>LM_LICENSE_FILE=/your/directory/license.dat</code> <code>export LM_LICENSE_FILE</code> or <code>LM_LICENSE_FILE=<port>@<hostname></code> <code>export LM_LICENSE_FILE</code>

After the file has been placed in the new directory, make sure to remove or rename the file `$telelogic/license.dat`.

4. Make sure that the information in the `license.dat` file is correct according to your server and installation:
 - The `SERVER` line must have the correct hostname and `hostID`.
 - The `VENDOR` line must have the correct path to the “telelogic” daemon. This daemon is located in the `/flex/{arch}` subdirectory in your installation directory (where `{arch}` is the architecture of your server, i.e. “solaris”)

Installation Procedure

Starting the License Server

You will now start the FLEXnet license server:

Note:

If you are using an evaluation license, or if the word “DEMO” ends each FEATURE line in your `license.dat` file, **you do not need to start the license server.**

1. Make sure no license servers for the IBM Rational tools are currently running. Search for the license daemons `lmgrd` and `telelogic` in the current process list, for instance by using the command `ps -ae | egrep '(lmgrd|telelog)'`. If you have any license daemons running, terminate them using the `kill` command and the PID number(s).

2. Change to your installation directory:

```
cd $telelogic
```

3. Start the license server:

```
./bin/startlicd
```

4. Check that the license server has been started correctly with the following command:

```
./bin/stat -a
```

The license server statistics is displayed containing the server, the vendor daemon `telelogic` and the features available in your `license.dat` file.

5. If the startup has failed, check the `license.dat` file for errors and omissions; see [“Common problems” on page 74 in chapter 6, *Understanding IBM Rational Licenses*](#). Double-check your file with the original sent from IBM Rational Customer Support. Especially check the “company name” information in the quote-field of the first FEATURE line in the file.

There is also a `license.log` file in the installation directory, where all actions concerning the license server are logged. The events to be logged includes:

- Startup and shutdown of the license server
- Checking licenses in and out
- Denying licenses

Each event involving a license also specifies:

- The telelogic FEATURE name (license controlled tools only)
- The user
- The node
- The date and time
- The usage time (for check-in log entries)

Note:

The log file will grow as users run SDL Suite and TTCN Suite. You may consider deleting the head of the file from time to time to save disk space.

6. The license server has to be restarted every time the server computer is rebooted.

The license installation is now finished.

Installing a C Compiler

You must also install a C compiler to be able to use certain features of the SDL Suite and TTCN Suite tools, such as Simulation and code generation. How to install a C compiler is described in the compiler documentation.

For information on which C compiler you need, see [“The SDL Suite Compiler Environment” on page 5](#) and [“The TTCN Suite Compiler Environment” on page 9 in chapter 1, *Platforms and Products*](#).

Starting Up

We recommend you to add the binary directory to your existing `PATH` variable.

Note:

The X Windows System and Motif Window Manger have to be started before you start SDL Suite and TTCN Suite.

In the case the computers on which you run the X Windows server and the client (SDL Suite and TTCN Suite) coincide, make sure the environment variable `DISPLAY` is set to `unix:0.0` before starting.

Do not use the notation `hostname:0.0`

- Below the installation directory, you will find a subdirectory called `bin`. This directory should be added to the user's path, e.g.

```
set path = ( $path $telelogic/bin )
```

- Start SDL Suite and TTCN Suite with the command:

```
sdlsuite
```

You can also start SDL Suite and TTCN Suite with:

```
ttcnsuite
```


Starting Up

Installation Procedure for Windows

This chapter contains step-wise instructions for installing SDL Suite and TTCN Suite on Windows Vista / XP / 2000, including the software licenses.

For instructions on installing the SDL Suite and the TTCN Suite on UNIX systems, see [chapter 2, *Installation Procedure for UNIX*](#).

In case you encounter problems, contact IBM Rational Customer Support, see [“How to Contact Customer Support” on page iv in the *Release Guide*](#).

Overview

This chapter's installation procedure will help you install the SDL Suite and the TTCN Suite on your system. You can do a full installation or customize it to meet your needs.

The process involves installing the actual IBM Rational software, as well as installing and activating your licenses.

Before You Start

Have the license materials at hand before starting the installation. You should have received your FLEXnet™ license key by e-mail.

For general information on licensing, see [chapter 6, *Understanding IBM Rational Licenses*](#).

If you have not yet received a FLEXnet license key, see the box marked [Important! on page 31](#).

Caution!

At some points in the installation you must supply directory names where SDL Suite and TTCN Suite will reside. SDL Suite and TTCN Suite does not support file or directory names that contain space characters.

Installation Options

When installing the software you can choose what components to include. You can always add components afterwards by running the installation procedure again (see [“Adding Components to an Existing Installation” on page 37](#)).

The components are:

- SDL Suite program files (binary executables).
- TTCN Suite program files (binary executables).
- Example files. With these files, you will be able to follow the tutorials and other complete examples described in the documentation.
- On-line help files in HTML format.

Note: PDF documentation

The complete documentation is also available in PDF format in the directory `\PDF\files` on the installation CD-ROM.

- SDL Suite application files necessary to run the tools.
- TTCN Suite application files necessary to run the tools.

Note: Limiting disk space

To limit local disk space usage in a multi-user environment, you may optionally put the on-line help files on a network server, if you are not performing a network installation. See [“Configuring the Help Environment” on page 298 in chapter 4, *Managing Preferences, in the User’s Manual*](#).

Installation Procedure

The flowchart below shows the basic steps of the installation procedure.

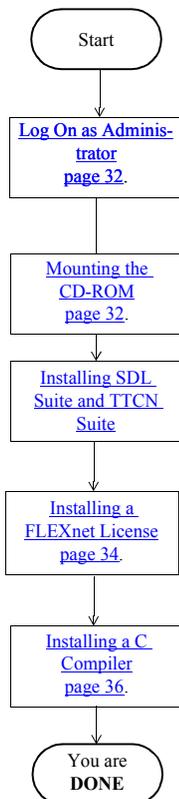


Figure 2: Flowchart for installation

Installation Procedure

Important!

If you have not received a FLEXnet license key you will not be able to start SDL Suite and TTCN Suite after the installation is performed. Please see below for information on how to obtain the license key.

How to obtain a license key

To obtain a license key you have to provide IBM Rational Customer Support with the **hostname** and **hostID** of the machine on which the license server will run. To obtain this information:

1. Log in on the license server machine.
2. Insert the SDL Suite and TTCN Suite CD-ROM.
3. Change directory to the flex directory on the CD-ROM, and execute the batch file called `lmhostid.bat`. One of the Ethernet addresses should be used as `hostid`.
4. Alternatively start the FLEXnet utility called `lmtools.exe`; select the **System Settings** tab.
 - If you want the license to be locked to your network card, note the 12-character hex code in the **Ethernet Address** field. (example: “00abcde12345”).
 - Use the 14-character code in the **FLEXID** field of `lmtools` (example: “8-5E700060F63D”). `lmtools` is also included on the CD-ROM. The FLEXID can also be read on the dongle.

For information on how to install the dongle, see [“Installing the FLEXID dongle and drivers” on page 34](#).

5. **EMAIL** or **FAX** this information to IBM Rational Customer Support.

For contact information, see [“How to Contact Customer Support” on page iv in the Release Guide](#).

When you have obtained a FLEXnet license key, you can complete the entire installation and run SDL Suite and TTCN Suite.

Log On as Administrator

To install on Windows 2000/XP, you do not need to be logged on as the Administrator, but your login ID **must** be a member of the local or domain Administrators group.

- Log on as Administrator, or make sure you have administrative privileges. To grant administrative privileges, use the Windows User Manager feature (see *Windows System Guide*).

Mounting the CD-ROM

- Insert the installation CD into the CD-ROM drive or mount it if it resides on a network drive.

In the rest of this chapter, we assume that the CD-ROM drive is mounted on drive D:

Installing SDL Suite and TTCN Suite

An installation utility, `SETUP.EXE`, is enclosed in the distribution.

The installation files for SDL Suite and TTCN Suite are compressed and require the installation utility to be run. **You will only be able to run the installation using `SETUP.EXE`.**

Installation Steps

Perform **all** the steps below:

1. Start your Windows environment. Be sure you have Administrators privileges.
2. Exit all running Windows programs.

Note: Starting the installation script

The instructions below describe how to start the installation script from the Windows Start menu. The script can also be started from the installation CD HTML interface. In that case, click the *Install on Windows* link on the *Installation* page and proceed with step 5 below.

3. From the Windows *Start* menu, select *Run*.

Installation Procedure

4. In the dialog that appears, specify:
`D:\sdl_ttcn\setup.exe`
and press <Return>. A welcome screen is opened.
5. Click *Next* to continue the setup.
6. Click *Yes* to accept the software license agreement.
7. Select the installation directory. The default installation directory is:
`C:\IBM\Rational\SDL_TTCN_Suite6.3`
where 'C' is the local hard drive on which Windows is installed.
You may also change to a network drive to perform a single network installation for all users on your network.
8. Click on *Next* to select the *Setup Type*:
 - **Typical** installation will install all SDL Suite and TTCN Suite files, including the Help files.
 - **Compact** installation will install SDL Suite and TTCN Suite files, excluding example files and on-line help files.
 - **Custom** installation enables you to choose components to install.

If you want to add components to your installation, use the *Custom* installation. See [“Adding Components to an Existing Installation” on page 37](#).
9. Select an option and click *Next*. The disk space requirements and which files to install before proceeding are determined. If you have chosen the Custom installation, select which components to install (see [“Installation Options” on page 28](#) for more information).
10. Specify the program folder where the program shortcuts are to be placed.
11. Click *Next*. Setup will now install the selected files, create shortcuts and update the registry.
12. If not already defined, you will be asked for the license server and port number used. This information is found on the first line of the FLEXnet license key.

If you have not received the license key, you can later add the license server and the port number to the file `license.dat` in the installation directory.

13. Click *Finish*.

The installation of the SDL Suite and the TTCN Suite is now completed.

If you are using a host ID to identify your license, continue with [“Installing a FLEXnet License” on page 34](#).

Installing the FLEXID dongle and drivers

If you are using a dongle continue with the following steps.

1. Turn off the computer.
2. Find the parallel port or the USB port on the back of the computer and plug in the dongle.
3. Turn on the computer.
4. To install the drivers run `FLEXidInstaller.exe` located in the `flexid` directory on the CD-ROM.

Installing a FLEXnet License

Follow the directions below to install your textual FLEXnet license file. The license file contains the license key you have received from IBM Rational Customer Support.

If you have not yet received a FLEXnet license key, see [“How to obtain a license key” on page 31](#).

Caution!

All information in the `license.dat` file is **case significant**, so be careful not to accidentally invalidate any of the encryption codes. Otherwise you will not be able to start SDL Suite and TTCN Suite.

Installation Procedure

You have two options in installing your FLEXnet license:

- In a **shared license file**, which is shared with other FLEXnet licensed software, see [“Using a Shared License File” on page 35](#). You may consider this option if you have other software products that make use of FLEXnet licensing.
- As a **IBM Rational specific license**, which only handles licenses for SDL & TTCN Suite, see [“Using a telelogic Specific License File” on page 36](#). This is the default option if you only will use FLEXnet for the licenses.

Using a Shared License File

Install the Telelogic License Server by running `setup.exe` in the `flex` directory on the CD-ROM. Avoid starting the license server as a service as you are assumed to already have a server running. Make sure the global installation is FLEXnet 11.5 or higher.

If you have other products that make use of FLEXnet you may wish to install your IBM Rational license features into the existing FLEXnet `license.dat` file. To install the license key:

1. Copy the following lines from the license key you received from IBM Rational Customer Support into the existing `license.dat` file:
 - the **VENDOR** line. **Change the path** to the license server installation directory (e.g. `"C:\Program Files\IBM\Rational\Tools\Licensing_11\Server\telelogic.exe"`).
 - the **FEATURE** line(s)

You must do this since your existing license server’s “`lmgrd`” daemon is not in the same directory as the “`telelogic`” daemon (for information, see [“Common problems” on page 74 in chapter 6, *Understanding IBM Rational Licenses*](#)).

2. When you have changed any information in the `license.dat` file, you **must** update the license server to let it know about the changes. To do this, start the FLEXnet utility by selecting **IBM Rational > IBM Rational License Server > LMTOOLS** from the Programs menu and select *Reread*.

The license installation is finished. Continue with [“Installing a C Compiler” on page 36](#).

Using a telelogic Specific License File

If you will only use FLEXnet for licenses using the vendor telelogic, or wish to run a separate FLEXnet license server for products using the telelogic vendor daemon, do the following:

1. Save or copy the FLEXnet license key you received from IBM Rational Customer Support into a text file called `license.dat`.
2. Store the file, for instance in the directory where IBM Rational products are installed.

Starting the License Server

Install and start the Telelogic License Server by running `setup.exe` in the `flex` directory on the CD-ROM. For more info see [“Setting up Your License Server” on page 52 in chapter 5, *Licensing Management*](#).

Installing a C Compiler

You must also install a C compiler to be able to use certain features of the SDL Suite and TTCN Suite, such as Simulation and code generation. How to install a C compiler is described in the compiler documentation.

For information on which C compiler you need, see [“The SDL Suite Compiler Environment” on page 5](#) and [“The TTCN Suite Compiler Environment” on page 9 in chapter 1, *Platforms and Products*](#).

Starting Up

SDL Suite and TTCN Suite can be started from an icon in *Start* menu > *Programs*. An alternative way is to double-click an `.sdt` file.

Post Installation

Limiting On-Line Help Disk Space

If you have installed SDL Suite and TTCN Suite locally on several PC's, you may wish to limit the disk space usage in a multi-user environment. Instead of storing the on-line help files locally on every PC where you have installed SDL Suite and TTCN Suite, you may put a single copy of the on-line help files on a network server. This is further described in [“Configuring the Help Environment” on page 298 in chapter 4, *Managing Preferences, in the User's Manual*](#).

Adding Components to an Existing Installation

If you want to add components to your installation, follow the instructions below. For more information on available components, see [“Installation Options” on page 28](#).

1. Mount the CD, as described in [“Mounting the CD-ROM” on page 32](#).
2. Follow all steps described in [“Installing SDL Suite and TTCN Suite” on page 32](#).
 - In the *Destination Location* dialog, enter the same installation directory as you did when you installed SDL Suite and TTCN Suite the first time.
 - Choose *Custom* installation in the *Setup Type* dialog.
 - Deselect the components you do not want to install in the *Select Components* dialog. If you install a component that is already installed, the existing component will be overwritten.

System Setup

In this chapter, you will find information about what UNIX command line tools and what OS environment variables SDL Suite and TTCN Suite takes advantage of.

You can also find information about factors in X Windows, OSF/Motif and Microsoft Windows that may affect the behavior of SDL Suite and TTCN Suite.

For UNIX, some of the setup information in this chapter is applicable on a user level and may thereby be required to be performed by each user on UNIX.

UNIX Command Line Tools

All the SDL Suite and TTCN Suite tools that are possible to start from the UNIX prompt are invoked via commands in the `$stelelogic/bin` directory (`$stelelogic` is the installation directory). By adding this directory to the `PATH` variable, the user will be able to conveniently start all SDL Suite and TTCN Suite tools with exception for stand-alone generated Simulators and SDL Explorers; see [“Source Files” on page 41](#).

The start script `$stelelogic/bin/.tlwrapper` is a common start script for IBM Rational products that make use of the PostMaster, the integration mechanism of the SDL Suite and the TTCN Suite. It also sets up all environment variables needed to run the IBM Rational products.

Caution!

The `.tlwrapper` script should never be invoked manually; it is only supposed to be executed via internal commands.

The following table lists the most important command line tools to use for controlling licensing and starting SDL Suite and TTCN Suite.

Command	Description
<code>gethostinfo</code>	Obtain useful system information for FLEXnet licensing. See the box Important! on page 14 in chapter 2, <i>Installation Procedure for UNIX</i> for more information.
<code>startlicd</code>	Start license server. See “Setting up the IBM Rational License Server TL on UNIX” on page 54 in chapter 5, <i>Licensing Management</i> for more information.
<code>updatelicd</code>	Reread the <code>license.dat</code> file, useful after the license file has been edited. See “Updating your license” on page 72 in chapter 6, <i>Understanding IBM Rational Licenses</i> for more information.
<code>stat</code>	Show statistics about the license server; useful optional parameters <code>[-a -A -f 'feature']</code> . See step 4, on page 21 in chapter 2, <i>Installation Procedure for UNIX</i> for an example.

Command	Description
sdlsuite	Start the IBM Rational Organizer.
ttcnsuite	Start the IBM Rational Organizer.
tau	Start the IBM Rational Organizer.
sdt	Start the IBM Rational Organizer.
itex	Start the IBM Rational Organizer.

UNIX User Setup

For each **UNIX** user the following setups should be made.

Source Files

The installation provides a file which is suitable to be “sourced” at log-in, when the user’s `.cshrc` or `.profile` file is executed. This source file will make the following environment variables visible in the terminal shell:

```
telelogic
telelogicbin
sdtrelease
sdt_dir
sdtbin
itexrelease
itexlib
itexaccess
itexaccessroot
itexaccesscompiler
```

These environment variables are useful as they can easily be used as pointers into the installation, without knowing where the installation is placed in the file system.

Note:

You do not need to set these variables to be able to run the SDL Suite or the TTCN Suite, except if you want to run a generated SDL Simulator or SDL Explorer stand-alone, that is, run from the UNIX prompt without the graphical user interface.

To read the source file (`/appl/telelogic` is assumed to be the installation directory for SDL Suite and TTCN Suite):

If you run	Type
C shell-compatible shell (e.g. csh or tcsh)	<code>source /appl/telelogic/bin/telelogic.sou</code>
Bourne shell-compatible shell (e.g. sh, ksh, zsh or bash)	<code>. /appl/telelogic/bin/telelogic.profile</code>

Path and Display Variables

For each user, the `bin` directory should be contained in the list of directories defined by the `PATH` environment variable:

```
set path = ( $path $telelogic/bin )
```

This should be done in the shell startup files, as described above.

In the case the computers on which you run the X Windows server and the client (SDL Suite and TTCN Suite) coincide, the environment variable `DISPLAY` should be set to `unix:0.0` before starting SDL Suite and TTCN Suite. **Do not** use the notation `hostname:0.0`

Environment Variables

Environment variables common to UNIX and Windows:

- `HOME` is used by the SDL Suite applications to find preference files. **On UNIX**, it is also used to find SDL Explorer/Simulator command and button files and other files.
- `TMPDIR` is used by SDL Suite and TTCN Suite applications when temporary files are created.

Note:

An ending slash ('/') or backslash ('\') is **mandatory**. Example:

On UNIX: `setenv TMPDIR /usr/tmp/`

In Windows: `set TMPDIR=c:\tmp\`

- `SDT_STORAGE_FORMAT` is used by the SDL Suite applications to decide what format to use when storing diagrams. The value `ASCII` means to use only printable ASCII characters in stored diagrams. Otherwise, the diagrams are binary files.
- `LM_LICENSE_FILE` or `TELELOGIC_LICENSE_FILE` is used by the FLEXnet license mechanism in the SDL Suite and TTCN Suite tools.

If this variable is set, the tools will append the search path to the license file in `LM_LICENSE_FILE`. If it is not set, the start-up command sets the variable.

UNIX-specific environment variables, in addition to the ones listed in [“Source Files” on page 41](#):

- `TeleLOGIC_USEEXTVAR` is used to make it possible to use already existing settings for the environment variables `LM_LICENSE_FILE`, `sdtrelease` and `itexrelease`. If the variable is set (it may be set to any value), the start-up script will not overwrite these variables.
- `XFILESEARCHPATH` is used by X applications in the tools to find X resources. If it is set (before starting) the tools will append the search path to the resource files in `XFILESEARCHPATH`. If it is not set, the start up command sets the variable.
- `SDTTMPMNT` is used to strip the prefix which is added to directory names by some auto-mounters. When this variable is not set

`/tmp_mnt` is stripped from directory names. Setting `SDTTMPMNT` to, for example `/my_prefix`, will strip `/my_prefix` from directory names.

- `SDLENOGRAPHICS` is used by the SDL Editor's Signal Dictionary window to turn off the use of SDL icons and to use textual notation instead. This variable should be used when running the SDL Suite on terminals with limited graphical capabilities.

Preferences

You may specify the default behavior of the SDL Suite tools, and also for common tools (such as the Organizer), by using the *Preference Manager*. You may define preferences in such way that they apply to an entire company, a specific project, or to an individual user only. See [chapter 4, *Managing Preferences, in the User's Manual*](#) for more information on customization.

Microsoft Windows System Factors

The SDL Suite for Windows requires a display resolution of at least 640 * 480 pixels (VGA resolution).

The SDL Suite for Windows can use any of the TrueType fonts that are installed in Microsoft Windows. For more information, see [“Font Preference \(Windows only\)” on page 223 in chapter 3, *The Preference Manager, in the User's Manual*](#).

Bindings between Microsoft Windows Explorer file types and the SDL Suite for Windows files is performed through system files (with the `.sdt` extension).

X Window System Factors (UNIX only)

Display Resolution

The SDL Suite relies on the display resolution reported by the X Server for mapping between screen (pixel) coordinates and diagram unit coordinates. If the X Server has erroneous resolution information, the screen image of an SDL Suite document will have the wrong scale.

If required, the X Server must be adjusted to report the correct display resolution. See the documentation from the computer/software vendor for instructions.

Installed Fonts

The SDL Suite and TTCN Suite tools assumes that the fonts included in the MIT distribution of X11R5 are available.

Font Scaling

Note:

Font scaling is used by the SDL Suite only – not the TTCN Suite.

To achieve WYSIWYG between screen and printout, the SDL Suite can use scalable fonts in conjunction with AFM (Adobe Font Metrics) files. Not all fonts scale well without the use of an X11R5 font server. Therefore, it is possible to turn off font scaling (at the price of the WYSIWYG capabilities), in which case the SDL Suite will try to use only pre-scaled X fonts.

To turn on font scaling, edit the X resource file `$teletologic/x11/app-defaults/SDT` and change the line:

```
SDT*sdtUseScalableFonts: false
```

into:

```
SDT*sdtUseScalableFonts: true
```

X Server Version

The SDL Suite and TTCN Suite tools have been tested with the MIT X11R5 server. No interoperability with earlier or later versions of X11 is guaranteed.

Window Manager

The SDL Suite and TTCN Suite tools are tested with Mwm, the Motif window manager, version 2.1. It is the recommended window manager to use.

Color Allocation

In the case of another X application having allocated all available color cells, the SDL Suite and TTCN Suite tools might fail to allocate colors for its windows and icons. The SDL Suite and TTCN Suite tools will try to allocate colors as close as possible to the ideal in the case of icons, but window colors cannot be guaranteed. To avoid this problem, a user might consider closing color-intensive applications that are not necessary to run in conjunction with SDL Suite and TTCN Suite.

Changing the Color Settings

The color settings for the SDL Suite are specified in the file `$telelogic/X11/app-defaults/SDT` and the color settings for the TTCN Suite are specified in the file `$telelogic/X11/app-defaults/Itex`. You can change the colors by modifying the color resources settings; the color settings are found at the end of this file. When changing the colors, you may find some help about usable color names in the file `$telelogic/X11/rgb.txt`

How to modify resources is described in [“Work Order for Modifying Tools Resources” on page 47](#).

OSF/Motif Factors (UNIX only)

Event Translations

The X resource files `SDT` and `Itex` uses both OSF/Motif virtual bindings and ordinary X event specifications in translation tables. Refer to the OSF/Motif documentation for a discussion of virtual bindings.

Work Order for Modifying Tools Resources

Modification of the tools resources is only recommended for users who have good knowledge about the X Window System.

1. Exit SDL Suite and TTCN Suite.
2. Copy the resources you wish to modify from the default resource file(s) `$telelogic/X11/app-defaults/SDT` and/or `$telelogic/X11/app-defaults/Itex` and paste them into the file `$HOME/.Xdefaults`, or into local files `$HOME/SDT` and/or `$HOME/Itex`, by using a text editor.
3. Restart SDL Suite and TTCN Suite by typing any of the following:
`sdlsuite`
`ttcnsuite`

The X-resources will now be taken from the default `SDT` and/or `Itex` files. The modified resource values in `.Xdefaults`, `SDT` or `Itex` will then override the values from the default resource file(s).¹

The system.mwmrc File

The `/usr/lib/X11/system.mwmrc` file is the default Motif Window Manager startup file. In this file, which contains definitions of the button bindings and the root menu, your system manager may, for instance, add a menu choice for starting SDL Suite and TTCN Suite.

Any user can override the settings in this file by creating his own `.mwmrc` file in his login directory.

1. It is also possible to use the `XAPPLRESDIR` and `XUSERFILESEARCHPATH` to control X resources. Please refer to the X11 manuals for more information.

Note:

On Sun workstations you will find the `system.mwmrc` file in the SDL Suite and TTCN Suite distribution. This file is placed in `$stelelogic/X11` and is only used if you run the X Window and Motif software provided by SDL Suite and TTCN Suite.

The app-defaults/Mwm File

The `/usr/lib/X11/app-defaults/Mwm` file contains the default resource specifications for Motif Window Manager. This file contains the names of the button bindings which are defined in the `system.mwmrc` file, mentioned above.

If you want to add resources to Mwm, you can create your own `.Xdefaults` in your home directory, containing your personal resource definitions.

Example 1: Changing pointer focus policy

For example, to indicate the current window by pointing to it with the cursor, instead of clicking in the window, add the following line to `.Xdefaults`

```
Mwm*keyboardFocusPolicy:      pointer
```

Note:

On Sun workstations you will find the `Mwm` file in the SDL Suite and TTCN Suite distribution. This file is located in `$stelelogic/X11/app-defaults` and is only used if you run the X Window and Motif software provided by SDL Suite and TTCN Suite.

Licensing Management

This chapter gives you more information about the procedures for managing the licenses that are used in IBM Rational products.

The following topics are discussed:

- **Setting up the license on a client machine**
- **Setting up a license server**
- **Licensing specifics for the SDL Suite**

Setting up Your license on a Client Machine

Before you start

There are three license types that can be used by IBM Rational client software. Before you run the license setup, make sure a valid license is available. The license types are explained in [Table 1](#).

Table 1 License types for IBM Rational licenses

License type	Description
Floating	A floating license is obtained from a FLEXnet license server. Ask your administrator for the FLEXnet license server details, for example 19353@licenseserver.
Node-locked	A node-locked license key can only be used by the computer for which it was created. Copy your <code>license.dat</code> file to a directory on your machine, and take a note of the location of the file.
FLEXid Dongle	A hardware-id that connects to a parallel or USB port. The dongle is associated with a FLEXid. The <code>license.dat</code> file references the FLEXid associated with your dongle. Copy the <code>license.dat</code> file to a directory on your machine, and take a note of the location of the file. Note: Dongles are only available for Windows machines.

For more information see [chapter 6, Understanding IBM Rational Licenses](#), and the [FLEXnet Licensing End User Guide](#), which is available from the support area of the Acresto website at www.acresto.com.

Setting up your license on Windows

If you are unfamiliar with using FLEXnet licenses you can run the license setup utility if you didn't provide license information when you installed your software, or if you have already setup a license but now want to change your license setup.

Setting up Your license on a Client Machine

There are several ways to setup licenses for FLEXnet. Choose one of the following that best suite your needs.

- If you are using floating licenses you can edit the license.dat file in the installation directory to have the following format:

```
SERVER licserver 1 19353
USE_SERVER
```

The name of the license server is licserver and 19353 is the port-number used.

- If you are using floating licenses you can set the environment variable TELELOGIC_LICENSE_FILE to 19353@licserver.
- If you are using floating licenses you can set the environment variable LM_LICENSE_FILE to 19353@licserver.
- If you are using a node-locked license keep the license.dat file in the installation directory.
- If you are using a node-locked license set one of the environment variables TELELOGIC_LICENSE_FILE or LM_LICENSE_FILE to the full path where the license.dat file is found.
- If you are using a FLEXid license keep the license.dat file in the installation directory.
- If you are using a FLEXid license set one of the environment variables TELELOGIC_LICENSE_FILE or LM_LICENSE_FILE to the full path where the license.dat file is found.

If you are using a FLEXid dongle, you must install the needed drivers for the specific dongle used, these drivers can be found in the flex directory on the CD-ROM.

Setting up your license on UNIX

On UNIX machines the easiest way to setup licenses is to ensure that the license.dat file is placed in the installation directory. This file should have the following content:

```
SERVER licserver 1 19353
USE_SERVER
```

The name of the license server is licserver and 19353 is the port-number used.

As an alternative the environment variables TELELOGIC_LICENSE_FILE or LM_LICENSE_FILE can be set to point at the license server. If you are using the Bourne or K shell enter

```
setenv TELELOGIC_LICENSE_FILE=portnumber@servername
```

If you are using the C shell enter

```
env TELELOGIC_LICENSE_FILE portnumber@servername
```

Setting up Your License Server

If you want to use floating licenses for your IBM Rational software, you have to install the IBM Rational License Server TL. If you haven't received your floating license from IBM Rational, you can still install the IBM Rational License Server TL. When you receive your license, follow the instructions in [“*Changing the location of your floating license on Windows*” on page 53](#).

You only need to set up the IBM Rational License Server TL once. The same license server can be used for all your IBM Rational products (formerly Telelogic products). For more information about licensing, see:

- [chapter 6, *Understanding IBM Rational Licenses, in the Installation Guide*](#).
- FLEXnet Licensing End User Guide, which is available from the support area of the Acrecco website at www.acresco.com.

Installing the IBM Rational license server TL on Windows

If you have a IBM Rational floating license, copy it to a folder on the license server machine and take a note of its location. If you do not have a floating license yet, you can install the IBM Rational License Server TL and set up the license later.

1. Double-click `setup.exe` in the flex directory on the CD-ROM. The **Welcome** screen is displayed.
2. Click **Next**. The **Choose Destination Location** screen is displayed. Enter the path to the folder you want to use for your IBM Rational installations, or leave the default.

Setting up Your License Server

If you want to change the directory:

- Click the **Browse** button
- Browse to the directory you want to install to
- Click **OK**

3. Click **Next**. The **License File Locations** screen is displayed.

If you have your floating license file, type the path to the file, including the file name in the **License File** box. If you do not have your floating license file yet, leave the default path.

The IBM Rational License Server TL also creates a log file that records the all the actions concerning the license server. If you want the log file to be created in a different location, type the new location in the **License Log** box.

4. Click **Next**.

Note:

If the installer cannot find the license file you specified, a message is displayed stating that the license file could not be found. This happens if you do not have your license yet, or if you have your license but typed the path incorrectly. Click **OK** in the message.

5. The **Start Copying Files** screen is displayed. Click **Next** if you are happy with the settings.
6. The IBM Rational License Server TL is configured, and the **Finish** screen is displayed.

If you want to register the license server service, leave the check box selected. A service called **Flexlm License Manager** is created. To start it, you must either reboot your machine, or start the service manually.

7. Click **Finish**.

Changing the location of your floating license on Windows

If you installed the IBM Rational License Server TL before you received your floating license, or if you move your floating license to a

different folder, you have to modify the license manager using the LM-TOOLS utility.

1. Copy your floating license file to a folder on the license server machine and take a note of its location.
2. On the task bar, click **Start**, then select **IBM Rational > IBM Rational License Server > LMTOOLS** from the Programs menu.

The LMTOOLS by Acrecco window is displayed.

3. Click the **Config Services** tab.
4. Click the **Browse** button next to the **Path to the license file** box, and browse to the folder containing your license file.
5. Select the file and click **Open**.
6. Click the **Start/Stop/Reread** tab, saving the changes when prompted.
7. Click **Start Server**.

The IBM Rational License Server TL is started.

Setting up the IBM Rational License Server TL on UNIX

1. Unpack the `flex.tar` file from `../license_server/<arch>` to a directory of your choice, for example `/flex/<arch>`, where `<arch>` is the architecture of your system.

Note:

Any directory can be used to store the unpacked files, as long as the license server can access the files. However, we recommend not to put the files in the same directory as the IBM Rational installation (or in a subdirectory to the installation directory). Having the FLEXnet files stored on a directory separate from the installation directory will simplify administration tasks when upgrading to future versions, and will also make it easier to co-exist with other products that use FLEXnet.

2. The FLEXnet license management software does not require root privileges to operate. The FLEXnet license management daemon should be run from a non-privileged user account.

Setting up Your License Server

If the license management daemon is currently executing with root, or some other system account permission, modify it. For example, create a non-privileged user account, `flexnet`, for running the FLEXnet license management daemon.

3. Save or copy the FLEXnet license file you received from IBM Rational into a text file called `license.dat`.
4. Make sure that the information in the `license.dat` file is correct according to your server and installation.
 - The `SERVER` line in the license file must contain the correct hostname and hostID.
 - The FLEXnet license server uses the port number specified on the `SERVER` line of the `license.dat` file. By default, this is 19353. If this clashes with a port already defined on your system, edit `license.dat` to specify the port number you want to use.
 - The `DAEMON` line contains the correct path to the `telelogic` daemon in the `/flex/<arch>`, where `<arch>` is the architecture of your server.
5. Start the FLEXnet license server on UNIX.

Make sure no license servers for IBM Rational tools are currently running. Search for the license daemons `lmgrd` and `telelogic` in the current process list, for instance by using the command:

```
ps -ae | egrep '(lmgrd|telelog)'
```

If you have any license daemons running, terminate them using the `lmutil lmdown` command.

6. Change to your installation directory:

```
cd /flex/<arch>
```
7. Start the license server:

```
lmgrd -local -c license.dat -l license.log
```
8. Check that the license server has been started correctly with the following command:

```
lmutil lmstat -c license.dat
```

The license server statistics are displayed containing the server, the vendor daemon `telelogic` and the features available in your `license.dat` file.

9. If the startup has failed, check the `license.dat` file for errors and omissions; see [“Common problems” on page 74 in chapter 6, Understanding IBM Rational Licenses](#). Double-check your file with the original sent from IBM Rational.
10. There is also a `license.log` file in the installation directory, where all actions concerning the license server are logged.

Note:

The log file can grow rapidly. You must switch logs and/or delete the head of the file on a regular basis.

If the FLEXnet License Server Goes Down

In some cases, licensed tools may lose contact with the license server. This could happen, for instance, if there is a communication failure in your network, or if the license control processes terminate for some reason. A recovery mechanism is provided – currently running sessions of the IBM Rational tools will only have to wait for the license server to come up again. (They will not have to perform any special operations.)

Losing Contact with the License Server

From a user’s point of view, the following will happen if the license server goes down:

- SDL Suite and TTCN Suite disables the Organizer’s menu commands. Some other functionality which is managed by the Organizer is disabled as well. It is however possible to finish the current session (saving and printing diagrams for instance).
- The license failure is reported in the Organizer Log window.

Regaining Contact with the License Server

When the license server comes back up, the tools can be used again. Users are notified by a message in the Organizer Log window and SDL Suite and TTCN Suite resume normal functionality.

Specific Licensing for the SDL Suite

Licensing by Feature

Licensing is done by “features”, which are individual components of the tool set, such as the SDL Simulator or the TTCN Suite’s TTCN to C compiler.

A license key specifies the number of “seats” (simultaneously available licenses) for each feature of the tool set listed in the license key. FLEXnet (floating) licenses allow the number of licenses available to be specified on a feature-by-feature basis.

Standard/Package license model (SDL Suite)

SDL Suite has two license types - the Standard license and the Package license.

The **Standard license** follows the conventional license model used in SDL Suite and TTCN Suite. It is based on the principle that each tool feature is connected to a unique license feature. It is possible for a user to use any tool feature as long as there is an available license feature for the specific tool to allocate.

The **Package license** is a license model created to simplify the administration and the dimensioning of license configurations. The content of the Package license is tailored to the needs of specific user roles. The specific license feature is used to license all tool features within a specific package license. Optional features can be used together with a Package license (as long as they are not part of any Package license). It is not possible to combine the license model for standard licensing and the package based model.

Description of packages

This table defines which components each package contains.

Name	Included components
SDL Suite Author	Organizer SDL Framework MSC Editor C/C++ Access
SDL Suite Model Builder	Organizer SDL Framework MSC Editor C/C++ Access SDL Simulator
SDL Suite Code Builder (C-advanced)	Organizer SDL Framework MSC Editor C/C++ Access SDL Simulator SDL to C compiler, advanced
SDL Suite Code Builder (C-micro)	Organizer SDL Framework MSC Editor C/C++ Access SDL Simulator SDL to C compiler, micro

Set up and change a Package license

To be able to use package based licenses the SDL Suite needs to be tuned.

On Unix

There are two ways of setting up a package based license on UNIX:

- Using a start up command parameter
- Setting an environment variable

Start up command parameter

To start using a specific package just add the package name as the first parameter when issuing the command to start the tool. For example:

Specific Licensing for the SDL Suite

```
$ /opt/telelogic/bin/sdlsuite author
```

The packages to be selected in this way are:

- **AUTHOR**
- **MODELBUILDER**
- **CODEBUILDERCADVANCED**
- **CODEBUILDERCMICRO**

When the package is added to the issued command the package based mechanism is used.

Environment variable

Another way to setup a specific package is to set the environment variable `SDLSUITE_ROLE` to one of the above values before issuing the tool.

Note:

This value will be overridden if the package parameter is used.

In Windows

On Windows the packages can be set up during runtime:

1. On the *Help* menu select *License Information*.
2. Press the button *Configure License*.
3. Select the wanted package.

Note:

When changing between the different packages during runtime you might end up using licenses for several different packages. To avoid this it is recommended that you restart the tools when changing from one package to another.

Display your package setup

To see which package you have selected do the following:

1. On the *Help* menu select *License Information*.
2. Press the button *Configure License*. The selected package is displayed.

Understanding IBM Rational Licenses

This chapter introduces the licensing system used with IBM Rational products. Provided are both background material and practical tips on setting up and maintaining your licenses.

The following topics are discussed:

- **A general overview of the FLEXnet licensing system.**
- **Details about the FLEXnet system, including types of licenses, usage options and possibilities, structure of a license key and common problems.**
- **How to obtain a license.**

Licensing – A General Overview

The FLEXnet Licensing System

IBM Rational uses FLEXnet Publisher (formerly FLEXlm) for licensing. FLEXnet is a third party licensing system marketed by Acresto Software. FLEXnet licenses are available as node-locked (standalone) licenses, which are tied to a specific machine, and as floating (server) licenses, which are available anywhere on a network.

FLEXnet main components

The four main components of FLEXnet are:

- The License Manager Daemon, `lmgrd`
- The Vendor Daemon. For formerly Telelogic products, the vendor daemon is called `telelogic`
- The client application program, in this case any formerly Telelogic application
- The license file, `license.dat`

If you would like more information about FLEXnet or Acresto, see www.acresto.com

Licensing terminology

The licensing terminology is described in the following table:

Term	Description
Daemon License Daemon	Background processes that run on the license server. They administer the check-in and check-out of licenses for each feature of each application that uses FLEXnet.
Demo license	A node-locked license that will work on any computer. A demo license is usually cut for a maximum of 30 days, for evaluation or diagnostic purposes.

Licensing – A General Overview

Term	Description
Dongle	A hardware-id that connects to a parallel or USB port. The dongle is associated with a FLEXid. A license can be locked to a FLEXid instead of a specific hostID, which makes it possible to move a license between different machines. Each machine needs a copy of the license file.
Floating or Network license	A floating license system allows users on a network to check out individual licenses from a commonly shared set. When a user quits an application, all licenses used during that session are returned to the pool of available licenses.
hostID	A number that uniquely identifies a machine. It is obtained from different sources within a machine, depending on the architecture. For example it may be the machine's ethernet address, or its disk serial number.
hostname	The name that has been assigned to the machine by the system administrator, and can contain characters and/or numbers. For example, Einstein or suns20.
License borrowing	License borrowing lets an end user check out a license from a license server. The user can then disconnect their computer, but retain the license for a specified borrowing period. For more details about license borrowing, contact your local IBM Rational sales representative.

Term	Description
License file	<p>A text file called <code>license.dat</code>. It includes the following information:</p> <ul style="list-style-type: none"> • Server names and hostIDs • Vendor names and paths to vendor daemon executables • Feature and package information
License key	<p>Each FEATURE/INCREMENT line in the license file is a license key for a feature or a package. A license key specifies the number of licenses that are available for that particular feature or package. The license key is based on data that is specific to IBM Rational.</p>
License manager daemon <code>lmgrd</code>	<p>Handles the initial contact with the client application program and passes the connection to the appropriate vendor daemon. It also starts and restarts the vendor daemons.</p>
License server	<p>The computer on which the license manager daemon and the vendor daemon are running. Users with node-locked licenses do not use a license server.</p>
Node-locked license	<p>A node-locked license key is for use on one computer, and is tied to that computer. You do not need to run a license server if you are using a node-locked license.</p>
Per-user license	<p>A per-user license is allocated to the same user permanently, or until an administrator frees the license for that product user. Per-user licensing is only available for Synergy.</p>

Licensing – A General Overview

Term	Description
Token-based licensing	<p>The token-based license model means that you can buy a certain number of Token licenses. If you use an IBM Rational tool that checks out a FEATURE that is token-based, the FEATURE line in the license file will specify the number of Tokens that are checked out.</p> <p>Token-based licenses can only be used with floating licenses. They cannot be used for node-locked licenses or licenses locked to a dongle.</p> <p>For more details about Token-based licensing, contact your local IBM Rational sales representative.</p>
Vendor daemon <code>telelogic</code>	<p>A process that permits and keeps track of the number of licenses that are used. Each application that uses FLEXnet has its own vendor daemon. Formerly Telelogic's daemon is <code>telelogic</code>.</p> <p>The IBM Rational application and the telelogic daemon communicate through TCP/IP. As the format of the traffic is independent of the machine, the license server and the computer running the IBM Rational application can be on different platforms and operating systems.</p>

Types of FLEXnet license keys

There are two types of FLEXnet license keys:

- Floating license keys contain the hostname and hostID of the license server. The license manager daemon and vendor daemon must be running on the license server whose hostname and hostID are specified in the license key.

- A node-locked license key is for use on one computer, and is tied to that computer or to a dongle. You do not need to run a license server if you are using a node-locked license.

Note:

The license key information you receive may not be identical to the information contained in the following examples.

Floating FLEXnet license file

An example of a floating license key is given below. The content of the file is explained in the table.

```
SERVER myserver DISK_SERIAL_NUM=12341234 19353
DAEMON telelogic "C:\Program Files\Telelogic\Tools\Licensing 10\Server\telelogic.exe"
FEATURE DOORS telelogic 7.000 31-dec-2006 5 \1234567890ABCDEF1234 VENDOR_STRING-T99-12345
```

Figure 3: Floating license file example

Line	Description
SERVER	<p>This line has four fields:</p> <ul style="list-style-type: none"> • The SERVER label. • The hostname of the license server. • The hostID of the license server. • A TCP/IP port number. This is the port number on which the license daemons communicate. <p>In the example license file, the hostname of the machine is MYSERVER, the hostID is 12341234, and the port number is 19353.</p>

Licensing – A General Overview

Line	Description
DAEMON VENDOR	<p>This line has three fields:</p> <ul style="list-style-type: none">• The DAEMON label (or VENDOR Label)• The name of the vendor daemon• The path to the vendor daemon executable. If this is missing or incorrect the <code>telelogic.exe</code> application placed in the same directory as the <code>lmgrd.exe</code> will be used.
FEATURE	<p>This line specifies the permissions for each component of the IBM Rational application that is licensed.</p> <ul style="list-style-type: none">• The FEATURE keyword.• The name of the licensed component.• The name of the vendor daemon responsible for handling the feature. For all formerly Telelogic products, this is <code>telelogic</code>.• The version number of the feature.• The date that the license for the feature expires. This date is inclusive.• The number of licenses available for the feature.• A 20-character (hex) encryption code for the FEATURE line. This is determined by the exact character-by-character makeup of the FEATURE line, and by the <code>hostID</code> of the license server, specified on the SERVER line.• The <code>VENDOR_STRING</code> containing a customer specific ID.

Node-locked FLEXnet license file

A node-locked license file contains a list of FEATURE lines that describe the products or features for which the local computer is licensed. A node-locked license can contain feature lines for all of the IBM Rational products, or for a selection of them.

To make sure that you cannot use the license file on any other computer, the FEATURE line includes a HOSTID value that uniquely identifies the computer. It contains an encryption of the ethernet address of its network interface card or the disk serial number of the local disk on which the operating system is installed.

Note:

If you change the computer's network card, the license file won't work, because the new network card has a different ethernet address. If you reformat that disk, your existing license file won't work, because formatting a disk changes its serial number. Contact IBM Rational to request a new license file.

An example of a node-locked license key is given below.

```
FEATURE DOORS telelogic 7.000 31-dec-2006 uncounted \  
1234567890ABCDEF1234 VENDOR_STRING=T99-12345 \  
HOSTID=DISK_SERIAL_NUM=12341234
```

Figure 4: Node-locked license file example

How do FLEXnet floating licenses work

This is what happens when you start up an IBM Rational product if you are using floating licenses. IBM Rational DOORS is used in this example, but the same events occur for all the IBM Rational products.

1. Your IBM Rational program uses the TELELOGIC_LICENSE_FILE system variable to find out the name of the computer that's running the FLEXnet license server and the port that it's using.
2. The IBM Rational program contacts the license manager on the FLEXnet license server, using the specified port.

It requests a floating license and makes the request for the telelogic vendor daemon.
3. On the FLEXnet license server, the license manager sends the request to the telelogic vendor daemon.
4. The telelogic vendor daemon checks to see if any licenses are available.

5. If there are free licenses, the telelogic vendor daemon grants a license and the IBM Rational program runs.

If there aren't any licenses available, the telelogic vendor daemon refuses the request, and the IBM Rational program fails to start and displays a message saying that it couldn't obtain a license.

What is the TELELOGIC_LICENSE_FILE variable?

IBM Rational products store the location of the license file in the TELELOGIC_LICENSE_FILE system variable.

The value of TELELOGIC_LICENSE_FILE depends on whether your computer is using floating or node-locked licenses.

License	Value	Description
Floating	port@license-server-name	The FLEXnet license server from which your computer is requesting server licenses and the port number the server is using.
Node-locked	license-file-name	The full path to the license file on your computer.

If your computer is using several node-locked and/or floating licenses, the values in TELELOGIC_LICENSE_FILE are separated by semicolons (;) on Windows, or colons (:) on UNIX. The list can consist of the following components:

- The full path to the license file
- A directory containing one or more license files with a .lic extension
- A port@host setting, where port and host are the TCP/IP port number and host name from the SERVER line in the license file. Alternatively, use the shortcut specification @host if the license file SERVER line uses a default TCP/IP port, or specifies a port in the default port range (27000-27009).

- A comma separated list of three `port@host` specifiers denoting a three-server redundant configuration. For example, `port1@host1, port2@host2, port3@host3` specifies the three-server redundant configuration composed of `host1`, `host2`, and `host3`.

IBM Rational applications that use FLEXnet rely on the environment settings that FLEXnet uses to find licenses. The applications search for license servers and license files in the following order:

1. The environment variable for `TELELOGIC_LICENSE_FILE`.
2. The registry/`.flexlmrc` for `TELELOGIC_LICENSE_FILE`.
3. The environment variable for `LM_LICENSE_FILE`.
4. The registry/`.flexlmrc` for `LM_LICENSE_FILE`.
5. The application dependent path or specific license file relative to the installation directory.
6. Any `.lic` file located in the same directory as the application.
7. The backup location `/usr/local/flexlm/licenses/license.dat` or `c:\flexlm\license.dat`. Using the backup location is not recommended by Acreoso.

On Windows, the registry key is `HKEY_LOCAL_MACHINE\SOFTWARE\FLEXlm License Manager`. On UNIX, the equivalent information is stored in `$HOME/.flexlmrc`. In this file, the syntax is `variable=value`.

The registry value on Windows or the `.flexlmrc` file on UNIX is automatically updated with the license file or license server for which a successful checkout was made. The license file location used for the checkout is stored and remembered for all future checkouts for products using the same vendor daemon. This may lead to checkouts from an unexpected license or license server. To avoid this behavior set the environment variable `FLEXLM_NO_CKOUT_INSTALL_LIC` to 1. This can be set in the environment, or on **Windows** in the FLEXlm registry, or on **Unix** in `$HOME/.flexlmrc`.

To avoid performance degradation due to licensing, make sure you use valid license files and license servers. If it takes an exceptionally long time to start up a licensed application the following points can be useful.

Licensing – A General Overview

- On Windows, remove the registry key value:

```
HKEY_LOCAL_MACHINE\SOFTWARE\FLEXlm License  
Manager\TELELOGIC_LICENSE_FILE
```

Removing this value removes all cached values, and a new search is initiated to find licenses.

- On UNIX, remove the file `$_HOME/.flexlmrc`
- Examine the environment variables `TELELOGIC_LICENSE_FILE` and `LM_LICENSE_FILE`. Make sure that they list valid license servers and/or license files. When setting up the environment for FLEXnet products it is better to use a vendor specific variable, like `TELELOGIC_LICENSE_FILE`, instead of `LM_LICENSE_FILE`. For example, if the user has different servers for different vendors, the IBM Rational application will only check the `TELELOGIC_LICENSE_FILE` value and not the `OTHERVENDOR_LICENSE_FILE` value. If `LM_LICENSE_FILE` is configured to point to both servers, it takes more time as both servers are checked for licenses.

For more information about setting up license servers and licenses, see the **FLEXnet Licensing End User Guide**, which is available from the support area of the Acresso website at www.acresso.com.

Obtaining a license

The following table describes how to obtain a license key if you have not used IBM Rational products before.

Region	Instructions
USA	When you purchased your IBM Rational software, you should have received an e-mail with instructions on how to request a license. Follow these instructions. If you did not receive an e-mail then mail license.us@ibm.com
Rest Of World	Please contact your local sales office. If you are not sure how to do this, you can find the nearest sales office on www.ibm.com

The following table describes how to obtain a license key if you are an existing user of IBM Rational products.

Region	Instructions
USA	New license requests for IBM Rational can be sent to license.us@ibm.com . Please provide your Site ID/Account number and a copy of your current license.dat file so we have all of the host information present.
Rest Of World	Please contact your local sales office. If you are not sure how to do this, you can find the nearest sales office on www.ibm.com . Please have a copy of your current license.dat file available.

Locating your license file

Windows users

If you are using a node-locked license, locate your license file by inspecting the TELELOGIC_LICENSE_FILE environment variable.

If you are the administrator for the license server, you can find the license file by inspecting the TELELOGIC_LICENSE_FILE environment variable.

Alternatively, on Windows you can use the LMTOOLS application from Aceso by clicking on the **Start** menu and clicking **IBM Rational > IBM Rational License Server > LMTOOLS**. You will find the license file on the **Config Services** tab.

UNIX users

Locate your license file using LM_LICENSE_FILE variable.

Updating your license

If you already have some IBM Rational products and you then buy additional products, IBM Rational sends you a new license file, which contains all your previous license features and the new license features. You have to replace your existing license file with your new license.

Windows users

1. Locate your license file. See [“Locating your license file” on page 72](#) for details.
2. Replace your existing license file with the new file supplied by IBM Rational.
3. To enable the new license feature you have to reread your license file:
 - Run **lmttools.exe** by clicking on the Start menu and clicking **IBM Rational > IBM Rational License Server > LM-TOOLS**.
 - Select the **Start/Stop/Reread** tab.
 - Click the **Stop Server** and **Start Server** buttons to restart the license server. Due to a problem with FLEXnet the **ReRead License File** button does not work correctly.

Unix users

1. Locate your license file. See [“Locating your license file” on page 72](#) for details.
2. To reread the license file avoid using `lmutil lmreread` as the result might not be correct. Instead, restart the license server using the following commands:

```
lmutil lmdown -c <license_file_path>  
lmgrd -local -c <license_file_path> -l <license_log_path>
```

Changing the license server machine

The FLEXnet license server is the computer where the license daemons are running. If you change the FLEXnet server after you have received your license key information from IBM Rational customer support, the license will not work. You have to request a new license from IBM Rational Customer Support and provide them with the hostname and hostID of the new license server machine.

Setting up your license

If you want to set up a floating license, see [“Setting up Your License Server” on page 52 in chapter 5, *Licensing Management*](#).

If you want to set up a client license, see [“Setting up Your license on a Client Machine” on page 50 in chapter 5, *Licensing Management*](#).

For more information about setting up license servers and licenses, see the **FLEXnet Licensing End User Guide**, which is available from the support area of the Acrecco website at www.acresco.com.

Common problems

When you install a new FLEXnet license key, you should be aware of the following points.

- FLEXnet license keys are text files, and are often sent to customers via email. If the file contains long lines, they may wrap during the transmission of the mail and this text wrapping can affect the validity of the license. Before you install your new license you should make sure that there is no text wrapping in the file. To do this, open the license.dat file and resize the window until no lines are wrapped. Each FEATURE line should begin with the keyword `FEATURE`.
- FLEXnet license files are case sensitive.
- If your license is for Windows, the DAEMON line in your license contains the default path to the telelogic DAEMON. This is

```
VENDOR telelogic C:\Program  
Files\IBM\Rational\Tools\Licensing_10\Server\telelogic.exe
```

If your license is for UNIX, the DAEMON line in your license does not include a path to the telelogic DAEMON.

If you did not install the license server to the default directory on Windows, or if your license server is on UNIX, you have to edit your license file to include the full path to the telelogic DAEMON. To do this, open your license file, find the line that starts DAEMON telelogic, type the correct path to your telelogic DAEMON (telelogic.exe), then save and close the file.

- If you move the telelogic DAEMON, or if you use a pre-existing FLEXnet license server, you should specify the complete path to it.
- An infrequent problem is a TCP/IP port conflict with another application. If there is a conflict, an error message is logged in the `license.log` file. You can change the port number in your license file without invalidating the key. Finding a port number that is not in use is a matter of trial and error, but most applications use numbers be-

low 5000, so numbers between 5000 and 20000 are generally not in use. The default port in most of IBM Rational's license keys is 7598.

- By default, the telelogic DAEMON uses random ports. If you want to limit communication through a firewall, you can specify a port number for the telelogic DAEMON to use. To do this, open your license file, and type `PORT=<portnumber>` at the end of the DAEMON telelogic line. For example,

```
DAEMON telelogic C:\Program Files\IBM\Rational\Tools\Licensing  
10\Server\telelogic.exe PORT=7194
```

You must allow access through the firewall for the port specified on the DAEMON line and the port on the SERVER line.

- If the FLEXnet manager cannot find your dongle ID, check that the sentinel drivers are installed by locating **HASP Device Driver** in **Add/Remove Programs** in the **Windows Control Panel**.
- You can mix normal licenses with token-based FEATURES by using several license servers, where one server has normal licenses and the other uses token-based licenses. Normal licenses must be used first, so make sure that your settings force a search for normal licenses before token based licenses. If the search order is reversed only token-based licenses are found and the normal licenses cannot be used.

Understanding the license log file

The license log file may contain lines that you do not understand. Some of these lines are explained in the following table.

Log file	Description
<pre>13:51:01 (telelogic) TCP_NODELAY NOT enabled</pre>	<p>When a FLEXnet licensing session is established, TCP/IP sends data between the server and client using packets. By default, the TCP/IP processing kernel delays small packet transmissions in the hope of gaining an efficiency advantage by using a buffer to coalesce a large number of small packets prior to sending them across the network. These delays can result in artificially high latency times for the small packets that are related to most FLEXnet licensing operations.</p> <p>The <code>TCP_NODELAY</code> system setting (as a FLEXnet license server environment variable) can be set to overcome this behavior, and reduce the licensing wait period. Use of the setting causes data packets to be sent through the network more frequently, so there will be less delay in the licensing process due to TCP/IP operations. However, network traffic can increase as a result of smaller and more frequent licensing related packet transmissions.</p>
<p>Where token-based licenses are used:</p> <pre>14:46:39 (telelogic) DENIED: "DOORS" indkach@indkach [telelogic] (Licensed number of users already reached. (-4,342:10054 "")) 14:46:39 (telelogic) DENIED: "DOORS" indkach@indkach [telelogic] (Licensed number of users already reached. (-4,342:10054 "")) 14:46:39 (telelogic) OUT: "TLOG-token" indkach@indkach [DOORS] (3 licenses)</pre>	<p>For a token-based DOORS license the normal log is:</p> <pre>14:46:39 (telelogic) OUT: "DOORS" indkach@indkach [telelogic] 14:46:39 (telelogic) IN: "DOORS" indkach@indkach [telelogic] 14:46:39 (telelogic) OUT: "TLOG-token" indkach@indkach [DOORS] (3 licenses)</pre> <p>If the DOORS license is already checked out, the DENIED lines will appear. However, the tokens are still checked out so the license will be granted. This can happen when two different users try to check out the license at the same time, or if the license is kept by an older version of DOORS, which did not support token-based licenses. It can also happen for FEATURES that have a lingering time.</p>

Licensing – A General Overview

Log file	Description
14:16:17 (telelogic) Multiple dup-groupings in effect for DOORS: 14:16:17 (telelogic) NONE vs. USER HOST DIS- PLAY 14:16:17 (telelogic) No further warnings about this	This message is an informational message from FLEXnet. It is the normal behavior for IBM Rational applications.

Additional Information

For more information on IBM Rational Licensing, see the `Licensing_guide.pdf` available in the IBM Rational License Server TL.

For more information on FLEXnet Publisher visit:

<http://www.acresso.com>

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