DLM Administrators Guide

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Contents

Preface

The *DLM Administrators Guide* describes how to configure and administer the license environment for Uniface products using the DLM Windows application and DLMCV command line tools.

Who Should Read this Guide

This guide is primarily intended for license administrators who need to configure and administer the Uniface license environment. For the complete Uniface DLM documentation, see the *DLM Online Help*.

Documentation Conventions

The Uniface documentation employs a number of conventions for documenting the syntax and user interface of Uniface products.

Syntax Descriptions

The following conventions are used in syntax descriptions, such as ProcScript statements and functions, configuration and assignment settings, APIs, and so on. Unless otherwise specified, names, commands, and settings are not case sensitive.

Table: Syntax Conventions

Syntax Element	Description	Example

`Exact String`
`command`
`setting`
`api`
`property`
`value`
`/switch`
	`Monospace` typeface is used for literal information that must be typed as shown (although you can usually ignore the case).	`"a message"`
		`retrieveENTITY_A`
		`backcolor="red"`
		`/asn=app1.asn`

VariableContent	*Italic* typeface must be replaced by actual data. It is typically used for parameters.	*TargetFilename*
{…}	Braces ({ }) indicate optional information, such as optional arguments, parameters, options, values, or switches	{*Entity*}
|	Vertical bars (|) separate a list of options where only one item can be entered. They are used for mutually exclusive arguments, parameters, options, values, or switches.	<u>`true`</u> | `false`
<u>`default value`</u>	Underlined value indicates the value used if a property is not specified	<u>`true`</u>
<u>`;!`</u>	<u>Underlined</u> punctuation represent profile characters or subfield separators in Uniface lists. (These separators can be entered in using the Gold key.)	

For example, the following syntax description indicates that the `rollback` command can occur with no following arguments, or with either of the two optional arguments:

`rollback` {**"***Connector***"** \| **"**$*Path***"**}

According to this syntax description, the following forms of the rollback statement are allowed:

```
rollback
rollback "SYB"
rollback "$MYPATH"
```

Uppercase and Lowercase

Uniface ProcScript instructions, assignment and initialization settings, object names, and so on are case-insensitive. However, the following conventions are used in the documentation:

- Assignment settings and assignment file sections are in uppercase. For example, `$DEF_CHARSET` in the [SETTINGS] section.

- Initialization settings are in mixed case and file sections in lowercase. For example `AutoMaximize` in the [upi] section.

- ProcScript commands and data types are usually lowercase. Sometime, mixed case is used for readability. For example, `$procerror`, `$CurEntProperties`, `structToXml`.

Typographic Conventions

Table: Typographic Conventions

Convention	Used for	Example
Italic	Variable content, such as parameters. Citations or references to other documents. Word emphasis.	`retrieve/e` *EntityName* Refer to the *Uniface Library*. … known as an *operation*.
^Function	Structure editor function	^Add_Occ
Key KeyKey Key+Key	Keyboard keys Keys separated by a space are pressed sequentially. Keys joined by a plus symbol are pressed in simultaneously.	F1 *Gold*R Alt+F
Bold	Labels in the user interface, such as window titles, tabs, and field or property names.	Structure

`Monospace`	Literal values that must be entered as is (except for the case), including:
	
	 • ProcScript keywords (statements, functions, data types, and so on)
	 • Assignment settings
	 • Initialization settings
	 • Command lines switches
	 • APIs
	 • Values of properties, parameters, and variables
	 • Literal user input
	 • File and directory names
		`retrieveENTITY_A`
		 `backcolor="red"`
		 `/asn=app1.asn`
		 `"a message"`

<u>Underline</u> <u>;!</u>	Default value Uniface list separators such as Gold ; or Gold !	<u>True</u>`│False` `red`<u>;</u>`blue`

Related Publications

The documentation for DLM includes an *Installation Guide* and *Users Guide* in PDF format, and online help in the product.

The documentation is available from the product installation disk and, after installation, from `C:\Program Files\Common Files\Compuware`.

To access the online help from within a licensing component, you can:

- Click **F1** to open the **Help** menu.
- From the **Help** menu, choose **Index** to browse for help for the licensing component being used.

Customer Support Information

You can access customer support and a wealth of Uniface product and technical information on uniface.info. Features include online product documentation, user forums, technical tips and articles, up-to-date platform availability and product fixes.

Uniface Customer Support is available for maintenance-paying customers and can assist you with all your technical problems, from installation to troubleshooting. Prior to contacting customer support, please gather the following information:

- Name, version, and patch level of Uniface or related product. For example, Uniface 9.7.04 X401 or Uniface DLM 9.04.01.
- The location of the problem in the product and the actions taken before the problem occurred.
- Exact error message, if any, and any other information pertaining to the error.
- The operating system on which your product is installed.

Email

Uniface Customer support can be contacted at customer.support@uniface.com.

Priority Issues

For urgent, high priority issues, we advise to contact us via telephone. The various contact details around the world are published on uniface.info.

Corporate Web Site

For information about Uniface customer support offerings, see the Uniface corporate web site at uniface.info, or contact us at ask.uniface@uniface.com.

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DLM: What's New

DLM is Uniface's license management software.

DLM 9.1.0.333

Issue 31843: It is now possible to configure the frequency with which a Uniface application notifies the DLM license server that a license is still in use.

A new configuration parameter is supported in the DLM client's `config.xml` file. Setting `heartbeat_interval>` to a shorter interval enables an application to be restarted more quickly if it crashes, but increases the network and server load. For more information, see **Client Configuration File**.

DLM 9.1.0

Feature: Security updates

DLM 9.0.4

Issue 30840: Problem with the display of buttons on Japanese Windows systems has been fixed.

DLM 9.0.3

Feature: Uniface DLM is now supported on Windows 10.

Issues: Some problems on Unix and Linux platforms are fixed.

DLM 9.0.2

Feature: The DLMInfo utility has been enhanced to provide additional system information about the machine for which a license is requested, such as the number and type of processors.

The file that is generated by the DLMInfo utility is required when requesting new licenses, and may also be requested by Uniface to ensure that you have the correct licenses for your needs.

DLM 9.0.1

The name has been changed to Uniface DLM **and the version is changed to 9.0. It replaces Compuware's Distributed License Manager 4.6.**

DLM is based on Compuware's DLM and provides the same functionality.

Note:

This version of Uniface DLM is completely compatible with the Compuware DLM, so a Uniface DLM Client can run against a Compuware License Service, and vice versa.

Customers who are currently using the Compuware DLM do not have to install Uniface DLM. You can continue to use your existing licenses, managed by the Compuware DLM License Service.

If you are a new customer, you will need to install the Uniface DLM in order to use Uniface.

The documentation delivered with Uniface DLM has been updated and consolidated to ensure that the information provided in PDF guides and online help is consistent and accurate.

Chapter 1 Introduction to License Management

The Uniface Distributed License Management system (DLM) protects Uniface software products from unauthorized usage and enables you to administer licenses for your Uniface products.

Licenses are provided as XML files that, depending on the license, may be installed on the same workstation as the Uniface product or feature, or on a central server that will check out and serve licenses to client workstations. When a central license server is used, client machines or servers running Uniface products must connect to a license service to obtain their license.

DLM must be installed on any machine that acts as a license source, whether an individual workstation or a central server, and on every workstation that will act as a client of a license server. The DLMcomponents that are installed depend on the platform and the type of license.

DLM Components

The core components of the DLM system are the license file, various administration tools, and the License Service.

Uniface DLM Core Components

DLM software consists of the following key components:

License file

An XML file that contains information about the license for one or more of your Uniface applications or features. It is generated by Uniface for a specific customer and specific machine.

Uniface DLM Application

A Windows-based administration tool that can be used by both administrators and users to view and manage Uniface licenses. It can also be used to obtain host information before requesting a license, administering the license server, and monitoring license usage and generating usage reports.

Uniface DLM Command Line Version (DLMCV)

The command line version of DLM provides most of the functionality provided by the DLM Windows application. It is available on all supported platforms. A simple menu interface enables you to use it interactively, but it can also be used for script-based configurations.

License Service

A process that manages requests from clients for a concurrent license. On Windows, it is automatically installed . On Unix, it must be manually installed.

Additional Tools and Utilities

Depending on the platform, Uniface Distributed License Management includes the following utilities:

DLM LicenseSync (Windows)

A desktop synchronization tool that enables end users to transfer license keys between a desktop computer and an attached mobile device It supports the communication protocols currently supported by Microsoft ActiveSync.

DLMInfo

A command line utility that generates a file containing information about the host ID, operating system, and processors of the machine where it is run. This file is used when requesting a new license, and may also be requested by Uniface to ensure that you have the correct license for your needs.

UMFilter

A command line utility used to generate license usage reports. It can be run in interactive mode or used with parameters in script files.

Usage reports can also be generated from the DLM application.

License Proxy Service

A proxy service that provides licensing support for platforms that support Uniface but which are not yet supported by DLM.

DLM Windows Application

The DLM application is used on both Windows servers and clients to interactively set up and manage license sources, and to configure and manage the License Service (if there is one installed).

> ***Note:*** *A command line interface is also available.*

The DLM application displays the Uniface license information available on both the client and server environments. It is used for license configuration and it provides current information about the system and local environment.

When DLM is started on a configured system, it immediately analyzes the license path and checks license sources. This determines the information displayed and the functionality available in the application.

User Interface

The following tabs are available on both server and client machines:

- Local Environment — displays the license sources and license keys available in the local environment, and enables you to add, remove, and sequence license sources.
- Advanced Configuration — enables you to configure the license environment. The contents vary depending on whether the License Service is installed in the local environment.

Figure: Figure: DLM Application on Windows Server
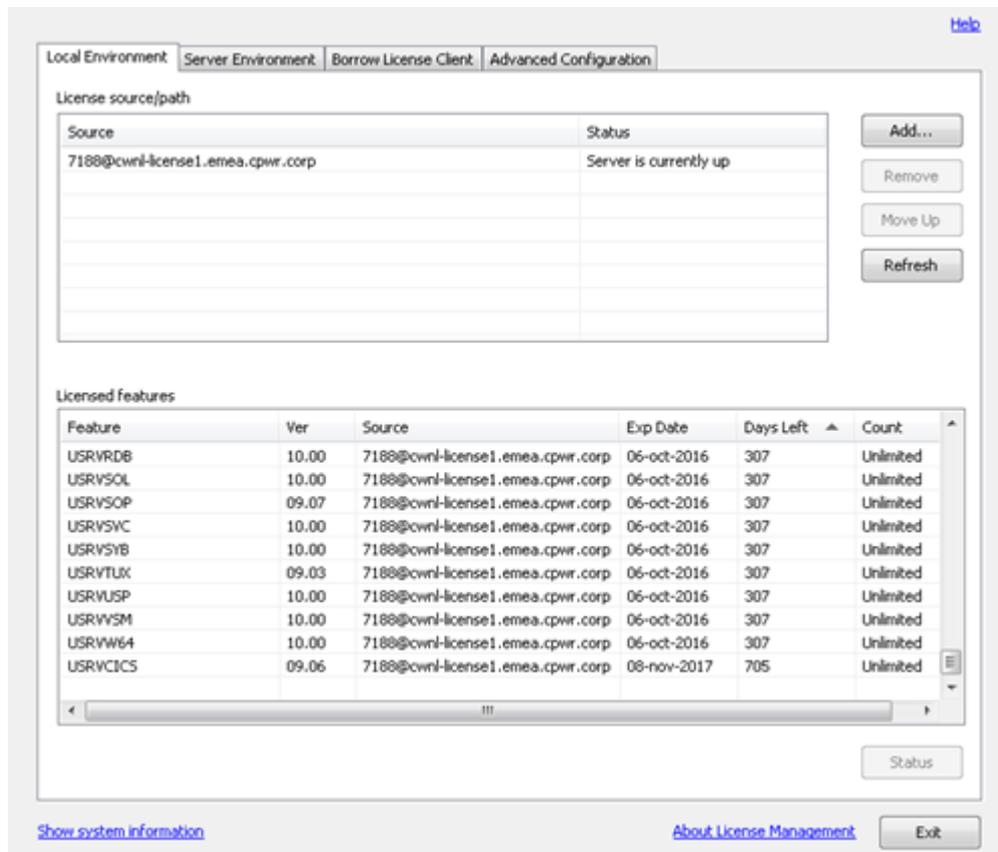
On a server machine, the following additional tabs are available:

- Server Environment—lists the license sources and licensed features served by the License Service, and enables the license administrator to manage the License Service.
- Borrow License Server—(if there are license features that support borrowing)

On a client machine, the following additional tabs may available

- Borrow Licence Client—(if there are license features that support borrowing)

DLM Command Line Version (DLMCV)

The DLMCV is the command-line version of DLM, and is available on all supported platforms. It provides both a text menu interface for interactive use and command-line options for script-based configurations.

DLMCV provides most of the functionality provided by the DLM Windows application. Some functions can only be accessed in menu mode, others only via the command line.

The DLMCV application is located in the license installation directory on the same directory level as the License Service.

The interactive DLMCV consists of a series of text-based menus, called *command lists*. Each menu label begins with one or more uppercase letters. Entering either the label of a menu or its abbreviated character set (denoted by the uppercase characters) provides access to the menu item. Menu items are either references to submenus or commands. Clicking the `Enter` key from any submenu returns you to the next highest menu level.

When the DLMCV is launched, the Main menu is displayed. It contains two submenus: **Client** and **License Service**. The following figure shows the **Main** menu.

To launch DLMCV run it from the platform's command line. For example, on OpenVMS run `dlmcv.exe` or on Unix, run `dlmcv.sh`.

Figure: Figure: DLMCV Main Menu

```
dlmcv - Copyright (C) 2015, Uniface B.V.
 All rights reserved


Last compiled Sep 15 2015 13:31:47


---DLMCV Main---


Client
 License service


Hit enter to return to the previous menu or key

in a command. Commands can be abbreviated using

the first N unique characters which are denoted

by the leading uppercase characters.
dlmcv>
```

License Service

The License Service is a long running process that manages and services requests for the licenses for multiple client machines. It is required for concurrent licenses.

The License Service can serve all Uniface features. It keeps track of licenses as they are checked out and checked in by users. Licenses are checked out by users on a first-come, first-served basis when they access the product. After all available licenses are issued, no additional users can run the product until another user exits and a license is checked in. Your license determines how many users can access the product at one time.

Figure: Figure: Typical Configuration for a Concurrent License
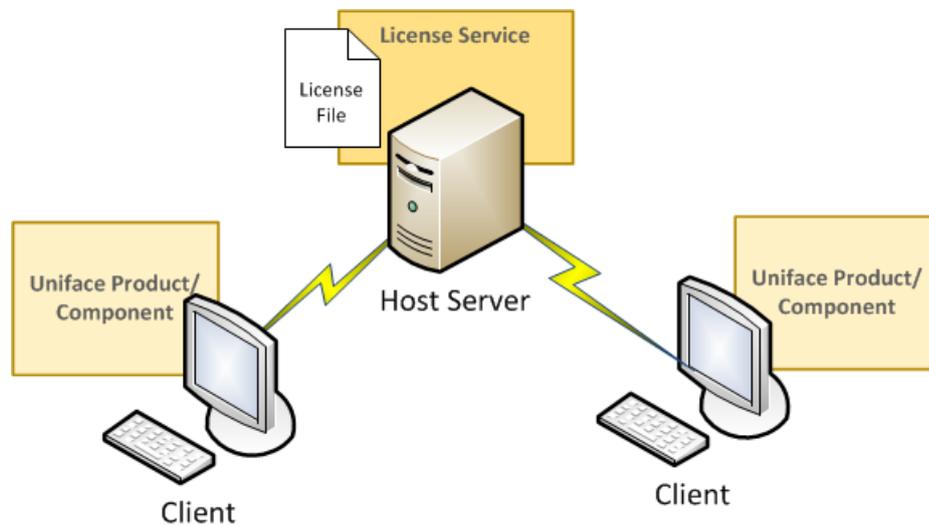
The License Service must be running on a computer or server that is always available to all clients needing access to the product. In many cases, it is recommended that you co-locate the License Service with the server-based components of one of the Uniface products you are installing.

If a large number of licenses are governed by a single license server, you should set up redundant servers so that if one server goes down, the License Service can still function. In this case the license file must support server redundancy.

On Windows, the DLM application will automatically start the License Service when a concurrent license is to the license environment.

On non-Windows platforms, the License Service must be explicitly started after a concurrent license is added to the license environment.

UMFilter

`UMFilter` is a command line utility that can be used to create usage reports for the License Service. It provides cross-platform and script support for database filtering and conversion of filtered data to comma-delimited files.

`UMFilter` can be found in the DLM installation directory.

If it is started without parameters, it runs in interactive mode, prompting you to specify the mandatory and optional parameters.

You can use the following syntax to run `UMFilter` in batch mode.

> ***Note:***
>
> *The command and parameters must all be entered on a single command line. They are presented on separate lines here for readability.*

```
UMFilter {{{-ffilename } | {-sport@host} }
{-sdMMDDYYYY}
{-edMMDDYYYY}
{-uusername}
{-afeature}
{-hhostname}
{-stHH:MM{AM|PM}}
{-etHH:MM{AM|PM}}}
```

Parameters

-f

Specifies a local database file.

-s

Specifies a remote service that has capture enabled.

-sd

Specifies the starting date within the database where filtering is to begin.

-ed

Specifies the ending date, that is, the date of the last record were filtering is to end.

-st

Start time window.

-et

Ending time window.

-u

Filter all records that contain the provided username.

-a

Filter all records containing the provided feature name.

-h

Filter all records that contain the provided hostname.

License Proxy Service

The License Proxy Service (`cpwrProxy32`) provides licensing support for platforms that are supported by Uniface, but not directly by DLM.

The License Proxy Service acts as a client for DLM. It is used when a licensed product runs on a platform that is not supported by Uniface DLM. Such applications are required to use concurrent licensing.

The License Proxy Service acts as a TCP/IP relay between a client on an unsupported platform and a License Service running on a supported platform. Both the License Proxy Service and the License Service must be run on a supported platform.

When the License Proxy Service and the License Service run on the same system, the port number chosen for License Proxy Service must be different from the port number used by the license server.

Command Line Syntax

```
cpwrProxy32
 [[-port port][-install[-start]|-remove]|[-stop]]
 | [-port?] | [-h] | [-status]
```

-install

Install as a service

-port

Specify a port number to listen on

-start

Start in the foreground or as a service

-remove

Remove the service

-stop

Stop the service if it has been installed

-port?

Get current port number

-help

Display command line help

-status

Display status

-about

Display current version

License Models

Uniface offers two license models—node-locked for single users, and concurrent for multiple users.

Node-Locked Licenses

A *node-locked license* allows the product to run on a single workstation, and does not require a License Service to manage license checkout.

Uniface issues node-locked licenses only for the trial version of Uniface.

A node-locked license is characterized by the absence of a `count` tag for the licensed feature. It is bound to the workstation by its NIC MAC Address or a hard disk signature.

Concurrent License Model

A *concurrent* license allows the product to run on more than one workstation so that multiple users can access the product at the same time. It is server-based and requires the use of the License Service to manage license requests.

Instead, licenses are checked out by users on a first-come, first- served basis when they access the product. When all available licenses are issued, no additional users can run the product until another user exits and a license is checked in. This request-and-issue process is managed by the License Service.

Concurrent licensing allows you to purchase a specific number of licenses without assigning these licenses to particular clients or having to obtain their unique node identifiers. Instead, the License Service running on a server handles requests for licenses from client workstations. When all available licenses are checked out, no additional users can run the product until a license is checked back in.

A concurrent license is defined by the `count` tag for the licensed feature in the license file. Other tags in the license file determine the type of concurrent license model.

There are several types of concurrent license model.

- Borrow-Enabled License Model—allows a user to borrow a feature or product for a specified amount of time, up to a maximum of 365 days.
- User-Manage License Model—allows the license administrator to control user access to specific options or features.
- First-Come, First-Served (*FCFS*)—limits the number of physical users to a defined set.
- User Duplication License Model—allows the user to run an unlimited number of instances of an application as long as it is the same user on the same machine. The net usage in this case is always one for the individual user, regardless of the number of instances running.
- Redundant Server License Model—provides limited protection against license server failure. It disperses the responsibility for managing the license files over a predetermined number of servers.

Borrow-Enabled License Model

A *borrow-enabled* concurrent license model allows a user to borrow a feature or product for a specified amount of time, up to a maximum of 365 days.

The license is exclusively checked out to each user, enabling multiple users to use the same machine, but to have access only to the keys checked out by their user ID. It can also be used to check out a license to a mobile device.

The key is checked in and returned to the server when the borrow time expires, or when the user checks the key in before the complete borrow time has elapsed.

A disadvantage to using this type of concurrent model is that if a machine with a borrowed license on it becomes disabled or lost, the borrowed license remains checked out until the time limit has expired. A good rule of practice is to keep the checkout duration to a minimum.

A borrow-enabled license is characterized by the presence of a *Borrowing* parameter in the license key for the application or feature.

Administrators can configure the number of licenses and the maximum number of days that specified license keys can be borrowed by editing the contents of the *borrow* parameter in the server configuration file. .

User-Manage License Model

A *user-manage* concurrent license model allows the license administrator to control user access to specific options or features.

This model is characterized by the presence of a *Umanage* parameter in the license key for the application or feature..

Administrators can grant or deny access to specified users or groups of users by editing the contents of the *user-management* parameter in the server configuration file.

Redundant Server License Model

A *redundant server* concurrent license model provides limited protection against license server failure. It disperses the responsibility for managing the license files over a predetermined number of servers.

If redundant servers have been set up and one or more of these servers goes down, you can continue to operate licensed Uniface features without interruption for as long as the policy specifies, provided the number of redundant servers does not fall below a failsafe count. No action is necessary after the downed servers are brought up again.

If the license supports redundant servers, it will have a `redundant` object, and each license key that supports redundancy will have a *Redundant* parameter that references the `redundant` object.

First-Come, First-Served License Model

A *First-come, first-served* (*FCFS*) concurrent license model limits the number of physical users to a defined set.

A physical user is defined as a login ID and is allowed to run on one machine per network. The set of defined users is based on a registration process in which the License Service registers each licensed user up to *N* users, where *N* is based on the license count. The *Nth*+one user that attempts to register is denied.

The FCFS license model is characterized by an *Fcfs* parameter in the license key of the licensed application or feature.

User Duplication License Model

A *user duplication* license model allows the user to run an unlimited number of instances of an application as long as it is the same user on the same machine. The net usage in this case is always one for the individual user, regardless of the number of instances running.

A *user duplication* license model is characterized by the presence of a *Dup_usr* parameter in the license key for the application or feature.

License Files

Uniface generates a license file based on your contract and on the machines where the license will be located.

A license file is an XML file that contains a single license object that includes one or more license keys, each of which corresponds to a specific feature or application. The license file is keyed to a specific host machine, and can only be provided by Uniface when you know where it will be installed.

License Keys

Each license key specifies the limits or behavior of a product based on the purchase agreement.

If an end user modifies license keys, the purchase agreement is invalidated and the associated application or feature will not work.

License File Format

1. The license is defined by the `license` object that contains at least one `key` object that licenses a specific application or feature.
2. If the license supports redundant servers, it will have one or more `redundant` objects, and each license key that supports redundancy will have a *Redundant* parameter that references a specific `redundant` object.
3. The `key` specifies the security key in its `protected` attribute. The `key` element contains parameters that define the application or feature it applies to, and specify the details of the usage extent.

Figure: License File Format

```
❶ <license>

    <customer_id>CustomerID</customer_id>


    <-- A redundant concurrent license contains a <redundant> object -->
❷   <redundantprotected='SecurityKey'>

        <!-- Omitted parameters ... -->
    </redundant>


❸ <keyprotected='SecurityKey'>

        <Description> ProductDescription </Description>
        <App> ApplicationName or undefined </App>
        <Vers> VersionNumber or undefined </Vers>
        <Start> StartDate or undefined </Start>
        <End> EndDate or undefined </End>
        <Count> NumberOfCurrentUsers | unlimited | undefined | infinite </Count>
        <hostid>
              <Eth> Ethernet address of licensed system </Eth>
              <Softkey> Softkey ID of licensed system  </Softkey>
              <Serial> Disk serial number of licensed system </Serial>
              <Ip> IP address of licensed system </Ip>
        </hostid>


        <!-- A key can have only a <hostid> (lowercase) or a <HostId> (mixed case)
        <Hostid> Host Id </Hostid>
        -->


        <!-- A concurrent license may specify the license model using the following parameters
        <Fcfs/>
        <Borrowing/>
        <Umanage/>
        <Dup_usr/>
        <Redundant> Policy Id </Redundant>
        -->


        <Parameters> Application-specific parameters  </Parameters>
    </key>
</license>
```

Request a License File from Uniface

Uniface generates license files based on your contract and on the machines where the licenses will be located.

Before you begin:
Install DLM on each machine that will act as a license server (for concurrent licenses). Uniface DLM can also be installed on a Windows virtual machine.

To obtain a license for a Uniface application or feature, you need to run the DLMInfo command line utility, which gathers the information about the machine on which the license will reside.

> *Tip:*
>
> *For a concurrent license, you need to supply Uniface with the host ID of the server (or servers) on which the License Service runs, not the host IDs of the client machines.*

1. Navigate to the directory where DLM is installed and run the DLMInfo utility.

    1. On Windows, Unix, and Linux systems, type **dlminfo** (or **dlminfo64**) and press Enter.

        This displays information about the system and the location of a file called **system_ info.txt**, which contains the system information.

        > *Note:*
        >
        > *On Windows virtual machines, Uniface DLM generates a unique identifier using the Ethernet address and the network name on which the virtual environment image resides.*

    2. On iSeries, run the DLMINFO program using the following CL command to display system information. .

        Assuming, Uniface DLM is located in the **DLM** library:

        ```
        CHGCURLIB DLM
        CALL DLM/DLMINFO
        ```

2. Send an email with the **system_info** file to the Uniface License Management department at License.Management@uniface.com.

    A Uniface representative will generate a valid license file and send it to you by email. The license file is based on your contract and on the machine where the license will be located.

What to do next:
After you receive the license file, copy it to the **/license** directory or library of the Uniface DLM installation on the specified host machine, then add license and configure Uniface DLM on each machine with a license source.

Redundant License Servers

If a large number of licenses are governed by a single license server, you should set up redundant servers so that if one server goes down, the License Service can still function.

This is only possible if the license file supports redundancy. Host information about the servers used for redundancy must be included when you request a license.

Under license server redundancy, multiple license servers are deployed to support a single license. If one or more of the servers fails, the remaining servers ensure that a temporary state of license support is maintained for a predetermined amount of time while the initial state is restored.

Most redundant license systems rely on communications between license servers to maintain a consistent count of usage. The License Service relies on its clients to maintain license count consistency across redundant license servers.

License Pools

A license pool is a collection of license tokens for use in managing a concurrent license key. The number of license tokens available in the pool is determined by the `Count` specified for the license key. By default, a license pool exists for each concurrent license key.

To distribute and manage the license tokens available for a license feature, the license administrator can define virtual license pools, so each license feature may have several license pools associated with it. In this case, all clients that use that key must be provided with a pool ID, otherwise they are denied access to the licensed application or feature.

Each license pool has a limit set for the maximum number of tokens it contains. The total number of tokens set for all license pools associated with a specific license key may exceed the number of licenses specified by the `Count`. This is possible because denial will always occur when the number of tokens in use exceeds the `Count`.

Multiple users can share the same pool ID. Users that share defined pool IDs are collectively limited by both the pool limit and the `Count`.

License Borrowing

License borrowing enables you to check out concurrent licenses from the License Service and then use a Uniface application disconnected from the network.

On Windows, configuration of the license borrowing components is handled automatically when a license is installed using the DLM application.

On other platforms, license borrowing must be configured using the DLM - Command Line (DLMCV) application.

Managing Borrow-Enabled Licenses

Both the DLM Windows application and DLMCV provide facilities for license administrators to configure license borrowing, and for clients to borrow and return licenses.

You can also use the command line interface to borrow and return licenses.

Chapter 2 Configuring the License Environment

The first step in configuring the license environment is to add license sources. For concurrent licenses, the administer can then configure the License Service.

A concurrent license is installed on a machine that will act as the license server to client workstations where Uniface applications and features are installed. The License Service must be installed and configured on this same machine.

Data transmission between DLM clients and the License Service is platform independent, providing support for heterogeneous networks. This means that DLM running on one operating system, such as Windows or Unix, can communicate with a client running on a OS.

Licenses sources are added and configured using the DLM application on Windows, and the DLMCV on all platforms.

License Environment

Every DLM installation has a client license environment that defines the available license sources. If one of the license sources is a locally-available license file that includes a concurrent license, there is also a server license environment for the License Service.

A license environment can include multiple sources, including locally-installed license files and license servers. When a request is made to check out a license for a Uniface feature, all sources in the client license environment are scanned until a valid key is found.

> *Tip:*
>
> *If there are old or obsolete license sources in the environment setting, you should delete them to improve product response time. Only currently operating servers should be specified in the license environment setting.*

Information about the license environment is managed using the DLM administration tools (the Uniface DLM Windows application or DLMCV), and stored in a configuration file, which is created the first time a license source is added. The configuration files are XML-based, so they provide a similar heterogeneous methodology for component configuration. The location of these files on clients and servers is similar for all supported platforms.

- For a concurrent license, the license environment is maintained in the `config` directory of the Uniface DLM installation.

- For a node-locked license, the license environment can be defined globally for all users of a

machine, or locally for individual users. If end users have a local configuration, it overrides a global configuration. The location of a configuration file determines whether it is global or a local.

Global and Local Client License Environments

The client license environment is maintained in a `.compuware` directory. The location of this directory determines whether it is shared by all users or processes on the system (global environment), or whether it is applicable on to specific users (local environment).

By default, the client license environment is global, but this can be changed when configuring the client license environment.

- Depending on the Windows platform, the global `.compuware` folder may be in `\Documents and Settings\All Users` or in `\Users\Public\`. For example, `C:\Users\Public\.compuware`.

- On Unix, the global `.compuware` directory is located in the root directory of the system

- On iSeries, the global `.compuware` directory is located under the directory defined by the `DLM_ROOT` data area.

On Unix and Windows, a local `.compuware` directory is located in a user's login directory.

Client Configuration File

The client configuration file `config.xml` identifies the license sources that can be used by the licensed client during key resolution, and modifiable parameters for the client license environment.

The configuration file is located in the `.compuware` directory, which may be in the system's root directory or in the user's login directory.

For example, on Windows, the configuration file could be in `C:\Users\Public\.compuware` or `C:\Users\jdoe\.compuware`.

If a user's `.compuware` directory cannot be found, the License Service client will try to use the `.compuware\` directory that resides in the system's root directory.

```
<config>
  <connection_timeout>Seconds</connection_timeout>
  <nagel_algorithm/>
  <server_loading/>
  <proxy_server>
    <port>
       <start>PortNumber</start> |
       <range>PortNumberRange</range> |
       <linger>Integer</linger>
```

```
    </port>
  </proxy_server>
  <borrow_server>host@server</borrow_server>
  <license>host@server</license>
  <heartbeat_interval>Seconds</heartbeat_interval>
  <broadcast_attrib>
    <user_case> upper | lower </user_case>
    <host_case> upper | lower </host_case>
  </broadcast_attrib>
  <pool>PoolId</pool>
</config>
```

Table: Client Configuration Parameters

Parameter	Description
connection_timeout	Number of seconds to keep a non-responding connection open. Default is 10.
Common Configuration Parameters	The license parameter defines a single license source. A configuration file must have at least one license parameter and it may have more.
heartbeat_interval	Sets the number of seconds to wait for a Uniface application to notify the DLM server that checked out licenses are still in use.
port	On the client, this parameter can be used to define a port number, or a range of port numbers, that is used to receive the data stream from the License Service. On the server, it specifies the port number that the License Service uses for incoming requests.
nagle_algorithm	When defined, the Nagle Algorithm is used when transmitting data via TCP/IP to DLM.
Client Configuration Parameters	If the License Proxy Service (cpwrProxy32) is required, defines the port number that it uses.
borrow_server	Defines a License Service that contains borrow-enables license keys.
server_loading	If more than one license source is defined, instructs the client to split requests for one or more license tokens across multiple license sources.
broadcast_attribute	Defines the letter case used to exchange data between the client and the License Service. This is useful when dealing with user-managed licenses.
pool	Name of a license pool to which a client belongs.

Server Configuration File

The server configuration file is an XML file (`config.xml`) that holds the configuration parameters for the License Service. It defines the location of the license sources and modifiable attributes that govern license management.

The server configuration file is located in the `config` directory of the Uniface DLM installation.

A running License Service will automatically re-load the configuration file if changes are detected, so the License Service does not need to be restarted after a change.

The configuration file can be modified using the Uniface DLM Windows application, DLMCV command line application, or by manually editing the file.

Configuration File Format

Element names are case-sensitive and must be entered exactly as shown. The *server* section is mandatory and contains parameters that define: the server's timeout, license files, and port number. Other parameters and sections are optional.

```
<config>
   <server>
    <port>PortNumber</port>
    <connection_timeout>Seconds</connection_timeout>
    <nagle_algorithm/>
    <max_threads>ThreadCount</max_threads>
    <max_log_size>SizeInBytes</max_log_size>
    <audit/>
    <license>LicenseFile</license>
    <net_security>AllowedNumberOfFailedTransmissions</net_security>
    <new_log_on_start/>
   </server>

   <mail_notification><smtp>SmtpServer</smtp>
    <enabled/>
    <on>
       <denied>
         <filter>
           <keep>host|user|feature</keep>
           <discard>host|user|feature</discard>
         </filter>
         <frequency>FrequencyValue</frequency>
       </denied>
       <borrowed/>
```

```
        <security/>

        <stop/>

        <start/>

        <expire>DaysRemaining</expire>

    </on>

    <to>EmailAddress</to>

    <subject>Subject</subject>

 <mail_notification>


 <user_management>

    <application>

        <user/>

        <everyone/>

    </application>

</user_management>


<pools>

    <Application>

        <poolID>MaxTokenCount<PoolID>

        <poolID_N>MaxTokenCount<PoolID_N>

    </Application>

<pools>


 <borrow>

    <ApplicationN>

        <count>MaxTokenCount</count>

    </ApplicationN>

  </borrow>


 <concurrent>

    <ApplicationN>

        <count>MaxTokenCount</count>

    </ApplicationN>

  </concurrent>


</config>
```

Table: Configuration Parameters

Parameter	Description
Server Configuration Parameters	Mandatory section of a server configuration file. It contains parameters that define the server's timeout, license files, and port number. Other parameters and sections are optional.
port	On the client, this parameter can be used to define a port number, or a range of port numbers, that is used to receive the data stream from the License Service. On the server, it specifies the port number that the License Service uses for incoming requests.
connection_timeout	Number of seconds to keep a non-responding connection open. Default is 10.
Common Configuration Parameters	The license parameter defines a single license source. A configuration file must have at least one license parameter and it may have more.
nagle_algorithm	When defined, the Nagle Algorithm is used when transmitting data via TCP/IP to Uniface DLM.
max_threads	On Windows only, the maximum number of threads that can be launched by the License Service at any given time.
mail_notification	Used to configure the License Service to provide email notifications for license-related issues. The Simple Mail Transfer Protocol (SMTP) protocol is used.
net_security	Instructs the License Service how to handle dubious or malicious requests for licenses.
pools	Defines one or more license pools that can be used to manage concurrent license features.
concurrent	Limits the number of concurrent licenses that can be used for specified applications or features.
Restricts the number of license tokens and the maximum number of days that specified license keys can be borrowed.	Restricts the number of license tokens and the maximum number of days that specified license keys can be borrowed.
user_management	For licenses that are enabled for the user-manage license model, defines who can use application or feature.

Configuring Uniface DLM

Once DLM is installed, you need to add one or more valid license sources. A license source can be a local file or the address of the License Service. The procedure for adding a license source is the same on both the server that hosts the License Service, and for client machines.

License Server

For a concurrent license, the license file must first be added to the licensed server. This is any system that has been authorized by a valid license file to provide remote start-up authorization for Uniface applications.

When a valid concurrent license file is added on the licensed server machine, the License Service must be started. This is done automatically on Windows, but must be done explicitly on other platforms. The address of this License Service can then be added as a license source to the Uniface DLM clients.

Depending on the licensed functionality (such as license borrowing and user manage licensed) the organization's requirements, it may be necessary for the license administrator to configure license borrowing, define authorized users, configure redundant servers, create license pools, and define usage log files.

License Client

A license client is any system that runs a Uniface application and connects to a License Service to obtain licenses for Uniface features.

In most cases, adding license sources is all that is required to configure the client license environment. If required, the license administrator may assign a pool ID to a client.

Configuring the License Environment on Windows

Configuring the license environment requires you to copy the license to the DLM installation on the host server, and configure the configure each client to access the License Service on the server.

Before you begin: **Before you begin**

Obtain a license file from Uniface. The license file is based on your contract and on the machine where the license will be located.

1. Copy the license file to **C:\Program Files\Common Files\Compuware\License**.
   Note:

   You can add the license file directly to the **License** *folder, then start up the License Service to install a license.*

**Configure the License Environment**

Define a local license environment by adding one or more license sources. When adding licenses, you must run Uniface DLM as administrator.

1. Start the Uniface DLM application from the Windows Programs menu. (Right-click and choose **Run as administrator**.)

   If this is the first license being installed, use the **Local Environment** tab.

   If you have previously installed a concurrent license, the License Service should already be installed and running, and a **Server Environment** tab will be present in the DLM application. You can use it to add another license source.

2. Click **Add** to open the Add License dialog box.
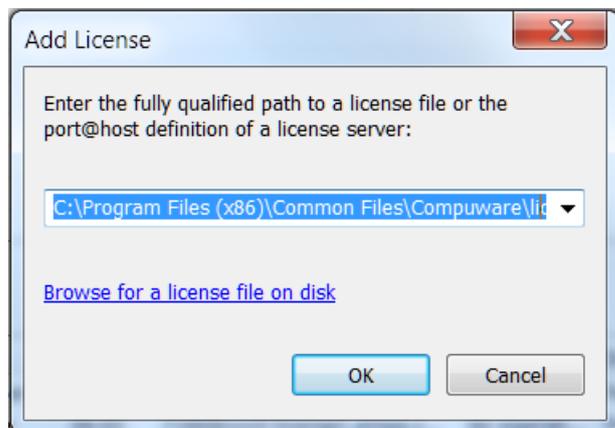
3. Specify the location of a license.

   On a license server, the source must be a file, not another license server. If a license file is available locally, it is usually located in the **License** folder of the Uniface DLM installation.

   If the license is available on a server, enter the of the host server, in the format **port@host**. The port number is typically 7188. For example 7188@license1.mycomp.corp.

4. Click **OK** to add the license source to the environment.

   If the license file is located on this machine and it is a concurrent license, the License Service is automatically started and installed. A **Server Environment** is added to the Uniface DLM application, which can be used to administer the License Service.

What to do next:

In some circumstances, additional configuration may be required for the client. In most cases, you should only change these options if instructed to do so by a license administrator or a Uniface representative.

1. Go to the Advanced Configuration tab.

2. In the **Client Configuration** section, modify settings as required.

Configure the License Service on Windows

You can use the DLM application to add remove license sources, and preform additional license administration.

1. **Start the License Service**

   The License Service is automatically started on Windows machines where a concurrent license has been added. However, when performing maintenance, you may need to stop and restart the License Service. For example, you may need to switch to a different license or perform service in your license environment.

   a. In the DLM, go to the **Server Environment** tab and click **Start** or **Stop**.

   b. Alternatively, in Windows File Explorer, navigate to your DLM installation and double-click `cpwr.exe`.

   You cannot run more than one License Service at a time, so if it is already running you will be prompted to shut it down, and optionally to remove it altogether.

   If the License Service has not been installed or is not running, you are prompted to (install and) start it.

2. **Adding Licenses**

   Use the DLM Windows application to configure a license for use by Uniface. It enables you to add a license file to a License Service, and then to configure each client to access the License Service.

   a. Start the DLM application from the Windows Programs menu.

   If you have previously installed a concurrent license, the License Service should already be installed and running, and a **Server Environment** tab will be present in the DLM application. You can use it to add another license source.

   b. Click **Add** to open the Add License dialog box.
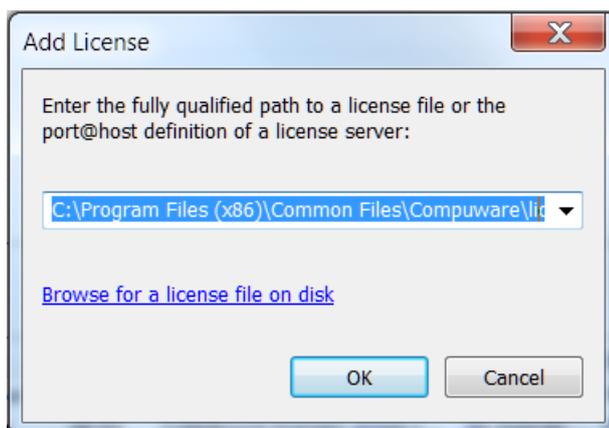
   c. Specify the location of a license.

   On a license server, the source must be a file, not another license server.

      d. Click **OK** to add the license source to the environment.

        The License Service is stopped, the license file is added, and the License Service is restarted.

      e. Review the list of licensed features to ensure that the desired features are available.

        If there are multiple old or obsolete paths listed field, delete them to improve response time.

3. **Removing Licenses**

    To remove a license source, select it in the **License source/path** field and click **Remove**.

4. **Further License Environment Configuration**

      a. If there are multiple (redundant) license servers available, repeat the previous steps on each server.

        If one of the licensed features is borrow-enabled, a **Borrow License Server** tab is also added.

      b. To initialize the redundancy policy, launch the product that uses DLM from one client.

        Note:

        If redundant servers have been set up and one or more of these servers goes down, you can continue to operate licensed Uniface features without interruption for as long as the policy specifies, provided the number of redundant servers does not fall below a failsafe count. No action is necessary after the downed servers are brought up again.

      c. To remove a license source, select it in the **License source/path** field and click **Remove**.

        Caution:

        This will physically remove the license file from its specified location. You should ensure that you have a backup in another location.

4. To configure other aspects of the License Service behavior:

      1. Go to the Advanced Configuration tab.

      2. In the **Server Configuration** section, modify settings as required.

Reviewing the Use of Licensed Features

Checking the status of a license feature allows you to identify the users currently using this feature, as well as checking your license environment for errors.

In the **Local Environment**, select a feature in the **License features** field and click **Status**.

The **Status** dialog box displays the number of users and whether the feature is working properly.

Configuring User-Manage Licenses

Specify the users who can use a specified license feature. This is only possible for license keys that have the *Umanage* parameter.

1. In the Advanced Configuration tab, select **User manage** and click the ellipsis button.

   The User Manage window is displayed.

   Figure: Figure: User Manage Window

2. Add the users that are allowed to use a selected feature.

    1. Select the feature and click **Add**.

    2. To allow all users to access the feature, add the keyword `everyone`.

    3. To exclude, some users, add the `everyone` keyword and the login IDs of excluded users.

    4. To authorize only selected users, enter the login IDs of users who are allowed to use the feature. Do not use the `everyone` keyword.

3. Once the changes have been made, click **OK** to implement them.

Configuring the License Environment with DLMCV

On non-Windows platforms, you can use DLMCV to add and remove license sources with DLMCV from the **License Path** menu.

If the License Service is required (concurrent license), each client must be configured to access the license key database. If the License Service is not required (node-locked license), a license file is required on each client machine.

The DLMCV application is located in the license installation directory on the same directory level as the License Service.

When the DLMCV is launched, the **Main** menu is displayed. It contains two submenus: **Client** and **License Service**.

Adding a license source

a. Start DLMCV from the platform command line.

b. Choose the license environment you are configuring.

    - Enter `C` to start the **Client** menu.

    - Enter `L` to start the **License Service** menu.

    Both menus include a **License path** command.

c. Enter `L` to start the **License Path** menu.
   Figure: Figure: License Path Menu

```
 Current setting(s):


  not set


 ---[License path ] Command list---


  Add
  Remove
```

```
 Hit enter to return to the previous menu or key

 in a command. Commands can be abbreviated using

 the first N unique characters which are denoted

 by the leading uppercase characters.

 dlmcv>
```

d. Enter **A** to add a license.

e. At the prompt, specify the ***port@host*** to your license server, or the fully qualified path to a local license file, then press Enter.

   If a license file is available locally, it is usually located in the **License** folder of the Uniface DLM installation.

   If the license is available on a server, enter the of the host server, in the format ***port@host***. The port number is typically 7188. For example, 7188@license1.mycomp.corp.

   > ***Note:***
   >
   > *If you are installing a concurrent license on a License Service, you will need to (re-)start the License Service.*

f. Press **Enter** again to return to the previous menu.

g. Enter **v** to choose **Verify**.

   You can now test whether a license checkout would work using the current setting. It is important that you do this, because if you cannot successfully verify a license, then Uniface cannot check out the license.

h. If there are multiple (redundant) license servers available, repeat the previous steps to add each server as a source.

i. To initialize the redundancy policy, launch the product that uses DLM from one client.

   > ***Note:***
   >
   > *If redundant servers have been set up and one or more of these servers goes down, you can continue to operate licensed Uniface DLM features without interruption for as long as the policy specifies, provided the number of redundant servers does not fall below a failsafe count. No action is necessary after the downed servers are brought up again.*

Configure the License Environment on Unix

To configure the license environment, you need to copy the license to the DLM installation on the host server, start the License Service, and configure the License Service and configure each client to access the license.

1. **Before you begin**

   Obtain a license file from Uniface. The license file is based on your contract and on the machine where the license will be located.

   a. Copy the license file you received from Uniface to the **/license** directory in the DLM installation on Unix

2. **Start the License Service**

   You can configure the License Service to start automatically (each time the server boots) or to be started manually.

   You cannot run more than one License Service at a time. If one is already running, you must shut it down before starting a new one.

   a. To start the License Service manually (required each time the server reboots), type **cpwr.sh -start**.

   b. To start the License Service automatically each time the server reboots, follow the suggested procedure below for the appropriate platform.

Platform	Action
AIX	In **etc/rc.local**, type the following command on one line: `/DLMInstallDir/cpwr.sh -start`
HP-UX	In **/sbin/rc3.d**, create a file named **s95cwlm.server** and add the following command to the file: `/DLMInstallDir/cpwr.sh -start`
Linux	In **/etc/rc.d/rc2.d**, create a file named **s95cwlm.server** and add the following command to the file: `/DLMInstallDir/cpwr.sh -start`
Sun Solaris	In **/etc/rc2.d**, create a file named **s95cwlm.server** and add the following command to the file: `/DLMInstallDir/cpwr.sh -start`

   c. To stop the License Service, type **cpwr.sh stop**

3. **Configure the License Environment**

   Use the DLMCV License Administration Utility to configure a license for use by Uniface. It enables you to add a license file to a License Service and then to configure each client to access the License Service.

The DLMCV provides a simple text interface for configuring both the License Service and Uniface clients. It also provides support for script-based configurations.

a. Start DLMCV by entering the following command:

```
/DLMInstallDir/dlmcv.sh
```

The DLMCV Main Menu is displayed. It contains two submenus: Client and License Service.

b. Choose the license environment you are configuring.

- Enter **C** to start the **Client** menu.

- Enter **L** to start the **License Service** menu.

Both menus include a **License path** command.

c. Enter **L** to start the **License Path** menu.
    Figure: Figure: License Path Menu

```
Current setting(s):


 not set


---[License path ] Command list---


 Add
Remove


 Hit enter to return to the previous menu or key
in a command. Commands can be abbreviated using
the first N unique characters which are denoted
by the leading uppercase characters.
dlmcv>
```

d. Enter **A** to add a license.

e. At the prompt, specify the **port@host** to your license server, or the fully qualified path to a local license file, then press Enter.

If a license file is available locally, it is usually located in the **License** folder of the Uniface DLM installation.

If the license is available on a server, enter the of the host server, in the format **port@host**. The port number is typically `7188`. For example, `7188@license1.mycomp.corp`.

> **Note:**
>
> *If you are installing a concurrent license on a License Service, you will need to*

> *(re-)start the License Service.*

f. Press **Enter** again to return to the previous menu.

g. Enter **v** to choose **Verify**.

You can now test whether a license checkout would work using the current setting. It is important that you do this, because if you cannot successfully verify a license, then Uniface cannot check out the license.

DLM Components on Unix Platforms

The installation directory on Unix includes the following files:

Table: Uniface DLM Components on Unix Platforms

Component	Description
Readme	Additional License Service information.
/bin	For Uniface use only.
/config	Directory containing the server configuration file **config.xml**.
cpwr.sh	License Service.
dlminfo.sh	Generates a file containing system information.
install.log	Contains data from the installation process.
dlmcv.sh	Uniface Distributed License Management - Command Line Version.
libdlm32.so	Runtime library used by clients.
libdlm64.so	Runtime library used by clients.
/license	Directory containing license files.
os	Multi-platform support.
vlog.sh	License Service log file.

Configuring the License Environment on iSeries

Configuring the license environment requires you to copy the license to the DLM installation on the host server, start the License Server, and configure the License Server and each client to access the license.

Before you begin:
Obtain a license file from Uniface. The license file is based on your contract and on the machine where the license will be located.
Copy the license file you received from Uniface to the **/.DLM/license** IFS subdirectory of the Uniface DLM installation.

You can do this by using FTP in ASCII mode (the license files are text XML files).

1. **Start the License Server**

   Before a client can access a served license, the host server must have the icense Server installed and running.

   To be able to start it, you need to be authorized to submit the **CPWR** program in the installation library.

   a. Check whether a License Server is running using WRKACTJOB.

      You cannot run two License Servers simultaneously and must shut one down before starting a new one.

      ```
      SBMJOB CMD(CALL PGM(DLM/CPWR)

             JOB(CPWR)

             CURLIB(DLM)

             WRKACTJOB(*YES)
      ```

      A job called CPWR will be shown under subsystem QBATCH.

      Note:

      For more information regarding the syntax and available command line options, perform the following command:

      ```
      CALL PGM(DLM/CPWR) PARM('/h')
      ```

   b. Start the License Service:

      ```
      SBMJOB CMD(CALL PGM(DLM/CPWR)

             JOB(CPWR)

             CURLIB(DLM)

             ALWMLTTHD(*YES)
      ```

      Note:

      To start the License Server in debug mode, use the following command:

      ```
      CALL PGM(DLM/CPWR) PARM('/d')
      ```

2. **Configure the License Environment**

   Use the DLMCV License Administration Utility to configure a license for use by Uniface. It enables you to add a license file to a License Service and then to configure each client to access the License Service.

   The DLMCV provides a simple text interface for configuring both the License Service and Uniface clients. It also provides support for script-based configurations.

a. Start DLMCV by entering the following commands:

```
CHGCURLIB DLM
CALL DLM/DLMCV
```

The DLMCV Main Menu is displayed. It contains two submenus: Client and License Service.

b. Choose the license environment you are configuring.

- Enter **C** to start the **Client** menu.

- Enter **L** to start the **License Service** menu.

Both menus include a **License path** command.

c. Enter **L** to start the **License Path** menu.
Figure: Figure: License Path Menu

```
Current setting(s):


 not set


---[License path ] Command list---


 Add
Remove


 Hit enter to return to the previous menu or key

in a command. Commands can be abbreviated using

the first N unique characters which are denoted

by the leading uppercase characters.
dlmcv>
```

d. Enter **A** to add a license.

e. At the prompt, specify the ***port@host*** to your license server, or the fully qualified path to a local license file, then press Enter.

If a license file is available locally, it is usually located in the **License** folder of the Uniface DLM installation.

If the license is available on a server, enter the of the host server, in the format ***port@host***. The port number is typically 7188. For example, 7188@license1.mycomp.corp.

> **Note:**
>
> *If you are installing a concurrent license on a License Service, you will need to (re-)start the License Service.*

f. Press **Enter** again to return to the previous menu.

g. Enter **v** to choose **Verify**.

You can now test whether a license checkout would work using the current setting. It is important that you do this, because if you cannot successfully verify a license, then Uniface cannot check out the license.

For a typical iSeries installation, you can verify license feature USRVDB2, or UDB2, and version 09.01. If everything works correctly, you will see a screen similar to this:

```
This feature is working properly


source             : 7180@myiseries.mydomain.com
feature/app        : USRVDB2
requested version  : 09.06
actual    version  : 09.06
expires            : 40 days
type               : concurrent

```

Client License Environment on iSeries

On the iSeries, login directories are not required so not every user has a login directory to define a local configuration. To provide similar functionality, an administrator can define data areas within `DLM.LIB`, naming them after user login names that contain the parent directory locations in which local configuration folders reside.

iSeries administrators can set up local client configurations by using the following series of commands:

```
CRTDTAARA DTAARA(DLM/USERNAME) TYPE(*CHAR) LEN(256) VALUE('userdirectory')


CPY OBJ('/.uniface') TODIR('userdirectory') SUBTREE(*ALL)
```

- `DLM`—root directory in the root file system that contains DLM configuration files.
- *USERNAME*—login name of a user.
- The *userdirectory*—parent directory where the `.uniface` folder resides.

Note:

DLM does not provide a user interface to add user data areas because the iSeries already provides APIs and commands to perform this task.

During application startup, Uniface DLM checks for a local configuration by checking for the presence of a username-based data area within the `DLM.LIB` library object.

- If the data area exists, the client environment is loaded from the directory defined in the user's data area.

- If a matching data area is not found, the Uniface DLM runtime loads the client environment from `/.uniface/config.xml`.

The following diagrams illustrate the `DLM.LIB` library object and the Uniface DLM root folder in which configuration information is stored.

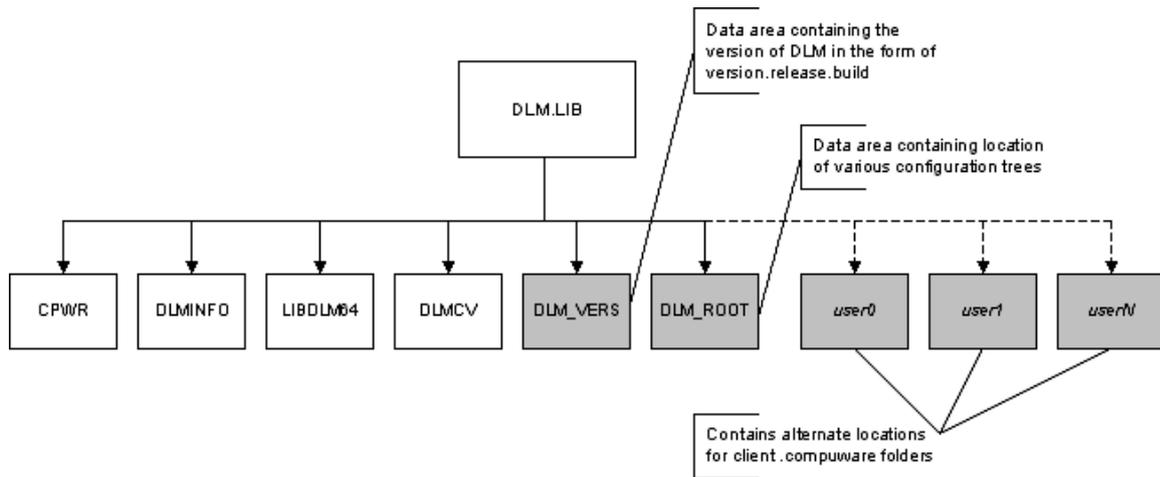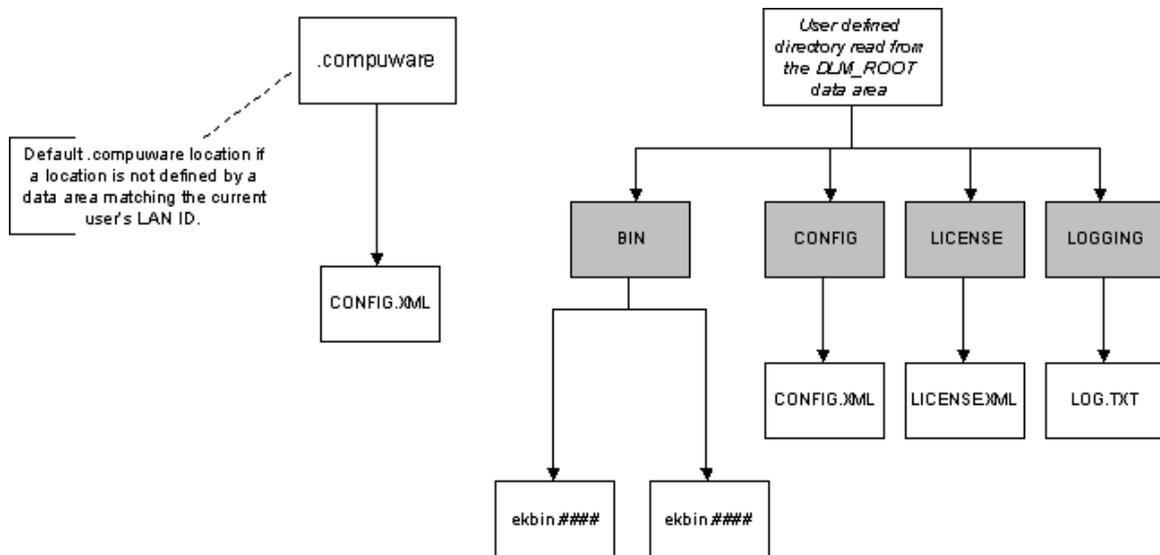Figure: Figure: DLM.LIB Library Object on the QSYS.LIB File System.

Figure: Figure: DLM Data Files on the ROOT File System

Chapter 3 License Administration

Once the license environment is configured and running, you can monitor usage, generate reports, and perform other license administration activities. Users can also borrow licenses.

License Pools

A license pool is a collection of license tokens for use in managing a concurrent license key. The number of license tokens available in the pool is determined by the `Count` specified for the license key. By default, a license pool exists for each concurrent license key.

To distribute and manage the license tokens available for a license feature, the license administrator can define virtual license pools, so each license feature may have several license pools associated with it. In this case, all clients that use that key must be provided with a pool ID, otherwise they are denied access to the licensed application or feature.

Each license pool has a limit set for the maximum number of tokens it contains. The total number of tokens set for all license pools associated with a specific license key may exceed the number of licenses specified by the `Count`. This is possible because denial will always occur when the number of tokens in use exceeds the `Count`.

Multiple users can share the same pool ID. Users that share defined pool IDs are collectively limited by both the pool limit and the `Count`.
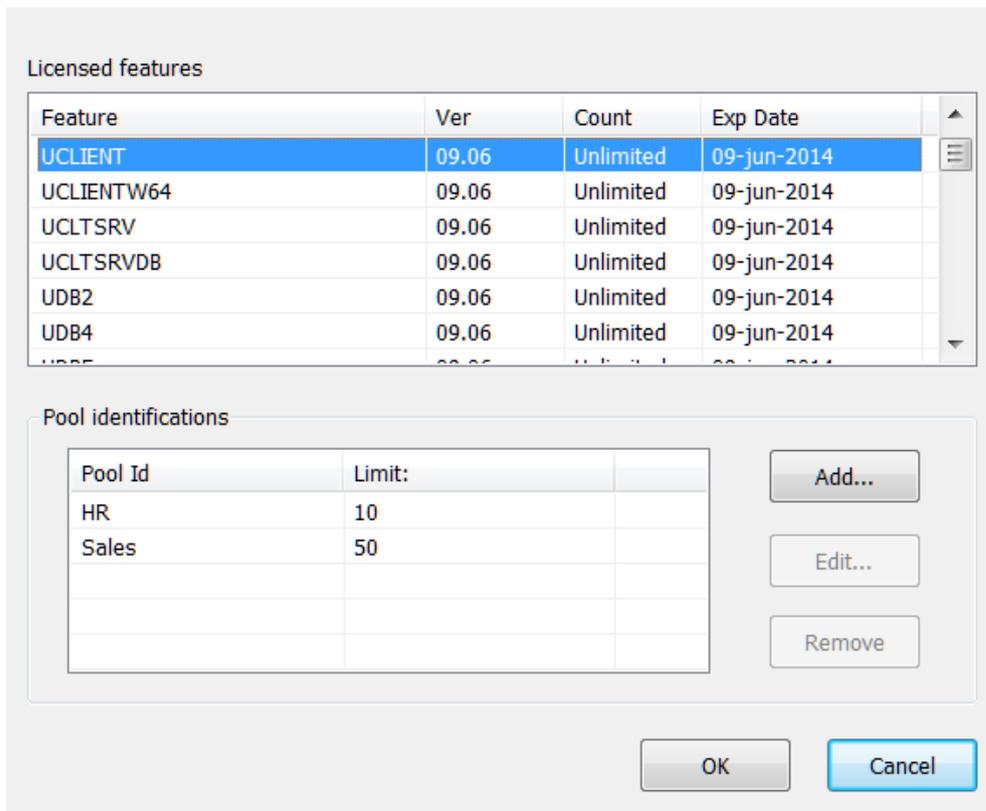
Defining License Pools

Define license pools for a specific feature

> ***Note:***
>
> *Once a pool has been defined, all clients referencing that License Service must have a pool ID.*

1. In the Advanced Configuration tab, select **Pools** and click the ellipsis button to the right. The Pools window is displayed.
   Figure: Figure: Pools Window

2. Add or edit a pool identifier.

    1. To add a pool identifier to a particular feature, select the feature and click the **Add** button.

        The Add Pool Identification dialog box is displayed.

    2. Change the value of the pool ID and specify the maximum number of licenses associated with this identifier.
    Figure: Figure: Add Pool Identification Dialog Box
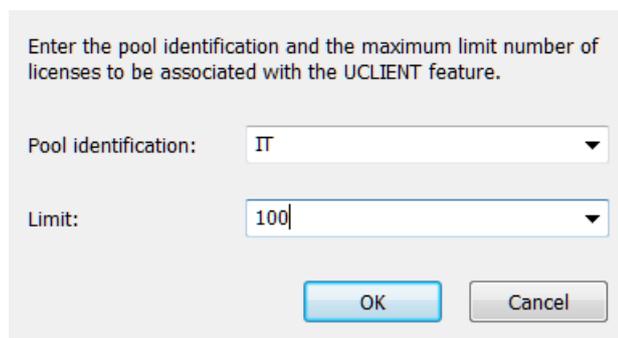
    3. To modify the number of licenses associated with an existing pool identifier, select the Pool ID and click the **Edit** button.

What to do next:
After defining license pools, you need to inform users what their pool ID is so that they can set their **Pool**

ID configuration option.

License Borrowing

License borrowing enables you to check out concurrent licenses from the License Service and then use a Uniface application disconnected from the network.

On Windows, configuration of the license borrowing components is handled automatically when a license is installed using the DLM application.

On other platforms, license borrowing must be configured using the DLM - Command Line (DLMCV) application.

Managing Borrow-Enabled Licenses

Both the DLM Windows application and DLMCV provide facilities for license administrators to configure license borrowing, and for clients to borrow and return licenses.

You can also use the command line interface to borrow and return licenses.

Creating a Group for License Borrowing

To make it easier to borrow several related license features, you can define license groups.

A group is one or more common product features grouped under a single common name. These groups are defined in group files and a single group file can contain multiple groups. The file names will have a `.grp` extension.

On Windows, `.grp` files can be created using the Uniface DLM application.

On non-Windows platforms, create a text file with the `.grp` extension in the `/license` directory. You can use the group file template as your model.

1. In the Uniface DLM application, go to the **Borrow License Client** tab.
2. Click the **Groups** button to display the Groups dialog box.
3. Check the **Use borrow group file** checkbox, and click the **Create** button.

Alternatively, to modify an existing group file, click the **Browse for a group file on disk** link and locate the file you want to modify.

4. Enter the name of the file to be created and click **Open**.

    A group file template is opened in Notepad.

5. Edit the group file template and edit it to create your own group, following the instructions in the file.
    Figure: Figure: Group File Template

```
# This file was created to define borrow groups.
# Please read the following comments on how to manage
# a borrow group file.


# All lines beginning with a '#' symbol are comment lines.


# A Borrow group is a group of borrow enabled features
# grouped under a single name/handle.  Borrow groups are
# useful in borrowing and returning sets of features/applications.


# Borrow groups are identified by their group handle name.
# All Borrow groups begin with the keyword "fgroup" followed by
# a "[", a group name, and an ending "]".


# Features/applications or members of a group are defined using
# the "feat" keyword.  As with group name definitions each feature/application
# member must be entered on a separate line.  A feature definition
# begins with the keyword "feat" followed by a "[", a feature/application
# name, and an ending "]".  Feature/applications that are defined in a
# group are not case sensative; however, each member value should exist
# in the license.


# Here is an example of a group called "alpha" that references the applications
# a, b, c, and d.


# fgroup[alpha]
#   feat[a]
#   feat[b]
#   feat[c]
#   feat[d]
```

For example, the following group defines the license features to be borrowed when running

Uniface on a Windows mobile device:

```
fgroup[Mobile]
feat[UWCE]
feat[UCLIENT]
feat[UCLTSRV]
feat[UCUCLTSRVDBLIENT]
feat[UMSM]
```

6. Save the file to return to the Groups dialog box. Press Ctrl+s or choose **File > Save**.

7. Click **OK** button to exit the Groups dialog box.

   The group file is created and activated.

You can proceed to **Borrow License Client** to borrow the license group.

Borrowing and Returning Licenses on Windows

For borrow-enabled license features, you can transfer a license temporarily from one machine to another.

You can use the **Borrow License Client** tab in the DLM application to

Borrowing across time zones can affect the actual amount of time your borrowed license is available for use. The start of the borrowing period is defined by the time zone of the licensed server from which the license is borrowed.

> *Caution:*
>
> *Do not adjust the date and time on a client machine with a borrowed license. This renders the license inoperable and you are not able to use the license until after the number of days you established for the borrowing period has expired. If you need to adjust the date and time, first return the license, change the date and time, and then re-borrow the license.*

Borrow a license:

1. In the Uniface DLM application, go to the **Borrow License Client** tab.

2. In the **Available features** section, select the feature you want to borrow.

3. Click **Borrow** to display the **Borrow** dialog box.

4. Select either **Days** or **Hours** as the interval for this borrow transaction.

5. Type the desired borrowing duration in the text box.

   The time requested cannot exceed 365 days or the equivalent number of hours. However, your administrator may have placed a more stringent maximum that you must adhere to.

6. Click **Apply** to execute the borrow transaction. If there is an error, the error dialog box will appear and the transaction will be canceled.

   Each time you start the product with a borrowed license, a message appears displaying the

number of days remaining on the borrowed license. You can also click **Time Remaining** on the **Borrow License Client** to view the time remaining on the borrowed license.

Return a license:

When the license expires or you return the license, the application will no longer run. The License Service makes this license available to all users on the network.

1. In the Uniface DLM application, go to the **Borrow License Client** tab.

2. In the **Borrowed features** section, select the feature you want to return.

3. Click **Return** and the license will be returned to the server.

Borrowing a License Group

Before you begin:
Before you can borrow a group of license features, a group file must be defined.

1. In the Uniface DLM application, go to the **Borrow License Client** tab.

   Any available groups to be borrowed will appear first in the **Available Features** section of this tab.

   Figure: Figure: Available Features Showing License Group

2. Select the group you want to borrow and click **Borrow Group**

Borrowing and Returning Licenses with DLMCV

Use the `Out` command on the DLMCV **Borrow** menu to check out a borrow-enabled license feature.

Borrow a license:

1. Start DLMCV and type c Enter to display the **Client** menu.

2. Type bo Enter to display the **Borrow** menu.

3. Type o Enter to display the list of borrow-enabled features and groups.

   A list of borrow-enabled features is displayed.

```
Feature                      Version   Expiration
--------------------------   --------- ------------
```

```
Uniface Products                    group      group

USRVUSP      09.06 27-jan-2014 UTL                        09.06 27-jan-2014 UMSS

09.06 27-jan-2014

USOL                            09.06 27-jan-2014

USRV3GL                         09.06 27-jan-2014

 USRVCORBA                         09.06 27-jan-2014

USRVMSS                         09.06 27-jan-2014 USRVSOL                    09.06

27-jan-2014


 Enter feature name or ['n' to continue] :
```

If the list does not fit on one page, enter `n` for next and `p` for previous to navigate through the list.

4. Enter the name of the feature you want to borrow.

   For example: **USOL** Enter

5. When prompted, confirm whether this is the feature you want to borrow. Enter **y** or **n**.

   ```
   USOL 09.06 selected.
   Is this the feature and version that you are
   attempting to borrow: (Y/N)?
   ```

   If the feature name exists more than once in the list of borrow-enabled features, entering **N** eliminates each subsequent match from the list of selectable features on the current page.

6. When prompted, specify whether you want to borrow the license for hours or days. Enter **1** for hours, or **1** for days.

   ```
   (1) hours
   (2) days
   ------------------------------ Enter borrow unit type (1->2): 1
   ```

7. When prompted, enter the number to specify the duration for borrowing the license

   ```
   Enter the length in hours to borrow: 8
   ```

   License features can be borrowed from one hour to 365 days.

   You are returned to the **Borrow** menu, and the borrowed license is listed under **Current borrow usage**.

   ```
   Current setting(s):


   Current borrow usage: Format:


    Feature, Host, DD:HH:MM:SS
   ```

```
        ---------------------------------------------------


        USOL, 7188@sfa141282k, 00:07:59:59


        ---[Borrow         ] Command list---
         Group
        In
        Out


          Hit enter to return to the previous menu or key
        in a command. Commands can be abbreviated using
        the first N unique characters which are denoted
        by the leading uppercase characters.
        dlmcv>
```

Returning a license

At any time before the specified borrowing duration elapses, you can return the borrowed license feature

1. From the **Borrow** menu, type **i**Enter.
2. When prompted, enter the name of the licensed feature you are returning.

```
dlmcv> i
Enter feature name to return-unborrow: otent
```

You are returned to the **Borrow** menu.

License Usage Monitoring

DLM enables users and administrators to monitor license usage both continuously, and by generating peak usage reports.

- Usage monitoring—provides continuous data monitoring. Data is captured in a compact binary format and all numerical fields within the database are in big-endian byte ordering to provide cross-platform compatibility.

- Peak usage reporting—available upon request. Users can generate comma-delimited reports about DLM peak license usage based on user-provided parameters.

Reviewing the Use of Licensed Features

Checking the status of a license feature allows you to identify the users currently using this feature, as well as checking your license environment for errors.

In the **Local Environment**, select a feature in the **License features** field and click **Status**.

The **Status** dialog box displays the number of users and whether the feature is working properly.

License Service Usage Reports

DLM provides facilities for creating reports about usage of the License Service.

These applications enable you to define the data to include in the report, such as:

- Application name
- User name
- Host/machine name
- Error type
- Pool ID
- Date and time range

The report data is output to one or more comma-delimited text files, one file for each of the following:

- Usage data
- Unique users (optional)
- Unique hosts (optional)

On Windows machines with Excel 2007 or higher, the reports open in Excel and include a usage chart that graphically represents the usage data.

> *Note:*
>
> *Excel cannot handle a file larger than 65,536 lines. If the report is larger, you are prompted to refine the search to be more exclusive.*

Unix users can display the text files in a graphing tool of their choice.

Generating a Usage Report

Both administrators and users can create usage reports for the License Service, using either the DLM application (Windows only) or the `UMfilter.exe` command line utility.

`UMFilter.exe` can be run either in interactive mode or in batch mode.

Generating a Usage Report with the Uniface DLM Application

1. In the Uniface DLM application, go to the **Advanced Configuration** tab.
2. Select **Create usage report**.

    The **Connect to a License Server** dialog box is displayed.

3. Enter or select the *port@host* definition of the license server from which to retrieve the data, then click **OK**.

    The **Create Usage Report** dialog box is displayed.

    Figure: Figure: Create Usage Report Dialog

4. Specify the data to be included, the starting and ending dates, and additional options as required.

5. Click **OK** to create the reports. The reports open in Excel if a supported version exists on the machine, or in a text file.
   Note:

*If the port@host specified does not have a usage database to report against, a message is displayed informing the user that the report cannot be created. To quit without creating the report, click **Cancel**.*

License Service Log Files

The License Service maintains a log file of user activities in the `logging` directory of the DLM installation.

The default file name is `log.txt`.

Entries record an action that increases or decreases the number of license tokens available, and any errors that occur, for example when the limit of available tokens is reached.

Log File Format

Each log entry consists of a single line containing the following information:

[*mm/dd/yy-hh:nn:ss*] *--Action-Method*

`tok(`*TokenId*`)`

`cv(`*VersionInfo*`)`

`usr(`*UserInfo*`)`

`app(`*Application, version*`)`

`cnt(`*n*`)`

or

[*mm/dd/yy-hh:nn:ss*] *--Action-Error*

`usr(`*UserInfo*`)`

`app(`*Application, version*`)`

`cnt(`*n*`)`

******Error Reason

Parameters

mm/dd/yy-hh:nn:ss

Time that the transaction occurred.

Action

Indicates whether the available license tokens increased or decreased; one of:

`IN`—logs an increase in the number of available license tokens.
`OUT`—logs a decrease in the number of available license tokens.

`HRTB`—logs a decrease in the number of available license tokens.

Method

Method used by the end-user to perform the action. This information is provided for Uniface Support.

tok

License token that this action is attached to.

cv

Version of the License Service that the client is running.

usr

User that requested a license token, usually delimited by the @ symbol. In most cases, an end user is identified as follows: *user_name@host_name@session_identifier*.

app

Licensed application or feature and the requested application version.

cnt

Number of tokens that were requested in the transaction. In the case of an `IN` action, it is the number of tokens returned.

Error Log Entries

Errors occur when transactions bump up against the limits of an enforced license agreement.

When `OUT` actions fail, two extra lines are provided in the error message:

First line—information about the request
Second line—the error condition

Where pool-id based errors occur, the user's pool identifier is also listed in the log message, delimited by the keyword `pool`.

Viewing a License Service Log File

The License Service writes its diagnostics to a log file which can be viewed with the DLM Application.

You can examine the file in the Uniface DLM Application from either the Local Environment or Server Environment tab.

1. **Viewing the Log File**
2. Go to the Local Environment or Server Environment tab of the Uniface DLM Application.

3. To open the log file:

    1. In the **Local Environment** tab, select a license source in the **License sources/path** field, right-click, and choose **View Log ...** from the popup menu.

    2. In the **Server Environment** tab, click **View Log**.

The **View Log** dialog box is displayed, showing the last 1000 lines of the log file.

Figure: Figure: View Log File
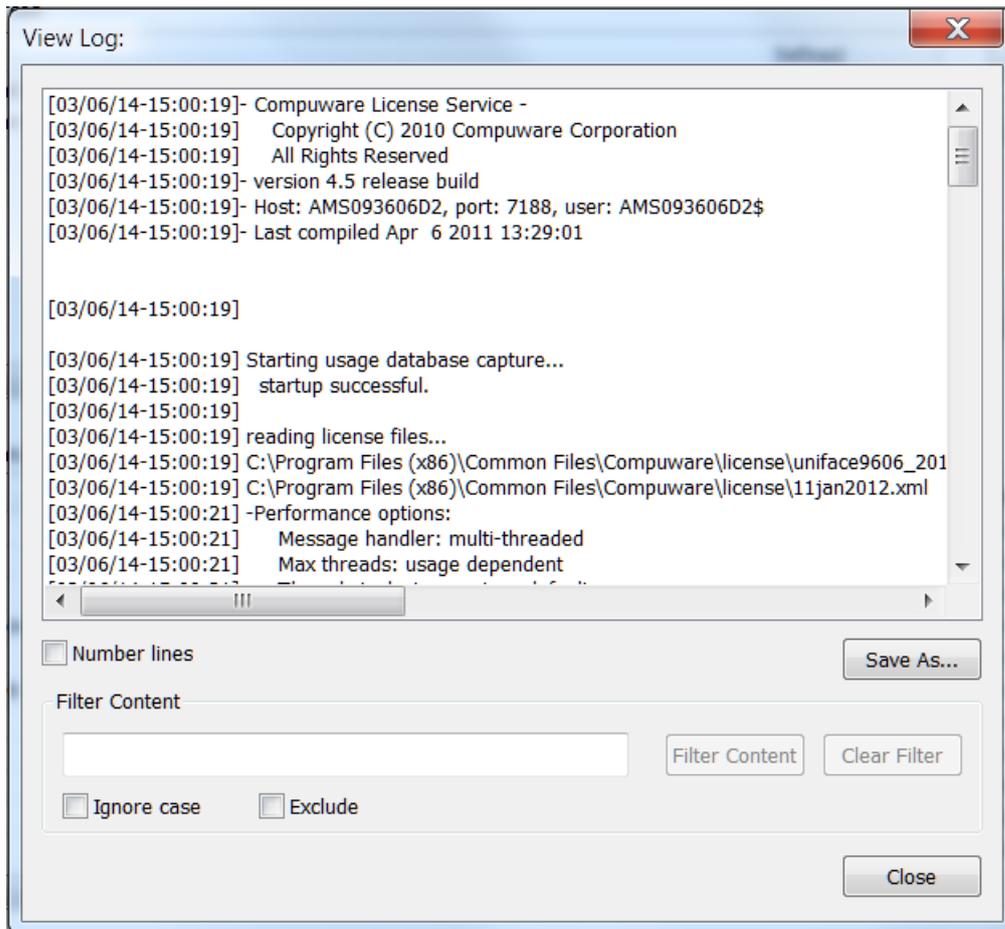
4. **Filtering the Log File Contents**

You can restrict the information that is displayed in the dialog box, by including or excluding lines that contain specific keywords or phrases.

Filtering works on the entire log file, not just what is displayed in the dialog box, so it will show the most recent lines containing or excluding the filtered terms, up to a maximum of 1000 lines.

5. To filter the log file contents:

    1. Enter keywords or phrases in the **Filter Content** field.
        Tip:

        *If you want the filter to be case-insensitive, select **Ignore case**.*

    2. If you want to exclude the lines that include the search terms, select **Exclude**.

    3. Click the **Filter Content** button to display the filtered results.

    4. To save the results of the filter, click the **Save As** button.

    5. If needed, click the **Clear Filter** button to return to the original log file content.

6. **Clearing the Log File**

    You can optionally clear the contents of a log file. This can be useful when repeated errors occur and you want to have only the items that are diagnostics pertaining to the error condition written into the log file.

7. To clear a log file:

    1. In the Local Environment tab, right-click a local license source (that is, the license file is located on the same machine), and choose **Clear Log ...** from the popup menu.

        If the license source is located on a server, the **Clear Log ...** option will not be available.

    2. In the Server Environment tab, select a license source, and click **Clear Log** from the popup menu.

    You will be asked to confirm that the contents of the log file will be deleted. Click **Yes** to proceed or **No** to cancel.

Chapter 4 Troubleshooting

Error Messages

Code	Symptom	Cause	Resolution
-1	The application that was requested is not licensed.	The license file does not contain a license for the product, component, or feature you are attempting to use.	If you have licensed this feature, verify that the license has been received and set up. Verify that the host ID identified by the license key matches that of the machine. The host ID is located under the `<Hostid>` or `<hostid>` tag of the license key. Contact Uniface to purchase a license allowing you to use this feature.
-2	A low memory condition exists and some requested resources could not be allocated.		Check resources and verify memory usage. If needed, free some space and try again. If the resources check out fine, record steps to reproduce and contact Uniface support.
-3	The requested application version is newer than the version currently authorized.	Your license does not support the version of the application you are attempting to run.	Ensure that the application version identified in the license key is greater than or equal to the version of the product you are attempting to run. If the problem persists, contact Uniface support.
-4	An unknown internal error occurred.		Record the steps to recreate this issue and contact Uniface support.
-5	The license period for the requested application has expired.		Contact Uniface to obtain a new license.
-6	The System ID that was authorized for the requested application does not match.	The application is being run on a machine that has not been authorized.	Verify that the machine where the application is running is the correct machine (i.e., the host ID matches the *hostid* identified under the key in the license file). Contact Uniface to obtain a new license

Code	Symptom	Cause	Resolution
			with the correct System ID.
-7	The provided license file does not exist.		Check to see if the file has been renamed. If so, open the Uniface DLM application and delete the old license file name and add the new license file name. For a concurrent license, contact your license administrator for assistance.
-8	This client has not been configured for licensing.	The client configuration file has not been created.	Run the Uniface DLM application. This will create the client configuration file. Now add a license source. If the problem persists, record steps to reproduce and contact Uniface support.
-9	The licensed number of concurrent users has been reached; try again later.	The number of users using the application exceeds the number of users licensed to use the application.	Have one or more users log out of the application. If this occurs frequently, contact your sales representative and purchase a larger capacity license key. If the number of counted users does not match the number of actual users contact Uniface support.
-10	A connection could not be established between this client and the License Service.	This error is usually caused by one of the following reasons: ● License Service has not been started yet ● Wrong server definition, *port@host*, is being used ● Port or hostname has been specified incorrectly	Ensure that the License Service is running. Shutdown and restart License Service. Verify that you are using the correct license environment. If the problem persists, contact Uniface support.
-11	The version of the license client does not match the version of the		Ensure that the client is at the same version level as the License Service version. Contact Uniface support.

Code	Symptom	Cause	Resolution
	License Service.		
-12	The connection between the client and License Service has timed out.	This error occurs when the timeout period allotted for a connection has expired. This results from one of these conditions: • License Service is down • Hostname of License Service has been changed and is not reflected by the *port@host* definition in the license path • the LAN or WAN is not fast enough	Ensure that License Service is still running. Increase the client timeout value from within the Uniface DLM application. Coordinate the timeout value of the client with the timeout value on the License Service; see documentation or contact your license administrator.
-13	The connection between the client and License Service was prematurely closed.	This error can occur if the License Service is stopped while a client/server connection is active, or the connection between License Service and the client was broken.	Verify that connectivity still exists between License Service and the client. Verify that License Service is running on the license server. Verify that hostname or IP address identified in the license path on the client matches the one on the server. If you are referencing the hostname in the license path try using the IP address. If this continues to occur frequently or sporadically, contact Uniface support.
-14	The digital signature for the data sent or the data received was invalid and/or garbled.	Internal systems error.	Record steps to reproduce the error and contact Uniface support.
-15	Could not read socket stream.	Internal systems error.	Record steps to reproduce the error and contact Uniface support.
-16	The application that	The application that you have	Wait until the transaction expires to

Code	Symptom	Cause	Resolution
	you have requested has already been borrowed.	requested has already been borrowed.	request another license or return the license before trying to borrow it again. If you do not have a license borrowed, contact Uniface support.
-17	The administrator has excluded this system, restricting it from using the requested application.		The license administrator will need to remove your system ID or LAN ID from the *user_management exclude* parameter in the server configuration file.
-18	The administrator has excluded this user account, restricting it from using the requested application.		The license administrator MUST set up the *user_management* information if a license has the `<Umanage>` tag.
-20	An uncounted license can not be used concurrently.	A license was added to the license server that is not a concurrent license.	Remove the uncounted license from the License Service environment. Install the license on the machine that has a matching hostid.
-22	The maximum number of registered users has been reached; no more users may be registered at this time.	The number of registered users in the Options File has exceeded the number of allowed users.	Remove one or more users from the registration file on the License Service (`drive:\program files\common files\Compuware\config\Usrs`). Restart the License Service. If this is a frequent problem, you may want to purchase a license key with a higher user capacity, contact Uniface support.
-23	The start date of the requested application precludes the authorized start date identified in	This is a pre-license agreement error.	Wait until the start date has been reached, or contact Uniface support.

Code	Symptom	Cause	Resolution
	the corresponding key.		
-24	The authorized session limit for this user and the requested application has been reached.	The user has exceeded the session limit specified in the license file. Some license keys limit the number of instances of a product that can be run under one user account.	If you frequently exceed the limit you may want to purchase a license key with a higher capacity of sessions, contact Uniface support.
-25	The use of a concurrent user key as a node-locked, single-user key is not allowed.	A License Service is required to support this license.	Verify that the license is for the current machine. If the license is for the current system remove it from the license environment and add it again. If the license is not for the current system, install the license on the system identified by the `hostids` in the license file. If the license was generated in error contact Uniface support.
-26	The number of licenses allotted to your assigned pool has been exceeded, contact your system's administrator.	The pool maximum set up in the server's configuration file has been reached.	Contact your license administrator.
-27	The application that you are attempting to checkout requires a pool identifier; one has not been provided.	A pool ID has not been assigned to the end-user when one is required.	Contact your license administrator to set up this pool ID.
-28	The number of licenses allotted by your administrator for borrowing has been reached.	All of the licenses allocated for borrowing are used.	Contact your license administrator to request more licenses for borrowing.

Code	Symptom	Cause	Resolution
-29	Invalid key signature, contact Uniface support.	Internal system error.	Contact Uniface support.
-30	You have requested more days than has been authorized by your administrator.	The number of days available to borrow a license has been exceeded.	Contact your license administrator. This is controlled by the server configuration file via the Uniface DLM application.
-31	You have requested more than 365 days, which is the maximum time a license can be borrowed.		Specify a length less than 365.
-32	Borrow transaction error, contact Uniface support.	Internal system error.	Contact Uniface support.
-33	A valid redundant feature does not have a valid redundant policy.	Internal system error.	Contact Uniface support.
-34	One or more redundant servers are not running; you are below the failsafe threshold.		Start all of the redundant servers.
-35	Redundant policy has not yet been initialized.	All of the License Services on the systems identified by the redundant key have not been started. Alternatively, a status was performed on one of the redundant license servers. This is expected and there is no resolution.	Make sure that all of the systems identified in the redundant key (see documentation) have been started. Contact Uniface support.
-36	The redundancy failsafe period has expired.		Contact your license administrator.

Code	Symptom	Cause	Resolution
-37	One or more features within the association could not be checked out.	A feature was not available for check out because none are available.	Use the **View log** button in Uniface DLM to see who is using the application or its subcomponents. Have one or more users log off the application or its subcomponents. If all of the features are not available, or you frequently have problems accessing the products identified by the association, you may want to consider purchasing a larger capacity license key, contact Uniface support.
-38	You can not run this application from within a remote shell.	An attempt was made to run a node-locked license from a remote session. This is not authorized.	Do not run single-user/node-locked licensed applications from within a remote session.
-39	License borrowing requires all redundant servers to be running.	An attempt was made to borrow a license without all of the redundant servers running. This is not authorized.	Start all redundant license servers.
-40	Redundancy is not supported for this license model.	An attempt was made to perform redundancy on a license model that is not supported.	If redundancy is needed, please contact a Uniface salesperson to discuss.
-41	An unknown internal error has occurred.		Contact Uniface support.
-42	The specified license method is not supported on this platform.	An attempt was made to use an unsupported license method on this platform.	Contact Uniface support.
-43	An attempt was made to use an un-licensed concurrent key as a served node-locked key.		Contact Uniface support.
-44	A previously translated 3.x key		Contact Uniface support.

Code	Symptom	Cause	Resolution
	has expired.		
-45	The date on the client is not consistent with the date on the License Service; the key has expired on the client.		Correct the client or server date.
-288888	Terminal Services is not supported for this license model or product.	With the current license model, a user cannot use this product when accessing this machine via a terminal service. a terminal service to access this machine and .	Contact Uniface support.

Verify that the License Service is Running (Windows)

Check that the License Service is running on Windows.

> **Note:**
>
> *If you did not install a concurrent license when Uniface DLM, then the License Service was not installed.*

Depending on the version of Windows you are using, these instructions may vary.

1. Open the **Control Panel** and choose **Administrative Tools > Computer Management** .
2. Double-click the **Services** entry.
3. Look for the Compuware or Uniface DLMLicense Service and ensure that is running.

License Service Does Not Start

If the License Service does not start, perform any or all of the following steps.

- If the machine was not rebooted after installation, try rebooting.
- If the machine ID does not match the machine identification in the license file, contact Uniface License Management.
- Start the Uniface DLM application. If the License Service does not start, it produces an exception error to assist in troubleshooting.
- Verify that the license file is located in the specified directory.

Appendix A DLM Configuration Parameters

Information about the license environment is stored in a configuration file, which is created the first time a license source is added.

The client and server configuration files are usually created and maintained using the DLM Windows application and/or the DLMCV. If preferred, you can manually edit configuration files.

Common Configuration Parameters

license

The *license* parameter defines a single license source. A configuration file must have at least one *license* parameter and it may have more.

`<license>`*LicenseFile | LicenseService*`</license>`

Table: Parameters

Value	Meaning
LicenseFile	Fully qualified path to a single license file. On a client machine, this is a node-locked license file. On a server machine, it is a concurrent license file.
LicenseService	The address of a License Service in the format *port@host*.

License Server

In the server environment, if no licenses are defined, the License Service uses the license repository.

Licenses loaded from the repository are loaded in a sequence based on the last access dates of the files. This form of license configuration is known as *User-Independent License Deployment*. In contrast, *User-Dependent License Deployment* requires the user to identify the location of each license source to the License Service via the configuration file.

If changes are detected in the license files defined in the configuration file or the license repository, the License Service automatically reloads them prior to the next license request. Changes can include the addition of new license files, the removal of existing license files, or the modification of existing license files.

The license repository allows users to drag and drop new licenses into a single location for the License Service to pick up, simplifying the administration of new license files.

port

On the client, this parameter can be used to define a port number, or a range of port numbers, that is used to receive the data stream from the License Service. On the server, it specifies the port number that the License Service uses for incoming requests.

Server:

`<port>`*`PortNumber`*`</port>`

Client:

```
<port>
    <start>PortNumber</start> |
    <range>PortNumberRange</range> |
    <linger>Integer</linger>
</port>
```

When a licensed client connects with the License Service to make a license request, it uses the port number of the License Service's source definition (*port@host*), to define the outgoing stream for data sent to the License Service.

The operating system on the client chooses a return port to provide to the License Service with its outgoing data stream.

Server Environment

In the server environment, the *port* specifies the port number that the License Service uses for incoming requests. Clients must include the port number in their license source definition (*port@host*).

Client Environment

By default, clients use the first available port to listen for the data stream coming from the License Service. To make port number assignment more predictable, it is possible to specify a range of ports. These can be used by the client for the License Service's outgoing data stream—that is, the client's incoming data stream. This allows firewall administrators to limit the number of return port openings in their firewall.

> *start*
>
>> Identifies the first port that is to be tried by the client for the License Service's output stream. This port number can be the same or different from the port number specified on the system where the License Service resides.
>>
>> If the client and the License Service reside on the same system, the starting port number should be different.
>
> *range*
>
>> Specifies the range of ports that will be tried by the client when it attempts to establish an output

stream for the License Service. Hence, a client will try port numbers that range from start to start+range where start+range should be less than 65535.

If the client and the License Service reside on the same system, the range of port numbers attempted by the client must not include the port number used by the License Service.

If a range is not provided, the client will attempt to use the port number that is defined by the start parameter only.

If the range is provided, it must be a value that is greater than or equal to zero.

linger

Controls the length of time that the operating system maintains a `TIME_WAIT` status on a previously closed socket. Sockets are used by the TCP/IP layer as streams of communications between clients and servers.

It is defined as an integer value from -1 to *N*.

Caution:

Use only if instructed to do so by Uniface customer support. In most cases, this value should not be set.

connection_timeout

Number of seconds to keep a non-responding connection open. Default is `10`.

```
<connection_timeout>Seconds</connection_timeout>
```

Client

If connections between a particular client and server result in frequent timeouts, the end-user should increase this value.

License Service

 Changing to a lower value may cause connection problems for clients. Changing to a higher value may affect the overall performance of the License Service.

To determine the optimal performance for your particular configuration, you may need to play around with the value.

nagle_algorithm

When defined, the Nagle Algorithm is used when transmitting data via TCP/IP to DLM.

```
<nagle_algorithm/>
```

By default, this action is disabled. You should contact Uniface support before enabling this behavior.

It can be defined for both the client and the server environment.

Client Configuration Parameters

proxy_server

If the License Proxy Service (**cpwrProxy32**) is required, defines the port number that it uses.

```
<proxy_server>
    <port>PortNumber</port>
</proxy_server>
```

port

> If the License Proxy Service is run on a system that currently supports a license server, the port number chosen must be different from the port number used by the License Service. By default port 7199 is used.

borrow_server

Defines a License Service that contains borrow-enables license keys.

server_loading

If more than one license source is defined, instructs the client to split requests for one or more license tokens across multiple license sources.

```
<server_loading/>
```

broadcast_attribute

Defines the letter case used to exchange data between the client and the License Service. This is useful when dealing with user-managed licenses.

```
<broadcast_attrib>
    <user_case> upper | lower </user_case>
    <host_case> upper | lower </host_case>
</broadcast_attrib>
```

If the value is upper, the client broadcasts user information in upper case, regardless of the character case returned by the system.

pool

Name of a license pool to which a client belongs.

```
<pool>PoolId</pool>
```

The *pool* parameter should only be used if virtual license pools have been created by the license administrator in theLicense Service's configuration file.

Server Configuration Parameters

server

Mandatory section of a server configuration file. It contains parameters that define the server's timeout, license files, and port number. Other parameters and sections are optional.

```
<config>
      <server>
              <port>PortNumber</port>
              <connection_timeout>Seconds</connection_timeout>
              <license>LicenseFile</license>
{             <nagle_algorithm/>
              <max_threads>ThreadCount</max_threads>
              <max_log_size>SizeInBytes</max_log_size>
              <audit/>
              <net_security>AllowedNumberOfFailedTransmissions</net_security>
              <new_log_on_start/>      }
      </server>
</config>
```

Table: Configuration Parameters

Parameter	Description
port	On the client, this parameter can be used to define a port number, or a range of port numbers, that is used to receive the data stream from the License Service. On the server, it specifies the port number that the License Service uses for incoming requests.
connection_ timeout	Number of seconds to keep a non-responding connection open. Default is 10.
Common Configuration Parameters	The license parameter defines a single license source. A configuration file must have at least one license parameter and it may have more.
nagle_ algorithm	When defined, the Nagle Algorithm is used when transmitting data via TCP/IP to DLM.
net_security	Instructs the License Service how to handle dubious or malicious requests for licenses.
max_threads	On Windows only, the maximum number of threads that can be launched by the License Service at any given time.

net_security

Instructs the License Service how to handle dubious or malicious requests for licenses.

Use one of the following configurations:

- `<net_security/>`

- `<net_security>`*AllowedNumberOfDenials*`</net_security>`

The License Service's memory usage is dependent on the number of valid requests that it receives from its clients.

To prevent denial-of-service attacks designed to overwhelm the License Service, the License Service can be configured to block transmissions from dubious sources, or to only allow requests from authorized clients.

A dubious source is an IP address that has sent erroneous data that has resulted in License Service denying the license request at least 3 times.

If the *net_security* parameter is present in the configuration file, the License Service will keep track of systems that have sent erroneous transmissions so that they can be blocked. This information is stored in a file called **elk_security.txt**, located in the License Service's **config** directory.

When the License Service receives a request from a transmission source that has previously been identified as having malicious intent, the License Service will close the connection immediately without committing additional resources to process the message. By default, only three failed transmissions are allowed per source before the License Service begins blocking the source.

There are three possible configurations for the *net_security* option.

<net_security/>

Enables default network security behavior. The License Service blocks transmissions after three denials.

<net_security>*nn* **</net_security>**

If the number of denials before blocking is too large or too small, specify the number of failed transmissions that can occur from a previously identified system before it is blocked.

<net_security/> plus authorized client list in elk_security.txt

In many cases, the identities of client machines that will be communicating with the License Service are already known. You can create an **elk_security.txt** file that contains a list of these authorized clients, which will cause the License Service to block transmissions from unknown machines.

Each record in the file should contain one IP-address entry identifying the machine that is authorized to talk with DLM. For example:

```
10.01.01.02
10.01.02.02
```

elk_security.txt

When **elk_security.txt** is created by DLM, it contains entries for blocked IP addresses and records the number of fault transmission received:

```
IPAddress FaultCount
```

IPAddress

    IP address of the system that delivered the unidentifiable message

FaultCount

    Number of times that faulty messages were sent from the identified source.

Entries within the file can be added and removed using a text editor. If you do so, the License Service must be restarted for changes to take effect.

max_threads

On Windows only, the maximum number of threads that can be launched by the License Service at any given time.

```
<max_threads>ThreadCount</max_threads>
```

On Windows, handler threads are spawned to handle each license request. The number and frequency at which threads are launched to handle client requests is dependent on the License Service's work load. Under certain conditions, namely network security, license administrators may choose to limit the number of threads that can be launched by the License Service at any given time.

mail_notification

Used to configure the License Service to provide email notifications for license-related issues.   The Simple Mail Transfer Protocol (SMTP) protocol is used.

```
<mail_notification>
    <smtp>SmtpServer</smtp>
    <to>EmailAddress1</to>
    <to>EmailAddress2</to>
    <subject>Subject</subject>
    <enabled/>
    <on>
        <!-- <denied/> -OR- -->
```

```
        <denied>
            <filter>
                <keep>host|user|feature</keep>
                <discard>host|user|feature</discard>
            </filter>
            <frequency>FrequencyValue</frequency>
        </denied>
        <borrowed/>
        <security/>
        <stop/>
        <start/>
        <expire>DaysRemaining</expire>
    </on>
 </mail_notification>
```

Mail Notification Parameters

smtp

Defines a hostname or IP address of a system that handles SMTP requests—the networked mail server.

> ***Important:***
>
> *If you are using an SMTP server as a relay to the main mail server, you need perform to the following steps on the relay server:*

1. Right-click on **Default Virtual SMTP server** and select **Properties**

2. Click the **Access** Tab and select **Relay**

3. Under **select which computer may relay through this virtual server** change the radio button from**only the list belowto all except the list below**.

to

Identifies a recipient of the email notifications. It is possible to specify multiple recipients.

subject

Subject line to be used for all notification emails. If omitted, the License Service will use pre-determined messages based on the subject matter.

enable

If present, switches the emailing system on. By default, it is absent so emailing functionality is not enabled.

on

Defines the conditions for which the License Service will send emails.

denied

Notify recipients of failed license requests. There are two types of denial definitions supported.

- If only the *denied* parameter is specified, recipients are notified of all requests that are denied by the License Service.
- If the *filter* parameter is specified, denial messages can be filtered based on their content.

filter

The filter can be used to keep or discard denial messages based on hostname, username, or feature name. Both the *keep* and *discard* parameters accept wild cards.

For example, `<discard>*.uniface.com</discard>` would eliminate any messages that contain a hostname, username, or feature that contains the string `.uniface.com`.

stop, start. expire

In addition to license-failure notification, notifications can be sent when the server is started or stopped. or when a license key is due to expire within the specified number of days. Expiration notifications are sent out every 24 hours after the Service is started.

warn

borrowed

Notify recipients of all license threshold warnings

security

Notify recipients of security breaches

frequency

Determines how often a message is to be sent within a 24-hour period. Optional.

pools

Defines one or more license pools that can be used to manage concurrent license features.

```
<pools>
   <Application>
      <PoolID>MaxTokenCount<PoolIDN>
   </Application>
<pools>
```

Application

Name of a license key to which the pool applies. For example, `UWCE`.

PoolID

Name of a license pool. The name usually defines a group or type of user, such as `HR` or `Admin`.

MaxTokenCount

Maximum number of license tokens that a pool contains.

pools

For example

```
<pools>
    <USERV>
        <HR>10<HR>
        <SALES>25</SALES>
    </USERV>
<pools>
```

concurrent

Limits the number of concurrent licenses that can be used for specified applications or features.

```
<concurrent>
    <Application>
        <count>MaxTokenCount</count>
    </Application>
    <ApplicationN>
        <count>MaxTokenCount</count>
    </ApplicationN>
</concurrent>
```

Concurrent License Parameters

For each concurrent license key in the application, you can define the following restrictions:

Application

Name of a license key in the license file that contains the *Count* parameter

count

Number of license tokens that can be used for the application.

Limit the Use of Concurrent Licenses

```
<concurrent>
  <UIDE>
        <count>15</count>
```

```
    </UIDE>
    <UWCE>
        <count>150</count>
    </UWCE>
</concurrent>
```

borrow

Restricts the number of license tokens and the maximum number of days that specified license keys can be borrowed.

```
<borrow>
    <ApplicationN>
        <count>MaxTokenCount</count>
    </ApplicationN>
</borrow>
```

Borrowing Parameters

For each borrow-enabled license key in the application, you can define the following restrictions:

Application

Name of a license key in the license file that contains the *Count* parameter

count

Number of license tokens that can be used for the application.

Setting License Borrowing Limitations

```
<borrow>
    <UCLIENT>
        <count>10</count>
        <max_days>100</max_days>
    </UCLIENT>
    <UWCE>
        <count>10</count>
        <max_days>100</max_days>
    </UWCE>
</borrow>
```

user_management

For licenses that are enabled for the user-manage license model, defines who can use application or feature.

```
<user_management>
    <Application>
        <everyone/>
        <User>
    </Application>
</user_management>
```

The system administrator can define the *user_management* parameter to configure who can use specific licensed features. This is only possible for license keys that have the *Umanage* parameter.

User Management Parameters

For each *Umanage*-enabled license key, you must define the following:

Application

> Name of a license key in the license file that contains the *Umanage* parameter

everyone

> If present, allows all users to use the licensed application or feature, *except* individual users that are added to the definition.

User

> User host ID or LAN id (login ID) of users who are allowed or denied access to the licensed application or feature.

> If the *everyone* keyword is specified, specified users are denied access. If it is omitted, only the specified users are granted access to the license key. Users that are not listed will be denied access.

user_management

```
<user-Management>
  <UIDE>
    <user>ulabglr1</user>
    <SALES>ulabbda2</SALES>
  </UIDE>
  <USERV>
    <everyone/>
```

```
     </USERV>

<user-Management>
```

Appendix B License Key Parameters

License Key Parameters

Each license key has parameters that define the licensed application or feature, and the limitations or allowed behavior that apply.

The `<key>` element in a license file defines the license key and contains sub-elements that define the key's parameters.

Parameter elements may contain the keyword `"undefined"`, in which case the parameter enforces no limitations. For example, if *App* has the value `undefined`, it authorizes any Uniface application or feature, and causes the *Vers* parameter to be ignored.

App

On or more applications or features authorized by the key. If multiple features are defined, they are separated by the pipe symbol. For example: `UCLIENT|UCLTSRV|UCLTSRVDB|UMYSQL`

Vers

Version number of the application authorized by the key. It must be greater than or equal to the version of the product licensed by the key.

Start

Start date of the license agreement, formatted as `DD.MMM.YY`.

End

End date of the license agreement, formatted as `DD.MMM.YY`.

If set to `undefined`, the license key does not expire.

Count

Maximum number of concurrent instances of a product, end-users using a product, or individuals that can use a product. If present, the License Service is required.

If set to `unlimited`, `undefined`, or `infinite`, there are no limitations on the number of users that can access it. However, if the key is served, a session limit may be imposed. (See *Usr_session_limit*.)

Hostid and **hostid**

Identifies one or more systems which are authorized to serve or use a license key.

A license key will contain either, but not both:

- *Hostid*—licensed feature can run on any machine.
- *hostid*—contains sub-elements that specify one or more types of host ID.

Eth

A system's MAC address

Softkey_id

A system's DLM 4.x softkey ID

Serial_no

A system's disk serial number (Windows only)

Ip

The IP address of the system

Fcfs

First Come First Serve flag. Authorizes the first N unique users, where N is defined as *Count*. Once N users have been registered with the License Service, other users are denied.

User registration is session independent; users remain registered until they are physically removed from the user-registration file. This file is located in the server's `config/Usrs` directory. Users are only allowed to run on one machine per network.

Only supported with multi-user licenses.

Borrowing

A flag that allows end-users to borrow licenses from the License Service for user-defined periods of time, where the smallest interval is one hour and the maximum interval is 365 days. The license administrator can place additional restrictions on the length of time a key-token can be borrowed.

Only supported with multi-user licenses.

Umanage

User Management flag. Allows a license administrator to manage which end users have access to a key.

To do so, the license administrator must set up a *user_management* object in the server's configuration file, defining which end-users have access to the licensed application. Users that do not have access to the key will be denied application startup for the corresponding application or feature.

Dup_usr

Duplicate user flag. Allows the same user to start multiple instances of an application with only the first instance consuming a license token.

Parameters

Additional parameters that are defined by the application that sponsors the key.

License Key Parameters for Redundant Servers

If the license supports redundant servers, it will have a `redundant` object, and each license key that supports redundancy will have a *Redundant* parameter that references the `redundant` object.

Only keys containing the keyword `redundant` have redundancy.

Figure: Figure: License that Supports Redundancy

```
<license>
      <customer_id>CustomerID</customer_id>
      <redundant protected='SecurityKey'>
             <Policy_id> Unique identifier </Policy_id >
             <Failsafe_count> Minimum number of servers required</Failsafe_count>
             <Initial_state> Total number of redundant systems</Initial_state>
             <Failsafe_duration> Maximum number of days a partial state can occur</Failsafe_duration>
      </redundant>
      <key protected='SecurityKey'>
             <!-- Omitted other license key parameters -->
             <!-- A license key that supports redundany includes a Redundant parameter -->
             <Redundant> Policy id </Redundant>
             <Parameters> Application-specific parameters  </Parameters>
      </key>
</license>
```

As with license key definitions, a security key to prevent content modification protects redundant objects. Not all keys in a license file that contain a redundant object are necessarily redundant. Thus, a single License Service can support both redundant and simple-concurrent license keys at the same time. (Simple-concurrent is any non-redundant concurrent license key.)

This is contrary to other licensing solutions, which can only support redundant *or* simple concurrent license keys at any given time.

Parameters of Redundant Object

Redundant objects contain four parameters:

Policy_id

Unique identifier for the redundancy policy. It is used bind the `redundant` definition to its corresponding license keys.

Failsafe_count

Minimum number of servers that can be running to support a corresponding redundant key.

Initial_state

Total number of servers that provide redundancy support for corresponding redundant keys.

Failsafe_duration

Maximum number of days that a failsafe state can exist before the initial state must be restored.