

Installation and Maintenance Guide Version 16

Linux

Oasys
PRIMER

Oasys
REPORTER

Oasys
T/HIS

Oasys
D3PLOT

Oasys
SHELL

Oasys Ltd

The Software House of ARUP

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Intended audience

This document is written for the System Manager responsible for loading and maintaining the Oasys Ltd LS-DYNA 16.0 Environment software. No special (engineering) knowledge of the software is required.

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or contact your local Oasys Ltd distributor.

1 IMPORTANT CHANGES FOR VERSION 16.0

Licensing

The version 16.0 software has been compiled using version 11.14.1 of FLEXlm.

Customers still using a v15.0 or earlier license file will require a new license file to run v15.1 or v16 software, this will be backwards compatible for all versions.

The version 16.0 license file and license daemons are backwards compatible with both the 15.x, 14.x, 13.x software releases. This means that any existing 15.x, 14.x, 13.x software will continue to work with new license files and servers.

We recommend that you update all of your Oasys license servers with the files shipped with the version 16.0 software.

1.1 Changes to Installation Organisation

The installation directory structure and nomenclature uses the same organisation as version 13.x. Users of the 13.x release should find the description below familiar, users migrating directly from an earlier release will find that some file names have changed and should read this section carefully.

From version 14 onwards the software is only available for 64 bit architecture, however we have retained the “_64” suffix in the executable names both for backwards compatibility and to make it clear that these are 64 bit executables.

1.1.1 Executable filenames now contain minor version numbers

Prior to V13 the executable names only contained the major revision numbers, for example primer16_64.exe. Some users found that if a minor release, for example 16.1, was issued this caused confusion because the executable name did not change, making it hard to tell executables apart solely by their filenames; however other users preferred this system since it meant that the generic filename was always the most up to date version.

To try to solve this problem, and also to please both schools of thought, the file naming convention has now been changed to include the minor version number:

name {major version} {_minor version} {_size} .exe

For example primer16_0_64.exe is PRIMER major release 16, minor release 0, 64 bit.

In order to preserve backwards compatibility with previous naming conventions, and also to please those preferring the old generic naming convention, symbolic links defining the generic names are also created as part of the installation process. For example:

primer16_64.exe ➔ primer16_0_64.exe (where ➔ is a symbolic link)

If a minor version (eg 16.**1**) of major release 16 is issued in the future, and the files are installed in the same directory then:

- The new executables (eg primer16_**1**_64.exe) will be distinct.
- The symbolic links will be updated so that the generic name points to the most recent minor release.

For example:

primer16_64.exe → primer16_**1**_64.exe

This updating of the symbolic links has consequences when one programme runs another, see the next section on usage of generic names.

(A symbolic link on Linux is a reference to a file, not the file itself. The syntax for creating a link is:

`ln -s actual_filename name_of_link`

for example to set up a symbolic link for PRIMER:

`ln -s primer16_0_64.exe primer16_64.exe`

Deleting the link (eg **rm primer16_64.exe**) does not delete the actual file that it points to. If you want to change a link you will need to delete it before recreating it.

Deleting the actual file does not delete the link, but leaves it “hanging” and pointing to nowhere.)

1.1.1.1 The software itself defaults to the generic names

Some pieces of Oasys software reference other programmes within the suite. For example:

- REPORTER can run PRIMER, D3PLOT and T/HIS,
- D3PLOT can run PRIMER and T/HIS
and so on.

Within the software the default names used for running the other executables are the **generic** ones, i.e. no minor version suffix. For example when REPORTER wishes to run PRIMER it will, by default, run the executable name primer16_64.exe.

This means that when a minor release is installed, the default will be for the most recent executable to run in this context. It is possible to override these defaults by using preferences, see section 4.

If you wish to segregate minor versions, for example you wish REPORTER 16.0 to run PRIMER 16.0 and REPORTER 16.1 to run PRIMER 16.1, then it will be necessary to place the new minor release in a separate installation directory.

Please contact Oasys Ltd for further information if you need more advice about this.

1.2 Supported architecture

From Version 14 onwards the Oasys LS-DYNA software suite is only available in 64 bit form for x86-64 hardware.

This means that all the executables, including the FLEXlm licensing software, will only run on x86-64 hardware running a 64 bit operating system.

The Oasys 16.0 suite has been built and tested on the following versions of Linux:

Red Hat Enterprise Linux (RHEL) 6 and 7

SuSE Enterprise 12.2

The standard Linux download is the RHEL6 build since that has been found to run on all the modern Linux installations we have tested. If you require one of the other builds, please contact Oasys Ltd.

1.3 Legacy Font support

Like earlier versions, the Oasys suite version 16 uses "legacy" X11 fixed fonts on Linux. (This will change in version 17.)

This can cause problems on more recent Linux distributions which do not include the required fonts packages by default, symptoms being any or all of:

- Messages about missing fonts when software starts.
- Some fonts are missing in the user interface.
- Some or all fonts look wrong.

This problem can be solved by installing the missing "xorg" legacy font packages on the system. The following are a typical minimum installation, more may be available if you search your repository for "xorg" fonts.

You will need root privileges to install these, so unless you are familiar with working as root and using commands such as "rpm", "yum" or "yast" please seek help from your IT department, or alternatively contact Oasys Ltd.

1.3.1 RedHat / CentOS 7

```
xorg-x11-fonts-100dpi  
xorg-x11-fonts-75dpi  
xorg-x11-fonts-ISO8859-1-100dpi  
xorg-x11-fonts-ISO8859-1-75dpi  
xorg-x11-fonts-Type1  
xorg-x11-fonts-misc
```

You don't have to install all of these.

The 75dpi and 100dpi font packages are the same typefaces at different resolutions. You should choose the one which gives the best looking results on your display, but on modern displays the 100dpi one is likely to look better.

1.3.2 SUSE 11

```
xorg-x11-fonts-core  
xorg-x11-fonts
```


2 INSTALLATION ORGANISATION

2.1 Version 16.0 Installation Organisation

In version 16.0 an option is provided to separate a top-level “administration” directory from the “installation” one where the executables are located.

For large installations on many machines this allows central configuration and administration files to exist in one place only, but executables to be installed locally on users’ machines to give better performance.

Version 16.0 also allows for the following items to be configured

- The location for user manuals and other documentation.
- The definition of a user’s home directory.
- The definition of the temporary directory for scratch files.

In addition parsing of the “oa_pref” (preferences) file will now handle environment variables, so that a generic preference can be configured to give a user-specific result, and preferences may be “locked” so that those set at the administration level cannot be changed by users.

These changes are entirely optional, and users performing a simple installation on a single machine do not need to make any changes to their existing installation practice.

Here are some diagrams which illustrate how installation might be carried out in various different scenarios.

a) Single user installation on one machine

There is no need to worry about separating administration and installation directories, and the default installation of all files in and below the single installation directory will suffice.

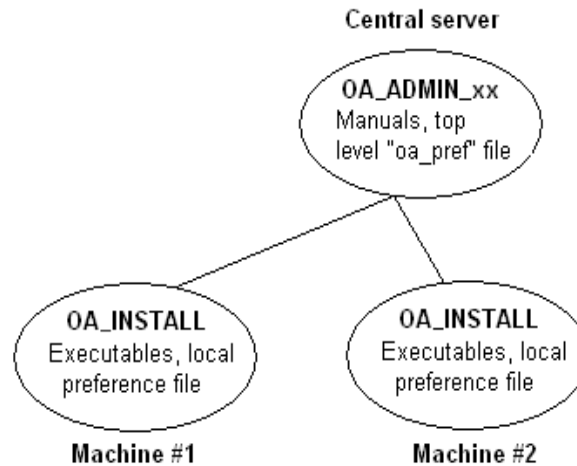


b) A few machines on a small network, each user has his own machine

The top level administration directory can be installed on a network server, possibly also locating the manuals centrally.

Each user's machine has its own "installation" directory to give good performance, but there is no need to manage home or temporary directories centrally since each user "owns" his machine.

If network performance is good an alternative would be to install executables on the central server, meaning that local OA_INSTALL directories are not required.



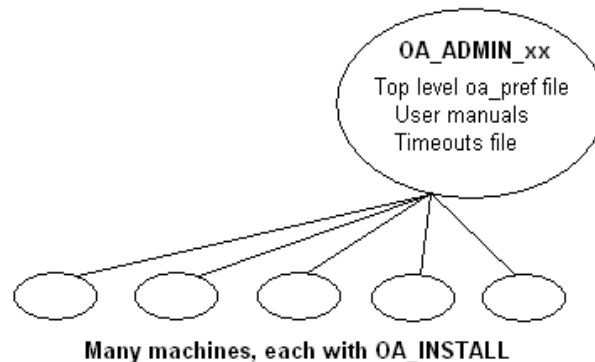
c) Large corporate network

The top level oa_pref file will set the "home" directory for users so that their home directory is the same regardless of the machine they use.

Timing out of idle licenses is managed centrally via the "timeouts" file.

Corporate policies can also be enforced if required by "locking" preferences in the top level oa_pref file.

Depending on network size & performance executables and manuals could be located on each machine, or on local server hubs, or centrally.



These configurations are not mandatory and are simply examples, you should choose the one that suits your needs.

Note the "_xx" in OA_ADMIN_xx and OA_INSTALL_xx refers to a version number, ie OA_ADMIN_16 for this release 16.0. This suffix is not required, but it is recommended as it

will provide an easy way of organising parallel installations of future releases on a single machine.

Note also that while the various directories (OA_ADMIN_xx, OA_INSTALL_xx, OA_MANUALS, etc) can be defined by environment variables this is not recommended because it is inflexible, and also it would not permit two different installations to have different directories on the same machine.

It is recommended that the options in the top level oa_pref file to define these directories are used instead, since this encapsulates the definitions in a single place, permits multiple installations to co-exist on the same machine, and makes administration easier. See "oa_pref file options" in the table below.

2.1.1 Details of directory names

Directory	Status	Directory Content and purpose	oa_pref file option
OA_ADMIN_xx or OA_ADMIN	<i>Optional</i>	Top level configuration files. (xx = 16 for release 16.0, thus OA_ADMIN_16) Admin level oa_pref file Other configuration files Timeout configuration file The generic version of this name, OA_ADMIN will be searched for if no release-specific version is set.	
OA_INSTALL_xx or OA_INSTALL	Required	All executables Installation level oa_pref file	oasys*OA_INSTALL
OA_MANUALS	<i>Optional</i>	Specific directory for user manuals. If not defined then will search in: OA_ADMIN_xx/manuals (xx = major version number) OA_INSTALL/manuals	oasys>manuals_dir
OA_HOME	<i>Optional</i>	Specific "home" directory for user. If not defined will use: \$HOME (Unix/Linux) %USERPROFILE% (Windows)	oasys*home_dir
OA_TEMP	<i>Optional</i>	Specific "temporary" directory for user. If not defined will use: P_tmpdir (Unix/Linux) %TEMP% (Windows)	oasys*temp_dir

OA_INSTALL_xx

Previously the software used the OA_INSTALL (renamed from OASYS) environment variable to locate the directory the software was installed in.

On LINUX systems the "oa_16" script that starts the SHELL automatically sets this Environment Variable and passes it to any application started from the SHELL. If you run applications directly from the command line and bypass the SHELL then you should set OA_INSTALL so that the software can locate manuals and other required files.

OA_ADMIN_xx

Users wishing to separate configuration and installation directories will be able to do so by making use of the new top level OA_ADMIN_xx directory (OA_ADMIN_16 for release 16.0).

If the OA_ADMIN_xx directory is used it will be necessary to set up an environment variable of this name to refer to it, however this should normally be the only environment variable required in the whole installation.

2.1.2 Dynamic configuration using the top level oa_pref file

While all the OA_... directories may be specified by environment variables of the same name it is recommended that you do not do this, but instead use the facility to set non-standard directory names dynamically using preferences in the top level oa_pref file.

For example:

Release 16.0	Release 16.1
Top level directory OA_ADMIN_16	Top level directory OA_ADMIN_161
oa_pref file in OA_ADMIN_16 contains: oasys*OA_INSTALL: <i><pathname for 16.0 installation></i> oasys*manuals_dir: <i><pathname for 16.0 manuals></i> oasys*home_dir: <i><pathname for home directory></i> oasys*temp_dir: <i><pathname for temporary files></i>	oa_pref file in OA_ADMIN_161 contains: oasys*OA_INSTALL: <i><pathname for 16.1 installation></i> oasys*manuals_dir: <i><pathname for 16.1 manuals></i> would almost certainly be unchanged between major versions, although they could be different if desired

For example if the Oasys 16.0 software has been installed in **/home/oa16**, then:

```
oasys*install_dir: /home/oa16
```

will enable all users' installations to find their locally stored executables.

Pathnames using environment variables will be deconstructed during oa_pref file reading, and this can be exploited to set user-specific paths using a generic definition. For example:

```
oasys*home_dir: $HOME/oa16
```

would set a home directory.

2.1.3 The hierarchy of oa_pref file reading

The oa_pref preference file contains code-specific preferences that can be used to modify the software behaviour.

This file can be located in multiple locations which are searched in following order:

OA_ADMIN_xx / OA_ADMIN	Top level configuration
OA_INSTALL_xx / OA_INSTALL	Installation level
OA_HOME	User's personal "home" file
Current working directory	File specific to the current directory (rarely used)

The rules for reading these files are:

If a given directory does not exist, or no file is found in that directory, then no action is taken. This is not an error.

A more recently read definition supersedes one read earlier, therefore "local" definitions can supersede "global" ones (unless they are locked).

If two or more of the directories in the table above are the same, then that file is only read once from the first instance.

More information about preferences, including the ability to "lock" them, is given in section 4.

2.1.4 Protection and ownership of installation directories.

Oasys software does not require Administrator / Root privileges for installation.

It is recommended, but not required, that OA_ADMIN_xx and OA_INSTALL_xx directories be protected "read and execute only" for unprivileged users. If top level preferences are to be locked or idle time-outs configured, then write protection will be required to prevent users from subverting these settings.

2.2 Pre Installation

The LINUX installation files can be downloaded from the following website:

<http://www.arup.com/dyna>

All of the installation files are supplied as a single gzipped TAR file.

There is a single LINUX installation package containing 64 bit versions of D3PLOT, T/HIS, PRIMER, REPORTER and the associated shell and job submission software. (32 bit executables are no longer supported from version 14 onwards.)

If you are going to install a license server on a different platform to that which you are running the software on then you can download just the FLEXlm tools for the machine type you want to use as the license server.

After downloading the installation file you should copy it to a directory where you can uncompress it and then untar it.

```
gunzip install_16.tar.gz
```

```
tar xvf install_16.tar
```

This should produce the following 5 files

- peripheral.tar
- environment.tar
- manuals.tar
- flex.tar
- setup.csh

As part of the installation process you will need to select the license type. If you are using a license server you will need to know the name of the license server (and the port number if this has been set). If you are using a node locked license then you will need to know the full pathname of where the license file is located.

If you are going to set up a separate OA_ADMIN administration directory then you should also know the pathname for the directory that you want to use as the installer script will prompt you for it.

2.3 Single User / Single Machine Installation

If you are installing the software on a single machine it is recommended that the software is installed on a local disk.

2.3.1 Installation

- a) To start the installation process run

```
setup.csh
```

from the command line

- b) When prompted enter the full pathname of the directory that you want to install the software in and the license information. If you do not know the name of the license server or if you have not yet obtained a node locked license file then you can enter any machine name / filename and change them later (see section 3).
- c) After entering the license information the installation process will continue and you will be offered the opportunity to set up an OA_ADMIN_xx directory (see section 2.1.1). For a single user / single machine installation this can be skipped.
- d) The installer should then complete the installation without prompting for any more information.

2.3.2 Post Installation

- a) The Oasys software is designed to be run via the command script "oa_16". As part of the installation process a number of Environment Variables will have been automatically set up within this script. See section 3 for more details on these Environment Variables and how to modify them.
- b) Configure the preference file "oa_pref", (see section 4)
- c) Optional - Configure the SHELL for submitting LS-DYNA analysis (see section 7).

2.3.3 Making the oa_16 shell accessible to users

The version 16.0 software is designed to be accessed via the command “oa_16”. For more information on how to make this command available to all users see section 2.6.

2.4 Multiple Machine Network Installation

Installing the software onto a network drive for access from multiple machines.

2.4.1 Installation

- a) To start the installation process run

setup.csh

from the command line

- b) When prompted enter the full pathname of the directory that you want to install the software in and the license information. If you do not know the name of the license server or if you have not yet obtained a node locked license file then you can enter any machine name / filename and correct them later (see section 3).
- c) After entering the license information the installation process will continue and you will be offered the opportunity to set up an OA_ADMIN directory (see section 2.2.1).
- d) The installer should then complete the installation without prompting for any more information.

2.4.2 Post Installation

- a) The software is designed to be run via the command script “oa_16”. As part of the installation process a number of Environment Variables will have been automatically setup within this script. See section 3 for more details on these Environment Variables and how to modify them.
- b) Configure the preference file “oa_pref”, (see section 5)
- c) Optional - Configure the SHELL for submitting LS-DYNA analysis (see section 7).

2.4.3 Making the oa_16 shell accessible to users

The version 16.0 software is designed to be accessed via the command “oa_16”. For more information on how to make this command available to all users see section 2.6.

2.5 Multiple Machine Local Installation

If you are going to install the software on multiple machines then you can either follow the procedure outlined in section 2.4 for each machine or you can install the software once and then copy the installation to each machine.

2.5.1 Installation

- a) To start the installation process run

setup.csh

from the command line

- b) When prompted enter the full pathname of the directory that you want to install the software in and the license information. If you do not know the name of the license server or if you have not yet obtained a node locked license file then you can enter any machine name / filename and correct them later (see section 3).
- c) After entering the license information the installation process will continue and you will be offered the opportunity to set up an OA_ADMIN directory (see section 2.1.1).
- d) The installer should then complete the installation without prompting for any more information.

2.5.2 Post Installation

- a) The software is designed to be run via the command script "oa_16". As part of the installation process a number of Environment Variables will have been automatically setup within this script. See section 3 for more details on these Environment Variables and how to modify them.
- b) Configure the preference file "oa_pref", (see section 5)
- c) Optional - Configure the SHELL for submitting LS-DYNA analysis (see section 7).

After you have configured the preference file the complete installation directory can be copied to the other machines.

2.5.3 Making the oa_16 shell accessible to users

The version 16.0 software is designed to be accessed via the command "oa_16". For more information on how to make this command available to all users see section 2.6.

2.6 Making the oa_16 shell accessible to users

The Oasys software is designed to be run via the command script "oa_16". This command has to be set so that all users can run the software with a single command. The way you go about this is up to you: the following are simply suggestions, you may prefer other methods.

(1) Set up a symbolic link in a directory accessed by all users.

On most systems each user's path is set up at login time to include directories that contain generally used commands and files. For example many systems include the /usr/local/bin directory. Putting a symbolic link in such a directory that points to the oa_16 shell is a straightforward way to provide access to it for all users. You do this by going to that directory and typing the command:

```
ln -s pathname/oa16/oa_16 oa_16
```

Where *pathname* is the directory of OA_INSTALL_xx

(2) Set up an "alias" for selected users.

You may wish to restrict access to the software to a sub-set of users, in which case a more elegant solution might be to add an "alias" to their individual ".cshrc" files. (This assumes that they are running C shell.) You would do this by adding the line:

```
alias oa_16 'pathname/oa16/oa_16'
```

to their ".cshrc" files.

3 CUSTOMISING THE OASYS SHELL

On LINUX systems the Oasys SHELL is accessed via the "oa_16" command. If you have installed the software using the install script then the oa_16 command file (in the /executables directory) will automatically be updated to contain the correct path for the directory the software was installed in and the name of the license server.

In addition to specifying the installation directory and the license server the "oa_16" command file can also be set a number of other options on LINUX systems.

After installing the software the "oa_16" command file should contain the following. (This assumes the software was loaded in a directory called /prg and that the license server in a machine called atghps50.)

```
#!/bin/csh -f
    onintr start_flush
#
# Set OA_INSTALL to point to the directory containing the software
#
    setenv OA_INSTALL "/prg/oa16/executables"
#
# Set OA_ADMIN directory
#
    setenv OA_ADMIN
#
# Set OASYS_LICENSE_FILE to either the Oasys flexlm license file or
# the license server
#
# e.g. setenv OASYS_LICENSE_FILE $OA_INSTALL/oasys_flexlm.dat
# or setenv OASYS_LICENSE_FILE @hostname
#
    setenv OASYS_LICENSE_FILE @atghps50
#
# Set LSTC_FILE to either the lstc license file or the server
#
# e.g. setenv LSTC_LICENSE local
# setenv LSTC_FILE $OA_INSTALL/LSTC_FILE
#
# or
#
# e.g. setenv LSTC_LICENSE_SERVER hostname
# setenv LSTC_INTERNAL_CLIENT ON
# setenv LSTC_LICENSE network
#
    setenv LICENSE local
    setenv LSTC_FILE $OA_INSTALL/LSTC_FILE
#
# Other environment variables
#
    setenv DISPLAY_FACTOR automtaic
    setenv USERID `whoami`
    setenv LICENSE_TYPE "flexlm"
```

```
set noglob
#
#
# Set EDITOR (if not set) to the command to invoke an external editor. This
# EDITOR is currently used for editing comment lines in Oasys PRIMER.
#
# if(! $?EDITOR) then
# setenv EDITOR /usr/bin/kedit # LINUX
# endif
#
# Environment variables for post processors
#
# If FILE_SKIP has not been set then set it to 5
#
# if(! $?FILESKIP) then
#   setenv FILE_SKIP 5
# endif
#
# MACHINE SPECIFIC LINES
# =====
#
# extra line needed for some IBM machines
# setenv LANG En_US
#
# Extra line needed for SUN Solaris Machines
# setenv LD_LIBRARY_PATH /usr/openwin/lib
#
#
# Now start the main shell executable
#
# set cwd = `pwd`
# setenv PWD $cwd
# $OA_INSTALL/xshell_16 $*
#
# exit
#
exit:
exit
```

3.1 Environment Variables for licensing

3.1.1 `setenv OASYS_LICENSE_FILE / LM_LICENSE_FILE` `<option>`

Either `OASYS_LICENSE_FILE` or `LM_LICENSE_FILE` can be used to locate a valid license for the Oasys software. It is recommended that `OASYS_LICENSE_FILE` is used as this can speed up the checkout of licenses on systems where `LM_LICENSE_FILE` is used to find other license servers as well.

3.1.1.1 Floating Network License

If the software will be run using a license server this variable should be set to point to the license server machine using the machine's hostname:

```
setenv OASYS_LICENSE_FILE @hostname
```

or if a non-default port has been specified for the license server:

```
setenv OASYS_LICENSE_FILE port@hostname
```

If you are using a triad license server then you should specify all 3 license servers:

```
setenv OASYS_LICENSE_FILE port@host1:port@host2:port@host3
```

3.1.1.2 Fixed Stand-alone (nodelocked) Licenses

If the software will be using a node locked license file this variable should be set to point to the location of the license file:

```
setenv OASYS_LICENSE_FILE <INSTALL_DIR>\oasys_flexlm.dat
```

3.1.1.3 Multiple FLEXlm license files

If other software programs on the system are using FLEXlm this variable may already be set to point to a license file or a license server. If this variable is already set the Oasys license server or file can be added by specifying a list of values separated by semi-colons, for example:

```
setenv OASYS_LICENSE_FILE port@hostname1;@hostname2
```

3.1.2 `setenv LSTC_FILE / LSTC_LICENSE_SERVER` `<option>`

On LINUX machines LS-DYNA can use either a floating license system or a nodelocked license.

3.1.2.1 Floating Network License

If you are using the floating license system then the variables `LSTC_LICENSE_SERVER`, `LSTC_INTERNAL_CLIENT` and `LSTC_LICENSE` should be set as follows:

```
setenv LSTC_LICENSE network
```

```
setenv LSTC_LICENSE_SERVER hostname (of license server)
```

setenv LSTC_INTERNAL_CLIENT off (or on)

Setting LSTC_INTERNAL_CLIENT to “off” forces LS-DYNA to use an external executable “lstc_client” to communicate with the license server rather than the dyna executable itself. The executable lstc_client must be in the search path of the user executing LS-DYNA.

The use of the external program has two potential benefits firstly it allows the latest version of the licensing software to be used. Secondly licenses are returned quicker to the license pool if the LS-DYNA executable terminates abnormally.

If you are using a triad license server then you should specify all 3 license servers:

setenv LSTC_LICENSE_SERVER ‘(host1 host2 host3)’

3.1.2.2 Nodelocked License

If you are using a nodelocked license then the environmental variable LSTC_LICENSE should be set to “local” and the environmental variable LSTC_FILE should be set to the full pathname of the license file.

By default this file should be called 'LSTC_FILE' and it should be located in the 'executables' directory.

setenv LSTC_LICENSE local

setenv LSTC_FILE <INSTALL_DIR>/LSTC_FILE

3.2 Other Environment Variables

The following parameters will require modifying in accordance with your system layout

setenv OA_INSTALL / OA_INSTALL_16<option>

setenv OA_ADMIN / OA_ADMIN_16 <option>

setenv MENU_AUTO_CONFIRM <option> (optional)

setenv FILE_EXIST_ACTION <option> (optional)

setenv ECHO_PREFERENCE <option> (optional)

3.2.1 setenv OA_INSTALL / OA_INSTALL_16<option>

The Oasys shell variable must be modified so that it references the directory in which the shell is loaded. i.e if the software has been loaded in:

/prg/oa16/executables

Then this line should be set to:

setenv OA_INSTALL "/prg/oa16/executables"

This line should be set automatically by the installation script.

3.2.2 **setenv OA_ADMIN / OA_ADMIN_16 <option>**

If a top level administration directory is to be used then OA_ADMIN_16 (for release 16.0) must be defined on all machines on which the software is to be run. This variable should be set to the full pathname of the administration directory.

3.2.3 **setenv MENU_AUTO_CONFIRM <option>**

This variable is often used when replaying command files which, when recorded, paused and asked the user to confirm things. (For example HELP and Warning messages.) Possible options for this variable are, true and false.

If the variable is set (true) then these will not pause and will behave as if the user had pressed "OK" - meaning that command files can play back without user intervention. As a general rule this variable should not be set for interactive usage, but may be required when performing "batch" type operations.

3.2.4 **setenv FILE_EXIST_ACTION <option>**

This variable controls the action to be taken when opening a file for output, and the file already exists. Possible options for this variable are "none", overwrite and append.

Normally you will be prompted for the action to be taken when a file selected for output already exists. However if this variable is set to overwrite or append then the relevant action will be taken automatically.

This is generally used when playing automatic post-processing batch scripts, and should not be set for normal interactive usage.

3.2.5 **setenv ECHO_PREFERENCE <option>**

If this variable is set to "1" then any command line arguments used to start T/HIS, PRIMER or D3PLOT will be echoed to the screen along with any settings read from preference files.

4 SETTING UP USER PREFERENCES

4.1 The 'oa_pref' file

This file contains code-specific preferences that can be used to modify the behaviour of the software suite. It is optional, and where entries (or the whole file) are omitted programs will revert to their default settings.

4.1.1 'oa_pref' naming convention and locations

The preferences are stored in a file called "oa_pref". This file can exist in multiple locations which are searched in the following order:

- 1) The optional administration directory defined by the environmental variable (\$OA_ADMIN or \$OA_ADMIN_xx - where xx is the release number).
- 2) The site-wide installation directory defined by the environment variable (\$OA_INSTALL_xx)
- 3) The user's home directory \$OA_HOME which defaults to: \$HOME (Linux) or %USERPROFILE% (Windows)
- 4) The current working directory

(see Section 2 for an explanation of the directory structure).

All four files are read (if they exist) with the last preference read being the one used; this means the file can be customised for a particular job or user if necessary.

Files do not have to exist in any of these locations; if none exists the programme defaults will be used.

Typically the following should be set:

Organisation-wide options in the version in \$OA_ADMIN_xx and/or \$OA_INSTALL,

User-specific options in \$OA_HOME

Project-specific options in the current working directory.

4.1.2 File Format

The file contains preferences for:

- all the software (lines commencing oasys*)
- SHELL (lines commencing shell*)
- THIS (lines commencing this*)
- D3PLOT (lines commencing d3plot*)
- PRIMER (lines commencing primer*)
- REPORTER (lines commencing reporter*)

All lines take the format

<program name> * <preference name> : <preference value>.

The general copy of the preference file should be present in the \$OA_ADMIN_xx and/or \$OA_INSTALL_xx directory. This should contain the preferences most suitable for all software users on the system.

An individual's specific preferences file can be stored in the individual's home area or \$OA_HOME. This can be used to personally customise the software to the individual's needs.

Whenever a program with preferences in the oa_pref file is fired up, the program will take preferences in the following order:

1. from the general preference file in the \$OA_ADMIN_xx directory (if it exists)
2. then the \$OA_INSTALL_xx directory
3. then from the file in the user's home area (\$OA_HOME)
4. then from the current working directory

Preferences defined in the general oa_pref file can be superseded by preferences of the same name in the user's personal file but they can't be removed by it.

Preferences can be locked. If a preference is locked it cannot be changed in an oa_pref file in a more junior directory. To lock a preference use the syntax '**program#**' rather than '**program***'.

An example of the file is shown below to illustrate the content of the file

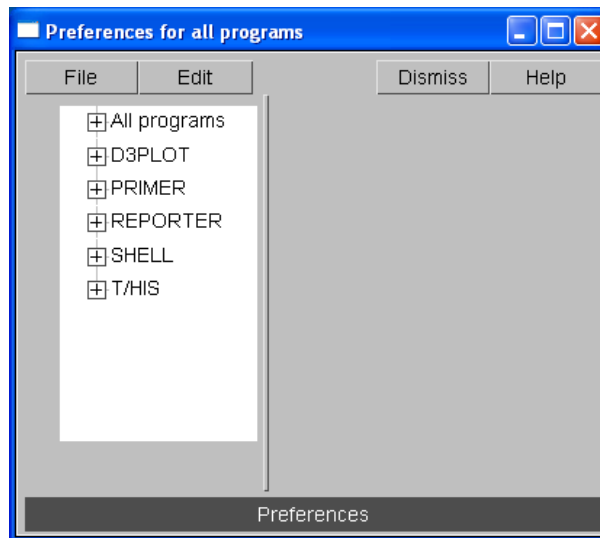
```
# Preferences file for software.
#
# Preferences for SHELL
shell*queue_cpu: 0
#
# Preferences for THIS
this*laser_paper_size: A4
#
# Preferences for D3PLOT
d3plot*overlay_colour: grey
#
# Preferences for PRIMER
primer*overlay_mode off
```

An example of a locked preference would be:

```
primer#background_colour: white
```

4.2 The Preferences Editor

The editor can be accessed from within the SHELL or from within D3PLOT, T/HIS, PRIMER or REPORTER. The preference settings for each program are listed in the appropriate manual.



4.2.1 The Preferences Editor Layout

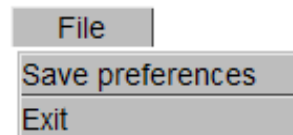
The preferences editor window is divided into two frames with a menu bar across the top.

4.2.2 Menu Bar



File options:

Save preferences: Save current preference settings. This will save the personal oa_pref file in the user's home directory. Only those preferences which differ from the preferences saved in the general oa_pref file will be saved.



Exit: Exit the preferences editor without saving.

Edit options:

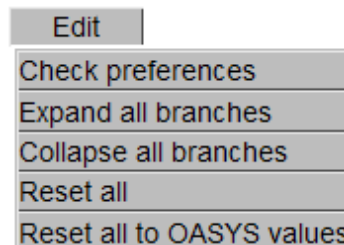
Check Preferences: Checks the current preferences for any errors. These errors will be listed in a separate window detailing the preferences with the errors and the nature of those errors

Expand all branches: Expands the categories in the left hand frame.

Collapse all branches: Collapses the categories in the left hand frame

Reset all: Resets all values.

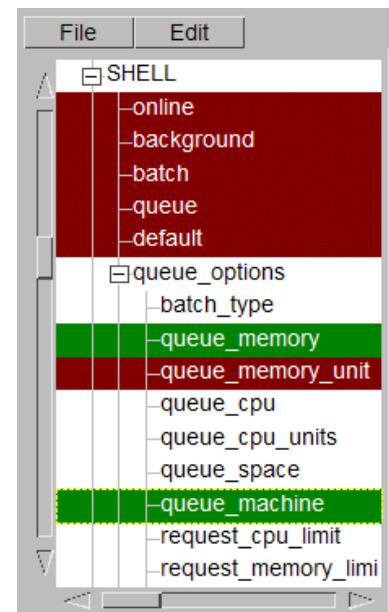
Reset all to OA_INSTALL values: Resets all values to the defaults stored in the main \$OA_INSTALL preference file.



4.2.3 The Preferences Editor Left Hand Frame

The left hand frame will contain the names of all preferences available to set. Preferences will be listed under the headings: PRIMER, D3PLOT, T/HIS, REPORTER and SHELL according to which program they are applicable to.

These categories can be expanded to reveal their respective preferences/contracted to hide their preferences by clicking on the box to the left of the respective category, alternatively, use the edit drop down menu and select expand all branches or collapse all branches.



Green	Means that the option has been read from your \$HOME/\$USERPROFILE file.
Red	Means that the option has been read from the \$OA_INSTALL file.
Magenta	Means that the option had been read from the \$OA_ADMIN file.

Preferences which aren't highlighted indicate preferences that haven't been set.

Preferences in **bold** type indicate preferences which haven't been assigned the default value.

A list of all the preferences available and their default value can be found in any oa_pref file written by the preferences editor.

4.2.4 The Preferences Editor Right Hand Frame

The right hand frame will contain information about the currently selected preference and provides the opportunity to edit this preference:

Name:	d3plot*maximise
Type:	<logical>
Default:	FALSE
Description:	Maximise window when D3PLOT starts
Active:	<input checked="" type="checkbox"/>
Value:	<input type="text" value="FALSE"/>

Name: States the name of the currently selected preference.

Type: Specifies the type of variable applicable to this preference.

Default: States the default value of the preference.

Description: Provides a brief description of the function performed by this preference.

Active tab: Highlighted in Green when the preference has been assigned a value. Press this tab to activate/ deactivate the currently selected preference. If the currently selected preference was defined in the general oa_pref file, deselecting this will bring up an error message as it is not possible to deselect preferences stored in the general oa_pref file.

Value: States the currently selected value for the preference. Clicking on the arrow to the left of this box brings up a drop-down menu which lists the possible values this preference can take and allows the user to select one of these values.

4.3 Locking Preferences

Preferences can be locked. Beside each option in the preference editor is a padlock symbol. If the symbol is green then the option is unlocked, if it is red then it is locked. If a preference option has been locked in a file that the user cannot modify then an error message will be generated if the user tries to edit that option.

If a user manually edits the "oa_pref" file to try and set an option that has been locked in another preference file then the option will be ignored in the users preference file.

An unlocked preference is defined in the oa_pref file by:

```
<programme> * <preference> : <value>
```

A locked preference replaces the "*" with a "#", thus:

```
<programme> # <preference> : <value>
```

5 AUTOMATIC LICENSE TIMEOUTS

5.1 Configuring automatic timeouts

Each application can be setup to exit automatically if it remains idle for a specified time. When the application exits it will automatically release any licenses that are being used and return them to the pool of free licenses.

The automatic license timeouts are controlled by a file called 'timeouts' located in the directory defined by the OA_ADMIN_xx or the OA_INSTALL_xx environment variable.

The format of this file is

<application name> <idle time> <grace period> (<%age in use>)

e.g

```
#
primer      60  5  80
d3plot      60  5  50
this        60  5
#
```

The times are defined in minutes. The idle time should be > 0 and the grace period should be >=0, both times are required.

The "%age in use" column is optional and may be omitted. If defined it should be a value in the range 1 to 100 which is a percentage of licenses in use for that product. The timeout process will only take effect if more than this percentage of licenses are in use, meaning that if usage is below this percentage a session will be allowed to remain open indefinitely.

If this column is omitted an implicit value of 0% is assumed, meaning that timeouts will occur regardless of the number of licenses checked out for that product.

Any line in the file starting with '#', '%' or '\$' is counted as a comment line.

Blank lines are ignored

Input is not case-sensitive

Input is free format, but each programme's settings must be on a single line.

When the idle time is exceeded a warning message will be displayed within the application's master window. This message will be displayed for the grace period specified; the application will be terminated if no response is detected. Giving a response resets both <idle> and <grace> counters so that a further <idle time> must elapse before a further warning is issued.

If programs terminate due to a license timeout the following occurs:

- PRIMER: a copy of any models currently loaded will be saved in the users home area or \$OA_HOME
- D3PLOT: will just exit
- T/HIS: will just exit

In all cases, the controlling terminal window receives a message explaining what has happened and why; this window will remain on both Windows and Linux platforms.

The warning notice is displayed within the master window of the application, not on the desktop. This is intentional to prevent users starting the application to grab a license then iconising/minimising it until they need it as the warning message will not be seen if the application is minimised.

Note that the `timeouts` file must be write-protected against users either by protecting the file, or the directory in which it exists, otherwise users will be able to change the file content.

Automatic timeouts are only active if this “timeouts” file is present, and then only for products with entries in the file. If it is not defined, or a product does not have an entry, no timeouts will take place and sessions will be allowed to remain open indefinitely.

5.2 Interrogating FLEXlm license usage

The FLEXlm utility “`lmutil`” is shipped as part of the standard installation, and will be installed in the same directory as the other executables.

The status of license usage can be listed at any time by using the command “`$OA_INSTALL_xx/lmutil lmstat`”, which will list all licenses checked out from servers known to this machine.

Further commands are available: the command “`$OA_INSTALL_xx/lmutil -h`” will list all the available options, and you will find full information about this and other aspects of FLEXlm licensing in the document `$OA_INSTALL_xx/manuals/flexuser/fnp_LicAdmin.pdf`.

6 CUSTOMISING THE SHELL FOR SUBMITTING LS-DYNA JOBS

In addition to accessing the Oasys software, the SHELL can be used to submit LS-DYNA jobs. To use the SHELL to submit LS-DYNA the following should be configured:

1. General Submission Options
2. The versions of LS-DYNA available
3. Queuing Options
4. MPI commands for MPP submission

For more details on how to perform all of these please see the Oasys SHELL manual.

7 TUNING THE GRAPHICS DRIVER

Oasys software makes intensive use of 3D graphics, putting a lot of stress on the graphics card. High-performance workstations and PCs tend to have one of the following cards installed:

NVidia Quadro series, or sometimes GeForce (really a gaming card)
AMD/ATI FirePRO series, or sometimes Radeon (really a gaming card)

It is our experience that as of late 2015 the up to date drivers for these cards will work satisfactorily with Oasys software without further tuning.

If you experience problems the first step should be to install the most recent graphics driver for your card, which can be found at:

NVidia <http://www.nvidia.com> (Choose “Drivers”)
AMD/ATI <http://www.amd.com> (Choose “Drivers + support”)

If you still experience problems, typically visual artefacts and/or “stuttery” animation performance, the diagnostic process below may help. However the advice here is only relevant for older cards and drivers and it is recommended that you contact Oasys Ltd for advice.

7.1 Finding out what graphics card and driver you have installed.

Unfortunately there is no ready-made tool on Linux to provide details of the graphics card installed, but the following procedure should work:

Type `glxinfo | grep -i string` which should give card manufacturer and name.

For example on a machine with an AMD/ATI card this might produce:

```
OpenGL vendor string: ATI Technologies inc
OpenGL renderer string: ATI FirePro V7750 (FireGL)
OpenGL version string: 3.3.10225 Compatibility Profile FireGL
```

And on a machine with an NVidia card:

```
OpenGL vendor string: NVIDIA Corporation
OpenGL rendered string: Quadro FX 3800/PCI/SSE2
OpenGL version string: 3.3.0 NVIDIA 256.35
```

Once you know the make of the card you can then look in file `/var/log/Xorg.0.log` for more information about its driver. The actual filename may vary with the version of Linux, but something like the following should work, the example here being for an NVidia card:

```
grep -i nvidia /var/log/Xorg.0.log | grep -i driver
```

Which should produce something like:

```
(II) Loading /usr/lib64/xorg/modules/drivers/nvidia_drv.so
(II) NVIDIA dlloader X driver 256.35 Wed Jun 16 18:45:02 PDT 2010
(II) NVIDIA Unified driver for all Supported NVIDIA GPUs
```

From which you can discern that the driver release is 256.35 dated 16th June 2010

It is recommended that if your graphics driver is significantly out of date that you consider upgrading it to a more recent version. This is not mandatory, and if the machine is working well there is a strong case for “if it isn’t broken, don’t fix it”; but certainly the first step to be taken if graphics problems arise is to upgrade an out of date driver.

7.2 Tuning an NVidia graphics driver

No tuning is required for NVidia drivers under Linux.

7.3 Tuning an AMD / ATI driver

NOTE!! The advice below only relates to AMD/ATI drivers up to mid 2014. More recent drivers no longer use the `atiogl.xml` file, so the changes below will not achieve anything.

It is our experience that on the most recent FirePRO cards a driver dated December 2015 or later is required to achieve stable performance, so if you have not already done so then try updating to that first. If problems persist after that please contact Oasys Ltd for further advice and help.

For older cards and drivers on Linux AMD/ATI create the following XML file:

`/etc/ati/atiogl.xml`

In which configuration settings for individual applications are stored. This file needs to be edited to include settings for the Oasys Ltd software suite. Here is the top of a typical file:

```
<PROFILES>
<!-- ===== -->
<!-- Workstation Applications -->
<!-- ===== -->
<!-- 3ds max -->
  <_3dsmax>
    <OpenGLCaps>0x00008040</OpenGLCaps>
    <OpenGLCapsEx>0x00000000</OpenGLCapsEx>
    <CrossFireCaps>0x00000010</CrossFireCaps>
  </_3dsmax>
```

The following lines need to be added. They can go anywhere in the file, but you might wish to insert them in the correct alphabetical location:

```
<!-- D3PLOT -->
  <d3plot16_64>
    <OpenGLCaps>0x00008000</OpenGLCaps>
  </d3plot16_64>
<!-- PRIMER -->
  <primer16_64>
    <OpenGLCaps>0x00008000</OpenGLCaps>
  </primer16_64>
<!-- THIS -->
  <this16_64>
```

```
<OpenGLCaps>0x00008000</OpenGLCaps>  
</this16_64>
```

Once edited simply save the file in its current location.

7.4 Advice for users generating graphics on Linux machines without local displays, typically clusters

Where batch graphical post-processing is performed on remote clusters we have observed problems when the standard OpenGL graphical libraries are used, giving images of inferior quality. We have also observed problems when interactive graphics are generated remotely and displayed locally on the desktop through a network, as this can give unacceptably slow graphical performance.

Better results can sometimes be obtained in these situations from executables linked with the MESA emulation library, since this removes any dependence upon OpenGL and – in the remote display case – reduces network traffic. If you wish to have executables linked in this way, or would like further advice, please contact us.

8 THE FLEXLM LICENSING SYSTEM

The LS-DYNA Environment software (PRIMER, D3PLOT, T/HIS and REPORTER) use the FLEXlm licensing system.

8.1 Installing FLEXlm

All of the files needed to install FLEXlm on the system will have been copied into the installation directory when the software was installed. The Oasys software is designed to be used with either ‘floating’ or ‘node locked’ licenses.

8.2 Obtaining Oasys FLEXlm Licenses

For floating (server) licenses: the hostname and FLEXlm host ID of the server machine only are required (although this does not have to be a machine that the Oasys software is installed on it is recommended to be).

For node locked licenses: the hostname and FLEXlm host ID of each machine upon which the software will run are required.

To generate this information go to:

OA_INSTALL_xx directory and run **lmtools**.

Please send the output generated by the **Hostid** button to Oasys Ltd by email: dyna.support@arup.com.

8.3 Entering Oasys FLEXlm licenses

The Oasys FLEXlm license codes are contained in a file called ‘**oasys_flexlm.dat**’ which should be placed in the directory where the executables themselves have been installed (ie OA_INSTALL_xx). Typically Oasys Ltd will send license codes by e-mail.

8.3.1 Node locked license

On LINUX systems the installation script should automatically have set the environmental variable OASYS_LICENSE_FILE to point to file **oasys_flexlm.dat**, specifying its full pathname. If not, set it by editing the oa_16 script.

8.3.2 Floating (server) license

If a floating (server) license is to be used the Oasys FLEXlm license daemon should be started.

8.4 Starting the Oasys FLEXlm license daemon

When the Oasys software is installed the ‘**start_flexlm**’ script is automatically added to the OA_INSTALL_xx directory. As part of the installation process this file should have been automatically modified so that the environment variable OASYS_LICENSE_FILE (or LM_LICENSE_FILE) has been set to point to the full pathname of the ‘**oasys_flexlm.dat**’ license file (see section 3.1)

Further, the oa_16 script should have

setenv OASYS_LICENSE_FILE @hostname

where hostname is the license server.

To start the Oasys FLEXlm license daemon go into the installation directory and enter:

./start_flexlm

If the command fails with the following error message

“License manager: can’t initialize: Cannot find license file”

check that the LM_LICENSE_FILE environment variable has been set correctly in ‘start_flexlm’.

If the license manager starts successfully it is recommended that system boot sequence is modified to ensure the **start_flexlm** script file is automatically run whenever the system is rebooted.

8.5 Redundant License Servers

If planning to use redundant servers it is advisable to select stable systems as server machines; do not pick systems that are frequently rebooted or shut down. Redundant license server machines are any supported server machines.

FLEXlm supports two methods of redundancy:

- Via a license-file list in the LM_LICENSE_FILE environment variable
- Via a set of three redundant license servers

With LM_LICENSE_FILE list redundancy, each one of a group of license servers serves a subset of the total licenses. The end user sets LM_LICENSE_FILE to a list of license files, where each license file refers to one of the license servers. The application then tries each server in the list in order until it succeeds or gets to the end of the list.

With three-server redundancy, if any two of the three license servers are up and running (two out of three license servers is referred to as a quorum), the system is functional and serves its total complement of licenses.

8.5.1 Three-Server Redundancy

The machines that comprise a three-server redundant configuration should

- Run the same operating system
- Have excellent communications
- Reside on the same subnet

The three servers must be located physically close to each other. This form of redundancy requires that the servers exchange heartbeats periodically and poor communications can cause poor performance. Avoid configuring redundant servers with slow communications or dial-up links.

Three-server redundancy is designed to provide hardware failure protection only and does not provide load-balancing (if load-balancing is desired use the LM_LICENSE_FILE list option).

With three-server redundancy only one of the three servers is “master,” capable of issuing licenses. If the “master” machine fails one of the remaining machines takes over the “master”

role and continues to serve licenses. Since all clients must contact the “master” all clients must have reliable networking to a single machine.