Intall Abaqus 2017 on a Linux System

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Description

This document aims to guide users to install and run Abaqus 2017 on a Linux machine. Table 1 summarizes the installation environments used in this guidance. Although Ubuntu is specified in the table, this instruction file is also suitable for installation of Abaqus on other Linux distributions (e.g. Archlinux, Fedora, etc.). The Linux desktop environment is not required. All installation steps are completed in terminal. Thus, this document is also suitable for users who want to install and run Abaqus on a Linux server remotely via SSH connection. Furthermore, if you want to install other version of Abaqus, you can still follow the methods given by this guide. But it should be highlighted that the administration right is required to complete the installation.

Table 1: Environments of Installation

Linux Distribution:	Ubuntu 14.04.4 LTS (64 bits)
Linux desktop environment:	N/A
Administration Right:	Yes
Abaqus version:	Abaqus 2017 (64 bits)

Prerequirments

Installation Files

The Abaqus installation files should be transferred to the Linux machine. In this document, the root directory of the installation files is marked *IFRD*. It should be noted that the *IFRD* should not contain any “space”.

To avoid any permission issues, the permission of *IFRD*should be modified so that every user read/write/execute the installation files. To achieve this, simply run the following command in terminal.

```
sudo chmod -R 777 IFRD
```

Install Required Packages

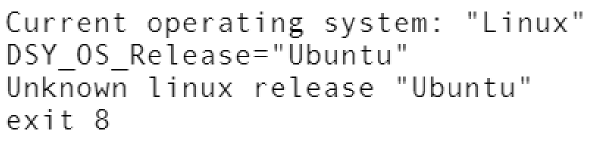
The Linux Abaqus installation program is based on ksh and the FLEXNET requires the lsb-core. The two packages should be installed before the installation of Abaqus by the following command:

```
sudo apt-get install ksh lsb-core
```

It should be noted that “apt-get” is the package handling utility of Ubuntu. If you are working with other Linux distribution, the command to install packages may vary.

Disguise Your Linux Distribution

When the Abaqus installation program starts, it will check your Linux release name. If your Linux distribution is not “Red Hat Enterprise Linux Server”, “Red Hat Enterprise Linux Client”, “Red Hat Enterprise Linux Workstation”, “Cent OS”or “Suse Linux”, the program will pop out error and exit, as shown in Figure 1.

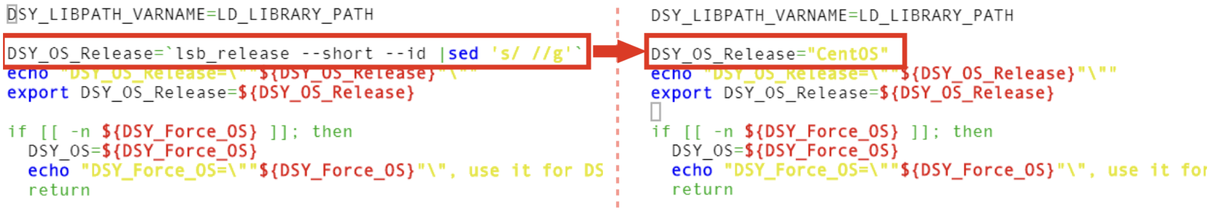


```
Current operating system: "Linux"
DSY_OS_Release="Ubuntu"
Unknown linux release "Ubuntu"
exit 8
```

Figure 1: Unknown linux release

To avoid this error, you have to disguise your Linux distribution as one of the aforementioned release names. The Abaqus installation program calls a script named “Linux.sh” to detect your Linux release name. In this file, you have to change the line “DSY_OS_Release =‘lsb_release –short –id —sed ’s/ //g’‘” to “DSY_OS_Release=“CentOS””, as shown in Figure 2. In the terminal, you can edit text script file with software “nano” or “vim”. By modifying the “Linux.sh” script, the installation program will detect your Linux release name as “Cent OS”.

There are eight “Linux.sh” scripts in the *IFRD*, you need to modify all the eight files. The directories which contain the scripts are listed in Table 2.



```
DSY_LIBPATH_VARNAME=LD_LIBRARY_PATH

DSY_OS_Release=`lsb_release --short --id |sed 's/ //g'`
echo "DSY_OS_Release=\""${DSY_OS_Release}"\""
export DSY_OS_Release=${DSY_OS_Release}

if [[ -n ${DSY_Force_OS} ]]; then
  DSY_OS=${DSY_Force_OS}
  echo "DSY_Force_OS=\""${DSY_Force_OS}"\", use it for DS
  return
```

```
DSY_LIBPATH_VARNAME=LD_LIBRARY_PATH

DSY_OS_Release="CentOS"
echo "DSY_OS_Release=\""${DSY_OS_Release}"\""
export DSY_OS_Release=${DSY_OS_Release}

if [[ -n ${DSY_Force_OS} ]]; then
  DSY_OS=${DSY_Force_OS}
  echo "DSY_Force_OS=\""${DSY_Force_OS}"\", use it for
  return
```

Figure 2: Change the "Linux.sh" file

Table 2: Directories which contain the "Linux.sh" files

IFRD/1/inst/common/init
IFRD/1/SIMULIA_Documentation/AllOS/1/inst/common/init
IFRD/2/SIMULIA_FLEXnet_LicenseServer/Linux64/1/inst/common/init
IFRD/2/SIMULIA_AbaqusServices/Linux64/1/inst/common/init
IFRD/2/SIMULIA_AbaqusServices_CAA_API/Linux64/1/inst/common/init
IFRD/2/SIMULIA_Abaqus_CAE/Linux64/1/inst/common/init
IFRD/2/SIMULIA_Tosca/Linux64/1/inst/common/init
IFRD/3/SIMULIA_Isight/Linux64/1/inst/common/init

Installation

First of all, login as root user before the installation. In Ubuntu, you can do this by:

```
sudo -s
```

To start the installation program, the following command should be executed:

```
IFRD/1/StartTUI.sh
```

This command will start a installation program in terminal. Alternatively, if you have Linux with Desktop Environment installed, you can call the following command to start the installation program with a GUI.

```
IFRD/1/StartGUI.sh
```

It should be highlighted that you cannot start the installation program from the *IFRD* or its subdirectories. You can switch your current directory with "cd" command.

When the installation program starts, you can select and install the SIMULIA products. To install Abaqus, the products "FLEXnet License Server", "Abaqus Simulation Services", "Abaqus Simulation Services CAA API" and "Abaqus/CAE" are necessary.

It should be noted that the "FLEXnet License Server" should be installed before installing the "Abaqus/CAE". When install the "FLEXnet License Server", you need to tick the option "Files only : do not start the license server program. ". When "FLEXnet License Server" is installed, you need to start the FLEXnet Server before starting installing "Abaqus/CAE". To achieve this, you need to open a new terminal window (or a new SSH connection) and start server with the following command (if you install the "FLEXnet License Server" into the default directory).

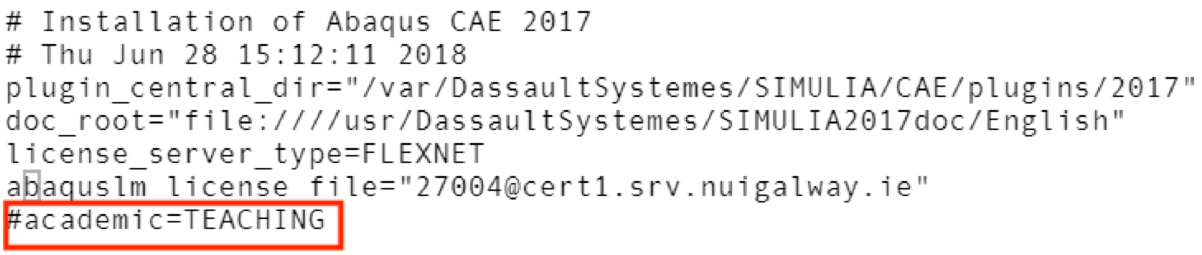
```
/usr/SIMULIA/License/2017/linux_a64/code/bin/lmgrd
```

During the installation of "Abaqus/CAE", the "SIMULIA FLEXnet" should be ticked as the license server. The license server of NUI Galway is "27004@cert1.srv.nuigalway.ie".

After the installation, the Abaqus licence type should be changed from academic to research. To do this, one of the Abaqus environment files, "custom_v6.env", should be modified. If the Abaqus is installed into its default directory, the file can be edit with "nano" or "vim".

```
nano /usr/DassaultSystemes/SimulationServices/V6R2017x/linux_a64/SMA/
site/custom_v6.env
```

The line "academic=TEACHING" in the "custom_v6.env" file should be commented or deleted, as shown in Figure 3.



```
# Installation of Abaqus CAE 2017
# Thu Jun 28 15:12:11 2018
plugin_central_dir="/var/DassaultSystemes/SIMULIA/CAE/plugins/2017"
doc_root="file:////usr/DassaultSystemes/SIMULIA2017doc/English"
license_server_type=FLEXNET
abaquslm license file="27004@cert1.srv.nuigalway.ie"
#academic=TEACHING
```

Figure 3: Change the license setting in the "custom_v6.env" file

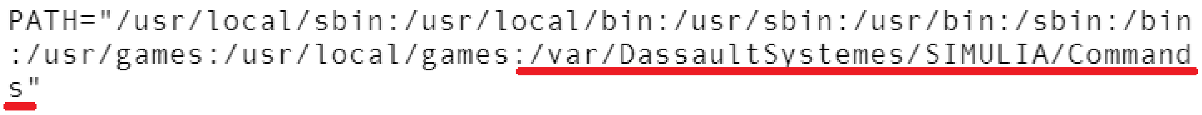
After finishing the installation, exit the root mode with command "exit".

Start Abaqus

If Abaqus is installed into its default directory, it can be called with command:

```
/var/DassaultSystemes/SIMULIA/Commands/abaqus
```

To avoid typing the full path to start Abaqus, the path "/var/DassaultSystemes/SIMULIA /Commands" needs to be appended to the "PATH" variable of Linux. The system "PATH" variable is defined in the file "/etc/environment". Open the file with "nano" or "vim" and append the Abaqus command path into the "PATH" variable, as shown in Figure 4.



```
PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
:/usr/games:/usr/local/games:/var/DassaultSystemes/SIMULIA/Command
s"
```

Figure 4: Append path to "PATH" variable

After modifying the "/etc/environment" file, a reboot or re-login is required to take the modification into effects. Now the Abaqus can be simply called by:

```
abaqus
```

The Abaqus CAE can be started by:

```
abaqus cae
```

It should be noted that other libraries (e.g. libstdc++.so.6, libjpeg62, etc.) may be required by Abaqus CAE. Just follow the error message given by Abaqus CAE and install the missing libraries with "apt-get".

Link C/C++ and Fortran compiler

Change the default Fortran compiler

On Linux, the default C/C++ compiler and Fortran compiler which Abaqus will search for are "gcc" and "ifort", respectively. As the usage of free version "ifort" is very limited, the "gfortran" compiler is considered as an alternative during linking. To do this, these two compilers should be installed:

```
sudo apt-get install gcc gfortran
```

Then, one of the Abaqus environment files, “lnx86_64.env”, should be modified. If you installed Abaqus into the default directory, the file is located in “/usr/DassaultSystemes/SimulationService
It is always recommended to create a backup file before editing the environment file.

To change the default Fortran compiler, change the line:

```
fortCmd = “ifort”
```

to:

```
fortCmd =“gfortran”
```

Correspondingly, the compiling arguments should be modified from:

```
compile_fortran = [fortCmd,
                   ’-V’,
                   ’-c’, ’-fPIC’, ’-auto’, ’-mP2OPT_hpo_vec_divbyzero=F’,
                   ’-extend_source’,
                  ’-fpp’, ’-WB’, ’-I%I’]
```

to:

```
compile_fortran = [fortCmd,
                   ’-c’, ’-fPIC’,
                   ’-I%I’]
```

Then, the linking arguments should also be changed from :

```
link_sl = [fortCmd,
          ’-V’,
          ’-cxxlib’, ’-fPIC’, ’-threads’, ’-shared’,
          ’-Wl,–add-needed’,
          ’%E’, ’-Wl,-soname,%U’, ’-o’, ’%U’, ’%F’, ’%A’, ’%L’, ’%B’,
          ’-parallel’, ’-Wl,-Bdynamic’, ’-shared-intel’]
```

to:

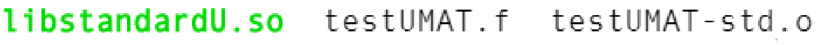
```
link_sl = [fortCmd,
                ’-fPIC’, ’-shared’,
                ’%E’, ’-Wl,-soname,%U’, ’-o’,
                ’%U’, ’%F’, ’%A’, ’%L’, ’%B’,
                ’-Wl,-Bdynamic’, ’-lifport’, ’-lifcoremt’]
```

Verify the linking

To verify if the linking is successful, you can try to compile and link a sample Fortran file.

```
abaqus make library=testUMAT.f
```

If the compilation and linking are successful, you will find two output files created, one ’*.o’ file and one ’*.so’ file (Figure 5).



```
libstandardU.so  testUMAT.f  testUMAT-std.o
```

Figure 5: Output files of the compilation and linking