

Title: Installation Guide SEE Version 2.0.1	Project/Product: DDMoRe 2107	Date: 5-Jun-2017	Version: 1.1	Status: Approved
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**DDMoRe Standalone Execution Environment (SEE)
Version 2.0.1
Installation Guide**

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1 Revision history

Version	Prepared by	Date (dd-mmm-yyyy)	Details
1.0	Mats Rogalski	16-Aug-2016	Written for 2.0.1 SEE release. QAT-4158 covers review/approval history.
1.1	Stuart Moodie	5 Jun 2017	Updated for revision 2.0.1

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2 Glossary

The following terms and abbreviations are used within this document:

Term	Description
IDE	Integrated Development Environment
CTS	Converter Toolbox Service
FIS	Framework Integration Service
MDL	Model Description Language
R	A programming language, available at https://www.r-project.org
SEE	Standalone Execution Environment
TES	Task Execution Service

A complete glossary of terms is available from the [DDMoRe Consortium](http://www.ddmore.eu) website at:
<http://www.ddmore.eu/instructions/glossary>.

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3 Introduction

This document details the recommended installation process for the DDMoRe Standalone Execution Environment (SEE) which is delivered as the Demonstrator 2.0.1 package.

3.1 Overview

The SEE provides a complete, standalone environment for performing modelling tasks using the DDMoRe MDL IDE, including translation to, and execution of, models with key tools.

The SEE includes the following elements:

- A bespoke IDE that supports development of models with MDL and also incorporates an R console with the DDMoRe packages pre-installed
- Translators from MDL to the following target languages:
 - o NM-TRAN
 - o MLXTRAN
 - o Simcyp
 - o WinBUGS
 - o PFIM (R package)
 - o PopED (R package)
- An instance of Monolix for running models, embedded with a licence that is valid until the 30th October 2016
- An instance of BlackBoxWinBUGS
- An instance of R, including standard and DDMoRe-specific modelling packages

NONMEM binaries that are preconfigured to use within the SEE are available directly from ICON and must be installed separately.

The Simcyp Simulator is available directly from Simcyp Limited and must be installed separately. A valid licence is also required.

3.2 Scope

This document details the installation process for the DDMoRe Standalone Execution Environment (SEE) Demonstrator 2.0.1 package only. These installation instructions cannot be guaranteed to be valid for earlier or later versions of the SEE package.

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4 Software Installation

The table below details the list of the software components and versions that will be installed by the installation process.

Software	Version
WP2 Framework Demonstrator software	2.0.1

For further details about the Demonstrator dependencies being installed and tools included in its plugins please refer to the README and *.info files located in the home folder of the installed SEE instance.

4.1 Environment requirements

The table below details the minimum environmental requirements for the software, in particular operating systems, available memory and disk space for installation / operation. See Section 4.2.5 for further details.

Operating System	Windows 7, SP1 or above (64-bit only)
Number & speed of CPUs	Dual-core Intel i5 or above (or equivalent)
Available memory	2GB minimum - 4GB/8GB ideally
Available disk space	8GB minimum

4.2 Installation pre-requisites

4.2.1 Configuration of localhost

Note that this section describes changes that may be required to your system's 'hosts' file. Editing this file requires Administrator privileges. If you do not have these privileges or are unsure how to proceed, please contact your IT department.

During testing, we have encountered instances when running Windows virtual machines (VMs) on non-Windows platforms, whereby the MDL-IDE could not communicate with the service that executes tasks because the operating system was referring to the host computer rather than the virtual machine itself. If you are not running in a virtual machine then this section probably does not apply to you.

This can be corrected by altering the setting of "localhost" to point to the IP address 127.0.0.1.

To check this setting, edit the file `C:\Windows\System32\drivers\etc\hosts`. If there is no setting for localhost, or it is commented out as shown below (i.e. the line starts with a '#'), everything should work as expected.

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```
# Copyright (c) 1993-2009 Microsoft Corp.
#
# This is a sample HOSTS file used by Microsoft TCP/IP for Windows.
#
# This file contains the mappings of IP addresses to host names. Each
# entry should be kept on an individual line. The IP address should
# be placed in the first column followed by the corresponding host name.
# The IP address and the host name should be separated by at least one
# space.
#
# Additionally, comments (such as these) may be inserted on individual
# lines or following the machine name denoted by a '#' symbol.
#
# For example:
#
#       102.54.94.97       rhino.acme.com           # source server
#       38.25.63.10      x.acme.com              # x client host
#
# localhost name resolution is handled within DNS itself.
#   127.0.0.1          localhost
#   ::1                localhost
```

If the localhost setting is not commented out and is not set to 127.0.0.1, then it will need to be changed or the DDMoRe Demonstrator software will not work. You may wish to contact your local system administrator if you are unsure about the status of your configuration. Following any changes, you may need to restart your machine to ensure that it is using the new setting of the IP address.

4.2.2 Availability of required ports

The server processes delivered with the SEE (FIS, CTS and TES) require a set of internal ports to be available for use so that they can communicate with each other. If these ports are being used by other processes (programs), then the servers will not be able to function correctly.

The Windows command 'netstat' can be used to check whether the required ports are available as detailed below.

1. Open a 'Command Prompt' window. To do this, from the Windows 'Start Menu', enter the text 'cmd.exe' in the 'Search programs and files' text box and click on the offered program
2. In the 'Command Prompt' window type the command *netstat -a*. Output similar to that shown below should be displayed.

```
C:\>netstat -a

Active Connections

Proto Local Address           Foreign Address         State
TCP   0.0.0.0:80              RKAVE:0                 LISTENING
TCP   0.0.0.0:135            RKAVE:0                 LISTENING
TCP   0.0.0.0:443            RKAVE:0                 LISTENING
TCP   0.0.0.0:445            RKAVE:0                 LISTENING
TCP   0.0.0.0:623            RKAVE:0                 LISTENING
TCP   0.0.0.0:1110           RKAVE:0                 LISTENING
TCP   0.0.0.0:5357           RKAVE:0                 LISTENING
TCP   0.0.0.0:16992          RKAVE:0                 LISTENING
TCP   0.0.0.0:24224          RKAVE:0                 LISTENING
TCP   0.0.0.0:42073          RKAVE:0                 LISTENING
TCP   0.0.0.0:49152          RKAVE:0                 LISTENING
TCP   0.0.0.0:49153          RKAVE:0                 LISTENING
TCP   0.0.0.0:49154          RKAVE:0                 LISTENING
TCP   0.0.0.0:49158          RKAVE:0                 LISTENING
TCP   0.0.0.0:49184          RKAVE:0                 LISTENING
TCP   0.0.0.0:49191          RKAVE:0                 LISTENING
TCP   127.0.0.1:1110         RKAVE:49467             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49469             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49471             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49473             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49475             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49477             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49479             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49481             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49483             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49485             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49487             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49489             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49491             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49493             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49496             TIME_WAIT
TCP   127.0.0.1:1110         RKAVE:49498             TIME_WAIT
```

3. In the Local Address column, all the internal ports that are currently in use are listed. For the SEE to function correctly, a number of specific ports need to be available. If NONE of the following ports appear in the Local Address column, it is safe to continue with the SEE installation. If ANY of the following ports appear in the Local Address column please contact the DDMoRe Foundation (<https://www.ddmore.foundation/contact/>) requesting further advice and we will respond as soon as possible:
- a) TCP 0.0.0.0:9000
 - b) TCP 0.0.0.0:9010
 - c) TCP 0.0.0.0:9020
 - d) TCP 127.0.0.1:9011
 - e) TCP 127.0.0.1:9021

4.2.3 Dependent Software

No dependent software is required prior to installing this item.

4.2.4 Deployment Mechanism

The SEE is shipped as a zip that can be extracted to a location specified by the user and run without configuration steps.

The SEE includes the Java Runtime Environment (JRE) for 64-bit Windows. This JRE is used to run Java-based utilities included in the system.

4.2.5 Deployment Environment

The officially supported deployment environment is Windows 7 (64-bit), but the SEE has been successfully run on Windows XP, Windows 8 and Windows 10.

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5 Installing the SEE

Two distinct mechanisms have been developed for installing the SEE:

1. Using the installer package
2. Downloading the complete 'pre-built' package

Option 1 offers greater flexibility as it can be used to customise an SEE instance and add further functionality at a later date. As the installer downloads the various components of the SEE separately, and offers the facility to restart an interrupted installation, it is useful for users with a slower or less reliable internet connection. However, this installer will not execute successfully when internet access is configured to route through a proxy, which may be the case in many commercial environments.

Option 2 offers a simplified installation process at the expense of a large download which may take a significant amount of time. This option does execute successfully when internet access is configured to route through a proxy and works best when combined with a fast and reliable internet connection.

Instructions for installing the SEE using both of the above options are detailed in the following two sections.

If you are unsure whether you have any environmental constraint that means you specifically need to choose one rather than the other of the above options, please contact your IT department.

Note that *either* Section 6 or Section 7 should be followed, not both.

Also note that:

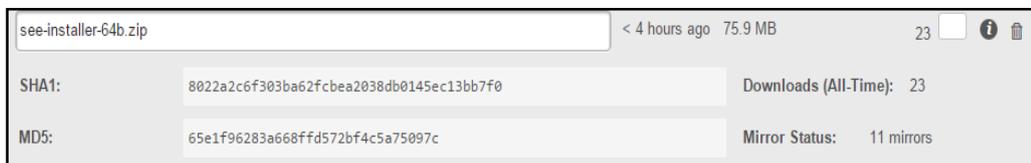
- the NONMEM binaries and licence need to be downloaded and installed as a separate step, described in section 8
- The Simcyp Simulator and licence needs to be downloaded and installed as a separate step, described in section 9

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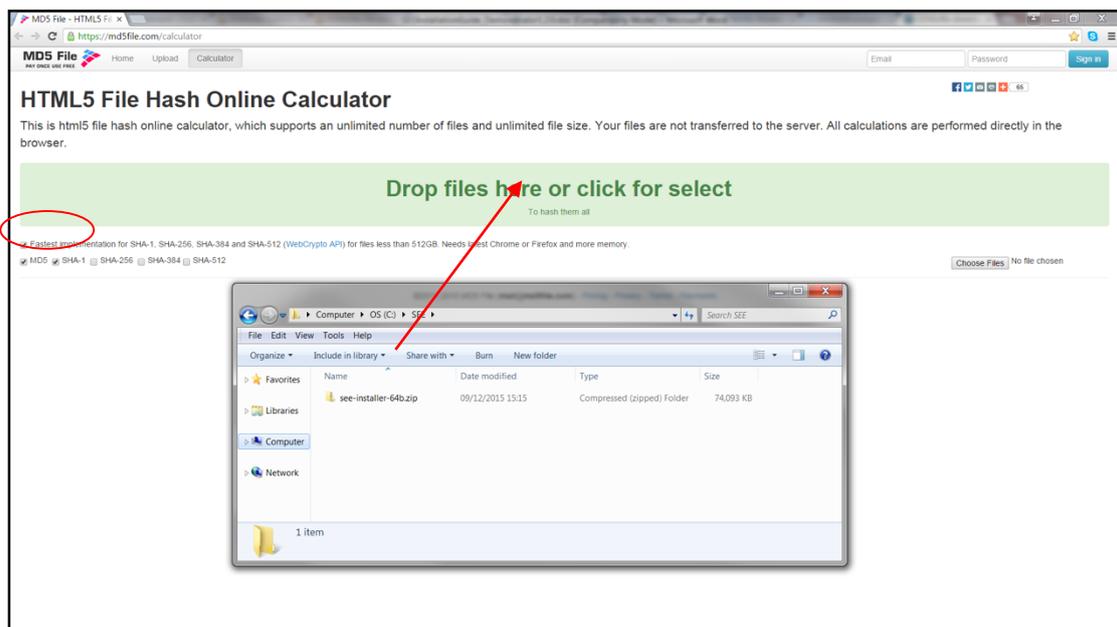
6 Using the installer package

6.1 Downloading the SEE Installer

1. Navigate to the DDMoRe Download Repository at <http://downloads.ddmore.foundation/repository/see/Foundation-2.0.1-alpha>
2. Locate the SEE package: see-installer-1.4.0-alpha-64b.zip
3. Download the SEE installer package by clicking on the SEE installer package name
4. Check the integrity of the download - NB. this step is not required, but if you encounter problems during installation, then perform these steps to make sure that the package was downloaded correctly:
 - a) Next to the required SEE package, at the right-hand side of the screen is an Information button: 
 - b) Click on the Information button to reveal SHA1 and MD5 checksums for the SEE installer package:

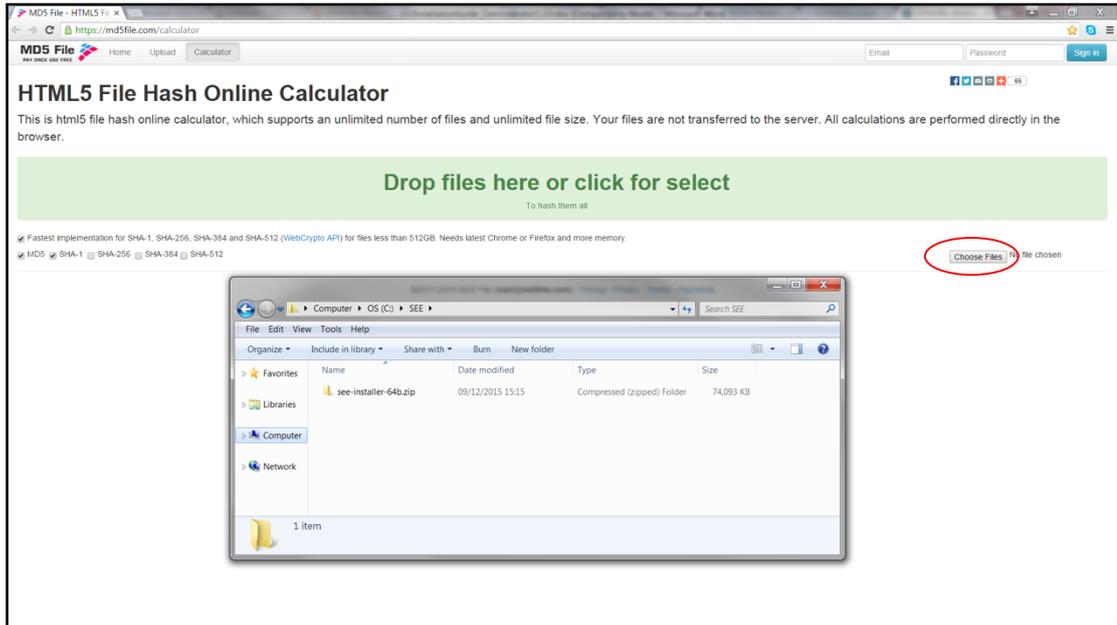


- c) Make a note of these checksums. Note that the checksums may actually be longer than they are displayed on the screen. Clicking in the checksum box should display (and highlight) the complete checksum string
- d) To verify the integrity of the downloaded SEE installer package, follow the steps below:
 - (i) Navigate to the URL: <https://md5file.com/calculator>
 - (ii) Ensure the MD5 and SHA-1 checkboxes are selected and either drag the SEE installer zip file directly on to the green bar as shown below:



- (iii) Or select the SEE installer zip file manually using the 'Choose Files' button as shown below:

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- (iv) Note that if Internet Explorer is being used, the screen may look slightly different and the 'Choose Files' button may be labelled 'Browse'
- (v) Compare the generated MD5 and SHA1 checksums with those noted from the download page in step 4.c) above
- (vi) If the checksums do not match, please try downloading the SEE installer package again. If the same problem occurs then this may indicate a security breach. Please contact the DDMoRe Foundation and await further advice. We will respond as soon as possible. DDMoRe Foundation:
<https://www.ddmore.foundation/contact>

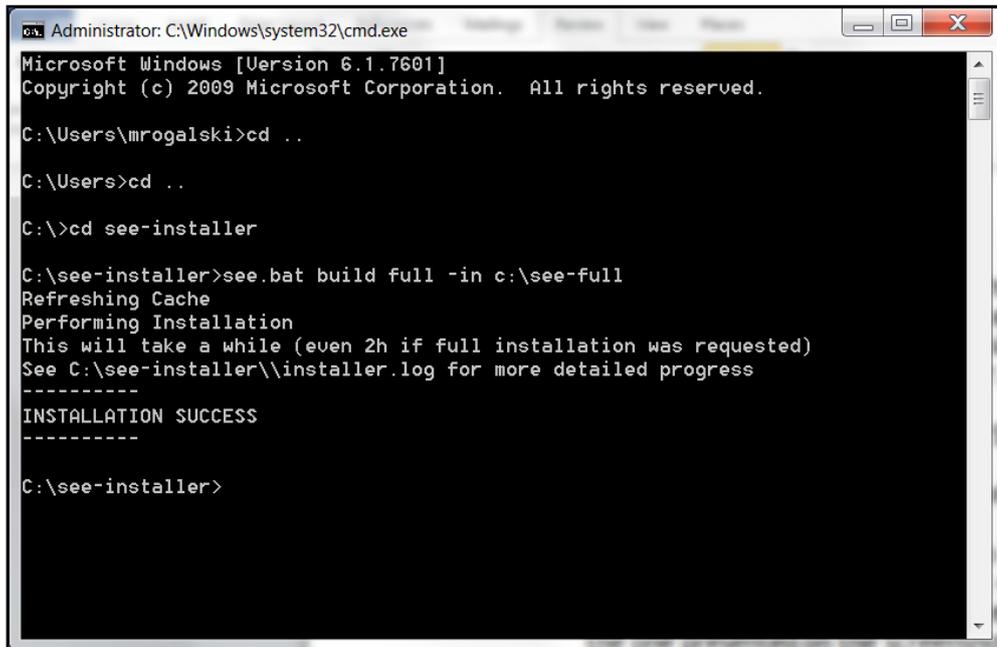
5. Unzip the SEE installer package to a local folder (eg C:\see-installer). **Note that this folder must not include spaces, and it must be a short path (< 50 characters) to avoid Windows path length issues arising from the deeply-nested structure of the SEE installation.** From here on in this guide, this folder is referred to as <SEE_INSTALLER_HOME> and any references to this location should be replaced with the actual folder path selected (eg C:\see-installer).

6.2 Running the SEE Installer

The SEE installer allows the user to select which third-party tool-specific modules should be included in their SEE instance. For more details and examples please refer to the README file in the <SEE_INSTALLER_HOME> folder. The guide below details the most generic scenario whereby the user requests a full SEE installation consisting of all available SEE modules.

1. Open a 'Command Prompt' window. To do this, from the Windows 'Start Menu', enter the text 'cmd.exe' in the 'Search programs and files' text box and click on the offered program
2. In the 'Command Prompt' window navigate to the <SEE_INSTALLER_HOME> folder (e.g. 'cd <SEE_INSTALLER_HOME>')
3. Invoke the SEE installer, requesting it to build an SEE including all modules under a location of your preference, e.g. 'see.bat build full -in c:\see-full'
4. Wait until the see.bat script completes - this may take a while. You should be presented with the message similar to the one in the screenshot below:

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```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\mrogalski>cd ..
C:\Users>cd ..
C:\>cd see-installer

C:\see-installer>see.bat build full -in c:\see-full
Refreshing Cache
Performing Installation
This will take a while (even 2h if full installation was requested)
See C:\see-installer\installer.log for more detailed progress
-----
INSTALLATION SUCCESS
-----

C:\see-installer>
```

Note: From here on in this guide, this folder containing the installed SEE is referred to as <SEE_HOME> and any references to this location should be replaced with the actual folder path selected (eg C:\see-full).

The downloaded components are stored in the <SEE_INSTALLER_HOME> folder - this may be deleted to free up space if you wish, although if you will run it again later to update your installation, these components will need to be downloaded again.

6.3 Downloading and Installing NONMEM

Note that at this stage, NONMEM is not yet installed. See Section 8 for instructions on how to add NONMEM to your SEE installation.

6.4 Downloading and Installing Simcyp

Note that at this stage, Simcyp is not installed. See Section 9 for instructions on how to add Simcyp to your SEE installation.

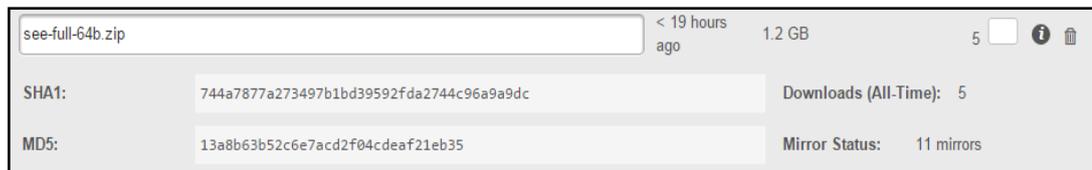
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7 Downloading the complete 'pre-built' package

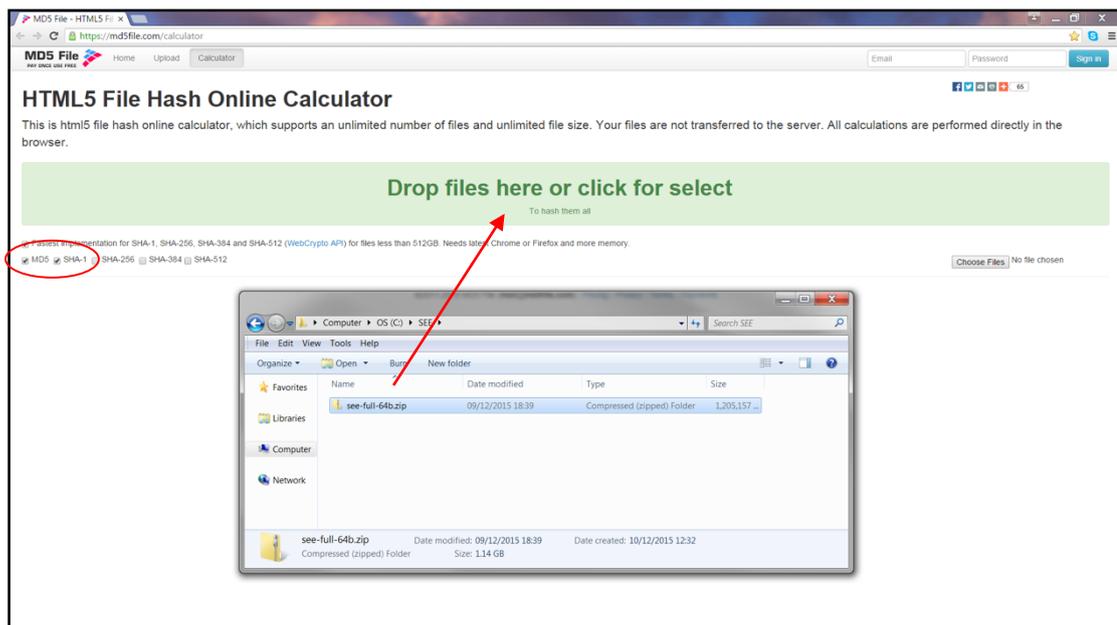
Skip this section if you have already installed the SEE by following the instructions in section 6.

7.1 Downloading and Installing the 'pre-built' package

1. Navigate to the DDMoRe Download Repository at <http://downloads.ddmore.foundation/repository/see/Foundation-2.0.1-alpha:>
2. Click 'Download the pre-built package'
3. Locate the SEE package: see-full-foundation-2.0.1-alpha-64b.zip
4. Download the SEE package by clicking on the SEE package name
5. Check the integrity of the download - NB. this step is not required, but if you encounter problems during installation, then perform these steps to make sure that the package was downloaded correctly:
 - a) Next to the required SEE package, at the right-hand side of the screen is an Information button: 
 - b) Click on the Information button to reveal SHA1 and MD5 checksums for the SEE package:

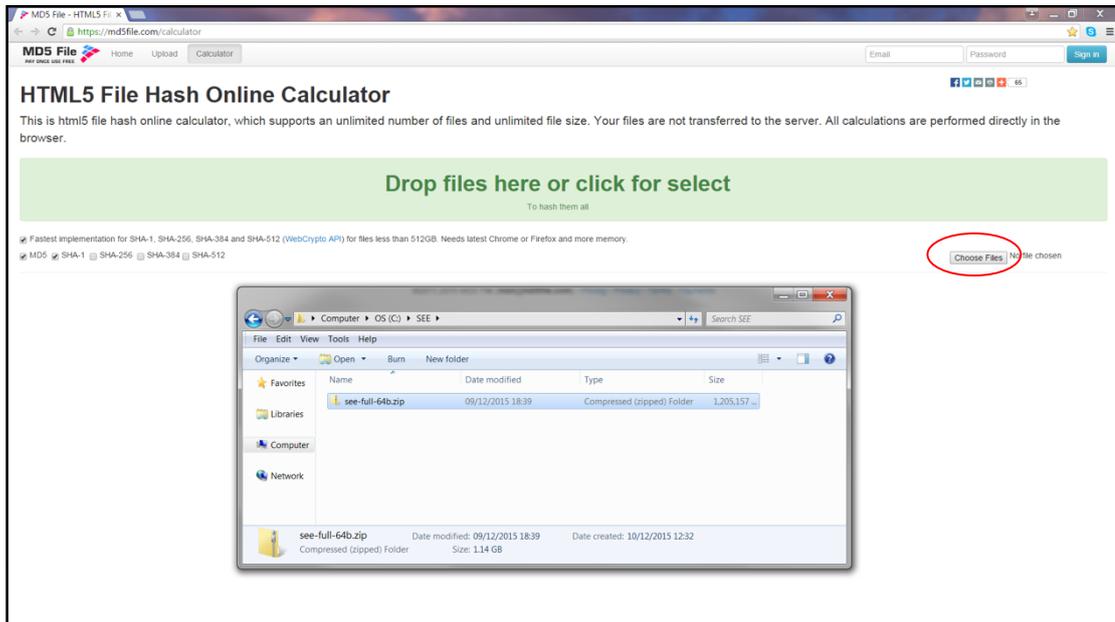


- c) Make a note of these checksums. Note that the checksums may actually be longer than they are displayed on the screen. Clicking in the checksum box should display (and highlight) the complete checksum string
- d) To verify the integrity of the downloaded SEE package follow the steps below:
 - (i) Navigate to the URL: <https://md5file.com/calculator>
 - (ii) Ensure the MD5 and SHA-1 checkboxes are selected and either drag the SEE zip file directly on to the green bar as shown below:



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(iii) Or select the SEE zip file manually using the 'Choose Files' button as shown below:



- (iv) Note that if Internet Explorer is being used, the screen may look slightly different and the 'Choose Files' button may be labelled 'Browse'
- (v) Compare the generated MD5 and SHA1 checksums with those noted from the download page in step 5.c) above
- (vi) If the checksums do not match, please try downloading the SEE installer package again. If the same problem occurs then this may indicate a security breach. Please contact the DDMoRe Foundation and await further advice. We will respond as soon as possible. DDMoRe Foundation:
<https://www.ddmore.foundation/contact>

6. Unzip the SEE package to a local folder (eg C:\see-full). **Note that this folder must not include spaces, and it must be a short path (< 50 characters) to avoid Windows path length issues arising from the deeply-nested structure of the SEE installation.** From here on in this guide, this folder is referred to as <SEE_HOME> and any references to this location should be replaced with the actual folder path selected (e.g. C:\see-full).

7.2 Downloading and Installing NONMEM

Note that at this stage, NONMEM is not yet installed. See Section 8 for instructions on how to add NONMEM to your SEE installation.

7.3 Downloading and Installing Simcyp

Note that at this stage, Simcyp is not installed. See Section 9 for instructions on how to add Simcyp to your SEE installation.

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8 Downloading and Installing NONMEM

The NONMEM binaries are hosted on ICON's website in a password protected zip file. Additionally, an optional temporary (45 day) NONMEM licence is available to DDMoRe users if they do not already have one.

To gain access to these, send an email to IDSSoftware@iconplc.com containing the text shown below. Select the relevant text if you just need the binaries, or if you need the binaries and the temporary licence. The requested information will then be sent by return email.

Access to NONMEM binaries only - use this if you already have a NONMEM licence

To: IDSSoftware@iconplc.com

Title: Request for password to use NONMEM with the DDMoRe Interoperability Framework

Dear Customer Service Lead

I am interested in testing the DDMoRe Interoperability Framework with NONMEM. I presently have a NONMEM license, and I would like to obtain the link and password for the relevant bundled NONMEM software for use in the framework. I understand I can copy my NONMEM license from my existing NONMEM installation (either local or enterprise) into the SEE 'nm_7.3.0_g\license' directory, as detailed in the DDMoRe SEE Installation Guide. So long as I do not use the DDMoRe/NONMEM environment for production use, and only for testing for a period of 45 days, I understand that it does not count against the usage limit of my existing NONMEM license, unless my existing license already permits me to run NONMEM in the environment into which I will be deploying the DDMoRe framework.

Get access to NONMEM binaries, and a temporary NONMEM licence

To: IDSSoftware@iconplc.com

Title: Request for password and temporary license to use NONMEM with the DDMoRe Interoperability Framework

Dear Customer Service Lead

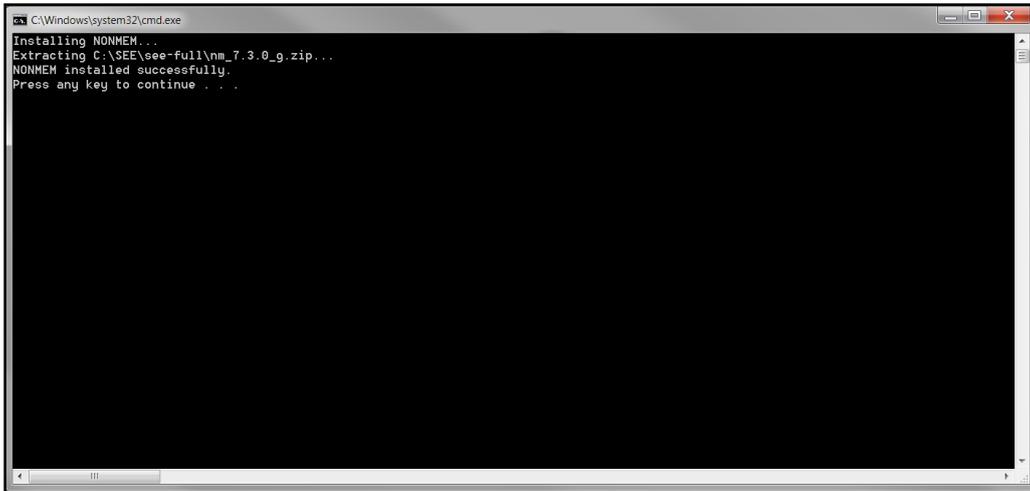
I am interested in testing the DDMoRe Interoperability Framework with NONMEM. I do not presently have a NONMEM license, and I would like to obtain both a 45 day NONMEM trial license to use with the DDMoRe Interoperability Framework, and the link and password for the relevant bundled NONMEM installation software. I will place the license in the SEE 'nm_7.3.0_g\license' directory as detailed in the DDMoRe SEE Installation Guide. I shall not use the product for production use, but only for testing. After the 45 days, I have the option to purchase a yearly renewable license, which will allow me to use the DDMoRe/NONMEM environment for production purposes.

Once you have received the relevant email from ICON, follow the steps below to install NONMEM into the SEE:

1. Click on the provided link to download the NONMEM binaries zip file which will be called *nm_7.3.0_gp.zip*. This may take 5-10 minutes
2. Unzip this file, entering the provided password when prompted, and place the resulting file (which will itself also be a zip file, this time called *nm_7.3.0_g.zip*), into the <SEE_HOME> folder

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3. Navigate to the <SEE_HOME> folder and double-click on the *InstallNonmem.bat* script. This may take 5-10 minutes. Once it completes, you should be presented with a screen similar to that shown below:



Your NONMEM installation is now complete.

Note that you need to copy your NONMEM licence into the NONMEM installation folder for NONMEM to run successfully, as described in section 10.1.

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9 Downloading and Installing Simcyp

Please contact Steve.Marciniak@certara.com for further details on downloading and installing Simcyp.

Note that you also need to obtain and configure a licence for Simcyp to run successfully, as described in section 10.1.

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10 Post-Installation Configuration

10.1 Licences

Necessary licence files for the software to be executed need to be installed. Install your licences as follows:

- a) For NONMEM, copy your licence file into the following location:
 1. <SEE_HOME>\nm_7.3.0_g\license

Note that this can be a licence that you have already, or could have been sent to you in response to the email you sent in section 8.
- b) For Simcyp, contact Steve.Marciniak@certara.com for details on how to obtain and configure the necessary licence
- c) For Monolix, the licence is pre-installed and no further action is required
- d) For Mlxlibrary, the licence is pre-installed and no further action is required

Note that the NONMEM, Monolix and Simcyp licences supplied for use with the DDMoRe Interoperability Framework are temporary. When these licences have expired, you can apply for a full commercial licence by sending an email request to the following addresses:

1. For NONMEM, email IDSSoftware@iconplc.com
2. For Monolix, email license@lixoft.com
3. For Simcyp, email Steve.Marciniak@certara.com

10.2 Additional software to be installed for Monolix and MlxLibrary

If Monolix or MlxLibrary (Simulx) executions are to be performed, then the relevant Visual C++ Redistributables need to be manually installed if necessary. The installation files are provided in the Monolix folder of the SEE, and the redistributables to install will depend on the O/S and the architecture as detailed below.

To install these, double-click on the executable(s) detailed in the following sections. Note that an installation dialog will not necessarily pop up; the software should still have been installed, and can be verified by checking the Control Panel “Programs and Features”/“Add or Remove Programs” (depending on your version of Windows). Check for the presence of “Microsoft Visual C++ 20xx Redistributable” where “xx” is 05, 08 and/or 10 as appropriate.

10.2.1 Windows 7, 8 and 10 64-bit

If you are running Windows 7 or higher, install both of the following:

The Visual C++ 2005 Redistributables:

<SEE_HOME>\Monolix432s\tools\mcr\v79\bin\win32\vcredist_x86.exe

The Visual C++ 2010 Redistributables:

<SEE_HOME>\Monolix432s\tools\mcr\vc\vs2010\vcredist_x86.exe

10.2.2 Windows XP 64bit

If you are running Windows XP, install all of the following:

The Visual C++ 2005 Redistributables:

<SEE_HOME>\Monolix432s\tools\mcr\v79\bin\win32\vcredist_x86.exe

The Visual C++ 2008 Redistributables:

<SEE_HOME>\Monolix432s\tools\mcr\vc\vs2008\vcredist_x86.exe

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The Visual C++ 2010 Redistributables:

<SEE_HOME>\Monolix432s\tools\mcr\vc\vs2010\vcredist_x86.exe

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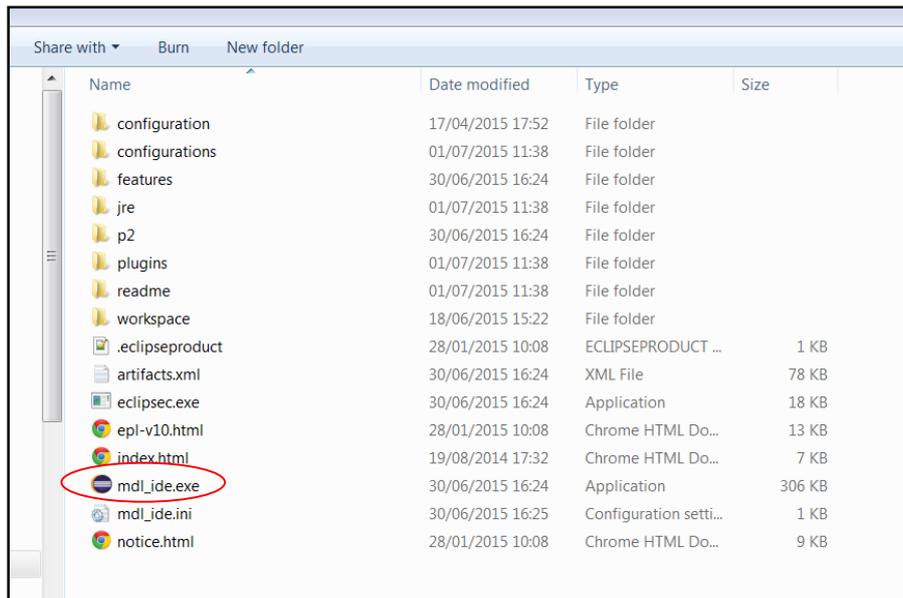
11 Verification of Software Installation

These post-installation tasks ensure the installed software is performing to specification.

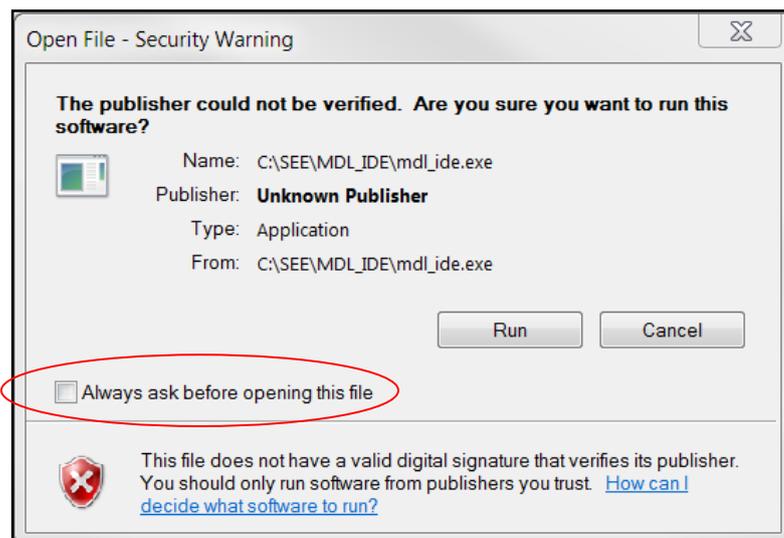
11.1 Starting up the SEE Package

To start up the SEE package follow the steps below:

1. Navigate to the folder <SEE_HOME>\MDL_IDE
2. Double-click on the file mdl_ide.exe as shown below:



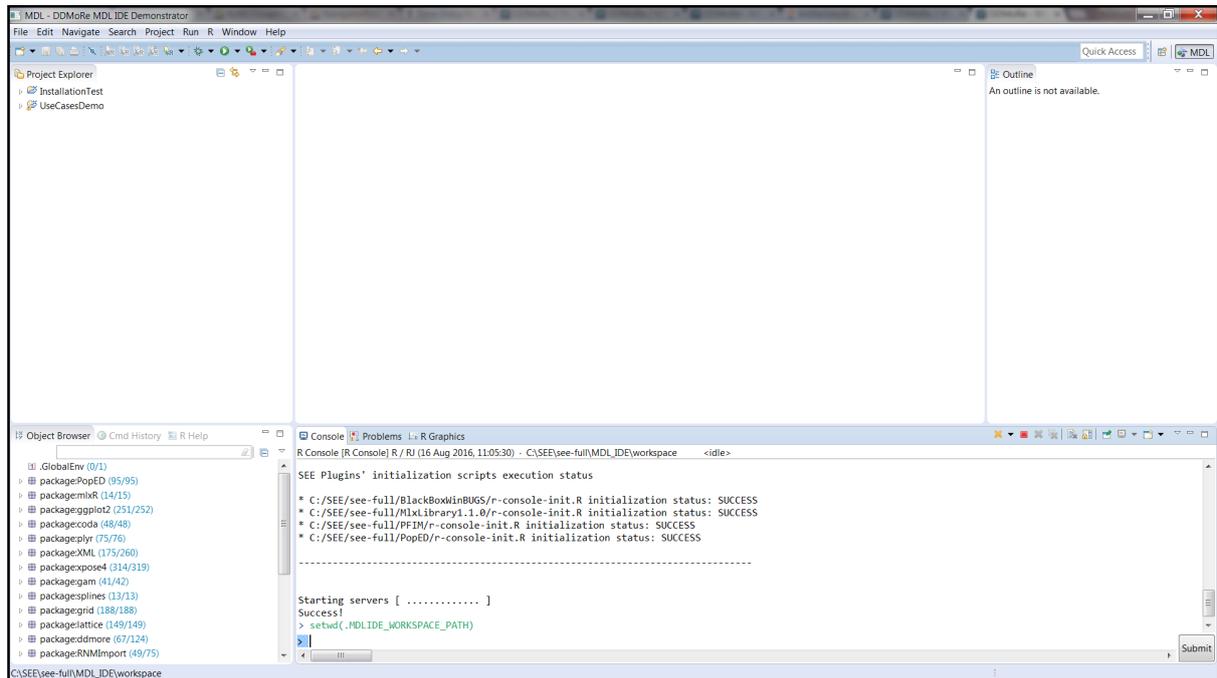
- a) A 'Security Warning' dialog may be presented as shown below as verified publisher details have not been embedded in the MDL IDE in this release. Ensure that the 'Always ask before opening this file' checkbox is *not* ticked and select 'Run'.



- b) The R Console will be automatically created. The server processes (FIS, CTS and TES) will also be automatically started. Wait until the message 'Success!' is

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displayed in the R console and the text <idle> is displayed in the R console title bar. The screen should then look similar to that shown below:



To check that the server processes have started up correctly, type the URL <http://localhost:9011/health> into a web browser. This should return a page similar to that shown below:



11.2 Verifying the SEE Package

A pre-configured project, *InstallationTest*, has been included in the MDL IDE. This project can be used to run tasks against Monolix, NONMEM, WinBUGS, PsN, Simulx, PFIM and PopED and generates an HTML report of the results. These results can then be evaluated against a reference set that are also included in the project.

Assuming that:

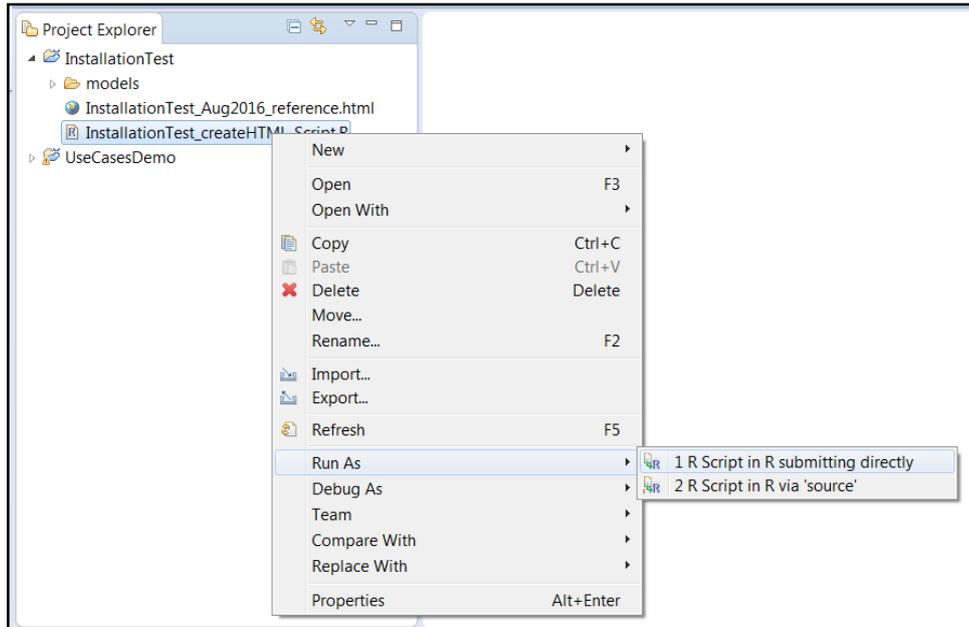
1. Section 6 or 7 has been followed (to install the framework)
2. NONMEM has added to the installation (section 8)
3. The NONMEM licence has been copied into the correct location (Section 10.1)

Then the SEE package can be validated by following the steps below:

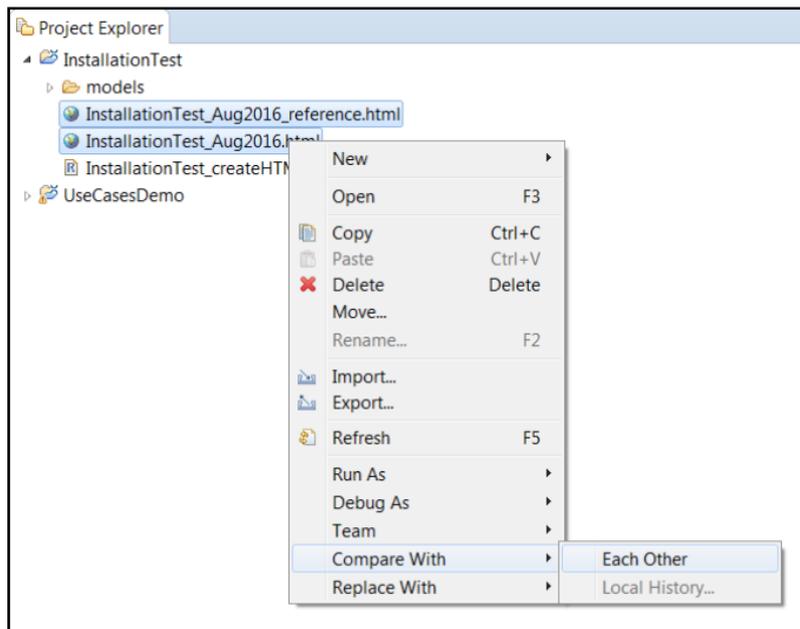
1. Open the *InstallationTest* project by double-clicking on the project name in the Project Explorer window
2. Right-click on the script *InstallationTest_createHTML_Script.R* and then select 'Run As'->'R script in R submitting directly' as shown below:

Filename: SEEInstallationGuide_Demonstrator2.0.1.docx	Page 21 of 25
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- a) This will start the script running in the R Console. It should take around 5-10 minutes to complete. Once it has finished (the word '<idle>' appears in the title bar of the R Console) a file *InstallationTest_Aug2016.html* should be created in the same folder as the script
3. To check that your installation has been successful, compare the *InstallationTest_Aug2016.html* file with the *InstallationTest_Aug2016_reference.html* file. This can be done by clicking on the *InstallationTest_Aug2016.html* file (it should become highlighted) and then holding down the CTRL key and clicking on the *InstallationTest_Aug2016_reference.html* file (it should also become highlighted). With the mouse pointer over one of the highlighted file names, right-click and then select 'Compare With'-'>'Each Other' as shown below:



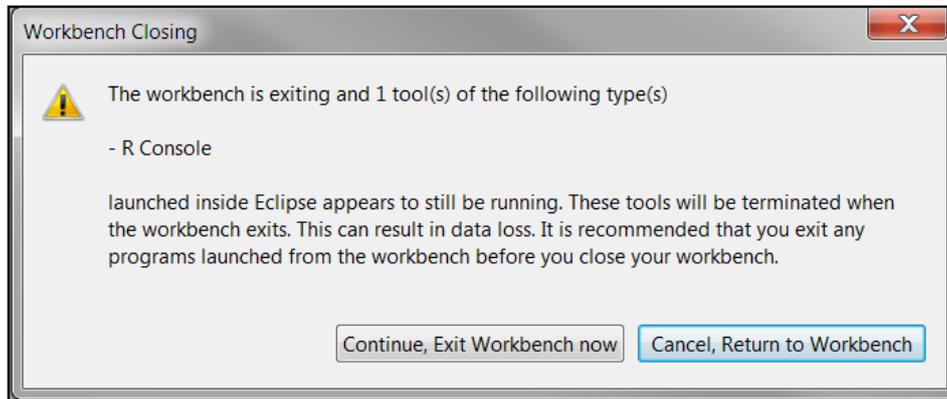
- a) The selected files should be shown side-by-side with any differences highlighted. It is safe to ignore any date/time, job ID or filepath location differences, but any

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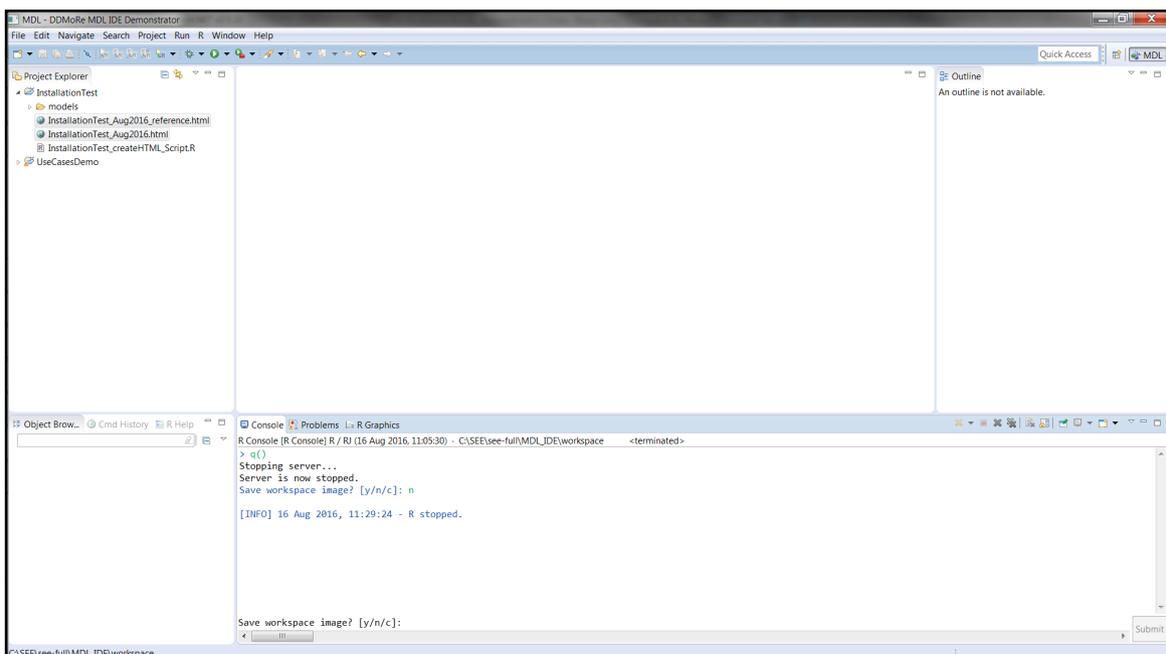
discrepancies in the population parameters (within a reasonable tolerance) should be investigated.

11.3 Shutting down the SEE Package

1. When shutting down the MDL IDE a 'Workbench Closing' screen may be displayed as shown below:



2. This means that the R Console and the server processes (FIS, CTS and TES) are still running. To avoid the possibility of these processes using up valuable resources on the machine, they should be safely shut down. This can be done as follows:
3. Select the 'Cancel, Return to Workbench' option on the 'Workbench Closing' screen
4. Select the 'Terminate' button on the R Console title bar: ✗
5. The message 'Server is now stopped' will be displayed in the R Console and you will be asked if you wish to save the workspace image:
 - a) if you select yes (y) or no (n), the message 'R stopped' will be displayed in the R console and the text <terminated> will be displayed in the R console title bar. The screen should look as shown below and it is now safe to close the MDL IDE:



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- b) if you select cancel (c) and you wish to continue working with the SEE, you will need to restart the server processes by calling the function: *DDMORE.startServer(DDMORE.getServer())* from the R Console

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12 What next?

An additional pre-configured project, *UseCasesDemo*, has been included in the MDL IDE. This project includes examples of a number of model forms encoded using the latest MDL grammar. Along with the collection of MDL models, a set of R scripts have been prepared to illustrate how these models can be used in a M&S workflow using the *ddmore* R package.

All the R scripts have been commented to guide the user through the code and provide information regarding the new functions written by the DDMoRe Consortium. Additional information on each of the functions can be obtained by using the usual R help mechanisms.

For the latest information about the IOF go to: <http://iof.ddmore.foundation>.