

How to configure your computer to run Abaqus with user subroutines?

1. Install Microsoft Visual Studio, Intel Fortran Compiler (the package of Intel Parallel Studio includes Intel Fortran), and Abaqus
 - a. The exact order of installing these three software shouldn't matter. Though it is suggested (not necessary) to go with this order: Visual Studio, Intel Fortran, Abaqus.
 - b. Fortran compilers other than Intel Fortran might need more configuration steps. It is suggested to use Intel Fortran. The student version of Intel Parallel Studio is free to download.
 - c. The version numbers matter a lot. The exact compatible VS and compiler versions for each Abaqus version vary from machine to machine. It is tested on our group's servers that, for Abaqus 6.13/6.14, VS version can be from 2010 to 2013 (newer ones might not work), Intel Parallel Studio can be from 2011 to 2017 (newer ones might have compatibility problems, but can be solved later). If Abaqus version is later than 6.14, the versions of VS and Intel Fortran can also be newer.
 - d. If still not sure about the versions to install, first go with what you have. From the error messages later (if any) you can determine where the problem is.

2. Run Abaqus verify to see if it already works

- a. Find the Abaqus Command shortcut. You can find the one in Start Menu -> Abaqus -> Abaqus Command. Run it and type in the following command:

```
abaqus verify -user_std
```

If after "Abaqus/Standard with user subroutines" it says anything other than "PASS", further configuration is needed. Otherwise you can carry on to test your own subroutines.

- b. For compatibility problems, the verify process should tell you the job met with error and was not completed. You can follow the instructions, go to the folder named "verify" under your Abaqus work directory, and find the *.log file. It tells you what went wrong. Generally it should be among compiling problem, linking problem, or problems finding specific files. Go along with the rest of the steps below.
- c. You can always come back and run the verify job after anything you have done following the rest of the steps, to see if the problem has been resolved.

3. Configure Abaqus to Intel Fortran and Visual Studio

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a. Find the Abaqus CAE shortcut. You can find the one in Start Menu -> Abaqus -> Abaqus CAE. Right click on it and select Open file location. It should lead to either "abq6134.bat" (numbers vary for different versions) or "abaqus.bat". Right click on the *.bat file and select Edit.

b. Originally it should look like this:

```
@echo off
"C:\SIMULIA\AbaqusCommands\abq6134.bat" %*
```

Add one line after the first line, such that it looks like this:

```
@echo off
@call ifortvars.bat intel64 vs2010
"C:\SIMULIA\AbaqusCommands\abq6134.bat" %*
```

"intel64" should match the system settings of your computer. Here it's for a 64 bit system. "vs2010" should match the Visual Studio version you want to use. Here it's for Visual Studio 2010. Save the file and close it.

4. Change system variables:

a. Search for "ifortvars.bat" in the Intel Fortran Compiler install directory. There should be only one. Record the path to this file (path1).

b. Search for "vcvarsall.bat" in the Visual Studio install directory. There should be only one. Record the path to this file (path2).

c. Go to Control Panel -> System -> Advanced System Settings -> Environment Variables. Under "System Variables", find an item named "Path". Add path1 and path2 to the existing list, following the format of other paths, without the file names. Save the changes.

5. Change Abaqus Command Prompt settings (this step is not necessary, just a double insurance)

Find the Abaqus Command shortcut. Right click on it and select Properties. In the "Target" line there should be some text like this:

```
C:\Windows\SysWOW64\cmd.exe /k
```

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Add path1 and path2 to the end of this line, with file names. It should look like this:

```
C:\Windows\SysWOW64\cmd.exe /k " "path1\ifortvars.bat" & "path2\vcvarsall.bat" "
```

including all the quotation marks.

6. If after doing all the above, there are still problems running the verify job, continue below to see if it looks like your problem (read the error messages in the *.log file):

a. "ifort" not recognized: The path to ifortvars is wrong. Check the system variable setting or the Abaqus Command Prompt setting and fix the paths. If the paths are correct but it still returns this error, try this: Search for "ifort.exe" in the Intel Fortran Compiler install directory. There might be several hits. Choose the one that's in the folder matching your system settings. For example, for a 64 bit system, choose the one in the "intel64" folder. Double click on the file to run it (you won't see anything happening, it's okay). Record the path to this file (path3). Follow the same step as 4.c, add path3 to system variables. If the problem is still there, your Fortran Compiler's version might not work. Or the installation might have problems.

b. "msmpi.lib" not found: HPC Pack MS-MPI's version doesn't match your Abaqus version. Uninstall the current MS-MPI. Search in your Abaqus original installation files to find the setup file for MS-MPI and reinstall it.

c. Other "*.lib" not found: Search your computer for the specific "*.lib" file. If there is none, the installation for the software that file belongs to has problems. You should search online to see which software it belongs to and reinstall that software. If you can find the lib file on your computer under the install directory of either Visual Studio or Intel Fortran, it means that software has compatibility problems with the current Abaqus installed. But you can still try to solve it without installing a different version. Record the path to that lib file (path4). Go to Control Panel -> System -> Advanced System Settings -> Environment Variables. Under "System Variables", find an item named "Lib". If there is no such item, you can add a new one. Add path4 to that item, without the file names. If this doesn't solve your problem, a different version of the related software might be needed.