1. **Necessary files**

* Download and unzip CACTUS Modeling Software source code from <http://energy.sandia.gov/cactus>
* Download and unzip [LAPACK\_3.1.1\_for\_Windows\_VS.zip](http://icl.cs.utk.edu/lapack-for-windows/VisualStudio/LAPACK_3.1.1_for_Windows_VS.zip) from <http://icl.cs.utk.edu/lapack-for-windows/VisualStudio_install.html>
* Copy the “lib” folder from “LAPACK\_3.1.1\_for\_Windows\_VS.zip” into the Rel1\_1 subdirectory of the “CACTUS” folder

2. Neccesary software

**2. Compile CACTUS**

Use either the command prompt (2.1) , the GUI (2.2), or MingW + gfortran (2.3) to compile CACTUS.

**2.1 Compiling Cactus with Visual Studio Command Prompt**

* Open a Visual Studio command prompt: (this may vary by machine)
* Start Menu -> Intel Parallel Studio XE 2013 -> Command Prompt -> Parallel Studio XE with Intel Compiler XE v13.1 Update 1
  + Click on either “IA-32 Visual Studio 2010 mode” or “Intel 64 Visual Studio 2010 mode”
* cd to …\CACTUS\Makefiles
* Type “nmake” –f Makefile.win
* “cactus.exe” should be in the …\CACTUS\bin directory
* “nmake clean” will clean the directory and remove compilation files

**2.2 Compiling Cactus with the Visual Studio GUI**

* In Visual Studio: From the top menu: File -> New… -> Project
  + Intel Visual Fortran -> Console Application -> Empty project
    - Name it Cactus and click OK
  + A new project will be created with three folders: “Header Files”, “Resource Files”, and “Source Files”
* In the drop down at the top change “Debug” to “release”
* From the top menu: Project -> Properties
  + Configuration Properties -> Fortran -> Data
    - Set the value of “Default Real Kind” to “8 (/real\_size:64)”
  + Configuration Properties -> Linker -> General
    - Set the value of “Additional Library Directories” to “...\CACTUS\lib\win32\” (the location of the LAPACK downloaded libraries)
  + Configuration Properties -> Linker -> Input
    - set “Additional Dependencies” to “LAPACK.lib BLAS.lib extras.lib MATGEN.lib”
  + Click OK
* From the top menu: Tools -> Options
  + Intel Composer XE -> Visual Fortran -> General
    - Set value of “sources” to “.f90;.f95” (to make visual studio recognize .f95 files as Fortran)
* From the Cactus download, drag every “.f95” file from “.\CACTUS\Rel1\_1\src\” “.\CACTUS\Rel1\_1\mod\” and “.\CACTUS\Rel1\_1\mod\util\” to the “Source Files” folder of the project
* From the top menu: Build –> Build Solution
* Wait
* The executable will be in your project directory.
  + For example …\Visual Studio 2010\Projects\Cactus\Cactus\Release\Cactus.exe
* Move the executable to …\CACTUS\bin

**2.2 Compiling Cactus with gfortran and MingW**

**3. Add Executable to Path**

**4. Check Compilation: Run Regression Test**

* cd into the Test/RegTest directory

$cd .\Test\RegTest

and run the RegTest by executing runreg.py with the path to the CACTUS executable as an argument.

$.\runreg.py ..\..\bin\cactus

or

$./runreg.py cactus

You might need to type ‘python’ in front of the above commands. Example:

$python ./runreg.py cactus

* The output should say 'No differences' for all three tests. Note: if you have python 3 installed use runreg\_p3.py instead. If you don’t have Python installed you will need to install it.

5. install DAKOTA