**Installing and Using CACTUS on Windows using CygWin**

If you do not have access to Virtual Fortran, this is a free (but more difficult) option.

Once you download Cygwin and compile CACTUS you will have two options:

1. Run CACTUS from the Windows terminal (cmd.exe). For this option skip step 8.b.

or

1. Run CACTUS from the Cygwin terminal. For this option skip step 5 and 8.a.

Note 1: Running CACTUS from the Windows Terminal is recommended. If you use the Cygwin terminal you will need to save all your files in the Cygwin path (*C:\cygwin\home\yourUsername\..*).

Note 2: You do not need DAKOTA or Octave to run CACTUS. In case you don’t want to use the CACTUS-DAKOTA interface skip steps 1.d, 7, and 8.

Note 3: You need to have Python installed.

1. **Install Cygwin**
2. Download Cygwin (takes a while)
   1. Got to <http://cygwin.com/install.html>. Click on setup-x86.exe. Save file. Run executable.
   2. During the install setup choose:
      1. Install from the internet
      2. C:\cygwin, All Users
      3. Your local Downloads folder
      4. Direct Connection or Proxy as needed
      5. Choose url or if none is showing, select one from this site: <http://cygwin.com/mirrors.html> and add it yourself. (e.g. for Nevada use http://cygwin.refractal.net/)
      6. Select the following packages in addition to those selected by default:
         1. Math >> lapack
         2. Math >> liblapack0
         3. Click next and accept downloading all required packages (for dependencies)
   3. Now you should have a *C:\cygwin* directory which serves as kind of a local installation of Linux. The Cygwin terminal always opens up in the *C:\cygwin\home\yourUserName\* directory, which for Cygwin is */home/yourUserName/*. That is, Cygwin uses Linux commands and directory paths, and has C:\cygwin as the root directory.
   4. Cygwin should have come with Octave installed. Check this by typing ‘octave –version‘ on the Cygwin Terminal. Else you will need to install the Octave package. This is only needed if you are going to download DAKOTA as well.
3. **Install CACTUS**
4. Create a directory for CACTUS that is on the Cygwin path (say *C:\cygwin\yourUserName\CACTUS\*) and put all the CACTUS files in there (unzipped Rel1\_1/ directory).
5. Open the Cygwin terminal. Cd into the correct directory (*/home/yourUserName/CACTUS/Rel1\_1/*). You should be able to see the Makefiles.
6. Create the executable by typing:

*$make -f Makefile.gfortran*

on the terminal. The executable will be called '*cactus.exe*' and be located in the directory one level above (*/home/yourUserName/CACTUS/*). NOTE: The executable generally only works if you are in the Cygwin terminal. If you want to run it from the windows command line you will need to follow extra steps. This will be described in step 5.

1. To be able to run cactus.exe from the Windows command line (cmd.exe) you need to add all the Cygwin libraries to your Windows path. Also add the path to the cactus.exe executable so that you can call the function by simply typing ‘cactus’ in the command line rather than the complete path to the executable. For Windows 7:
   1. Left click on the ‘start’ button. Right click on ‘computer’. Select ‘properties’.
   2. Click on ‘advanced system settings’. Click ‘Yes’.
   3. Clock on ‘Environment Variables’
   4. Either edit or create (if nonexistent) the variable ‘PATH’
   5. The value of PATH is a set of directories separated by semicolons ‘;’. Add the following three directories: *C:\cygwin\bin;C:\cygwin\lib\lapack;C:\cygwin\home\YourUserName\CACTUS*
   6. You will need to close and reopen cmd.
2. Install Python if you do not have it already.
3. 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 ../../../cactus.exe

or

$./runreg.py cactus.exe

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.

1. **Install Dakota**
2. To install DAKOTA: Choose whether you will be running CACTUS and Dakota from the Cygwin terminal or on the windows command line (cmd.exe). More instructions in the Dakota website: <http://dakota.sandia.gov/distributions/dakota/5.4/install.html>
   1. Windows version
      1. <http://dakota.sandia.gov> >> Download
      2. Login (enter email) or register then login.
      3. Click Download
      4. Select Windows, 32-bit, Windows(dakota-5.4-public-Windows.x86.zip or similar)
      5. Unzip file and put where you like (say *C:\Users\yourUserName\DAKOTA*)
      6. Add the bin directory (*C:\Users\cmichel\DAKOTA\dakota-5.4.0.Windows.x86\bin*) to your path. Follow the steps outlined in 6.a-f to do this.
      7. Check installation by opening cmd.exe and typing:

dakota –version

* 1. Cygwin Windows version
     1. Follow steps 8.a.i-iii
     2. Select Windows, 32-bit, Cygwin (dakota-5.4-public-CYGWIN.i686.zip or similar)
     3. Unzip file and put somewhere in the Cygwin path (say *C:\cygwin\home\yourUserName\DAKOTA*)
     4. Put the following lines on your ~/.bashrc file:

INSTALL\_DIR=/home/yourUserName/DAKOTA/dakota-5.4.0.CYGWIN.i686

export PATH=$INSTALL\_DIR/bin:$INSTALL\_DIR/test:$PATH

export PATH=$INSTALL\_DIR/bin:$INSTALL\_DIR/test:$PATH

export LC\_ALL="C"

* + 1. Either close and reopen the Cygwin terminal or source the .bashrc file.

1. Run DAKOTA-CACTUS test (Non-existent yet)

NOTE: CACTUS-DAKOTA driver is not currently working properly on Windows.

CONGRATULATIONS! You have successfully installed CACTUS and DAKOTA on Windows. :)