Using Visual Studio Compilers

Installation:

1. Download cygwin
2. Install cygwin with
    a. gcc,g++(required for making local Petsc tools sowing and c2html)
    b. python
    c. flex (required for making local Petsc tools sowing and c2html)
    d. make
    e. git
3. Get Petsc source
    a. checkout petsc by git
    git clone https://bitbucket.org/petsc/petsc.git
    Optional:
    git clone https://bitbucket.org/petsc/petsc.git petsc_bddc
    if anything to merge:
    git fetch && git checkout stefano_zampini/pcbddc-primalfixes
    b. OR get Petsc tarball and untar to cygwin/petsc folder (use tar in cygwin!)
4. Install Microsoft Visual C++ 2012/2013 (I prefer 2010 since it has MPI Debugger)
5. Install Microsoft MPI on a path without spaces like C:\MSMPI
6. Open Cygwin.bat and add
    a. For 32 bit : CALL "%VS110COMNTOOLS%\vsvars32.bat"
    b. For 64 bit : CALL "%VS110COMNTOOLS%\..\..\VC\vcvarsall.bat" amd64
7. Open Developer Command Prompt for 2012 (just type in start)
8. Call Cygwin.bat: D:\cygwin\cygwin64\Cygwin.bat
9. Test if cl Test.cpp
10. in cygwin shell, go to petsc folder: (red means does not work)
    - ./configure --with-cc='win32fe cl' --with-cxx='win32fe cl' --with-fc=0 --download-f2cblaslapack --with-mpi-dir=/cygdrive/c/MSMPI
    - ./configure --with-cc='win32fe cl' --with-cxx='win32fe cl' --with-fc=0 --download-f2cblaslapack --with-mpi-include=/cygdrive/c/MSMPI/Inc/ --with-mpi-lib=\"[/cygdrive/c/MSMPI/Lib/amd64/msmpi.lib,/cygdrive/c/MSMPI/Lib/amd64/msmpifec.lib]\"
    - ./configure --with-cc='win32fe cl' --with-cxx='win32fe cl' --with-fc=0 --download-f2cblaslapack --with-mpi-include=/cygdrive/c/MSMPI/Inc/ --with-mpi-lib='[/cygdrive/c/MSMPI/Lib/amd64/msmpi.lib,/cygdrive/c/MSMPI/Lib/amd64/msmpifec.lib]'
11. Cross your fingers and wait
12. If fails
    a. "rm -rf /home/semih/petsc/arch-mswin-c-debug/"
    b. For git users, clean the git repo with:
        i. git reset --hard
        ii. git clean -f -d -x
    c. and then rerun configure

13. make PETSC_DIR=/home/sozmen/petsc PETSC_ARCH=arch-mswin-c-debug all
14. make PETSC_DIR=/home/sozmen/petsc PETSC_ARCH=arch-mswin-c-debug test
15. make PETSC_DIR=/home/sozmen/petsc PETSC_ARCH=arch-mswin-c-debug streams NPMAX=4
16. You are done with it….

Usage:

export PETSC_DIR=~/petsc
export PETSC_ARCH=arch-mswin-c-debug
make ex2
make runex2

Update:

- git pull

Once updated, you will usually want to rebuild completely

- ./$PETSC_ARCH/conf/reconfigure-$PETSC_ARCH.py
- make

Additional options:

--with-openmp
--with-shared-libraries
--useThreads=0
--with-debugging=no
--with-pcbddc
Correct the error in bddcprivate.c @3208

Use for any problem with MKL;
https://software.intel.com/en-us/articles/intel-mkl-link-line-advisor/

Hypre:

- Download from http://acts.nersc.gov/hypre/
- Compile it! (MISSING PART: Compilation in Windows required!)
- Or you may use binaries from “Petsc For Windows”

Usage:

--with-hypre-include=/cygdrive/d/WorkDir/hypre-2.9.0b/src/hypre/include
--with-hypre-lib=/cygdrive/d/WorkDir/hypre-2.9.0b/src/hypre/lib/HYPRE.lib

BLAS/LAPACK:

- You need to install Intel MKL
- Usage:

--with-blas-lapack-dir=/cygdrive/d/HardLinks/PETSc/Intel2013/mkl/lib/intel64

ScaLAPACK:

- You need to install Intel MKL with cluster support
- Usage:

--with-scalapack-include=/cygdrive/d/HardLinks/PETSc/Intel2013/mkl/include
--with-scalapack-lib=\"[/cygdrive/d/HardLinks/PETSc/Intel2013/mkl/lib/intel64/mkl_scalapack_lp64.lib,/cygdrive/d/HardLinks/PETSc/Intel2013/mkl/lib/intel64/mkl_blacs_msmpi_lp64.lib]\"

METIS-PARMETIS:

-Download from http://glaros.dtc.umn.edu/gkhome/metis/parmetis/download
- Compile it! (MISSING PART: Compilation in Windows required!)
- Or you may use binaries from "Petsc For Windows"
-Usage:

--with-metis-include=/cygdrive/d/WorkDir/OtherPackages/parmetis-4.0.3_install/include
--with-metis-lib=/cygdrive/d/WorkDir/OtherPackages/parmetis-4.0.3_install/lib/metis.lib
--with-parmetis-include=/cygdrive/d/WorkDir/OtherPackages/parmetis-4.0.3_install/include
--with-parmetis-lib=\"[/cygdrive/d/WorkDir/OtherPackages/parmetis-4.0.3_install/lib/parmetis.lib,/cygdrive/d/WorkDir/OtherPackages/parmetis-4.0.3_install/lib/metis.lib]\"

Using Intel Compilers Instead of VSC

Append following alias to .bash_profile

alias ifort='ifort -Qlocation,link,"$VCINSTALLDIR/bin"'
alias icl='icl -Qlocation,link,"$VCINSTALLDIR/bin"'

Append following to icl.cfg

$VCINSTALLDIR/bin

mv /usr/bin/link.exe /usr/bin/cygwin_link.exe

Run Intel 64 bit Developer Command Prompt
Run Cygwin.bat
Get petsc source files etc.

Failes with;

- ifort could not find mpif.h !!!!
-Solution: copy C:\MSMPI\Inc\amd64\mpifptr.h to C:\MSMPI\Inc

./configure --with-cc='win32fe icl' --with-cxx='win32fe icl' --with-fc='win32fe ifort'
--with-blas-lapack-dir=/cygdrive/c/MKL/lib/intel64
--with-hypre-include=/cygdrive/c/EXTRLIBS/include/HYPRE
--with-hypre-lib=/cygdrive/c/EXTRLIBS/lib/HYPRE.lib
--with-scalapack-include=/cygdrive/c/MKL/include
--with-scalapack-lib='[/cygdrive/c/MKL/lib/intel64/mkl_scalapack_lp64.lib,/cygdrive/c/MKL/lib/intel64/mkl_blacs_msmpi_lp64.lib]' --with-metis-include=/cygdrive/c/EXTRLIBS/include/parametis
--with-metis-lib=/cygdrive/c/EXTRLIBS/lib/metis.lib
--with-parmetis-include=/cygdrive/c/EXTRLIBS/include/parametis

--with-parmetis-lib='[/cygdrive/c/EXTRLIBS/lib/parmetis.lib,/cygdrive/c/EXTRLIBS/lib/metis.lib]'
--with-mpi-include=/cygdrive/c/MSMPI/Inc/
--with-mpi-lib='[/cygdrive/c/MSMPI/Lib/amd64/msmpi.lib,/cygdrive/c/MSMPI/Lib/amd64/msmpifec.lib]' --with-shared-libraries --useThreads=0

--with-openmp

---

fp.c^M
C:\CYGWIN~1\PETSC-~1.2\src\sys\error\fp.c(425): error: expression must have arithmetic or pointer type^M
    if (feclearexcept(FE_ALL_EXCEPT))
SETERRQ(PETSC_COMM_SELF,PETSC_ERR_LIB,"Cannot clear floating point exception flags\n");^M
        ^^M
^M
C:\CYGWIN~1\PETSC-~1.2\src\sys\error\fp.c(436): error: expression must have arithmetic or pointer type^M
    if (fesetenv(FE_DFL_ENV)) SETERRQ(PETSC_COMM_SELF,PETSC_ERR_LIB,"Cannot disable floating point exceptions");^M

/cygdrive/c/cygwin_cache/petsc-3.4.2/arch-mswin-c-opt/include/petscconf.h.h
and remove the lines related to PETSC_HAVE_FENV_H

CAUTION: now -fp_trap will not function properly, so forget to use it!

Reconfigure PETSc to use ParMetis.
1 linux-c-debug/conf/reconfigure-linux-c-debug.py
-PETSC_ARCH=linux-parmetis
-download-metis -download-parmetis
2 PETSC_ARCH=linux-parmetis make
3 PETSC_ARCH=linux-parmetis make test

python ./config/builder2.py check
$PETSC_DIR/src/snes/examples/tutorials/ex5.c

put breakpoint PetscError() @ ./src/sys/error/err.c

Using following for maintance purposes
git remote add upstream git://github.com/wp-cli/wp-cli.git
git fetch upstream
git branch backup
git checkout upstream/master -B master
git push --force