Hi all,

after a long time I've finally succeeded in compiling a 64 bit parallel version of Petsc for Windows.

All tries with MPICH2 failed. It is known to have problems with newer 64 bit Windows (e.g. with UAC).

Therefore I gave Microsoft's MPI (which is also free of charge) a try.

Unfortunately there are some problems when using mingw compilers. (Some Fortran symbol

names are not compatible). So it does not work out of the box.

But the problems can easily be solved.

Here is the way it works:

Preparing Microsoft's MPI to work with x86\_64-w64-mingw32-gfortran

0.) You need Cygwin. Please make sure that the Devel tools and Python are installed.

1.) Download Microsoft's "HPC Pack 2008 R2 MS-MPI Redistributable Package":

<http://www.microsoft.com/en-us/download/details.aspx?id=14737>

2.) Install it in a Directory without any spaces in the path/folder name

(LO INSTALE EN C:\Microsoft-HPCPack-2008R2\Lib\amd64)

3.) Insert the following line at the beginning of the file InstallationPath\Inc\mpi.h

#include <stdint.h>

4.) In the file InstallationPath\Inc\mpif.h

replace INT\_PTR\_KIND()

by 8

5.) Copy C:\Windows\System32\msmpi.dll to InstallationPath\Lib\amd64\msmpi.dll

6.) In a Cygwin terminal please enter the following:

cd /cygdrive/c/your/HPC/installation/path/Lib/amd64

gendef msmpi.dll

x86\_64-w64-mingw32-dlltool -d msmpi.def -l libmsmpi.a -D msmpi.dll

This creates a library (libmsmpi.a) which now works with x86\_64-w64-mingw32-gfortran.

Compiling Petsc

7.) Download Petsc v3.1-p8: petsc-3.1-p8.tar.gz<<http://ftp.mcs.anl.gov/pub/petsc/release-snapshots/petsc-3.1-p8.tar.gz>> (or <http://www.mcs.anl.gov/petsc/download/index.html>)

8.) Untar it (In a Cygwin terminal go to the folder where you've downloaded petsc-3.1-p8.tar.gz<<http://ftp.mcs.anl.gov/pub/petsc/release-snapshots/petsc-3.1-p8.tar.gz>>

and type: tar -xzvf petsc-3.1-p8.tar.gz) and enter this directory (cd petsc-3.1-p8).

9.) Edit the file src/sys/memory/mal.c:

Change in line 39 (unsigned long) to (unsigned long long)

NO LO ENCONTRE

10.) Edit the file include/mpiuni/mpi.h:

Change in line 112

#define MPIUNI\_INTPTR long

to:

#define MPIUNI\_INTPTR long long

11.) Set the PATH variable in the Cygwin terminal:

export PATH=/usr/x86\_64-w64-mingw32/bin:/usr/x86\_64-w64-mingw32/sys-root/mingw/bin:/usr/local/bin:/usr/bin:/bin: / cygdrive/c/your/HPC/installation/path/Bin:$PATH

12.) Configure PETSc with the command given below in the Cygwin shell. Please adapt your mpi path and choose with-scalar-type=complex

or with-scalar-type=real according your needs.

Please note: GetDP can solve problems with real or complex DOFs regardless the scalar-type of Petsc. In this context the scalar-type is just an optimization in terms of speed and memory consumption.

PERO ANTES

0) cd PEtSC DIRECTory

1) export PETSC\_DIR=$PWD

2) export PETSC\_ARCH=NOMBRE-CONFIGURACION

Ejemplo NOMBRE-CONFIG: arch-mswin-c-mpi-hpc-release-64

O

–with-cc=

3-

export PATH=/usr/x86\_64-w64-mingw32/bin:/usr/x86\_64-w64-mingw32/sys-root/mingw/bin:/usr/local/bin:/usr/bin:/bin:/cygdrive/c/Microsoft-HPCPack-2008R2/Bin:$PATH

PC DEL TRABAJO

export PATH=/usr/x86\_64-w64-mingw32/bin:/usr/x86\_64-w64-mingw32/sys-root/mingw/bin:/usr/local/bin:/usr/bin:/bin:/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Bin:$PATH

MUESTRA LO SIGUIENTE:

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UNABLE to CONFIGURE with GIVEN OPTIONS (see configure.log for details):

-------------------------------------------------------------------------------

Did not find package METIS needed by parmetis.

Enable the package using --with-metis or --download-metis

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PARA ESTO SE AGREGA EL –-WITH-AR

./configure --CC=x86\_64-w64-mingw32-gcc.exe --CXX=x86\_64-w64-mingw32-g++.exe --FC="x86\_64-w64-mingw32-gfortran.exe -fno-range-check" --CPP=x86\_64-w64-mingw32-cpp.exe --with-debugging=0 --with-clanguage=cxx --with-shared=0 --with-x=0 --useThreads=0 --download-f-blas-lapac=1 --download-mumps=1 --download-parmetis=1 --download-scalapack=1 --download-blacs=1 --with-scalar-type=real --with-mpi-include=/cygdrive/c/Microsoft-HPCPack-2008R2/Inc --with-mpi-lib=/cygdrive/c/Microsoft-HPCPack-2008R2/Lib/amd64/libmsmpi.a --with-ar=/usr/bin/ar

CON BLAS Y LAPACK DE FORTRAN PARA BAJAR, SE CORRIGIO –download-f-blas-lapack=1 agregandose la k. por otra parte, SE BAJA PARMETIS Y SE COLOCA EN EXTERNAL PACKAGES y se coloca --download-parmetis=0, SI SE COLOCA BAJAR PARMETIS PIDE A METIS, AUNQUE UNO LO ASIGNE EN UN DIRECTORIO NO FUNCIONA

ESTO ES CON RELEASE

./configure --CC=x86\_64-w64-mingw32-gcc.exe --CXX=x86\_64-w64-mingw32-g++.exe --FC="x86\_64-w64-mingw32-gfortran.exe -fno-range-check" --CPP=x86\_64-w64-mingw32-cpp.exe --with-debugging=0 --with-clanguage=cxx --with-shared-libraries=0 --with-x=0 --useThreads=0 --download-f-blas-lapack=0 --download-mumps=1 --download-parmetis=0 –-with-metis-include=/cygdrive/d/Luciano/Numerico/Libs/metis-5.1.0/include –-with-metis-lib=/cygdrive/d/Luciano/Numerico/Libs/metis-5.1.0/bin-x86\_64-mingw/libmetis.a --download-scalapack=1 --download-blacs=1 --with-scalar-type=real --with-mpi-include=/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Inc --with-mpi-lib=/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Lib/amd64/libmsmpi.a --with-ar=/usr/bin/ar

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Configuring PETSc to compile on your system

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=============================================================================== \*\*\*\*\* WARNING: CC (set to x86\_64-w64-mingw32-gcc.exe) found in environment variables - ignoring use ./configure CC=$CC if you really want to use that value \*\*\*\*\*\* =============================================================================== =============================================================================== \*\*\*\*\* WARNING: CXX (set to x86\_64-w64-mingw32-g++.exe) found in environment variables - ignoring use ./configure CXX=$CXX if you really want to use that value \*\*\*\*\*\* =============================================================================== =============================================================================== WARNING! Compiling PETSc with no debugging, this should only be done for timing and production runs. All development should be done when configured using --with-debugging=1 =============================================================================== =============================================================================== Compiling FBLASLAPACK; this may take several minutes =============================================================================== =============================================================================== Trying to download http://www.netlib.org/scalapack/scalapack-2.0.2.tgz for SCALAPACK ===============================================================================

EL –AR LO AGREGUE YO, TB AGREGUE EL DOWNLOAD METIS, DEBE ESTAR ANTES QUE EL PARMETIS, YA HABIENDO BAJADO TODO

./configure --CC=x86\_64-w64-mingw32-gcc.exe --CXX=x86\_64-w64-mingw32-g++.exe --FC="x86\_64-w64-mingw32-gfortran.exe -fno-range-check" --CPP=x86\_64-w64-mingw32-cpp.exe --with-debugging=0 --with-clanguage=cxx --with-shared-libraries=0 --with-x=0 --useThreads=0 --download-f-blas-lapack=1 --download-mumps=0 --download-parmetis=0 –-with-metis-include=/cygdrive/d/Luciano/Numerico/Libs/metis-5.1.0/include –-with-metis-lib=/cygdrive/d/Luciano/Numerico/Libs/metis-5.1.0/bin-x86\_64-mingw/libmetis.a --download-blacs=1 --with-scalar-type=real --with-mpi-include=/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Inc --with-mpi-lib=/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Lib/amd64/libmsmpi.a --with-ar=/usr/bin/ar

SI NO QUIERO BAJAR NADA (ANDA, PERO NO ME AGREGA LAS LIBRERIAS)

./configure --CC=x86\_64-w64-mingw32-gcc.exe --CXX=x86\_64-w64-mingw32-g++.exe --FC="x86\_64-w64-mingw32-gfortran.exe -fno-range-check" --CPP=x86\_64-w64-mingw32-cpp.exe --with-debugging=0 --with-clanguage=cxx --with-shared-libraries=0 --with-x=0 --useThreads=0 --download-f-blas-lapack=1 --download-mumps=0 --download-parmetis=0 –-with-metis-include=/cygdrive/d/Luciano/Numerico/Libs/metis-5.1.0/include –-with-metis-lib=/cygdrive/d/Luciano/Numerico/Libs/metis-5.1.0/bin-x86\_64-mingw/libmetis.a --download-blacs=1 --with-scalar-type=real --with-mpi-include=/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Inc --with-mpi-lib=/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Lib/amd64/libmsmpi.a --with-ar=/usr/bin/ar

**SI QUIERO USAR EN DIRECTORIOS YA BAJADOS (ESTA ES LA QUE UTILICÉ EN LA NB)**

export EXT\_LIBS\_DIR=/cygdrive/c/EPSol-Libs

./configure --CC=x86\_64-w64-mingw32-gcc.exe --CXX=x86\_64-w64-mingw32-g++.exe --FC="x86\_64-w64-mingw32-gfortran.exe -fno-range-check" --CPP=x86\_64-w64-mingw32-cpp.exe --with-debugging=0 --with-clanguage=cxx --with-shared-libraries=0 --with-x=0 --useThreads=0 --download-f-blas-lapack=1 --download-mumps=0 --download-parmetis=0 –-with-metis-include=$EXT\_LIBS\_DIR/metis-5.1.0/include –-with-metis-lib=$EXT\_LIBS\_DIR/metis-5.1.0/bin-x86\_64-mingw/libmetis.a –with-parmetis-dir=$EXT\_LIBS\_DIR/parmetis-4.0.3 –with-mumps-dir=$EXT\_LIBS\_DIR/MUMPS\_4.10.0-p3 –with-scalapack-dir=$EXT\_LIBS\_DIR/scalapack-2.0.2 --download-blacs=1 --with-scalar-type=real --with-mpi-include=/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Inc --with-mpi-lib=/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Lib/amd64/libmsmpi.a --with-ar=/usr/bin/ar

MEJOR:

export EXT\_LIBS\_DIR=/cygdrive/c/EPSol-Libs

13.) Before Petsc is compiled the file ./cygwin-cxx-opt/include/petscconf.h has to be edited.

Replace ( BEWARE: check the number of underscores, don't touch to PETSC\_HAVE\_\_SLEEP )

#ifndef PETSC\_HAVE\_SLEEP

#define PETSC\_HAVE\_SLEEP 1

#endif

with

#undef PETSC\_HAVE\_SLEEP

and replace

#ifndef PETSC\_HAVE\_GETPAGESIZE

#define PETSC\_HAVE\_GETPAGESIZE 1

#endif

with

#undef PETSC\_HAVE\_GETPAGESIZE

14.) Now let's compile it.

make PETSC\_DIR=/your/path/to/petsc-3.1-p8 PETSC\_ARCH=cygwin-cxx-opt all

15.) Drink some coffee and pray that everything works ;-)

TAMBIEN HAY QUE IR AL CODIGO DE:

petsc-3.4.4\src\sys\objects

Y AGREGAR EN options.c

**//LUCIANO**

**#include <stdio.h>**

**#include <string.h>**

APARTE, ANTES QUE NADA (UNA VEZ BAJADA LA LIBRERIA), se hacen estos dos cambios:

1. TB MODIFIQUE /petscdir/src/dm/impls/plex.c agregandole el include petscsys.h
2. Por ultimo a /petscdir/petscsys.h le DESCOMENTÉ un inline en línea 2339:

PETSC\_STATIC\_INLINE PetscErrorCode PetscSegBufferGetInts

------------------------ LUEGO DE COMPILAR (SI NO SE QUIERE WINDOWS) ---------------

lueggo se cambio dps de configurar el archivo petscconf.h (dentro de debug)

se saco el def de

//MODIFIED BY LUCIANO, SET TO 0

//#ifndef PETSC\_USE\_WINDOWS\_GRAPHICS

//#define PETSC\_USE\_WINDOWS\_GRAPHICS 0

//#endif

Si no se hace esto no se encuentra PetscDrawCreate\_Win32 no se encuentra

SE PUEDE USAR PERO SE TIENE QUE INCLUIR EL ARCHIVO DE WINDOWS

That's all.

Hopefully this is helpful for some of you.

Have a nice day!

Michael

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Vorstand: Peter Bauer (Vorsitzender), Dominik Asam, Arunjai Mittal, Dr. Reinhard Ploss

Sitz der Gesellschaft: Neubiberg

Registergericht: München HRB 126492

EL SUMARIO DE COMPILACION ES ESTE

=============================================================================== TESTING: alternateConfigureLibrary from PETSc.packages.mpi4py(config/PETSc/packages/mpi4py.py:49) Compilers:

C Compiler: x86\_64-w64-mingw32-gcc.exe -Wall -Wwrite-strings -Wno-strict-aliasing -Wno-unknown-pragmas -O

C++ Compiler: x86\_64-w64-mingw32-g++.exe -Wall -Wwrite-strings -Wno-strict-aliasing -Wno-unknown-pragmas -O

Fortran Compiler: x86\_64-w64-mingw32-gfortran.exe -fno-range-check -Wall -Wno-unused-variable -Wno-unused-dummy-argument -O

Linkers:

Static linker: /usr/bin/ar cr

BLAS/LAPACK: -Wl,-rpath,/petsc-3.4.4/arch-mswin-mpi1-release/lib -L/petsc-3.4.4/arch-mswin-mpi1-release/lib -lflapack -Wl,-rpath,/petsc-3.4.4/arch-mswin-mpi1-release/lib -L/petsc-3.4.4/arch-mswin-mpi1-release/lib -lfblas

MPI:

Includes: -I/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Inc

Library: -Wl,-rpath,/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Lib/amd64 -L/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Lib/amd64 -lmsmpi

cmake:

Arch:

pthread:

Library: -lpthread

PETSc:

PETSC\_ARCH: arch-mswin-mpi1-release

PETSC\_DIR: /petsc-3.4.4

Clanguage: Cxx

Scalar type: real

Precision: double

Memory alignment: 16

shared libraries: disabled

dynamic loading: disabled

xxx=========================================================================xxx

Configure stage complete. Now build PETSc libraries with (cmake build):

make PETSC\_DIR=/petsc-3.4.4 PETSC\_ARCH=arch-mswin-mpi1-release all

or (experimental with python):

PETSC\_DIR=/petsc-3.4.4 PETSC\_ARCH=arch-mswin-mpi1-release ./config/builder.py

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EN EL TRABAJO TENGO ESTA SALIDA

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Configuring PETSc to compile on your system

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C Compiler: x86\_64-w64-mingw32-gcc.exe -Wall -Wwrite-strings -Wno-strict-aliasing -Wno-unknown-pragmas -O

C++ Compiler: x86\_64-w64-mingw32-g++.exe -Wall -Wwrite-strings -Wno-strict-aliasing -Wno-unknown-pragmas -O

Fortran Compiler: x86\_64-w64-mingw32-gfortran.exe -fno-range-check -Wall -Wno-unused-variable -Wno-unused-dummy-argument -O

Linkers:

Static linker: /usr/bin/ar cr

BLAS/LAPACK: -Wl,-rpath,/cygdrive/c/cygwin64/petsc-3.4.4/arch-mswin-mpi1-release/lib -L/cygdrive/c/cygwin64/petsc-3.4.4/arch-mswin-mpi1-release/lib -lflapack -Wl,-rpath,/cygdrive/c/cygwin64/petsc-3.4.4/arch-mswin-mpi1-release/lib -L/cygdrive/c/cygwin64/petsc-3.4.4/arch-mswin-mpi1-release/lib -lfblas

MPI:

Includes: -I/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Inc

Library: -Wl,-rpath,/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Lib/amd64 -L/cygdrive/d/Luciano/Programas/Microsoft-HPCPack-2008R2/Lib/amd64 -lmsmpi

cmake:

Arch:

pthread:

Library: -lpthread

PETSc:

PETSC\_ARCH: arch-mswin-mpi1-release

PETSC\_DIR: /cygdrive/c/cygwin64/petsc-3.4.4

Clanguage: Cxx

Scalar type: real

Precision: double

Memory alignment: 16

shared libraries: disabled

dynamic loading: disabled

xxx=========================================================================xxx

Configure stage complete. Now build PETSc libraries with (cmake build):

make PETSC\_DIR=/cygdrive/c/cygwin64/petsc-3.4.4 PETSC\_ARCH=arch-mswin-mpi1-release all

or (experimental with python):

PETSC\_DIR=/cygdrive/c/cygwin64/petsc-3.4.4 PETSC\_ARCH=arch-mswin-mpi1-release ./config/builder.py

xxx=========================================================================xxx