**Building UM7.6 PS25 APS1 ACCESS-C Executable**

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This document is to provide the technical information on how to build um forecast and reconfiguration executable of APS1 ACCESS City model (UM version 7.6 and PS25). Since the building process has not been standardised and finalised yet, this document is for reference only and subject to future updates. The building process on solar, ngamai and raijin will be summarised in three sections, respectively.

## 1. Building APS1 City Model Executable on Solar

**a. Background**

Xiao has got a UMUI job xbdec and this job has been compared with UK Met Office standard PS25 qazga job. The different between these two are very minor user configuration changes. The job has been copied to Wenming’s UMUI job laabc.

**b. Extracting the Source Codes**

After copying the job, in UMUI please open the job for editing and modify the following items,

* User Information and Target Machine: change to your own user id and platform to solar
* Input/Output Control and Resources: update $DATAW in the Time Convention and Script Environment Variables; (I make $DATAW=$DATADIR)
* FCM Configuration: update the UM\_OUTDIR and UM\_ROUTDIR in the FCM Extract Directories and Output Levels

In UMUI or UMUIX, please save the changes and process the job, and then submit the build job. The extraction process shall extract all the source codes to $DATADIR/UM\_OUTDIR but the building process will eventually fail due to some errors.

**c. Fixing the Source Codes**

* Add UM\_OUTDIR\_OK/$USER/laabc/umbase/src/UM/control/top\_level two Fortran codes, coder.F90 and decode.F90 ,

#coder.F90

subroutine coder

print \*,"The function 'coder' should not be called, aborting"

stop

end subroutine coder

#decode.F90

subroutine decode

print \*,"The function 'decode' should not be called, aborting"

stop

end subroutine decode

* Modify UM\_OUTDIR\_OK/$USER/laabc/umbase/src/UM/control/stash/pp2grib.F90: At line 532 before the subroutine CODER is called, add

! DEPENDS ON: CODER

* UM\_OUTDIR\_OK/$USER/laabc/umbase/src/UM/ utility/qxreconf/

rcf\_grib\_read\_data\_mod.F90: at line261 before calling DECODE

! DEPENDS ON: DECODE

**d. Compiling the um executable**

Change to UM\_OUTDIR/$USER/laabc/ummodel, type and run,

$module load compiler/intel-11.1.046

$module load mpi/sun-8.2.1

$fcm build

The um executable shall be produced within UM\_OUTDIR/$USER/laabc/ummodel/bin.

**e. Compiling the reconfiguration executable**

Change to UM\_OUTDIR/$USER/laabc/umrecon, type and run,

$module load compiler/intel-11.1.046

$module load mpi/sun-8.2.1

$fcm build

The reconfiguration executable shall be produced within UM\_OUTDIR/$USER/laabc/umrecon/bin.

## 2. Building APS1 City Model Executable on Ngamai

* Copy (use scp or rsync) UM\_OUTDIR to ngamai:$DATADIR; delete the executable compiled on solar in the bin directories if they are copied over
* Update UM\_OUTDIR/$USER/laabc/umrecon/cfg/bld.cfg and UM\_OUTDIR/$USER/laabc/ummodel/cfg/bld.cfg

Replace

-I/g/sc/ophome/access/GCOM3.6/linux\_ifort9.0\_mpich2/inc

With

-I/g/sc/ophome/access/apps/gcom/4.4/inc

Replace

-I/g/sc/ophome/nmoc\_share/local/intel\_builds/intel-11.1.038/netcdf-4.0.1/include/ifc

With

-I/apps/netcdf/4.3.0/include

Replace

-L/g/sc/ophome/access/GCOM3.6/linux\_ifort9.0\_mpich2/lib –lgcom

With

-L/g/sc/ophome/access/apps/gcom/4.4/lib –lgcom

Replace

-L/g/sc/ophome/nmoc\_share/local/intel\_builds/intel-11.1.038/netcdf-4.0.1/lib/ifc –lnetcdf

With

-L/apps/netcdf/4.3.0/lib –lnetcdf

* Load modules and set PATH,

$module load intel/12.1.8.273

$module load openmpi/1.6.5

$module load netcdf/4.3.0

$export PATH=/access/apps/fcm/fm\_solar/fcm1.5/bin:$PATH

* Use fcm to build executable for um and reconfiguration as on solar.

## 3. Building APS1 City Model Executable on Raijin

* Copy (use scp or rsync) UM\_OUTDIR to raijin:/short/$PROJECT/$USER; delete the executable compiled on solar in the bin directories if they are copied over
* Update UM\_OUTDIR/$USER/laabc/umrecon/cfg/bld.cfg and UM\_OUTDIR/$USER/laabc/ummodel/cfg/bld.cfg

Replace

/g/sc/data/$USER/UM\_OUTDIR//USER/laabc/umbase

With

/short/$PROJECT/$USER/UM\_OUTDIR/$USER/laabc//umbase

Replace

-I/g/sc/ophome/access/GCOM3.6/linux\_ifort9.0\_mpich2/inc

With

-I/projects/access/apps/gcom/GCOM4.4/raijin/bld\_mpp\_i12.1.8.273\_ompi1.6.3/inc

Replace

-I/g/sc/ophome/nmoc\_share/local/intel\_builds/intel-11.1.038/netcdf-4.0.1/include/ifc

With

-I/apps/netcdf/4.2.1.1/include

Replace

-L/g/sc/ophome/access/GCOM3.6/linux\_ifort9.0\_mpich2/lib –lgcom

With

-L/projects/access/apps/gcom/GCOM4.4/raijin/bld\_mpp\_12.1.8.273\_1.6.5/lib lib –lgcom

Replace

-L/g/sc/ophome/nmoc\_share/local/intel\_builds/intel-11.1.038/netcdf-4.0.1/lib/ifc –lnetcdf

With

-L/apps/netcdf/4.2.1.1/lib -lnetcdf

* Load modules,

$module load intel-fc/12.1.8.273

$module load intel-cc/12.1.8.273

$module load openmpi/1.6.5

$module load netcdf/4.2.1.1

$ module load fcm/2.3.1

* Use fcm to build executable for um and reconfiguration as on solar.