Installation of GAMIT-GLOBK

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GAMIT-GLOBK course
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Material from R. King, T. Herring, M. Floyd (MIT) and S. McClusky (now ANU)
Sources of prerequisite information

http://web.mit.edu/mfloyd/www/computing/gg/pre/

ftp://guest@chandler.mit.edu/updates/documentation/GAMIT_prerequisites.pdf

http://web.mit.edu/mfloyd/www/computing/mac/gfortran/

http://web.mit.edu/mfloyd/www/computing/mac/gv/
Master installation directory
Master installation directory

• Choose a suitable directory for installing the software
  – Suggested place in home directory, e.g. ~/src/gg, ~/Programs/gg, etc. For example, I install GG version 10.5 in /Users/Mike/Programs/gg/10.5
  – Alternative may be your /usr/local directory, e.g. /usr/local/gg/10.5

• Change to this directory for downloading the source code

• This will ultimately be the directory that is linked to from your home directory (~/gg)
Downloading source via FTP
FTP server

• chandler.mit.edu
  – username: guest
  – password: [changeable]

• Use FTP client, such as ftp or ncftp

• Alternatively, use internet browser
  – ftp://guest@chandler.mit.edu
Source code

• Change directory to updates/source/
• Need at least:
  – com
  – gamit
  – help
  – kf
  – libraries
  – tables
  – incremental_updates (if any)
• Also download install_software
• Depending on your processing strategy, may also need to download grids (e.g. ocean-tide loading, atmospheric loading grids, etc.) from ftp://everest.mit.edu/pub/GRIDS
Updates!

- Incremental updates are made available approximately every month, so please check
  - SV-PRN translation tables
  - Leap seconds
- Example: 2015-06-30T23:59:60Z leap second
Documentation

- Top-level “README” file at ftp://guest@chandler.mit.edu/updates/README
- Change directory to updates/documentation/
  - GAMIT-GLOBK prerequisites in GAMIT_prerequisites.pdf
    ftp://guest@chandler.mit.edu/updates/documentation/GAMIT_prerequisites.pdf
  - Introductory GPS material in Intro_GG.pdf
    ftp://guest@chandler.mit.edu/updates/documentation/Intro_GG.pdf
  - GAMIT reference manual in GAMIT_Ref.pdf
    ftp://guest@chandler.mit.edu/updates/documentation/GAMIT_Ref.pdf
  - GLOBK reference manual in GLOBK_Ref.pdf
    ftp://guest@chandler.mit.edu/updates/documentation/GLOBK_Ref.pdf
Installing GAMIT-GLOBK etc.
Required tools

Depending on your system, a number of programs may need to be added. One needs:

• A Fortran code compiler
• A C code compiler
• X11 libraries and headers, specifically:
  – libX11.a, libX11.so, libX11.dylib or libX11.la (depending on your system)
  – Xlib.h
• Linux
  – Be sure a C-shell (csh and tcsh) is installed (this is not the case by default with Ubuntu, for instance)
  – X11 libraries and headers may also need to be installed
• Mac
  – Have an Apple ID and download the latest “Command Line Tools for Xcode” (Mac OS X 10.7.3 or later) or “Xcode” (prior to Mac OS X 10.7.3) appropriate to your system from https://developer.apple.com/downloads/index.action
  – X11 was replaced by XQuartz (http://xquartz.macosforge.org/) for Mac OS X 10.8 (Mountain Lion) and later
• Windows (Cygwin)
  – Devel/make
  – Math/bc
  – Shells/tcsh
  – X11/libX11
Notes on known problems

• Very new gfortran releases, especially those with a version number ending in 0 (e.g. 4.9.0), often are buggy and produce compilation problems
  – If this is the case, try compiling a program using only the ‘-O3’ flag or revert to an older, stable version of gfortran

• I currently run gfortran 4.8.2 on my laptop with Mac OS X 10.10 (Yosemite) and 4.7.3 on MIT computers with Ubuntu Linux
  – Note Ubuntu’s gfortran 4.8 appears to be buggy
Running install_software

From the master installation directory, where the source tar-files and install_software should be copied

• Run ./install_software

• As you pass through the installation process, please read the questions, e.g.
  – Searching directories set in libraries/Makefile.config for X11 installation
    Verified these paths to X11 libs and includes
    X11LIBPATH:
    X11INCPATH:
    Are these paths complete and correct for your system? (y/n)

• If they are not correct, say “n” then install_software will search or exit and one can then edit libraries/Makefile.config appropriately
A note here on permissions

- A computer may read ("r"), write ("w") and/or execute ("x") a directory or file
- Each action may be allowed by a user ("u"), group ("g") or others ("o")
- A computer must follow instructions, called “permissions”, on if it allowed to do any or all of these for any
- Any file that you want to run as a program must be made “executable”
  - chmod a+x <file>
  - Change moderations (permissions) so executable ("x") permissions are added to <file> for all ("ugo")
- You may find you need to verify that directories and files are readable, writable and/or executable as necessary throughout your UNIX experience
Potentially necessary edits

- libraries/Makefile.config is the main control file for the installation process
- Check:
  - X11LIBPATH (path to libX11)
  - X11INCPATH (path to Xlib.h)
  - MAXSIT (max. number of sites to process simultaneously)
  - MAXSAT (do not change)
  - MAXATM (max. atmospheric estimates per session)
  - MAXEPC (max. epochs per session, e.g. 24 hours at 30 s interval = 2880 measurement epochs)
  - OS block (usually no need to change)
Setting environment variables

- sh/bash (e.g. in ~/.bashrc or ~/.profile):
  
gg='/usr/local/gg/10.4'
PATH="$gg/com:$gg/gamit/bin:$gg/kf/bin:$PATH"
&& export PATH
HELP_DIR="$gg/help/" && export HELP_DIR
INSTITUTE='MIT' && export INSTITUTE

- csh/tcsh (e.g. in ~/.cshrc):
  
set gg = '/usr/local/gg/10.4'
setenv PATH "$gg/com:$gg/gamit/bin:$gg/kf/bin:$PATH"
setenv HELP_DIR "$gg/help/"
setenv INSTITUTE 'MIT'
Additional software

• Generic Mapping Tools (GMT) ([http://gmt.soest.hawaii.edu/](http://gmt.soest.hawaii.edu/))
  – Required for plotting scripts to work
  – Download and run install_gmt.sh and follow prompts

• Tom’s GGMatlab tools ([http://www-gpsg.mit.edu/~tah/GGMatlab/](http://www-gpsg.mit.edu/~tah/GGMatlab/))
  – tsview
  – velview
GMT

Install netCDF ([http://www.unidata.ucar.edu/downloads/netcdf/current](http://www.unidata.ucar.edu/downloads/netcdf/current)) first:

- If unable to install via, e.g. Ubuntu Software Manager then...
  - Download latest source code to suitable directory (e.g. ~/src)
    - wget http://www.unidata.ucar.edu/downloads/netcdf/ftp/netcdf-4.3.0.tar.gz
  - Expand tar-file
    - tar xvfz netcdf-4.3.0.tar.gz
- Change directory and configure **without** netcdf-4 support (unless you have required HDF5 and zlib installed) and install in /usr/local
  - cd netcdf-4.3.0
  - ./configure --disable-netcdf-4
- Run the usual make sequence to install in /usr/local (configure’s default)
  - make
  - make check
  - sudo make install
GMT

• Download and execute install_gmt.sh (http://gmt.soest.hawaii.edu/gmt/install_gmt.sh)
• Answer the questions appropriately (most defaults settings are adequate)
• Default configuration installs netCDF in /usr/local/lib, /usr/local/include, etc. (previous slide)
• Suggested installation directory for GMT is /usr/local/GMTX.Y.Z (where X.Y.Z is currently 4.5.9)
• Be sure to follow the instructions regarding setting environment variables (PATH, MANPATH)
Processing directories
The *processing* directory will not have the same structure as the *master installation* directory.

Choose a different location, do not process in your master installation directory.

We will, however, be copying or linking to the master installation tables (soft link or “shortcut” ~/gg/tables).
Example continuous GPS structure
Example survey GPS structure