

Compiling WRF and WPS

- System Requirements

 - Required libraries (WRF and WPS):

 - FORTRAN 90/95 compiler

 - C compiler

 - Perl

 - netCDF

 - NCAR Graphics (optional, but recommended used by graphical utility programs)

- Optional libraries* for GRIB2 support (WPS):

 - JasPer (JPEG 2000 “lossy” compression library)

 - PNG (“lossless” compression library)

 - zlib (compression library used by PNG)

Compiling WRF

- Installing WRF

- Download source code:

http://www.mmm.ucar.edu/wrf/users/download/get_source.html.

- After gunzip and untar, should see a directory WRFV3/

- cd to WRFV3/ directory

- Set environment:

- setenv NETCDF /usr/local/netcdf-pgi

- unset limits

- setenv MP_STACK_SIZE 64000000: OpenMP

- setenv OMP_NUM_THREADS n: OpenMP use

- setenv MPICH_F90 f90

- setenv WRF_EM_CORE 1

	Makefile	Top-level makefile
	README	General information about WRF code
	README.NMM	NMM specific information
	README_test_cases	Explanation of the test cases for ARW
Data dictionary →	Registry/	Directory for WRF Registry file
Compile rules →	arch/	Directory where compile options are gathered
Compile scripts →	clean	script to clean created files and executables
	compile	script for compiling WRF code
	configure	script to configure the configure.wrf file for compile
Source code directories	dyn_em	Directory for ARW dynamic modules
	dyn_exp/	Directory for a 'toy' dynamic core
	dyn_nmm/	Directory for NMM dynamic modules
	external/	Directory that contains external packages, such as those for IO, time keeping and MPI
	frame/	Directory that contains modules for WRF framework
	inc/	Directory that contains include files
	main/	Directory for main routines, such as wrf.F, and all executables
	phys/	Directory for all physics modules
	share/	Directory that contains mostly modules for WRF mediation layer and WRF I/O
	tools/	Directory that contains tools
Run directories →	run/	Directory where one may run WRF
	test/	Directory containing sub-directories where one may run specific configurations of WRF.

Compiling WRF

- To create a WRF configuration file for your computer, type:
 `./configure`
- This script checks the system hardware and software (mostly netCDF), and then offers the user choices for configuring WRF:
 - Type of compiler
 - Serial, OpenMP, or MPI
 - Type of nesting (basic, preset moves, vortex following)

List of Configure Options

Choices for 32-bit LINUX operated machines are:

1. Linux i486 i586 i686, gfortran compiler with gcc (serial)
2. Linux i486 i586 i686, gfortran compiler with gcc (smpar)
3. Linux i486 i586 i686, gfortran compiler with gcc (dmpar)
4. Linux i486 i586 i686, gfortran compiler with gcc (dm+sm)
5. Linux i486 i586 i686, g95 compiler with gcc (serial)
6. Linux i486 i586 i686, g95 compiler with gcc (dmpar)
7. Linux i486 i586 i686, PGI compiler with gcc (serial)
8. Linux i486 i586 i686, PGI compiler with gcc (smpar)
9. Linux i486 i586 i686, PGI compiler with gcc (dmpar)
10. Linux i486 i586 i686, PGI compiler with gcc (dm+sm)
11. Linux x86_64 i486 i586 i686, ifort compiler with icc (serial)
12. Linux x86_64 i486 i586 i686, ifort compiler with icc (smpar)
13. Linux x86_64 i486 i586 i686, ifort compiler with icc (dmpar)
14. Linux x86_64 i486 i586 i686, ifort compiler with icc (dm+sm)
15. Linux i486 i586 i686 x86_64, PathScale compiler with pathcc (serial)
16. Linux i486 i586 i686 x86_64, PathScale compiler with pathcc (dmpar)

Choices for Nesting are:

0. no nesting (only available for serial and smpar)
1. basic
2. preset moves
3. vortex following

Compiling WRF

- Type `./compile`

<code>compile em_b_wave</code>	}	<i>3D Ideal Case (ARW only)</i>
<code>compile em_quarter_ss</code>		
<code>compile em_heldsuarez</code>		
<code>compile em_les</code>		
<code>compile em_grav2d_x</code>	}	<i>2D Ideal Case (ARW only)</i>
<code>compile em_hill2d_x</code>		
<code>compile em_squall2d_x</code>		
<code>compile em_squall2d_y</code>		
<code>compile em_seabreeze_x</code>		
<code>compile em_real</code>	}	<i>Real Data Cases (ARW and NMM)</i>
<code>compile nmm_real</code>		

`compile -h` → *help message*

- Type `./compile em_real` for real time case. If the real data case compilation is successful: `wrf.exe`, `real.exe`, `ndown.exe`, and `nup.exe`

Installing WPS

- A successful compilation of WRF is required prior to WPS compilation.

- Download static terrestrial data. The terrestrial fields interpolated by geogrid may be downloaded from same page as the code:

http://www.mmm.ucar.edu/wrf/users/download/get_source.html

- Download source code. The WPS source code can be obtained from:

http://www.mmm.ucar.edu/wrf/users/download/get_source.html

- Configure and Compile WPS. Type: **./configure**

Installing WPS

Please select from among the following supported platforms.

- | | |
|--|-----------------------|
| 1. PC Linux i486 i586 i686, PGI compiler | serial, NO GRIB2 |
| 2. PC Linux i486 i586 i686, PGI compiler | serial |
| 3. PC Linux i486 i586 i686, PGI compiler | DM parallel, NO GRIB2 |
| 4. PC Linux i486 i586 i686, PGI compiler | DM parallel |
| 5. PC Linux i486 i586 i686, Intel compiler | serial, NO GRIB2 |
| 6. PC Linux i486 i586 i686, Intel compiler | serial |
| 7. PC Linux i486 i586 i686, Intel compiler | DM parallel, NO GRIB2 |
| 8. PC Linux i486 i586 i686, Intel compiler | DM parallel |
| 9. PC Linux i486 i586 i686, g95 compiler, | serial, NO GRIB2 |
| 10. PC Linux i486 i586 i686, g95 compiler, | serial |

Enter selection [1-10] : 1

Configuration successful. To build the WPS, type: compile

- If configuration was successful, compile WPS:
./compile
- If the compilation is successful, it will create:
geogrid.exe, ungrrib.exe, and metgrid.exe
- Under util directory: **avg_tsfc.exe, g1print.exe, g2print.exe, mod_levs.exe, rd_intermediate.exe, calc_ecmwf_p.exe, plotgrids.exe, and plotfmt.exe**