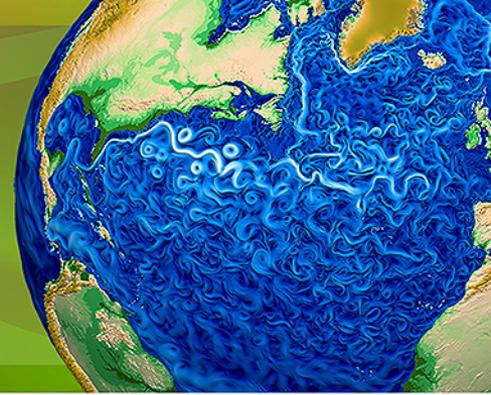




Accelerated Climate Modeling
for Energy



SE/CPL Group

- Repository workflow / management
- Testing infrastructure
- Project communication and productivity tools
- Parallel I/O
- Coupler; Configurability/Modularity of Model

Leads: Robert Jacob, Andy Salinger

Hubs: Foucar, Jacobsen*, Krishna, Sarich, Wilke, Burgess,
Dubey

Spokes/Integrators/Machine POCs: Singh, Bisht, Burroughs,
Keen, Taylor, Worley, Norman, Mehmetjanov

SE/CPL Group Progress -- Repository

Git repo: github.com/ACME-Climate/ACME

- 500+ commits 257 branches 49 contributors out of 146 developers
- Doesn't count MPAS components, pulled in as submodule updates

Code Development Workflow --

- Feature branches; Pull Requests; Staging on Integration branch “next”, Merge to “master”; Maintained Release branches “maint-v1.0”

Highlight: Integration of v1 Feature Branches

- 31 branches integrated from Nov 1-Jan 14
- v1 configuration testing ongoing.

SE/CPL Group Progress -- Testing

- Testing strategy:
 - acme_developer: <1hr on any platform; required for pull request
 - acme-integration: < overnight on all platforms; required for integration
 - Jenkins-based system to launch testing jobs from single server
 - Cdash dashboard for presenting results
 - http://my.cdash.org/index.php?project=ACME_Climate
- Progress:
 - Test suites developed – adding more all the time
 - acme_developer: 26 tests -- 5 machines
 - acme_integration: 56 tests – 3 machines
 - Distinction of namelist changes versus answer changes
 - Started major refactor of CIME scripts in collaboration with NCAR
 - Python based – configured with XML
 - Parallel build of tests (using threads on login node)
 - Testing scripts have their own stand-alone tests!

SE/CPL Group Progress – Collaboration Tools

- Confluence
- Slack
- GoTo Meeting
- Github issues
- Jira (using Kanban flow)

Licensing plans (draft)

- Modified-BSD (common, low-hassle Open Source license)
- Release from ACME-Climate GitHub organization

SE/CPL Group Progress – PIO

- New runtime configuration options
- Continuing to find optimum settings for different machines/cases.

Coupler and Configurability/ Modularity

- Mostly deferred
- Coupler support for subgrid orography and dynamic ice sheets starting.

SE/CPL Group – Planning 1

- Get on manifold of 100% tests passing on all targeted machines – and stay there
 - Machine POCs have had tough job, large learning curve
- Make sure all features are covered by tests
 - Continue to educate developers on adding tests
 - Restart work on Unit Testing infrastructure
- Elevate the *code testing* to top priority of scripts
 - Previously, priority was safety for a user running 1 case
 - Speed up build for comprehensive tests:
 - Parallel build (make -j 40)
 - Reuse of compile components for several executables
 - Reuse same executable for many tests (run time configurability)

SE/CPL Group – Planning 2

- Refactor of testing scripts
 - Python – get rid of csh and perl
 - Much more condensed, modular, built in error checking, fully configurable by XML
 - Stand-alone testing of test scripts
- Joint development of CIME ongoing
 - starting with reconciled “CIME4+A”
 - creating CIME 5

SE/CPL Group – Planning 3

- Repository:
 - Will soon need to manage release branch “maint-v1.0” as well as master
 - Will take some training and documentation
 - Support developers
- Machines:
 - Continue to support changing machines, compilers, queue systems
 - Support developers
- Collaboration tools:
 - Confluence, chat, github issues working well
 - Irregular use of JIRA tasks.
- PIO: Switch to PIO2
- Coupler: Proposal to rewrite for exascale using MOAB

SE/CPL Group – Planning 4

ACME-SM Proposal to CMDV-SE will accelerate and expand several of these activities, if funded:

- Build system upgrade
- Unit Tests
- Climate Reproducibility tests
- Verification of Atm Physics
- Single Column Model development
- Refactor of Atm Phys and Dynamics driver
- Next-Gen Coupler
- SE Dycore using Trilinos/Kokkos/C++
- SE Education