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, Mahmetjanov
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)
• 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
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