WRF Reference Configurations – DTC Concept and Plans

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Outline

- Developmental Testbed Center
  - Purpose
- Reference Configurations
  - Motivation
  - Definition
  - Selection process
  - Testing and evaluation
  - Feedback/Questions
Developmental Testbed Center

Fundamental purpose

- To serve as a bridge between research and operations to facilitate the activities of both halves of the NWP Community

  - **Research**: functionally equivalent operational environment to test and evaluate new NWP methods over extended retrospective periods
  - **Operational**: benefits from DTC T & E of strengths and weaknesses of new NWP advances prior to consideration for operational implementation
Reference Configurations

Motivation

■ Serve both the:
  □ **Research** community
    ■ Provide baselines to evaluate new techniques
    ■ Provide information to non-model developers for research application studies
  □ **Operational** community
    ■ Provide guidance for selecting next generation Operational Configurations

■ Accomplished by:
  □ Conducting carefully *controlled*, rigorous *testing* and *evaluation*
Reference Configurations

Definition

- **Operational Configuration**
  - robust, fully tested, current operational NWP system
  - maintained by the operational centers

- **Reference Configuration**
  - selected from the WRF Repository
  - extensively tested
  - design document & statistical results distributed by the DTC
  - possible elevation to Operational Configuration

- **WRF Repository**
  - in the WRF framework
  - meets WRF coding standards
  - minimal testing
  - code & documentation is maintained by the author

- Candidate configurations selected from the WRF Repository
  - Compile- and run-time configuration files
Reference Configurations
Selection Process

DTC Executive Committee\(^\wedge\) gives final approval

DTC Advisory Board\(^*\) establishes a prioritized list

Suggestions for candidate configurations obtained from community at large

\(^*\)DTC Advisory Board
Government agencies
Private sector
Academic community

\(^\wedge\)DTC Executive Committee
AFWA NCAR NWS OAR
Path to Reference Configuration

Reference Configurations

webpage
NCAR's MSS

Distribute results to the user community
Review of RC verification
RC testing
Selection of candidate RCs
WRF Repository
Developers Committee

Feedback to code developers
Community Input

Code Developer
Code Developer
Code Developer
Reference Configurations
Timeline relative to WRF releases

- Testing based on official WRF releases to be most relevant to the user community
- Balance between traceable history and new capabilities
Reference Configurations

Testing

- Retrospective, broad range of weather regimes
  - Comprehensive T & E
    - large number of cycles
  - Subsequent T & E
    - Subset of cycles
      - Obtain representative estimates of the verification statistics
    - Verify timing and performance have not been adversely affected
- Variety of Applications
Reference Configurations
Verification and Dissemination

- Verification statistics to include (among others):
  - RMSE, bias, ETS
  - New, relevant verification techniques
  - Confidence intervals where appropriate

- Results distributed by:
  - Webpage
  - Archived on NCAR’s Mass Storage System
Reference Configurations
What’s Next?

- First Reference Configuration designation and dissemination
  - What?
  - When?

*P8.7 Objective verification results from forecasts generated with the ARW and NMM dynamic cores of the WRF model (Bernardet et al.)
Reference Configurations
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