**NITE (NWP Information Technology Environment): an infrastructure to facilitate development of NCEP numerical models**

Laurie Carson\(^1\) and Ligia Bernardet\(^2\)

\(^1\)National Center for Atmospheric Research/Research Applications Laboratory and Developmental Testbed Center

\(^2\)Cooperative Institute for Research in the Atmosphere/NOAA Earth System Research Laboratory and Developmental Testbed Center

**Motivation:** The NITE project was established by the Developmental Testbed Center (DTC) to investigate and design a software infrastructure to encourage R2O (Research to Operations) in NWP, which would facilitate development of NCEP numerical models by scientists both within and outside of EMC. Recent reports from UCACN (UCAR Community Advisory Committee for NCEP, 2014) and the DTC Science Advisory Board (2013) recommend the development of software and IT infrastructure for conducting model experiments. Infrastructure is also critical to the success of NOAA’s NGGPS (Next Generation Global Prediction System).

**Background & Process**

A survey of the potential NITE user community was conducted to understand the main problems in running experiments with NCEP operation systems.

- Surveyed potential users (EMC, NOAA Labs, NCAR, etc.)
- Identified key challenge areas

An assessment of selected existing NWP infrastructure systems was conducted, including documentation review, focus groups and site visits.

- Held group discussions at NOAA ESRI, NCAR CESM, ESMF
- Visited NCEP, ECMWF, UKMO
- Reviewed some of the existing infrastructure and its documentation

**NITE Design Goals**

- Single system for NOAA and partners
- Datasets (inputs and outputs) are readily retrievable with well-documented format standards
- Predefined suites are available
- Customized suites can be created
- Past experiments can be browsed and reproduced
- Basic visualization and verification tools available for any suite
- Infrastructure is general and applicable to NCEP’s various suites, including future ones
- NITE experiments are relevant for R2O at NCEP
- Easy to use and well documented
- Modular and allows incremental implementation and growth

**Example of NITE use**

Select predefined suite
- NAM

Select workflow: management
- NAM

Execute workflow components
- NAM

Modify source code
- GSI operational

**RECOMMENDED PHASED IMPLEMENTATION**

- **Components:**
  - **Core Elements:**
    - Source Code Management
    - Scripts
    - Data Management
    - Workflow Management Systems
  - **Modules:**
    - EXPERIMENT METADATA DATABASE
    - SUITE CONFIGURATION
    - SCRIPTS
- **Roadmap:**
  - Start with a core component and grow as needed
  - Initial prototypes, testing, and validation
  - Plan and schedule
  - Documentation and training

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