

Supercomputing at the US National Weather Service

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The United States' National Weather Service (NWS) has been developing and running environmental models on supercomputers for well over 25 years. These computers are operated and maintained by the National Centers for Environmental Prediction (NCEP). The current supercomputing contract, the Weather and Climate Operational Supercomputing System (WCOSS), was awarded in 2011 and will run through 2021. The multi-year contract was structured with an initial system installation, followed by multiple enhancements throughout the life of the contract. In addition, NWS received additional funds during the life of the contract to use for additional supercomputing resources for the agency. The resulting system is currently a heterogeneous system comprised of IBM, Cray and Dell components woven into one computing cluster. WCOSS has had three upgrades since that first installation - each upgrade being an addition to the existing system, rather than a rip-and-replace of the old system.

This approach has presented opportunities as well as challenges. Interruption to development of modeling applications has been minimized by the upgrade paradigm. It has been possible to accommodate supplemental funding without too much disruption. At the same time, the conglomerate of systems has meant utilizing common technologies that were not necessarily optimal for all components. Management of the workload has been necessary to determine and control which applications should run on which computing components.

We will outline the current operational compute capabilities of WCOSS. We will discuss the experiences working with a heterogeneous computing environment. We'll discuss some lessons learned and some thoughts for the future.

Affiliation

United States National Weather Service

Primary author: COSGROVE, Rebecca (NOAA/National Weather Service)

Presenter: COSGROVE, Rebecca (NOAA/National Weather Service)

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