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Modernizing U. S. Navy NWP Operations: Toward Distributed HPC

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Recent updates to Navy NWP systems for multiple earth system components have resulted in a significant increase in computational requirements for future operational systems. At the same time, ongoing efforts to modernize the operational control of these NWP runs is driven in part by a high-level desire for allowing the Navy METOC Enterprise to leverage cloud computing and other distributed HPC opportunities.

We will describe recent updates to operational systems, including the upcoming transition of a high-resolution global coupled system in light of these computational challenges. These updates also include infrastructure changes aimed at promoting research to operations, increasing HPC utilization rates, and improving the reliability and maintainability of the operational run through the adoption and use of the Cylc workflow manager.

Finally, we will describe recent efforts to benchmark the performance of several cloud computing platforms to support the demand of production NWP HPC. We will show results comparing an on-premises standalone Cray system and several cloud platforms on the computational performance (both scalability and timing) using the NAVGEM global atmospheric model as the test code and discuss implications for future operational HPC deployments.

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