Advancing HPRC at VCU

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The HPRC advancement project spearheads research into new software and tooling for the High Performance Research Computing Core Laboratory at VCU. Researchers and students can use the HPRC and its main cluster, Athena, to run large-scale simulations, programs, and other computationally intensive jobs. Currently, compute nodes in production must be provisioned and configured manually, which significantly increases maintenance time and operational complexity while simultaneously accumulating technical debt, especially when adding new nodes and implementing additional features.

Our HPRC advancement team evaluates the OpenHPC + Warewulf 4 toolchain for automated node provisioning using the experimental cluster, Scylla. The Scylla testbed closely follows the OpenHPC project, which outlines centralized configuration and PXE booting of compute nodes for streamlined expansion of high performance clusters. Ease of use, smooth integration of new features, and rapid deployment of new nodes form the ethos of Scylla's overall design. Scylla deviates from OpenHPC with a hybrid approach to provisioning that allows for custom-provisioned nodes to be joined, enabling the use of less-standard equipment.

To further advance accessibility, Open OnDemand has been integrated into the Scylla experimental cluster's head node, permitting web interface access for researchers. With these technologies and capabilities, Scylla has become a role model cluster for the potential future of the HPRC program.

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