

# Parallel neutrino candidate selection using HEPnOS

## Achievements

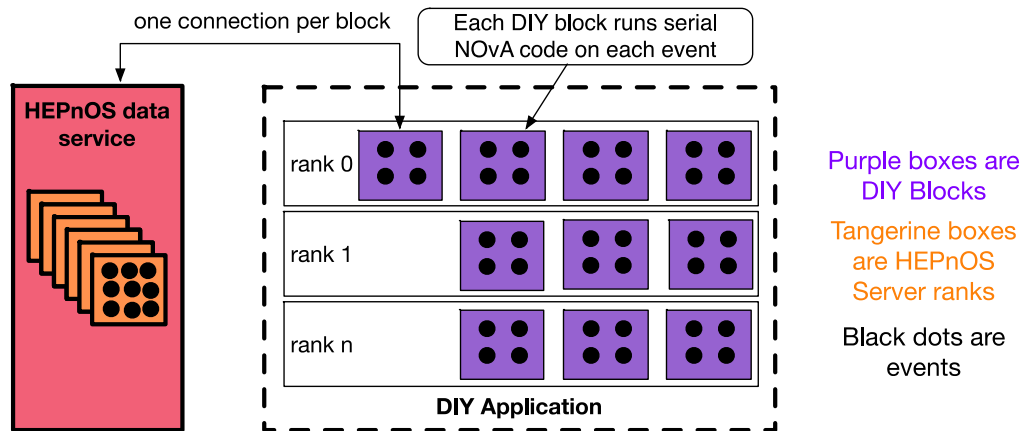
**Faithful reproduction** of NOvA's serial neutrino candidate selection procedure leveraging HEPnOS, a custom HPC data service for HEP, demonstrated on Theta.

## Significance and Impact

**Bypasses file system** to accelerate data access throughout analysis process (a major bottleneck). Enables existing serial experiment code to run efficiently in highly parallel context.

## Research Details

- Demo of NOvA's "4<sup>th</sup> analysis" candidate selection at ALCF
- DIY-based application, using data structures and candidate selection code from NOvA.
- Our application code provides all the parallelization, and experiment code is unaware of parallelism.
- HEPnOS data service supports the parallelism by providing global view of data and by removing software artifacts from the filesystem.
- Using containers to deliver complex software stack to ALCF and NERSC.
- Currently tuning performance and enhancing the API of the HEPnOS software



This figure shows the organization of our neutrino candidate selection application (DIY) and its communication with the HEPnOS data service.