

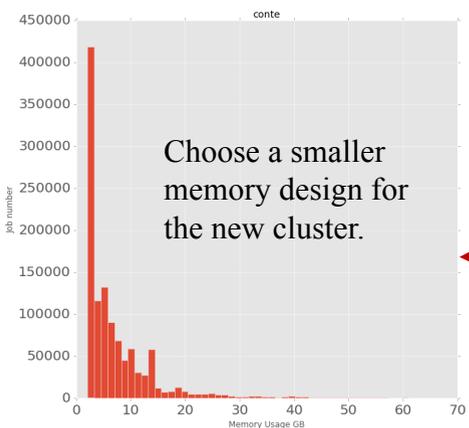
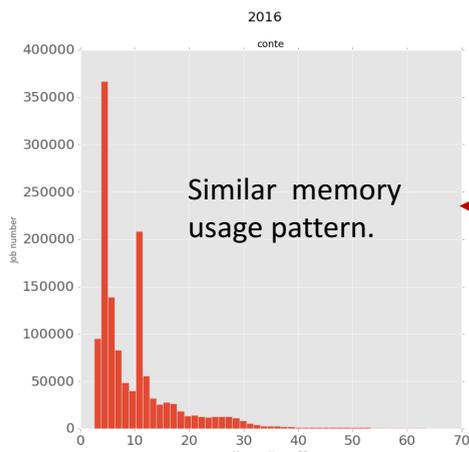
**Introduction**

This poster will present the current state of job and system metrics from analysis of jobs running on the high-performance resources at Purdue University. It is important for IT staff and users to understand their jobs' performance characteristics. The goal of this work is to analyze the data generated by TACC Stats and Open XDMoD, and apply that data to guide decision-making around Purdue's HPC systems.

**Data-driven HPC job performance analysis**

**TACC STAT**

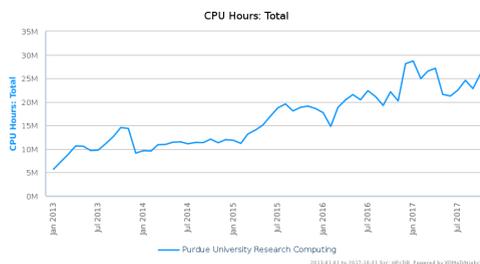
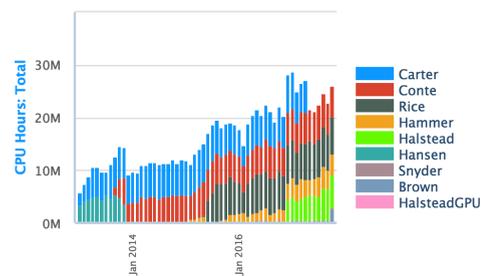
TACC Stats at Purdue University records various statistics, including Memory Bandwidth, Memory Usage and CPU User Fraction on job-level basis. Using Jupyter Notebooks and python scripts, we have developed tools to analyze system usage and job-level data, and used that data to make data-driven decisions around system design and procurement.



**OPEN XDMoD**

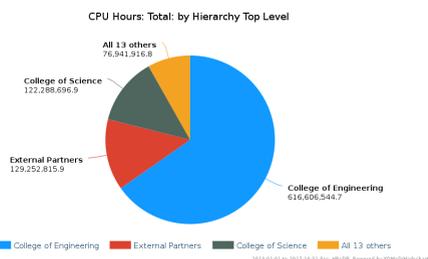
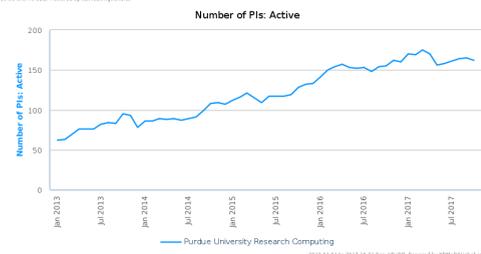
Open XDMoD can provide the overall summary of the usage of the clusters at Purdue, including the CPU hours, Number of jobs, node hours, and wait hours, etc. The following graphs summarize the usage of all the resources available at Purdue University during the last four years.

Purdue is providing more computational resources to support research and education needs during the past few years.



CPU hours utilized has increased from around 5 million hours to more than 25 million hours.

There are more and more PI groups at Purdue that are using the HPC resources for their researches.



PIs from College of Engineering, College of Science and external partners consume majority of the CPU hours usage.

**Conclusion**

Using TACC stats and Open XDMOD, we were able to analyze job characteristics of several existing Purdue systems, and use that data to establish specifications on the university's 2017 system that are optimized for the Purdue community's needs. This data driven design of system specifications led to a cost savings of over \$350,000 in memory and interconnect.