ClusterCockpit Monitoring Service

Jan Eitzinger, 10.01.2023
Overview

- Web-based job-specific performance monitoring
- Rudimentary job accounting and access to job performance metric data
- User Authentication with IDM HPC accounts
- HPC-Portal accounts only start session from within Portal
- ClusterCockpit Framework developed at NHR@FAU

https://github.com/ClusterCockpit/
Access to ClusterCockpit

URL: [https://monitoring.nhr.fau.de/](https://monitoring.nhr.fau.de/)

- Login with **IDM HPC account**
- **HPC Portal users can start session from within Portal**

- You can see **your running** and **completed jobs**
- **Future**: Project managers can see jobs from all users in a project
### Purpose and use cases

- **Access to job performance metrics**
  - Feedback about job performance
  - Identify **pathological jobs** early on
  - **Monitor** and **classify** your job performance

- **Simple job monitoring and accounting**
  - **Overview** about running and completed jobs
  - **Histograms** about walltime and node count
  - Powerful **filter** and **search** features
  - **Tag jobs** to group and organize your jobs
Empirical roofline plot

How fast can tasks be processed? $P$ [flop/s]

The bottleneck is either

- The execution of work: $P_{\text{peak}}$ [flop/s]
- The data path: $I \cdot b_S$ [flop/byte x byte/s]

This is the “Naïve Roofline Model”

- High intensity: $P$ limited by execution
- Low intensity: $P$ limited by data transfer
- “Knee” at $P_{\text{max}} = I \cdot b_S$:
  
  Best use of resources

Measured using hardware performance counter data
How to detect bad jobs

- Load metric indicates allocation or placement issues

- Basic resource utilization (arithmetic and memory bandwidth) can be seen in the roofline and polar plots
### Node statistic table to detect performance imbalance

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**ClusterCockpit Monitoring Service**

11.01.2023
Outlook

- Ongoing work on:
  - Intuitive Job performance visualization
  - Automatic Job classification
  - Automatic application tagging

- Please open a ticket if you encounter a problem!

Any remarks or questions? DEMO