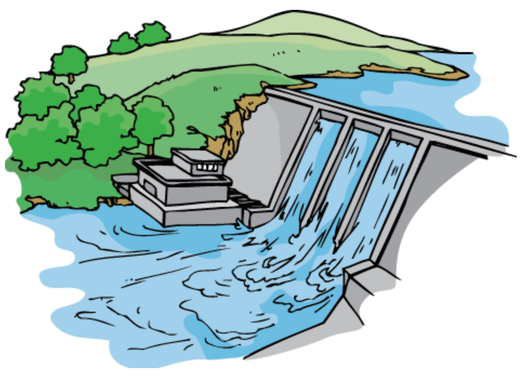
TSUBAME 3.0
Concepts and Features

TOKYO TECH Pursuing Excellence

Green Supercomputer

TSUBAME 2.0 was recognized as “Greenest Production Supercomputer in the World” in Nov. 2010, and TSUBAME-KFC was ranked 1st in Green 500 List in Nov. 2013 and June 2014.

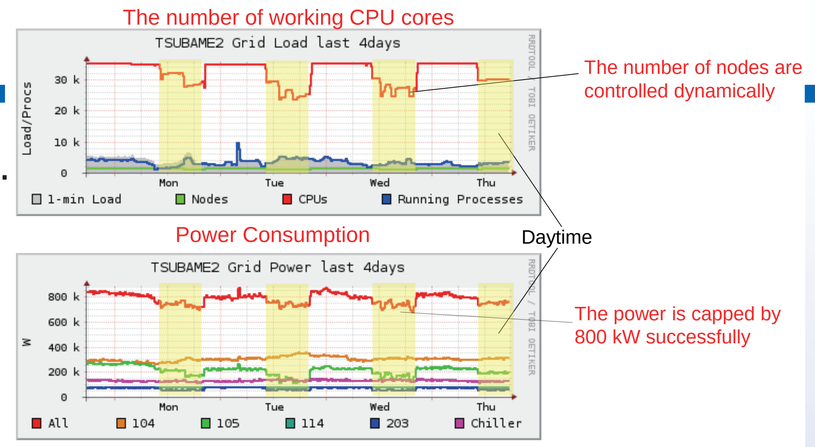
TSUBAME 3.0 aims better power efficiency than these systems, with power monitoring system in high frequency and resolution as TSUBAME-KFC for aggressive power management.



Cloud Supercomputer

TSUBAME 2.5 acts as cloud resource which changes its shape depending on demand and supply. In summer, the campus asks TSUBAME to save power consumption to 800kW in daytime to squeeze power for campus cooling. The number of nodes are automatically adjusted to meet the requirement. Some nodes are virtually split using VM technology to serve CPU-intensive and GPU-intensive jobs concurrently without interference.

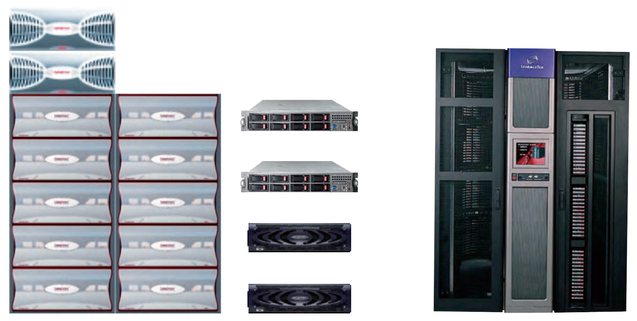
In TSUBAME 3.0, the nodes will be dynamically split according to resource requirement of assigned jobs using container technology. TSUBAME will serve more jobs with less nodes with efficient node allocation.



Big-Data Supercomputer

TSUBAME 2.5 provided hierarchical storage which consists of local SSD, parallel filesystems (Lustre, GPFS) and tape archive. Storage hierarchy accommodates extremely big-data applications with help of burst buffer technology. In addition to conventional big-data applications, deep learning applications work efficiently in TSUBAME 2.5 with GPU-accerelated DL frameworks such as Caffe and Chainer.

In TSUBAME 3.0, applications can exploit I/O performance with hardware based burst buffer. Support for Deep-learning and other big-data applications will be continued.

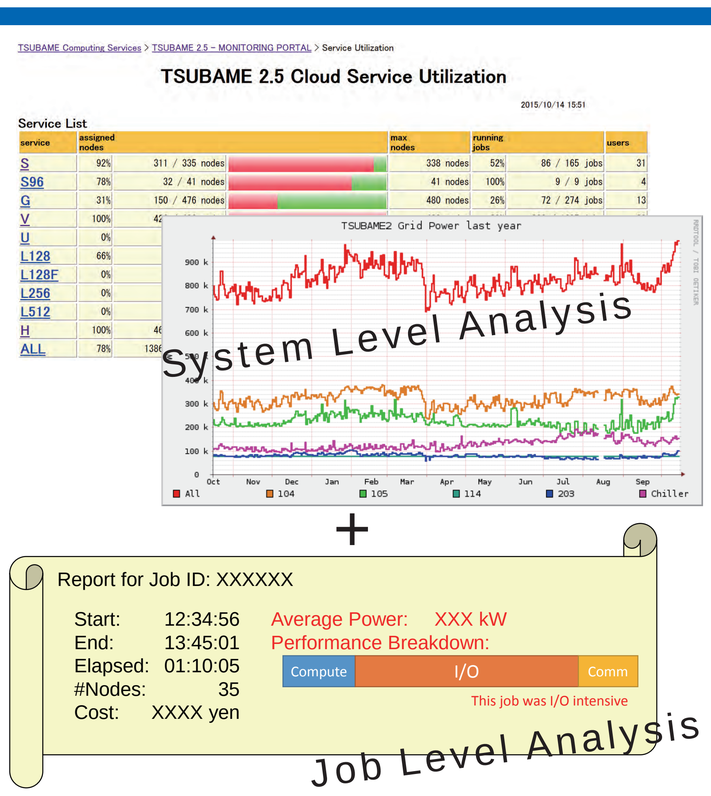


Storage Hierarchy in TSUBAME 2.5

Improved Visibility and Accountability

TSUBAME 2.5 was recognized as “visible” supercomputer. We have provided system-level information of cluster such as server status, node utilization, failure history, power consumption to all users and potential users.　(Available at: http://mon.g.gsic.titech.ac.jp/)

In TSUBAME 3.0, the functionality of monitoring and analysis will be extended. In addition to the system-level monitoring, job-level monitoring and analysis are recorded and provided to all users. Job level analysis report includes energy consumption and bottleneck analysis and they will be applied not only to conventional MPI applications but also for script-based jobs and ISV applications. Existing hardware-level monitoring log will also be rearranged to job-based analysis report and provided as one of hint for users to improve their application’s execution.



http://www.gsic.titech.ac.jp/sc15