HPC User Group meeting

Scientific Computing & Data Analysis Section
June 2018

1. Update on changes made in FY2017
2. Saion HPC cluster (GPGPU/high-core-count)
3. Computing and Visualization portal
4. Feedback / discussion

Your feedback is 

!

- How is your experience with the clusters ?
- Any services that you would like the SCDA provide ?
- Any question, topics you would like to raise ?

Updates on FY2017 changes

- **Changes summary**
  - Fresh installation of CentOS 7 (from ver. 6) on all nodes
    - New system libraries → more binary software to run out of the box
    - New GPU driver and CUDA version
  - Home area storage migration to new hardware
  - Limit quota on user home area storage space
  - Automatic clean-up of job local temporary files (in /tmp, /scratch,etc.)

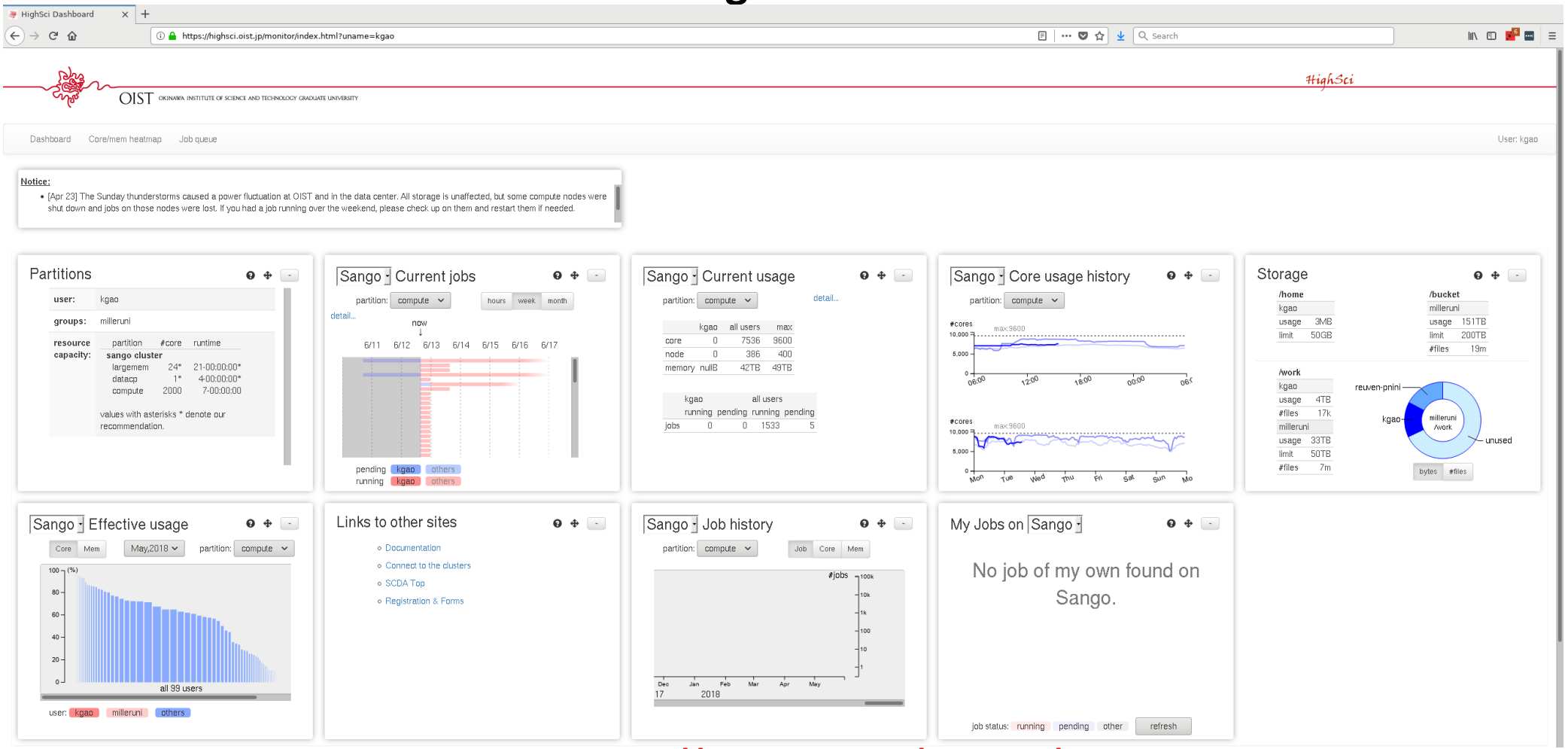
Updates on FY2017 changes

- **14 additionnal largemem node**
  - 2 x 18-core Broadwell Intel Xeon CPU per node
  - 768 GiB of memory per node
  - Automatic job scheduling based on requested memory/core

Updates on FY2017 changes

2017 | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | 2018 Jan | Feb | Mar

HighSci



https://highsci.oist.jp/monitor/index.html

Updates on FY2017 changes

2017 | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | 2018 | Jan | Feb | Mar

EnginFrame & DCV

- Was available for testing (Tombo only) and dedicated support usage
- Now available on Sango for general usage
- More info in third section of this presentation

Updates on FY2017 changes

- New version
  - From 14.x to 16.x
- History-based priority scheduling
  - User with less jobs running (or resources acquired) get high priority
- Job information reporting
  - You can see your job memory/cpu usage

Updates on FY2017 changes

- **Saion HPC cluster**
  - Highly parallel and GPGPU computing

More details in the Second part of the presentation ...

Updates on FY2017 changes

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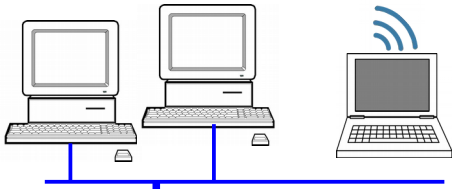
Research storage expansion

Wireless (~300Mb/s)



OIST service network (1Gb/s)

HPC "fast" network (10Gb/s, InfiniBand)

HPC cluster storage (>3000TB):
Sango:/work, Saion:/work, etc.

Backup/Archive (offsite)

Naruto (5500TB) ↓ (7500TB)

Bucket (3000TB → 6000TB)

Dedicated private network (10Gb/s)

Updates on FY2017 changes

2017 | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | 2018 | Jan | Feb | Mar

Research acquisition storage

Wireless (~300Mb/s)

OIST service network (1Gb/s)

HPC "fast" network (10Gb/s, InfiniBand)

Hpacquire (73TB)

(Now in pre-release)

https://groups.oist.jp/scs/documentation

Bucket (6000TB)

HPC cluster storage (>3000TB):

Sango:/work, Saion:/work, etc.

Backup/Archive (offsite)

Naruto (7500TB)

Dedicated private network (10Gb/s)

Updates on FY2017 changes

2017 | 2018

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Infiniband switch firmware upgrade ★

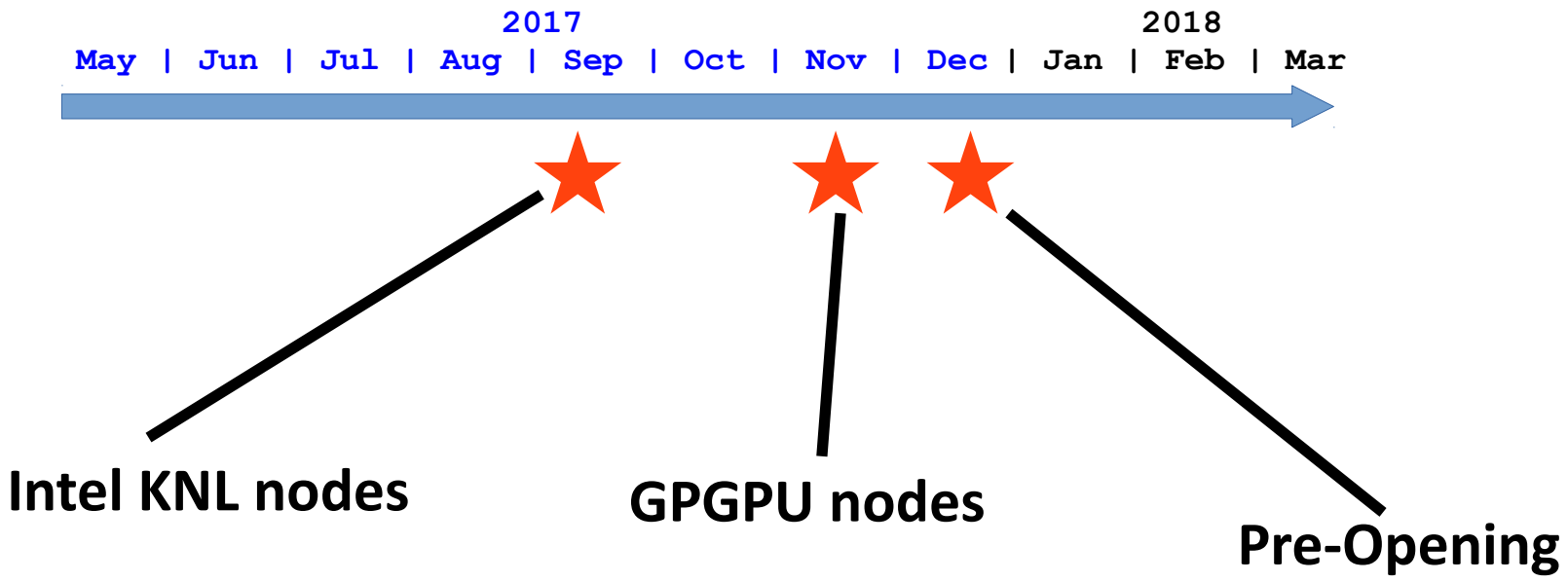
Mellanox® Infiniband Director Switch

Updates on FY2017 changes

- The infiniband (IB) switch makes Sango fast
  - Allow ultra-fast communication between nodes and with storage
- Sango 324-ports IB director switch suffered from a firmware bug
  - Root cause: a 32-bit counter overflowing (roughly after 4.3 billions count)
  - Overflow will occurred every 2 to 3 months causing Sango hanging
- Organized and coordinated onsite firmware upgrade with Mellanox (switch maker)
  - 3 days operation (2 days for the actual upgrade)
  - Highly critical operation: an upgrade failure would leave the switch unusable with several months lead time for replacement

Saion HPC Cluster

- **First Iteration of OIST GPGPU system**
- **Target units**
  - Intensive GPU computing (Machine learning, Image analysis, etc.)
  - Highly parallel computing (MPI, multithread)
  - No high performance storage requirement
  - Documentation and registration request form: **https://groups.oist.jp/scs/documentation**



蔡温 Saion HPC Cluster

EPISODE I

Dec-2017

14x 2x 18-core Intel Xeon
4x nVidia P100 GPU
512 GiB Memory
960GB local SSD drive

High core-count Nodes
4096 threads

16x 64-core/4T Intel Xeon Phi (KNL)
192 GiB Memory
500 GB local hard drive

>100TB

Sep-2017

Nov-2017

Campus 10Gb/s

Private (IB) 100Gb/s

GPGPU Nodes
56 GPUs

EPISODE II

Coming this fiscal year

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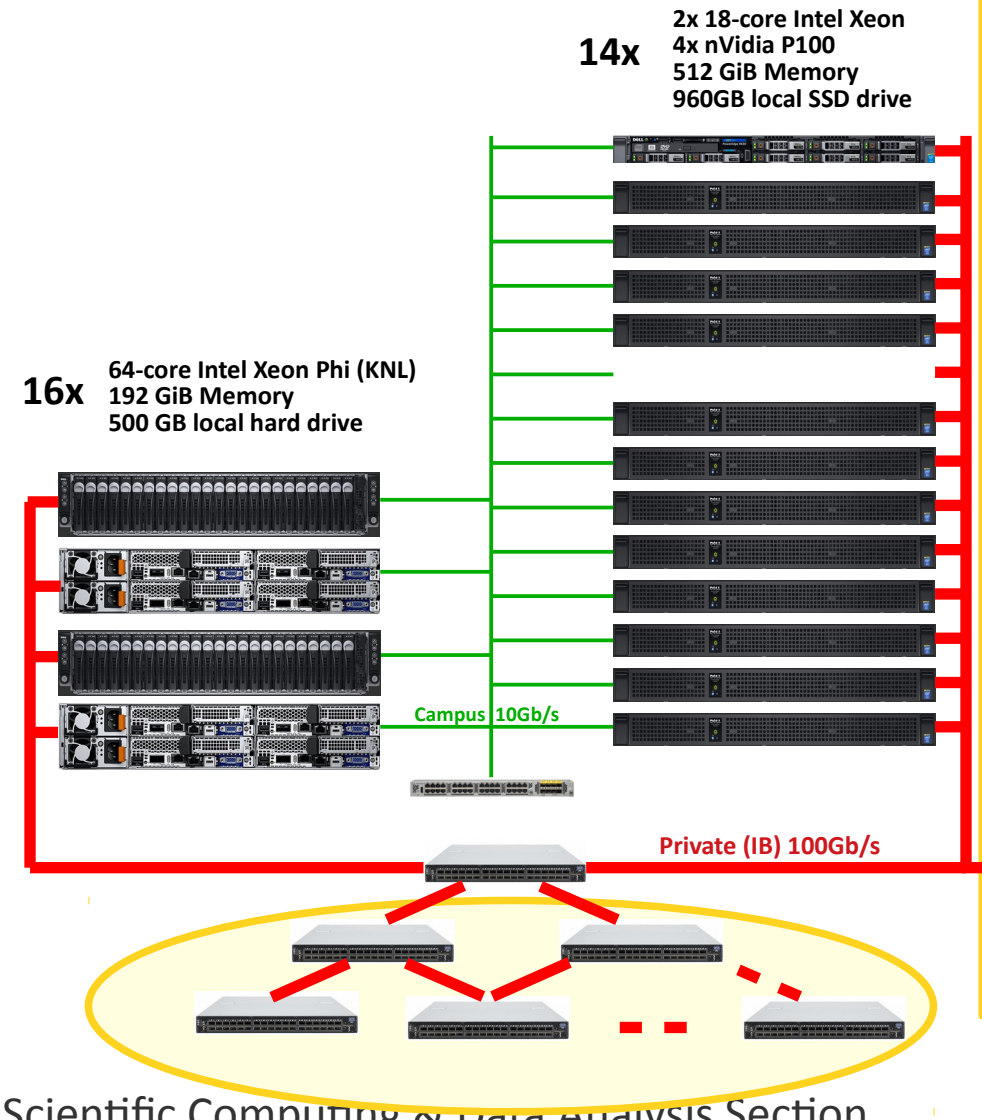
Saion+



GPU nodes

High core-count nodes

Candidates:
AMD 2x 32-core
ARM 2x 32-core
Intel 2x 24-core
....

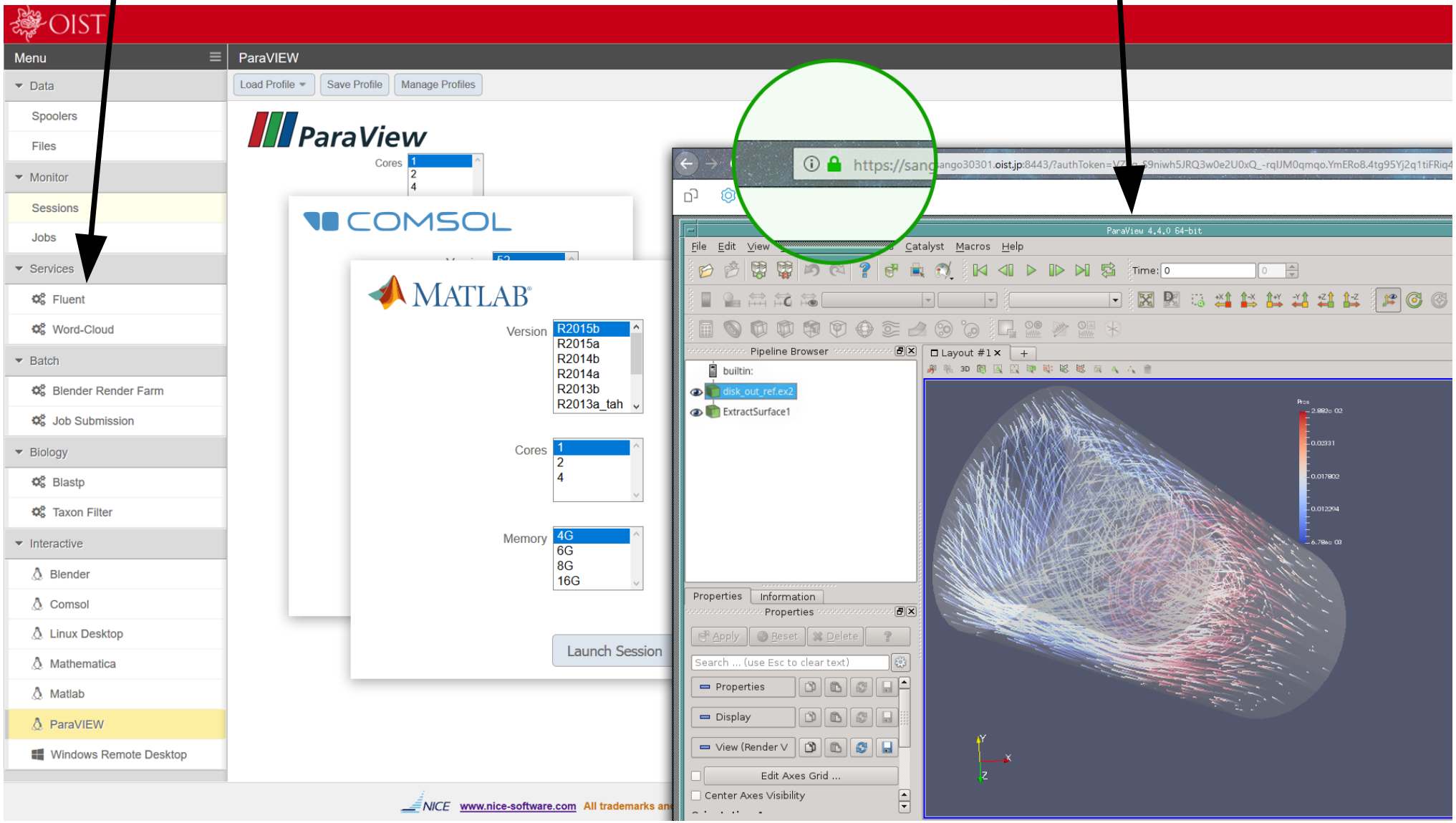
Candidates:
Intel + V100 + nvLink
IBM + V100 + nvLink
....

Campus 10Gb/s

Dedicated fast storage

Computing and visualization portal

- Upload your data and run your jobs in your browser
- See the your results in glorious 3D

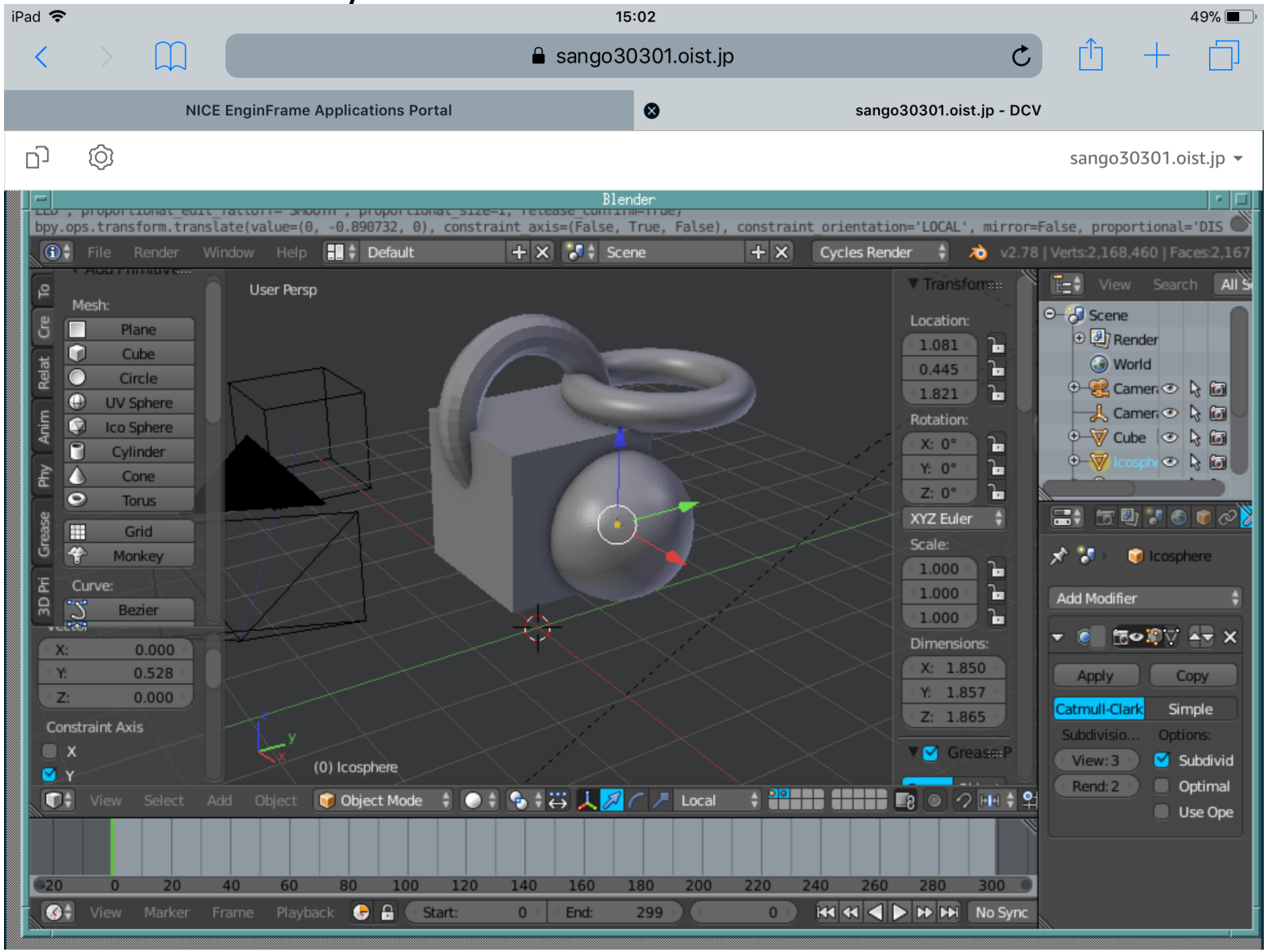


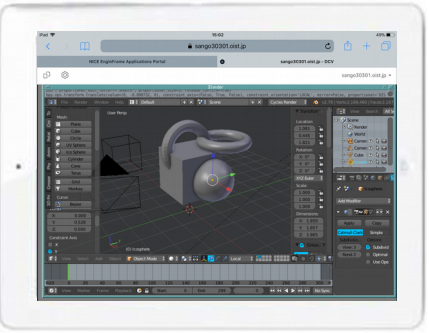
https://hpcframe.oist.jp/enginframe

Client-less, HTML5 support

Computing and visualization portal

- **Data 3D visualization from your tablet**





Contact Pavel at
it-help@oist.jp

Your feedback is 

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- Any services that you would like the SCDA provide ?
- Any question, topics you would like to raise ?

Thanks for listening !
Questions ?