

# HOKUSAI Users Meeting in May 2017

Information Systems Division,  
RIKEN

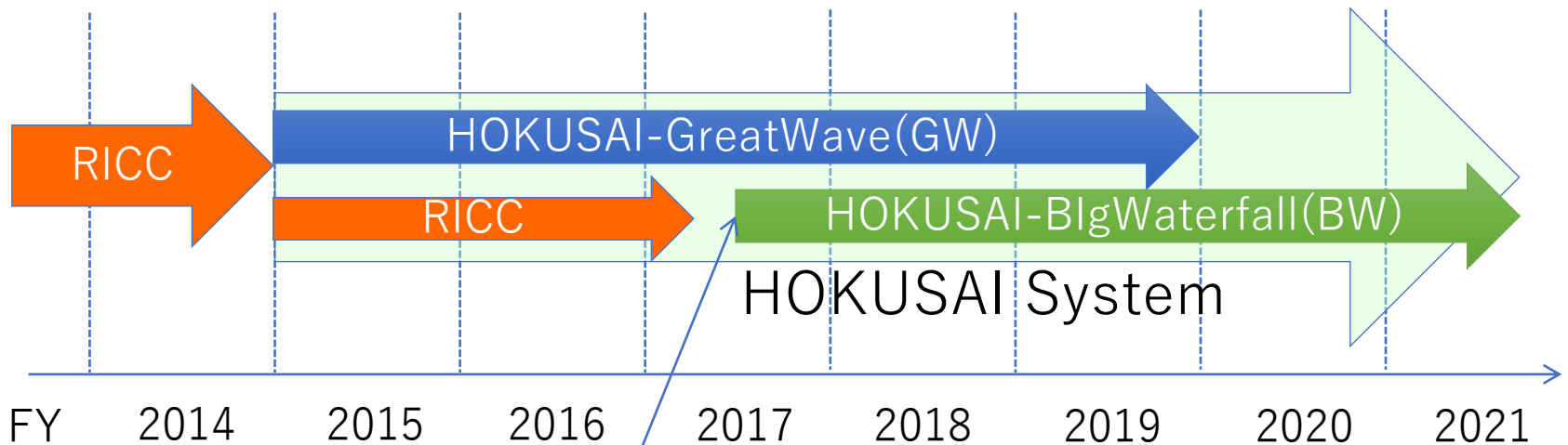
23 May. 2017

# Outline

- Overview of HOKUSAI system
  - Operation concept
  - Computing resources in FY2017
  - HOKUSAI BigWaterfall system
    - Operation plan of HOKUSAI BigWaterfall system
- Operation status in FY 2016 (Apr – Mar)
  - Summary of application projects
  - Utilization rate of CPU resources

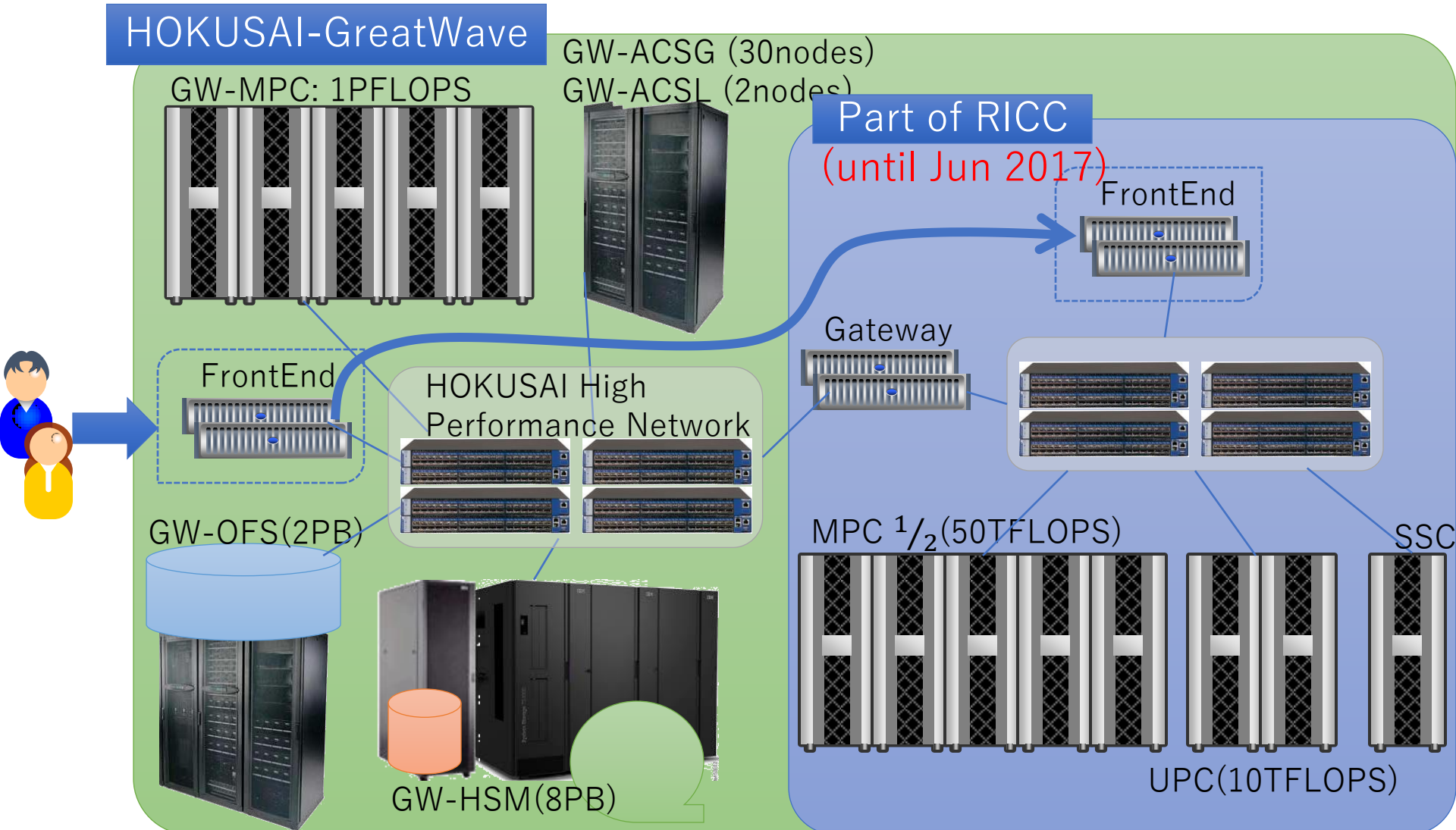
# Operation concept of HOKUSAI system

- We have operated HOKUSAI GreatWave (GW) system since 1<sup>st</sup> Apr 2015.
- HOKUSAI BigWaterfall (BW) system will be launched Oct 2017.
  - HOKUSAI GW and BW systems will share the same storage system.
  - HOKUSAI BW system will be decided by Mar 2017. We will inform you as soon as possible. -> [This meeting](#)
    - The system will be Intel Architecture (IA) compatible.

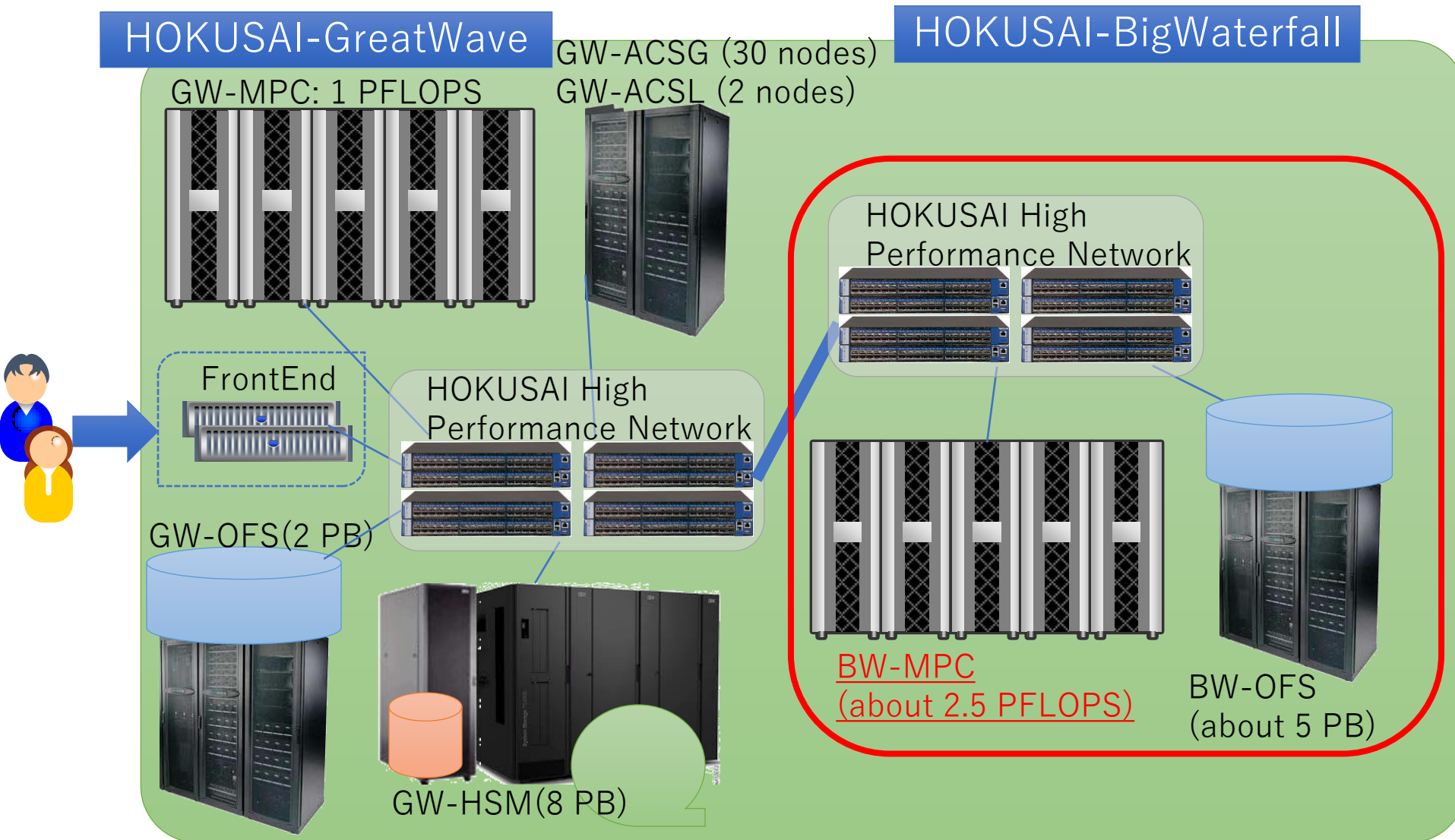


The operation will start Oct 2017.

# Computing Resources in FY 2017 (Mar to Sep)



# Computing Resources in FY 2017 (Oct to Mar)

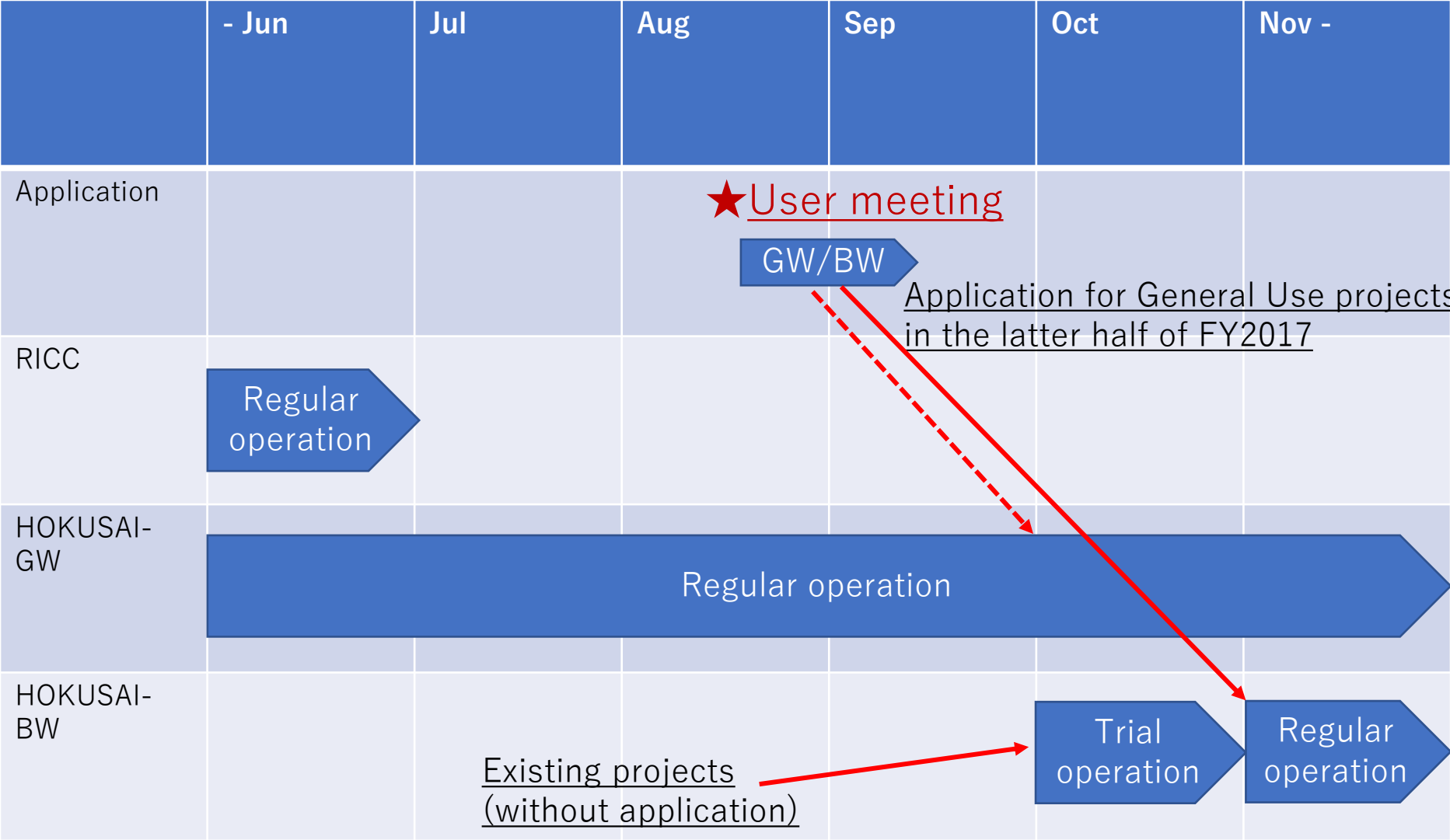


# Specifications of HOKUSAI BigWaterfall system

*provisional*

- Massively parallel supercomputer (BW-MPC)
  - 840 nodes
  - CPU: Intel Xeon (Skylake, 2.4 GHz, 2 CPUs/node, 40 cores/node)
  - Peak performance (64bit floating point): 2.58 PFLOPS
  - Memory: DDR4-2666 96GB/node
  - BW: 255 GB/s
  - Interconnect: InfiniBand EDR (12.6 GB/s)
- Update GW-ACSL
  - 2 nodes
  - CPU: Intel Xeon E7-4880v2 (4 CPUs/node, 60 cores/node)
  - Memory: DDR3-16000 1 TB/node -> 1.5 TB/node
- Storage system
  - Online(Disk) storage: 5 PB

# Startup schedule of HOKUSAI BigWaterfall system (Jun 2017 – Oct 2017) (tentative)



# Operations Report in FY 2016 (Apr 2016 – Mar 2017)



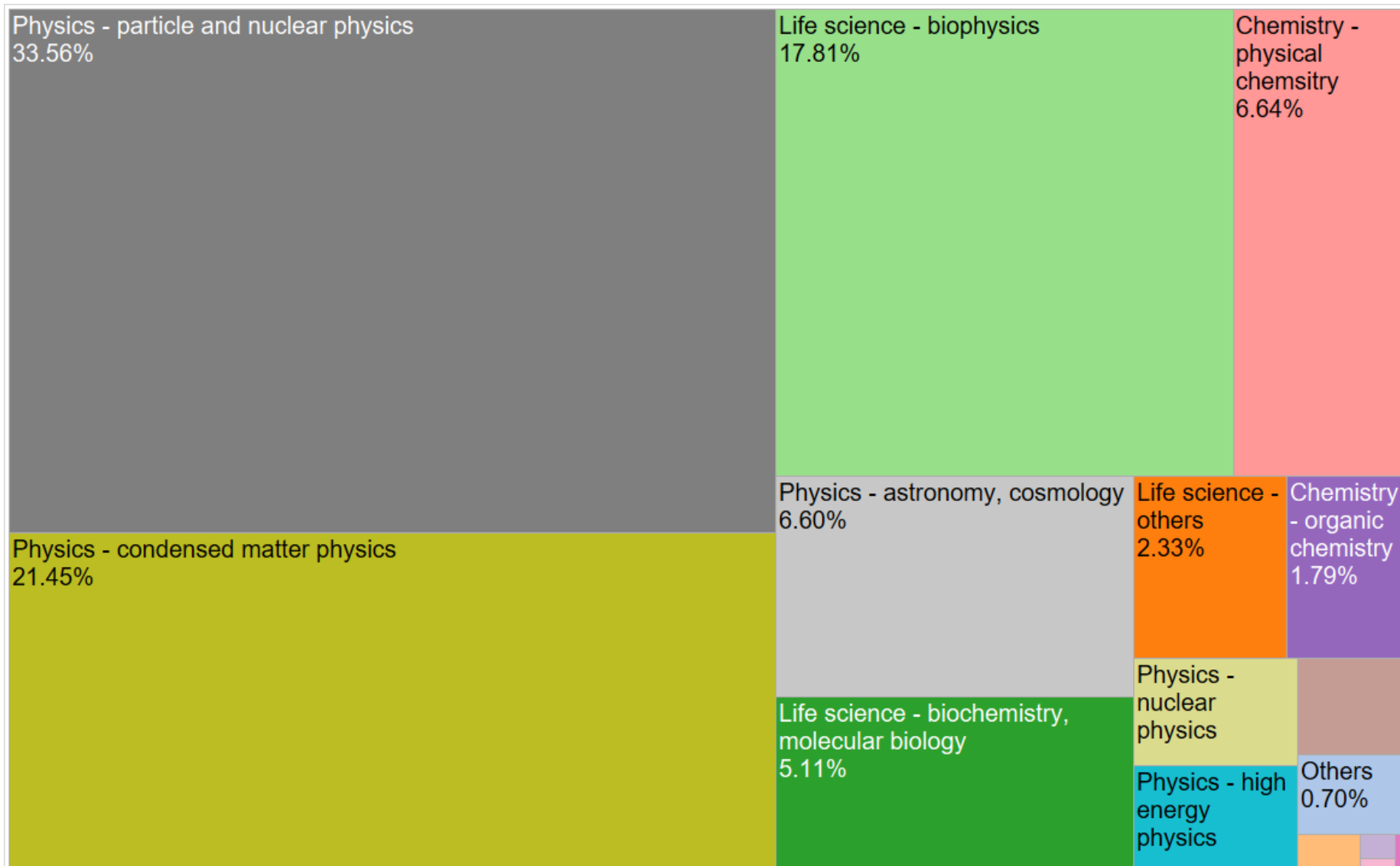
# Allocation policy for the CPU resources on HOKUSAI system

- Allocation policy has been changed since FY2016.
  - To improve the inconvenience of usage of HOKUSAI system in FY2015
- All allocated CPU resources of General Use projects are limited to 130% of the total CPU resources on the system.
- The upper limit of CPU resources in 1 project (and 1 user) is 20% of the total CPU resources.
- Review process
  - General Use projects are classified into large-scale projects (more than about 10% of a total CPU resources) and middle-scale projects.
  - Large-scale project is reviewed by all reviewers and may assign external reviewer.
  - Requested CPU resources of rank B projects are reduced by half if requested CPU resources of systems are more than 130%.

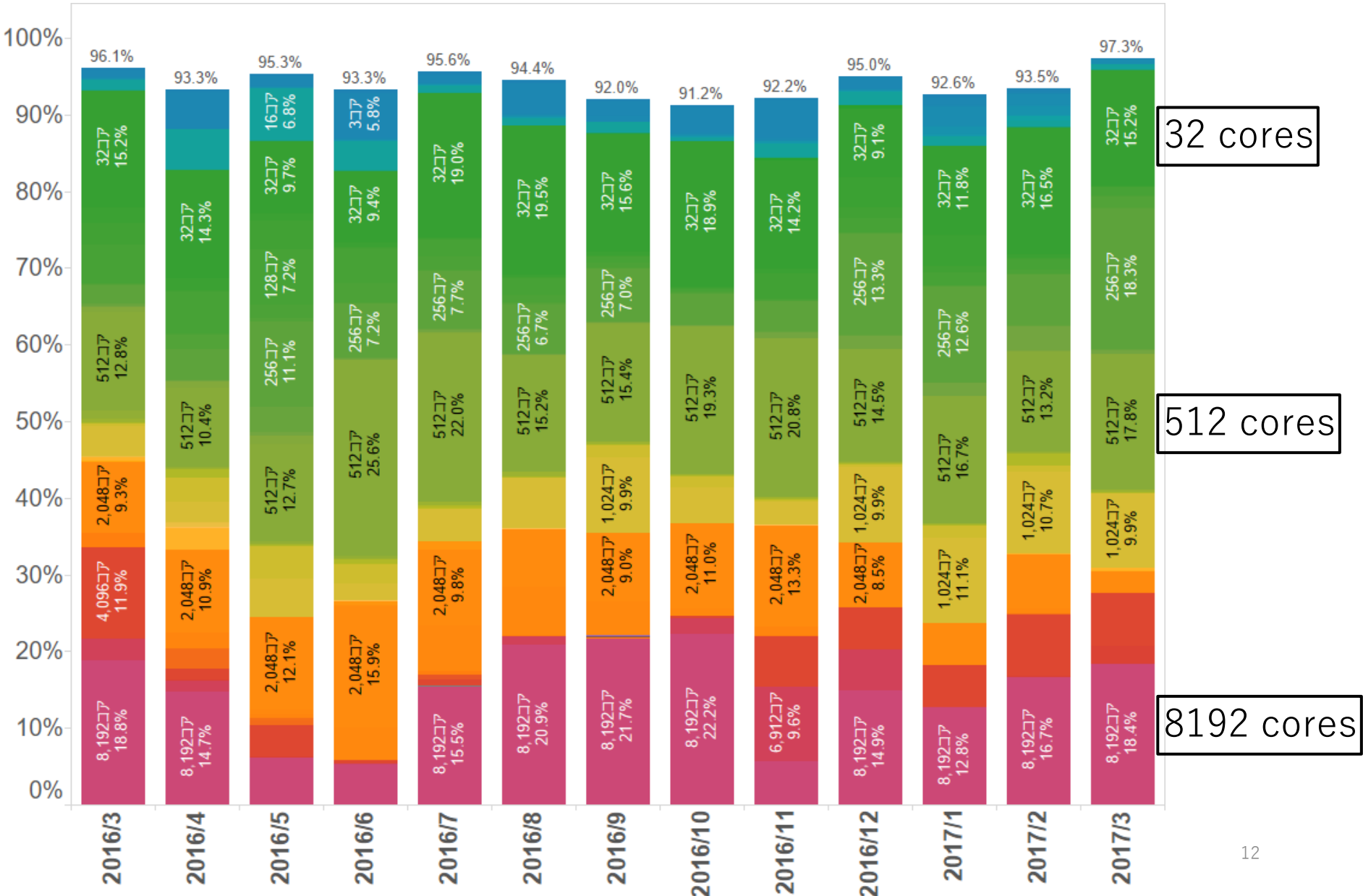
# Summary of application projects for HOKUSAI system in FY2016

- General Use
  - Accepted 36 projects (until 1<sup>st</sup> Oct. 2016)
    - Large-scale projects: accepted 3 projects and rejected 2 projects
    - Middle-scale projects: accepted all 33 projects
  - After review process, requested CPU resources on every system are less than 130%.
    - Requested CPU resources of rank B projects are not reduced by half.
- Requested CPU resources in 1st (Mar) applications
  - GW-MPC: 129%
  - GW-ACSG: 109%, GW-ACSL: 111%
  - RICC: 111%
- Requested CPU resources in 1st (Mar) and 2nd (Sep) applications
  - GW-MPC: 129%
  - GW-ACSG: 130%, GW-ACGL: 119%
  - GW-RICC: 116%

# Used CPU resources in each field

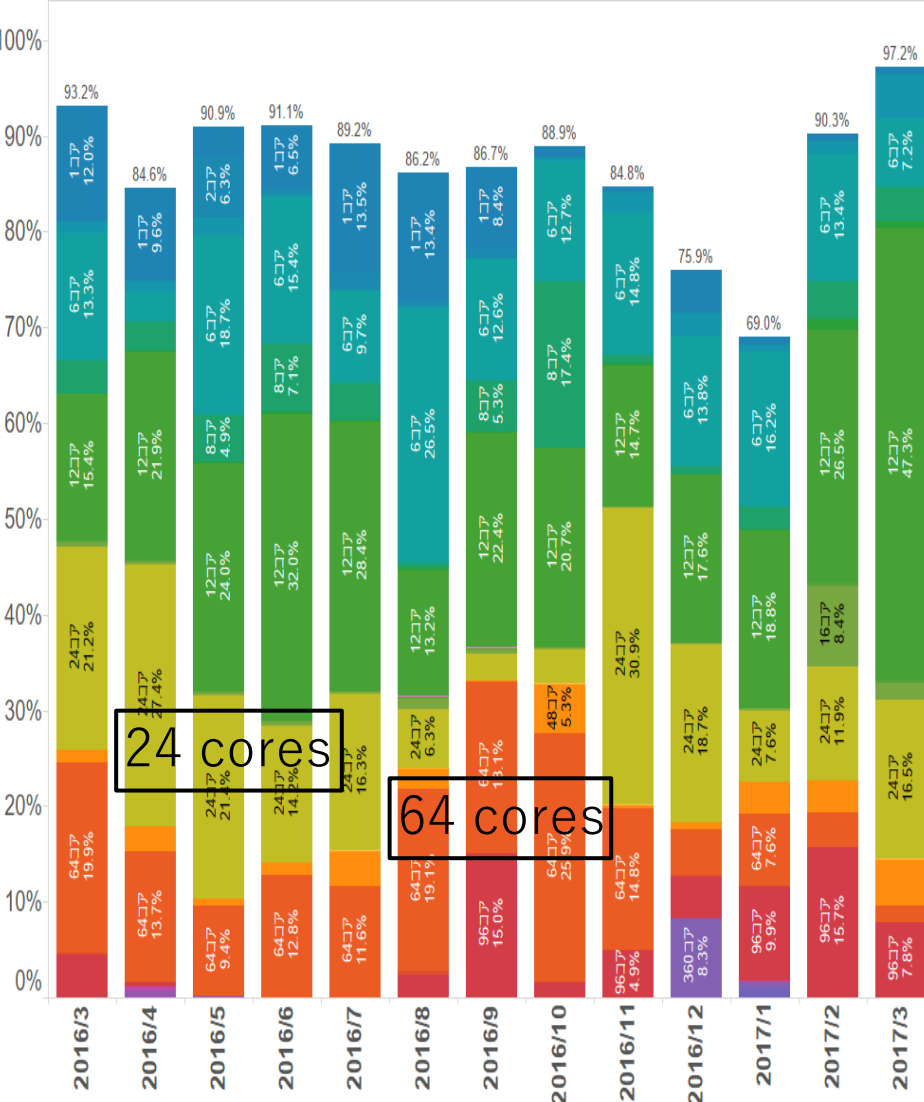


# Utilization rates of CPU resources on GW-MPC system

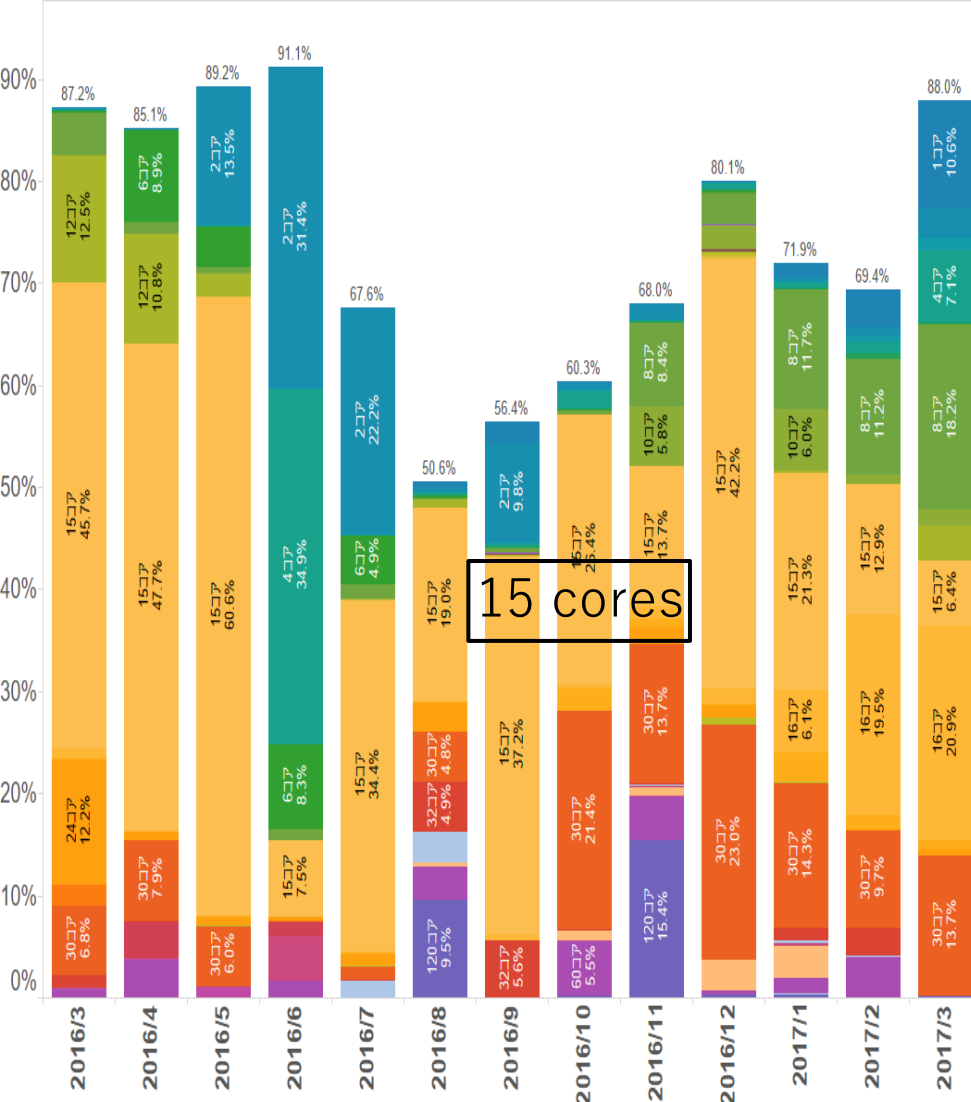


# Utilization rates of CPU resources on GW-ACSG/L system

## ACSG



## ACSL



24 cores

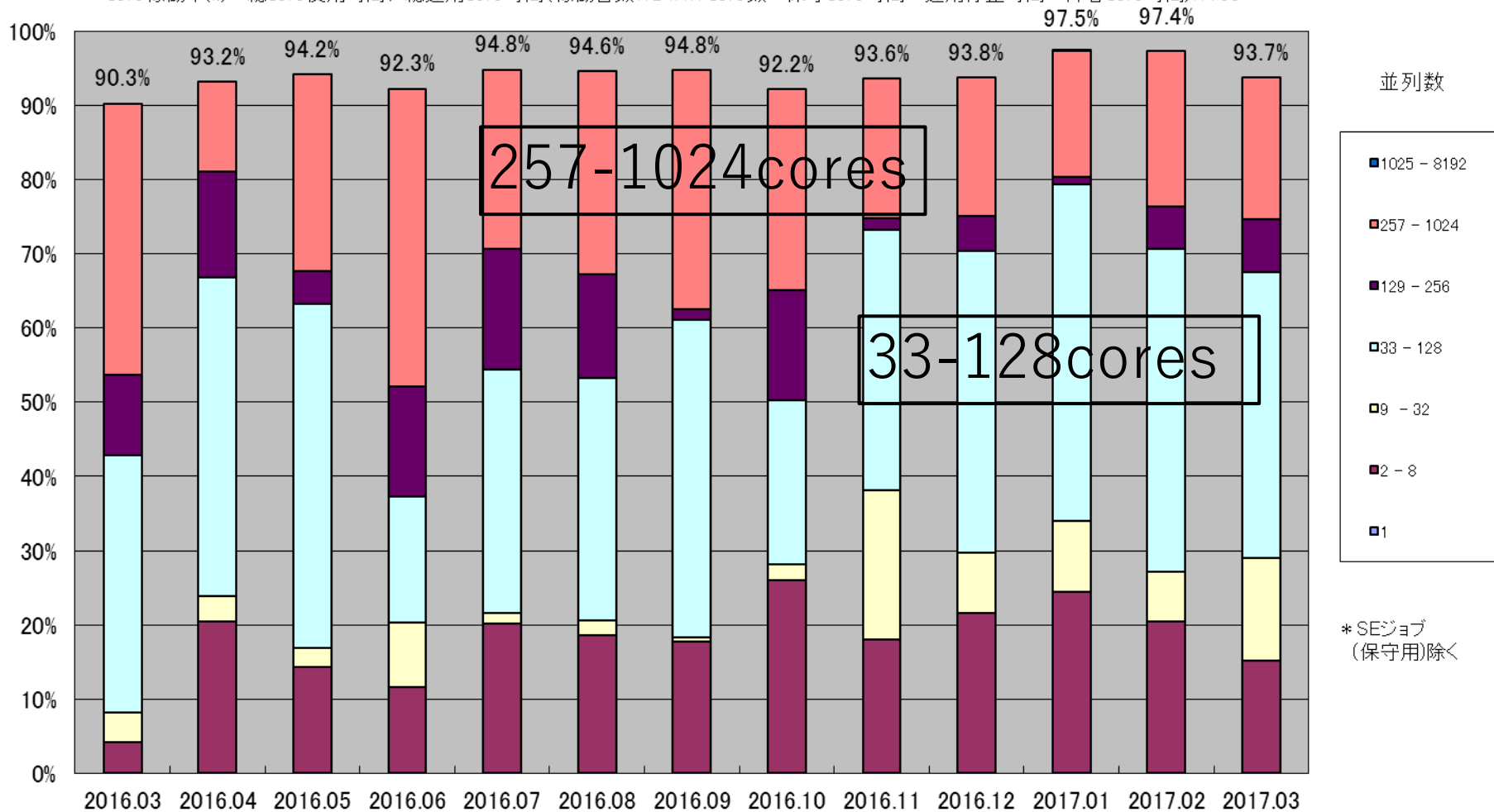
64 cores

15 cores

# Utilization rates of CPU resources on RICC-MPC system

## 超並列PCクラスタ core稼働率

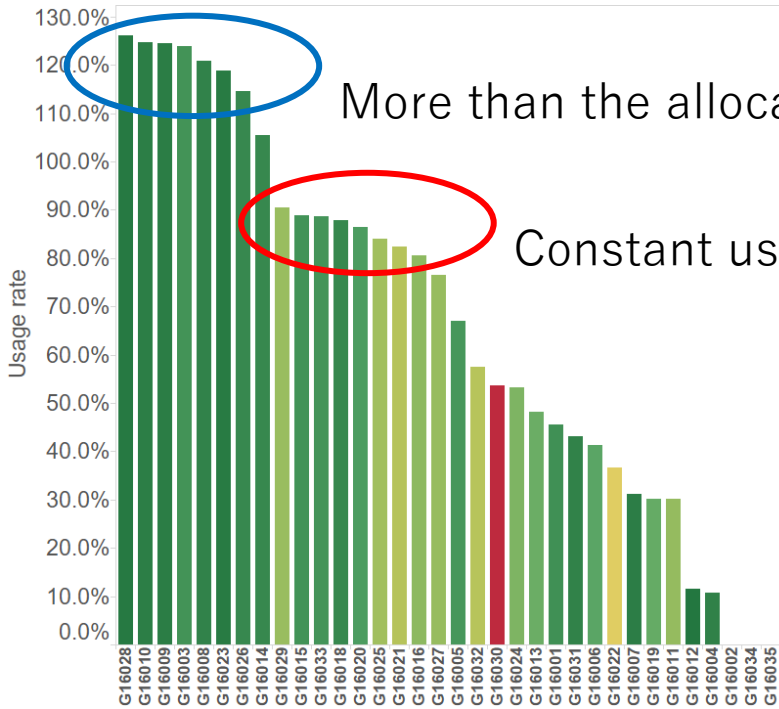
core稼働率(%) = 総core使用时间 / 総運用core時間(稼働日数 × 24H × core数 - 保守core時間 - 運用停止時間 - 障害core時間) × 100



# Utilization rates for each CPU resource

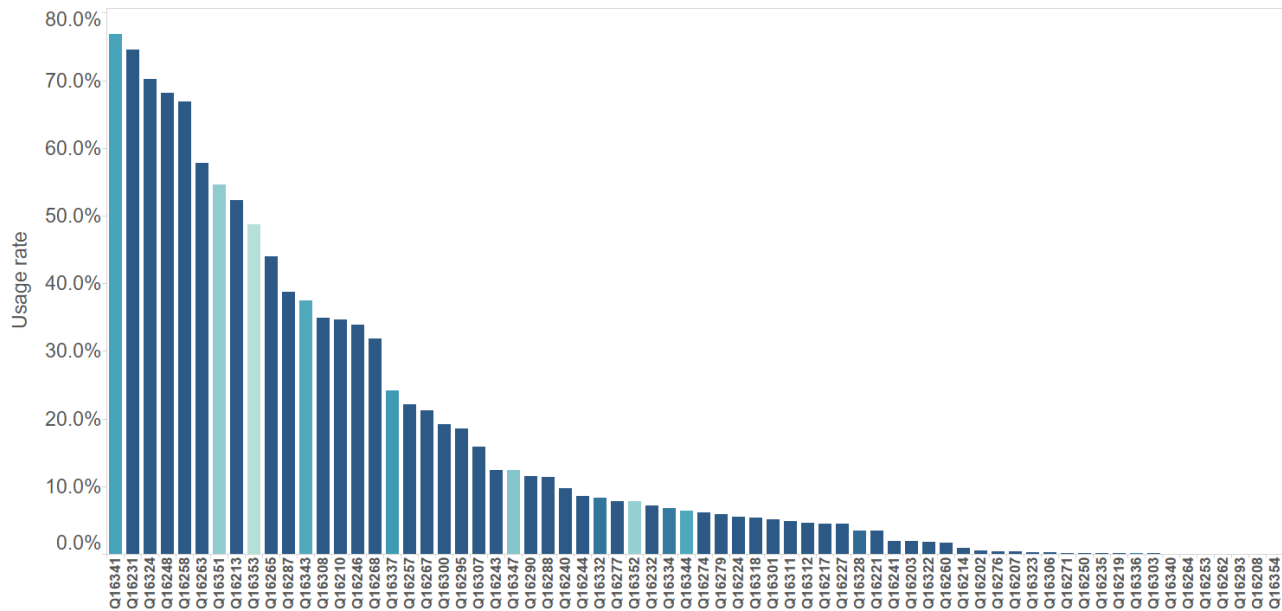
- The utilization rate of CPU resources have been high from the beginning of FY2016.
- MPC
  - Utilization rate is more than 90%.
  - More than 50% of CPU resources are used by large-scale jobs (use more than 512cores).
- ACSG
  - Utilization rate is around 85%.
  - 70-80% of CPU resources are used by within 1 node.
- ACSL
  - Utilization rate is around 50 - 90%.
  - Many jobs use only less than 10% of memory.
- RICC(-MPC&UPC)
  - Utilization rate is more than 90%.
  - More than 50% of CPU resources are used by small- and mid-scale jobs (use 1-128cores)

# Usage rates of allocated CPU resources (GW-MPC)



More than the allocated CPU resources -> Next slide

Constant usage of GW-MPC throughout the year





# Apologize for wrong calculation of consumed CPU resources

- There was mistake in the calculation of consumed core time of users.
  - General use project: consumed core time is 0.8 times.
  - Quick use project: consumed core time is 1.2 times.
  - The mistake had been made since RSCC.
  - The mistake is fixed from Apr 2017.
- Influence to Users
  - For General Use project: some projects were used more than the allocated CPU resources.
  - For Quick Use project: Only 0.83 % of total CPU resources is available instead of 1% of that.

We are really sorry for  
a confused status by setting error.

# Summary and schedule

- Computing Resources in FY2017
  - The former half of FY2017
    - HOKUSAI-GW system and RICC system
      - Operation of RICC system is until Jun 2017
  - The latter half of FY2017
    - HOKUSAI-GW system and HOKUSAI-BW system
- User Event Schedule
  - Around Aug of 2017
    - Next meeting about information of HOKUSAI-BW system
    - Application for general use of HOKUSAI-GW/BW system in the latter half of FY2017