

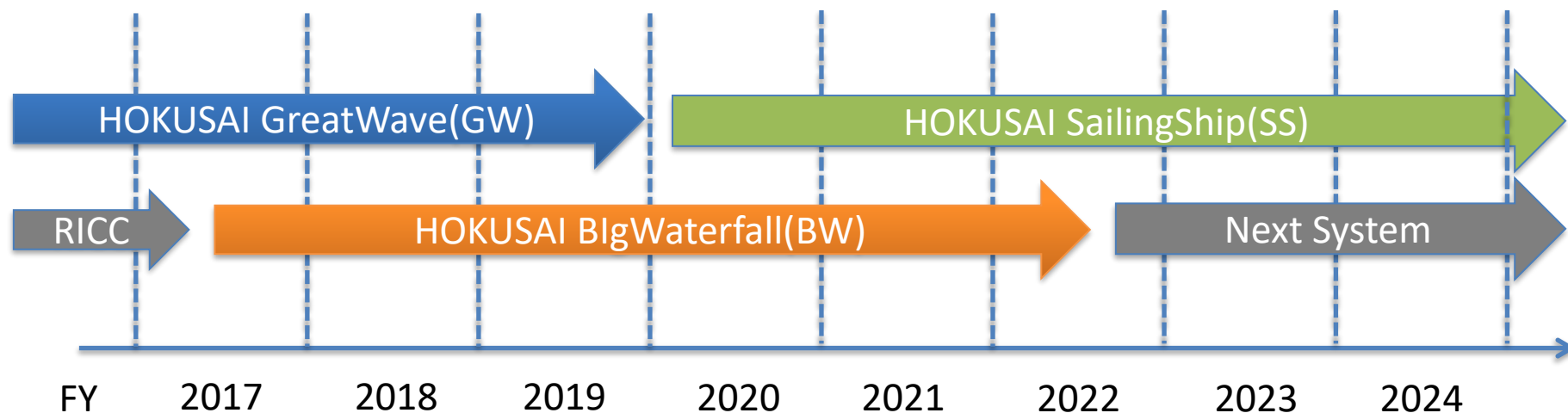
Handout 1

Regular operation of HOKUSAI SailingShip and HOKUSAI usage fee

Information and Communication Infrastructure Section,
Information Systems Division,
Head Office for Information Systems and Cybersecurity

Operation schedule of shared use computers

- HOKUSAI GreatWave (GW) system started operation in April and will end in March 2020.
 - 1080 nodes, CPU: SPARC64-XIfx, 2PB
- HOKUSAI BigWaterfall (BW) system started operation in October 2017 and will end in September 2022年.
 - 840 nodes, CPU: Xeon Gold 6148, 5PB
- Data Science Infrastructure HOKUSAI SailingShip(SS) system will start operation in June 2020. Regular operation will start on October 19.
 - 440 nodes, CPU: Xeon Platinum 8260, 30PB



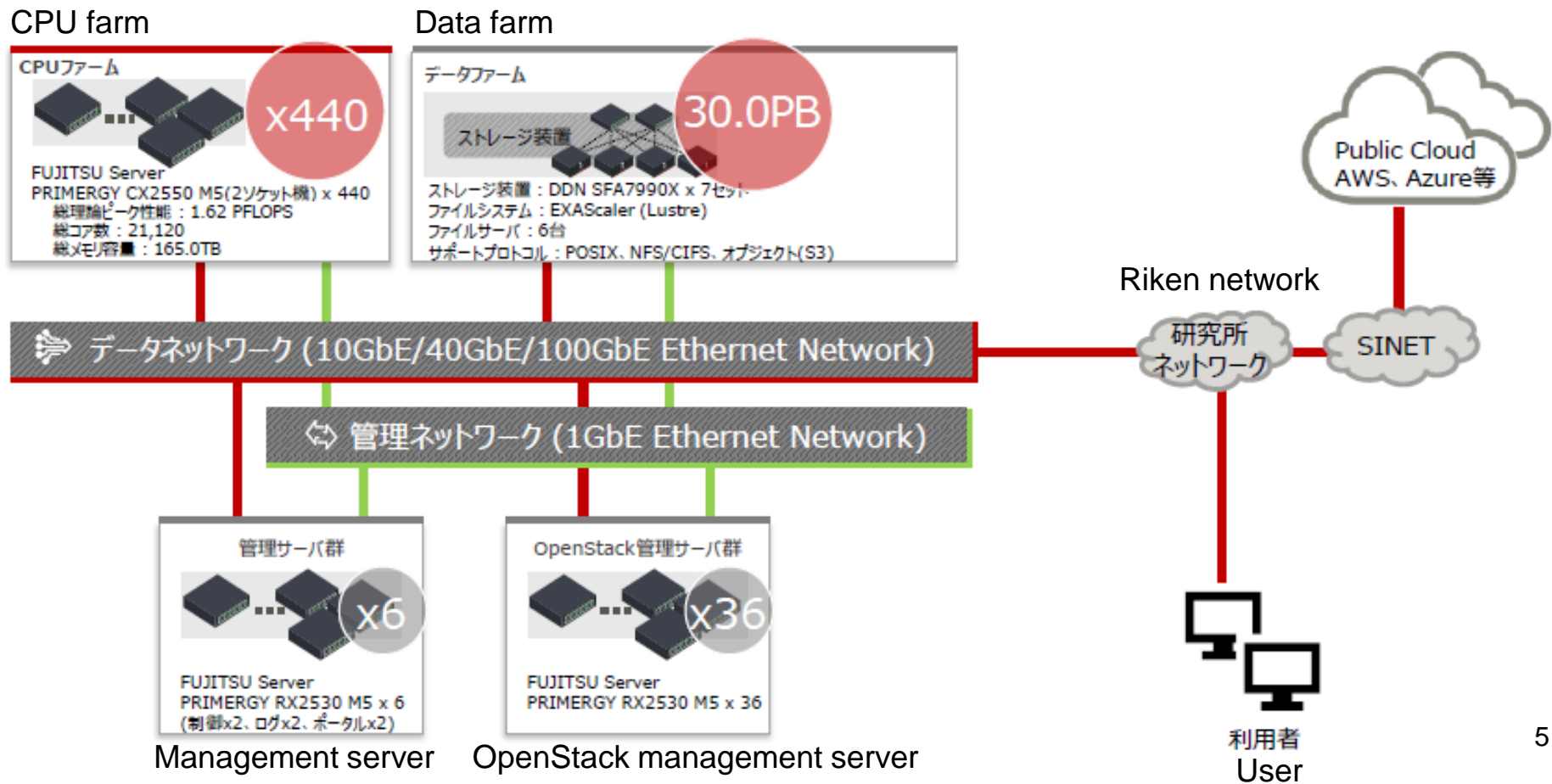
Regular Operation of HOKUSAI SalingShip

Operation schedule of Data Science Infrastructure HOKUSAI SailingShip(SS)

- Procurement process
 - November 2018 Procurement started (RFI public notice)
 - November 27, 2019 Bid opening→Fujitsu's proposal
- Operation schedule
 - June 1, 2020 1:00 p.m. – October 9, 5:00 p.m. Trial operation
 - October 19, 2020 3 p.m. Start of regular operation
- User meetings
 - October 3, 2019 Introduction of beneficiary pays
 - March 24, 2020 Outline of SS and usage fees
 - June 1, 2020 Trial operation guide
 - September 25, 2020 Regular operation guide
 - September 29, 2020 SS training session

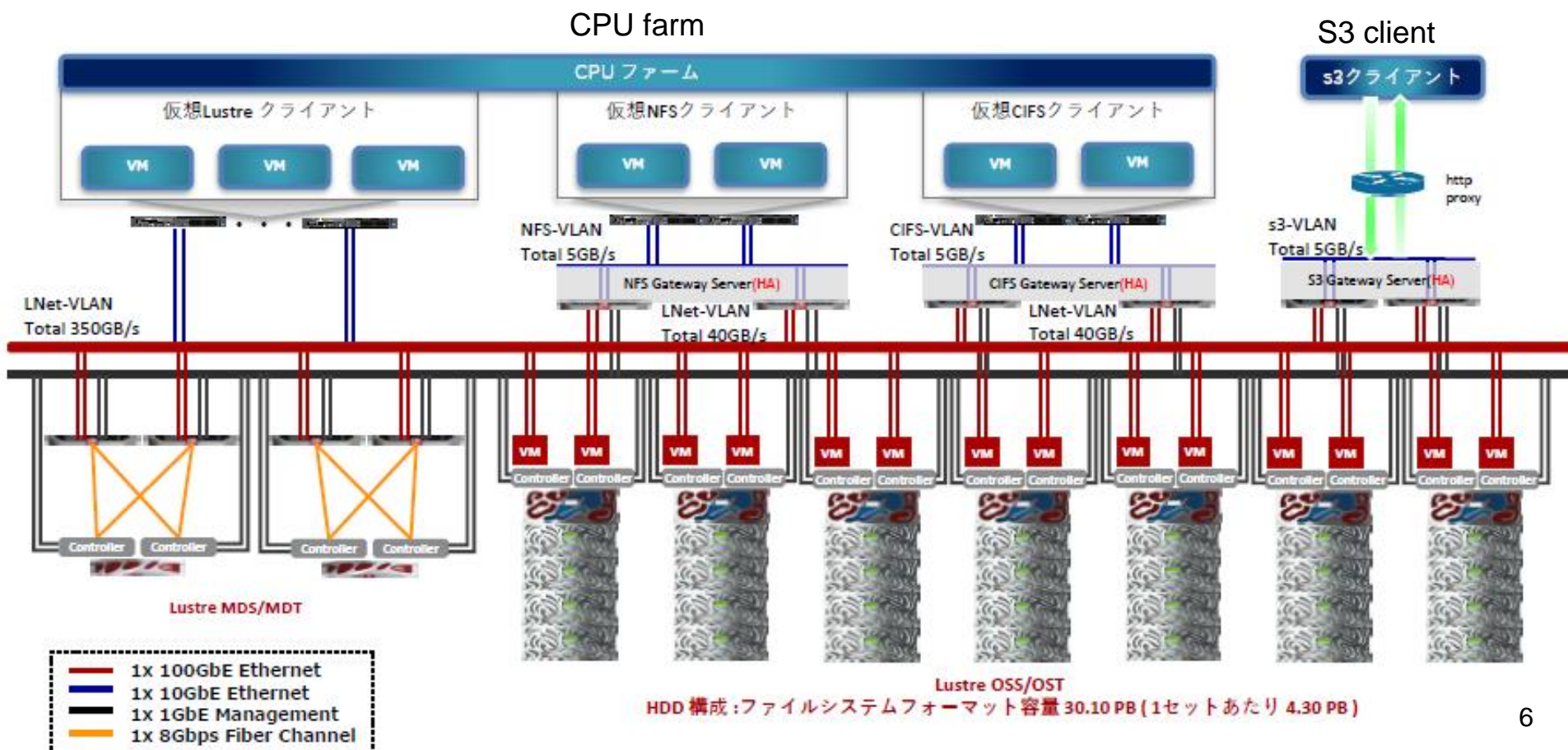
Outline of SS

- The lease period is from June 1, 2020 to May 31, 2026
 - Data farm
 - CPU farm
 - PlaaS (Private Infrastructure as a Service)



Data farm

- DDN ES7990X 7 unit
 - 30 PB、EXAScaler (Lustre) filesystem, 350 GB/s
 - NFS/CIFS gateway, URL access gateway 2 node each



CPU farm

- FUJITSU Server PRIMERGY CX2550 M5 440 node
 - Intel Xeon Platinum 8260 (2.40 GHz、24 core)
 - 2 CPU/node、21,120 core、1.62 PFlops
 - 384 GB (DDR4-2933)、SSD 1.92 TB、10GBASE-Tx2

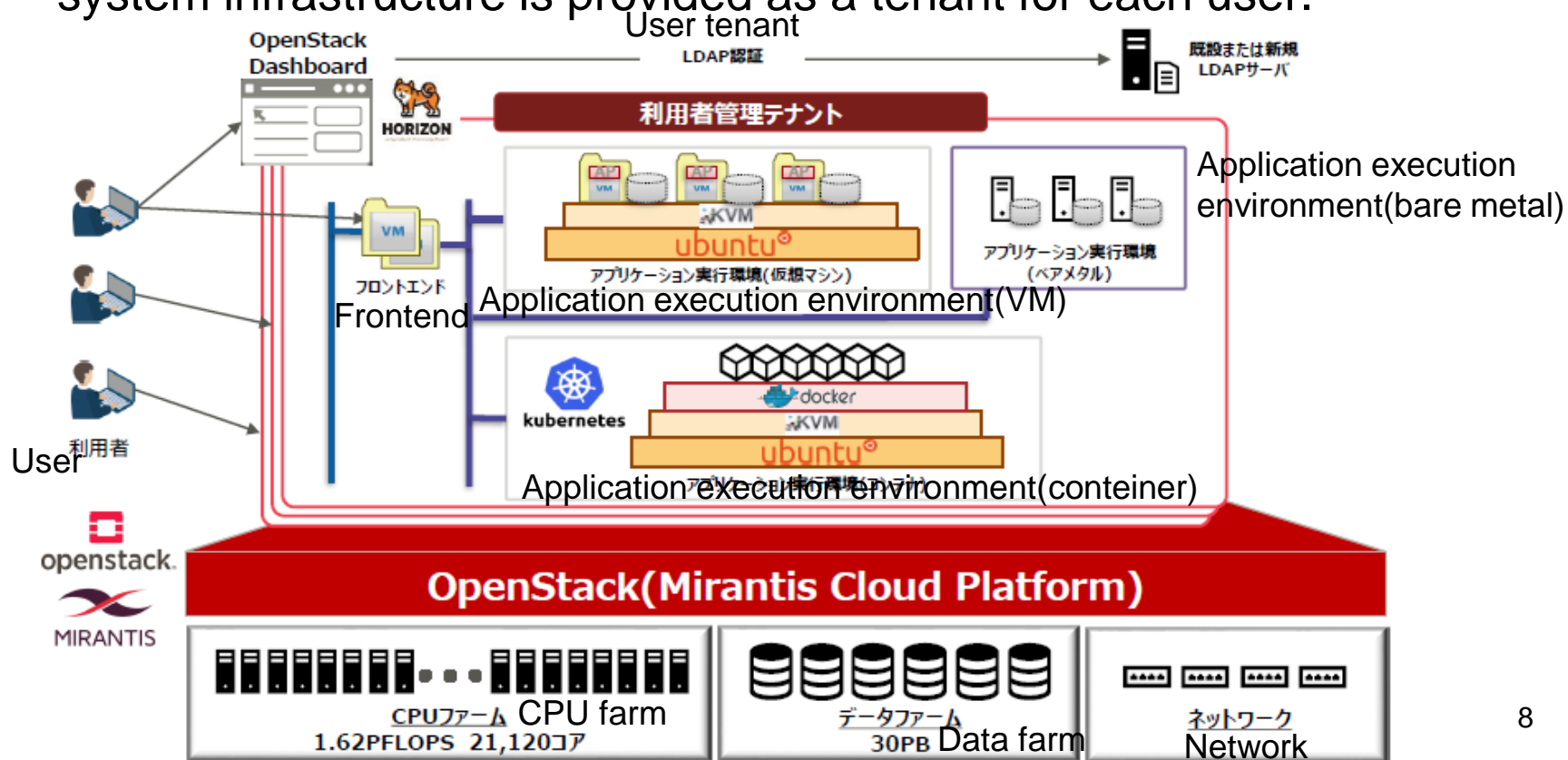
システム全体構成	
総理論ピーク性能 (FP)	1.62 PFLOPS (3.68 TFLOPS x 440ノード)
総コア数	21,120コア (48コア x 440)
総メモリ容量	165.0 TB (384GB x 440 / 1024)



1台あたりの構成		
CPU	プロセッサ	Intel Xeon Platinum 8260(2.4GHz/24コア) ※インテル64アーキテクチャ(x86_64) ※インテルバーチャライゼーション・テクノロジー含む(intel VT)
	プロセッサ数	2プロセッサ
	コア数	48コア(24コア x 2CPU)
	理論ピーク演算性能(FP)	3.6TFLOPS (2.4GHz x 32浮動小数点演算 x 24コア x 2CPU / 1000)
	理論ピーク演算性能(INT)	1.843TINOPS (2.4GHz x 16整数演算 x 24コア x 2CPU / 1000)
主記憶	種別	32GB DDR4 2933MHz RDIMM x 12 (ECC)
	容量	384GB (32GB x 12)
	コア当たりの容量	8GB (384GB / 48コア)
	メモリバンド幅	281GB/s (2933MHz x 8バイト x 12チャネル / 1000)
内蔵ディスク	OSブート用兼仮想環境の起動用	SSD-1.92TB x 1
データアクセスネットワークインターフェース	種別	10GBASE-T x 2ポート
	理論性能	20Gbps(10Gbps x 2ポート)
	接続先	データアクセスネットワーク用スイッチ
管理ネットワークインターフェース	種別	1000BASE-T x 1ポート
	接続先	管理・制御ネットワーク用スイッチ
電源		1600W x 2 (80PLUS PLATINUM)
筐体内監視		iRMC (CPU、メモリ、HDD、カード、ファン、電源、温度、電圧等)

PlaaS(Private Infrastructure as a Service)

- Mirantis Cloud Platform (MCP)
 - Commercial distribution of OpenStack that can provide VM, container and bare metal environment.
 - No bare metal environment in the operation
 - CPU farm, data farm, and network are virtualized by MCP, and system infrastructure is provided as a tenant for each user.



Cluster configuration of CPU farm and two types of usage

- Independent two clusters operation of CPU farm (hssa/hssb)
 - Dividing 440 nodes into 220 nodes each
- hssa cluster: pool type
 - Keep computational resources available at all times, and be charged by that number regardless of use.
 - Computational resources are pre-assigned and available at any time.
- hssb cluster: on-demand type
 - Allocate computational resources only when needed, and be charged for the amount actually used.
 - Computational resources can be used only when they are free.

User management sites of SS

- Web site of Information System Division
 - <http://i.riken.jp/en/>
 - User guide
- Online Submission System(hss-desk)
 - <https://accc-desk.riken.jp/>
 - Users access using the RIKEN authentication infrastructure
 - Login with Shibboleth authentication on the RIKEN authentication platform
 - The same User ID and Password as AIR100
 - Application and management of project
 - Management of computational resources and storage
 - Various documents
- OpenStack Control Console
 - Pool type (hssa cluster): <https://hssa.riken.jp/>
 - On-demand type (hssb cluster): <https://hssb.riken.jp/>
 - Accessible from inside RIKEN (or RIKEN VPN).
 - Tenant management
 - Starting VMs and network settings

SS user classification and management

- Project member
 - Payment representative: project management, approval, tenant management
 - Must be responsible for the project and budget payment and be the head of department such as principal investigator, team leader, unit leader and manager.
 - Assistant: the same authority as payment representative
 - Tenant manager: project application, tenant management
 - Sub manager: limited tenant management
 - Usage monitoring, start/stop instance, and using console
- VM user
 - User of VM within tenants, controled by each project
- Management of users
 - Payment representative are responsible for managing project members and VM users.
 - Including the management of non-residents
 - Creation and storage of a catch-all checklist for the use of HOKUSAI SS
- Addition of computational resources and storage capacity
 - First, buy points (1 point is 1 yen)
 - Next, add compute resources and storage capacity with points

SS availability and data integrity

- Availability
 - Our goal is to provide at least 97% of our service hours per year.
 - Timing of system downtime (as much as possible with one month's notice)
 - During power outage in the Wako area: Three consecutive holidays in October for planned power outage
 - Exceptionally 3 times in FY2020
 - Urgent Maintenance: Maintenance to perform updates to address urgent vulnerabilities.
 - Power outages and instantaneous power outages: Restore the system as quickly as possible.
- Data integrity
 - The entire system, including the Data Farm, is located in Information Infrastructure Building in Wako area.
 - Data is redundant and can be recovered up to the failure of the two HDDs in the pool.

SS support scope and security measures

- Support scope
 - Provide technical support to project members for user management and VM startup with provided images.
 - Each project is to be managed on its own within the tenant.
- Security measures
 - Security measures must be taken because VMs assigned to floating IPs can be accessed from all over RIKEN.
 - Be more careful in the case of global FIP
 - Permissions in the security group should be kept to a minimum.
 - The ports should be opened only as much as necessary.
 - Use services such as SSH and HTTPS to ensure that they are regularly updated and secured.
 - VMs that mount shared disk space (Lustre file system) should be managed more carefully as it is difficult to keep the kernel up to date.
 - Because updating the kernel makes it impossible to mount the Lustre file system.
 - If security cannot be ensured, use a VM that does not have the shared disk space mounted as a gateway server.

Application of new project for regular operation of SS

- Preparation
 - Obtain confirmation of use and budget from the payment representative
 - All project members get a ss account at hss-desk
 - ss account name is required for registration
- Submit a project with hss-desk
 - Fill in information about payment representative
 - Fill in project information
 - Budget number and name
 - Content of use
 - Choose between pool and on-demand tenant type
 - Registration of project member
- A certain amount of computational resources are available prior to verification by the payment representative
 - Up to 10,800 points (10,800JPY) can be purchased without approval from the payment representative and points can be converted to resources
 - Once approved new project from the payment representative, the initial cap will be removed.

Project management for regular operation of SS

- Project management
 - Changing project information
 - Changing project member
 - Purchasing points
 - The minimum unit of purchase is 360 points for 360 yen
 - Points can be purchased up to 1 million yen.
 - Change of upper limit is accepted by email.
 - Resources allocation (without approval by payment representative)
 - Converting points to computational resources and storage capacity
 - Adding an IP address or requesting a global IP address is accepted by email.
- Approval of the application by the payment representative
 - Applications are reflected after approval, except for the changing resources.

Transition to regular operation of SS and start usage fees

- Scheduled to start regular operation on October 19.
 - Points and CPU resources (on-demand type) are set to 0 at the start of regular operation.
 - CPU resources (pool type) and storage will be free during October.
 - Including BW data area (/data)
- Preparations before the start of regular operation
 - For SS trial project
 - Send an email to the payment representative
 - When continuing the project, should be register the budget number when continuing the project.
 - For BW project using data area (/data)
 - Send an email to project representative.
 - When continuing the data area, should be set up a payment representative and budget number, and purchase a fee through the end of the fiscal year.
- Processing at the start of regular operation
 - Stop the project for trial operations only.
 - CPU resources (pool type) and storage due at the end of October.
 - Disable the BW data area if it is not used continuously.
- Grace period from the start of regular operation until the end of October
 - During the grace period, CPU resources (pool type) and storage of SS must be purchased through the end of the fiscal year.

Example of creating VM

1. Log in to the OpenStack Management Console
 1. hssa cluster for pool type and hssb cluster for on-demand type
2. Create and launch instance
 1. Source (image of instance): select CentOS-7.6-Application
 2. Flavour (setting of VM): select 1Core-8GiB-36GiB
 3. Network: select <project name>-network
 4. Network port: select <project name>-storage-port
 5. Security group: select <project name>-security-group
 6. Key pair: register public key to access from outside of SS
 7. Launch instance
3. Allocate floating IP address(to access from inside of RIKEN)
 1. Click compute-instance menu
 2. Click “allocate floating IP” at the right pull down menu of the instance
 3. Select “floating IP address” at address pull down from private-network pool

Example of using VM

- Access
 - Accessible via SSH and SCP to VMs assigned a floating IP from inside RIKEN
 - \$ ssh -l centos -i <private-key> <floating-ip>
- File system environment
 - /home: home area (shared disk area)
 - Mount Lustre are as /home area in the case of *-Lustre images
 - If it is not a *-Lustre image /home is a local area.
 - /APL: application area
 - Mount application are as /APL and available in the case of CentOS-*-Lustre image
 - When the application area is mounted, the following ISV/OSS can be used by the module command
 - ISV: Intel compiler, Gaussian, GaussView
 - OSS: GROMACS, Python

CIFS Account For Research Data Management Service

- CIFS/SMB (Shared File System) account will be issued when you apply HokusaiSS project
 - For R2DMS:RIKEN Research Data Management Service
 - the publishing and sharing platform for research data which is launched by the end of this FY.

We will be announcing about the service and its usage around middle of October. Please keep your CIFS account.

This CIFS Storage is not visible from the HokusaiSS VM.
(If you want to show it, you'll have to mount NextCloud with WebDAV)
The HokusaiSS's project storage (Lustre) quota is shared by CIFS Storage and /home.

For more information, please contact to
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Data Management System Development Unit, Research and Development Division,
HO for Information Systems and Cybersecurity (ISC)

HOKUSAI Usage fee

Resources of shared use computers in FY2020

- HOKUSAI BigWaterfall(BW)(2017/10-2022/9)
 - BW-MPC: 840 nodes
 - CPU: Xeon Gold 6148(40 cores/node)
 - 2.58 PFlops、33,600 core
 - Memory: 96GB
 - Shared disk: 5PB
 - テープ: 8PB
- HOKUSAI SailingShip(SS)(2020/6-2026/5)
 - CPU farm: 440 nodes
 - CPU: Xeon Platinum 8260(48 cores/node)
 - 1.62 PFlops、21,120 core、42,240 v(virtual)CPU
 - Available 46 core/node (2 core for MCP hypervisor)
 - Memory: 384GB
 - Data farm (shared disk): 30PB
 - Private Infrastructure as a Service(PlaaS)
 - Mirantis Cloud Platform(MCP)
 - Commercial distribution of OpenStack that can provide VM, container and bare metal environment

How to use BW and fees

- In FY2020, the project will be reviewed as before.
 - Usage by batch job
 - Quick Use and General Use
 - In General Use, the allocated resources will be adjusted as if half of the allocated core hour was consumed at the beginning of the second half.
 - Usage fee will be introduced from October 2020 for the part of the use.
 - Usage fee will be set for priority job execution.
 - 90 JPY for 720 core hours
 - Approximately 1,080 JPY per core for one year
 - Approximately 43,200 JPY per node (40 cores) for one year
 - A project for priority execution will be created and controlled for each project.
- Usage of BW After FY2021
 - In principle, it is subject to the usage fee (the price will be determined in the future), and no project review will be performed.

How to use SS CPU farm and usage fees

- Renting a tenant, and users set up and use a VM environment
 - There are two types of use: pool and on-demand type.
 - In SS, a physical core is allocated by 2 virtualCPU (vCPU).
 - Allocate 8GB of memory and 36GB of local storage (SSD) per 2vCPU
- For pool type, resources are always reserved.
 - Monthly basis until the end of the year
 - 360 JPY per month for 2vCPU
 - 4,320 JPY per year for 2vCPU
 - 198,2720 JPY per year for 1node (92vCPU)
- For on-demand type, resources are reserved when needed.
 - Charged for actual use
 - 360 JPY per 720 hours for 2vCPU
 - Approximately 4,320 JPY per year for 2vCPU
 - Approximately 198,720 JPY per year for 1node (92vCPU)

How to use storage and usage fees

- Fees for storage

- Charged for BW data area (/data) and SS shared disc area
 - BW home area (/home) is free.
- 180 JPY per month per 1TB
 - Monthly basis until the end of the year
- For existing data in BW allocated by the end of FY2019
 - Until March 2021, 90 JPY per month per 1TB
 - Regular fee for FY2021 and beyond

- Tape area will be removed from user services in the future and operated as cold media
 - Tapes are not subject to the usage fee for long-term storage.
 - The possibility of cold media procurement when replacing BW.

Usage fee table and estimated total amount

SS Tenant(Pool type)	2vCPU * 1 month	360	for the secured resouces accounting by month
SS Tenant(On-demand type)	2vCPU * 720 hour	360	for the amount actually used
BW Batch(Priority use)	1core * 720 hour	90	for priority execution
Storage(SS and BW[/data])	1TB * 1 month	180	for the secured resouces accounting by month
Storage(BW[/data] requested by the end of FY2019)	1TB * 1month	90	only FY2020
Tape	0	0	will be cold stroage

	Paid use(node)	JPY/node	Subtotal(JPY)
SS (440 node)	220	198,720	43,718,400
BW (840 node)	420	43,200	18,144,000
	Paid use(PB)	JPY/TB	
SS Disk (30PB)	15	2,160	32,400,000
BW Disk (5PB)	2.5	2,160	5,400,000
Total			94,262,400

It is assumed that “data for use and application” will not be charged.

How to calculate usage fees of SS

- CPU farm (pool type) and storage are purchased in advance for the duration of use
 - Monthly basis until the end of the fiscal year
 - No prorating, even in the middle of the month
 - Example of CPU farm (pool type)
 - In the case of a 92v CPU from July 20 to the end of the fiscal year (9 months)
 - $\underline{92}/2 \times 9 \times 360 = 149,040 \text{JPY}$
 - Example of shared disk area
 - In the case of 10TB from July 20 to the end of the fiscal year (9 months)
 - $\underline{10} \times 9 \times 180 = 16,200 \text{JPY}$
- CPU farm (on-demand) is purchased in advance for the amount of core hours you plan to use.
 - Unit of purchase is 1440vCPU-hour (2vCPU times 720 hours)
 - For 500 units of 1440vCPU-hour
 - $\underline{500} \times 360 = 180,000 \text{JPY}$
- A point simulator to the menu on the screen will be available in hss-desk.
 - Enter the number of vCPUs, TB, or the number of unit of core-hour and calculate the required points.

How to buy points and resources in SS

- Computational resources and storage of SS can only be purchased with points.
- How to buy points
 - Register a budget number when you creating a project.
 - Fill in the code and name of the organization, project and expense.
 - Code: 6-digit number - 12-digit number - 6-digit number
 - Name: should not be blank
 - Purchase points by specifying a budget number.
 - Select from the registered budget numbers.
 - Note the deadline for purchasing each budget number at the end of the fiscal year.
 - Points are purchased in units of 360 points (360 JPY).
 - Points are valid until the end of the fiscal year.
- Cancellation and return
 - Point purchases are not cancelled after approval by the payment representative.
 - Assigned resources will not be returned to the point.
 - The exceptions to this rule are when the researcher leaves RIKEN or the external funding is due.

How to buy resources in BW

- Direct purchase of compute resources and storage for BW without any points in between
- How to buy resources
 - To be accepted via the web form
 - Registering the payment representative and budget number
 - Request core-hour for priority execution or data area (/data) for priority execution
- Add computational resources for priority execution
 - For priority execution, create a dedicated project.
 - $Q \rightarrow P$ 、 $G \rightarrow F$
 - Dedicated project jobs start their jobs in preference to regular project jobs.
 - The amount of core-hour set aside for the dedicated project is subtracted from the original project.
- Keeping data in the data area (/data)
 - The data in the data area (/data) is not guarantee to be retained after the end of use.
 - Confirmation of continued use at the end of the year
 - The home area (/home) retains data for six months after the end of use.

Registering Budget Numbers and Budget Transfers

- Register a budget number
 - The payment representative checks with the Office of External Funds in advance.
 - Payment availability, method of payment, deadlines at the end of the fiscal year, and other terms and conditions.
- The timing of the budget transfer is end of June, end of September, end of December and end of the fiscal year.
 - Budget transfer all purchases made before each deadline.
 - Purchase points basically by the end of December.
 - The end of the fiscal year transfers are adjusted on each budget to be on time for the budget payment deadline.
- Expected handling of external funds
 - Relatively easy to handle: JST, AMED, and MEXT
 - Need to be handled individually: NEDO and METI
 - It's difficult to pay in advance, so each budget transfer only what you use.
 - The need to use up points and computing resources of on-demand type.

Q&A

- Thank you very much for your attention.
- Q&A is only accepted by chat after the explanation is completed.
- We will answer verbally or via chat.
- Japanese and English versions of the Q&A will be available on the web at a later date.
 - If we need to check something, take it back and answer the Q&A.
 - The wrong answer is also corrected in the Q&A

APPENDIX

Provisions for services provided Head Office for Information Systems and Cybersecurity of RIKEN

(New regulation)

Provisions for services provided Head Office for Information Systems and Cybersecurity of RIKEN

Basic idea

Handling of usage fees for software licenses managed by the Information System Division (Notice at July 3, 2018)

- Usage support of software license

Target expansion

Handling of usage fees related to services provided by the Information System Division (**Notice**)

(will be revised)

- Usage support of software license
- Usage support of computers
- Others (Large format printer)

The price of usage fees

Fees for shared use computer will be determined by the Notice.

From “handling policy on beneficiary pays of ICT services”

- Settings of user fees
 - Up to 15% of total contract amount (about 100 million JPY)
 - Total contract amount includes hardware lease, maintenance and support, etc.
 - Not includes bills for building and electricity.
 - The upper limit is for use of computers and storage and not individually but as a whole.
 - Expecting to be lower than this because of subsidization and unused resources.
 - A usage fee will be introduced after starting regular operation of SS.
 - SS will be operated as test operation in the first half of FY2020, then regular operation will start after October FY2020.
 - The usage fee will also introduced for BW at the same timing.
 - Eliminate the review process and just check the usage content.
- Subsidization
 - Young scientist and exploratory research and promoting the strategy of RIKEN
 - Cooperation in operation and user support
- Easing measures
 - for existing users using large-scale resources
 - for existing data on the storage of HOKUSAI BW