CCJ operations in 2016

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1 Overview

The RIKEN Computing Center in Japan (CCJ)[1] commenced operations in June 2000 as the largest off-site computing center for the PHENIX[2] experiment being conducted at RHIC. Since then, CCJ has been providing numerous services as a regional computing center in Asia. We have transferred several hundred TBs of raw data files and nDST [a] files from the RHIC Computing Facility (RCF)[3] to CCJ.

Many analysis and simulation projects are being carried out at CCJ, and these projects are listed on the web page `http://ccjsun.riken.go.jp/ccj/proposals/`. As of December 2016, CCJ has contributed to 38 published papers and 41 doctoral theses.

2 Computing hardware and software

The computing hardware (nodes and RAIDs) and software (OS, batch queuing systems, database engine, etc.) have not been changed in 2016 from those described in the previous APR.[1] In summary, we have 28 computing nodes, two login servers, one main server (users' home directory, NIS, DNS, NTP), two disk servers, and 10 computing nodes provided by the RIKEN ACCC.[4] In total, $422\,(= 384 + 72)$ jobs can be processed simultaneously by these computing nodes.

Table 1 lists the number of malfunctioning SATA or SAS disks in the HP servers, namely, computing nodes and NFS/AFS servers.

Table 1. Number of malfunctioning HDDs in 2011-2016

Type	Size	Total	2016	'15	'14	'13	'12	'11
SATA	1 TB	192	8	14	11	16	20	9
	2 TB	120	2	10	0	2	5	4
SAS	146 GB	38	5	3	2	0	1	1
	300 GB	24	0	1	1	0	0	1

One database (postgreSQL[5]) server and one AFS[6] server are operated in order to share the PHENIX computing environment. Now, only the SL5[7] environment is shared by the computing nodes, which have approximately 0.9 TB of library files. We have two data-transfer servers, on which the grid environment[8] is installed for the data transfer to/from RCF. One of them will be retired in March 2017.

The new NFS server HP DL380eGen8 and Infortrend 16TB SAS RAID, deployed in October 2015, have not posed any trouble as of December 2016.

Batteries of three 10 KVA UPS were replaced in March 2016, and a UPS of 7.5 KVA was retired. Thus, the current total power is 40 KVA for all the four UPSs.

The main network switch was also replaced by the same model in June 2016. In early 2017, a login server machine will be replaced. Also, the two machine rooms (258/260 in Main Bldg.) currently used will be downsized to one room (260) in the fall of 2017.

3 HOKUSAI and network environment

CCJ and the RIKEN Integrated Cluster of Clusters (RICC) have been jointly operated since July 2009. In April 2015, a new system named "HOKUSAI Greatwave" was launched by RIKEN ACCC and the joint operation with CCJ has been successful. A new hierarchical archive system and 10 dedicated PC nodes were provided to CCJ by them. Approximately 900 TB of CCJ data are archived in the system. The 10 nodes are the legacy of RICC and will be operated until June 2017, when the system replacement is planned.

The network configuration is shown in Fig. 1. Between the CCJ main switch and HOKUSAI, two 10G Ethernet links are used. Toward the outside of RIKEN, one 10G line is used between the main switch and the zen-riken net. Another 10G line of our grid server for data transfer between RCF has also been retained.
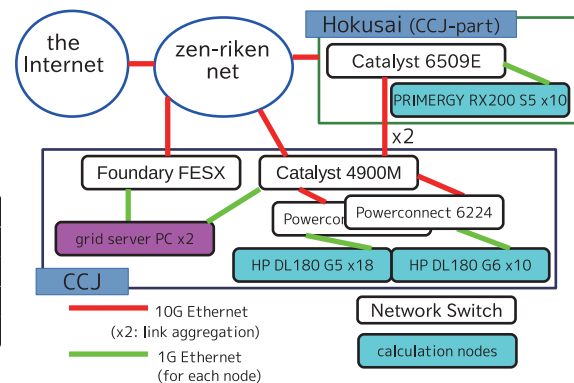

Fig. 1. Schematic view of the network configuration as of December 2016.

References
1) S. Yokkaichi et al.: RIKEN Accel. Prog. Rep. **49**, 204 (2016).
2) `http://www.phenix.bnl.gov/`
3) `https://www.racf.bnl.gov/`
4) `http://accc.riken.jp/`
5) `http://www.postgresql.org/`
6) `http://www.openafs.org/`
7) `http://www.scientificlinux.org/`
8) `http://www.globus.org/toolkit/docs/latest-stable/gridftp/`

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a) term for a type of summary data files in PHENIX