

Computing and network environment at the RIKEN Nishina Center

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We are operating Linux cluster systems^{1,2)} at the RIKEN Nishina Center (RNC).

Figure 1 shows the current configuration of the Linux servers at the RNC. The major part of the systems is installed in the 1F server room of the RIBF building that is equipped with emergency power supply and UPS systems, which ensure the non-stop operation of the computing system, even during power outages. We replaced the UPS systems (20 kVA) in December 2017, which were installed in 2005.

The host *RIBF.RIKEN.JP* is used as the mail server, NFS server of the user home directory, and the NIS master server. This is the core server for the RIBF Linux cluster with approximately 700 registered user accounts. Because six years had passed since the installation of this server, we replaced it with a new server, HP-DL380G9 with SL7.4 OS in January 2018. At the same time, the RAID for user home directory /rarf/u/ was replaced.

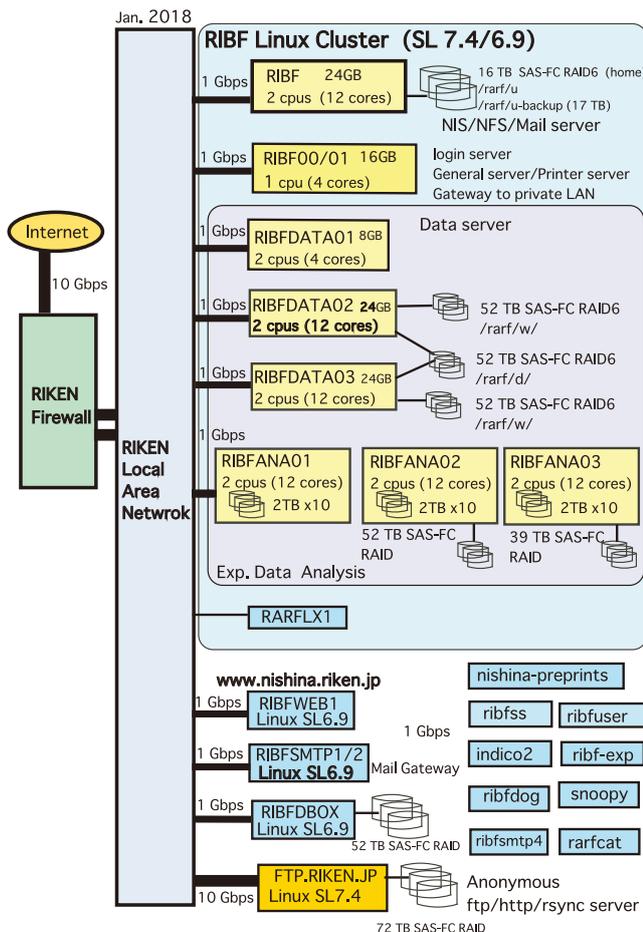


Fig. 1. Configuration of the RIBF Linux cluster.

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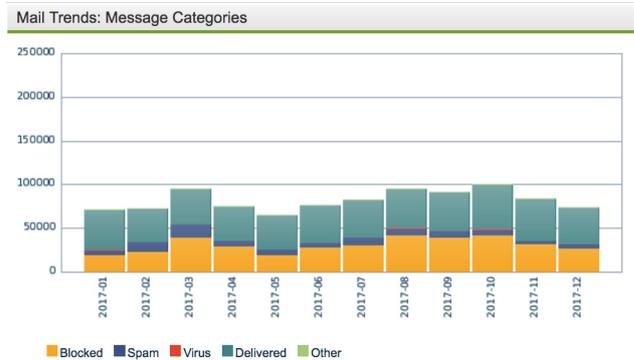


Fig. 2. Mail trends:message categories in 2017.

We installed three RAID units for *RIBFDATA02* and *RIBFDATA03* in 2012 for data analysis and raw data storage of RIBF experiments, as shown in Fig. 2. Each RAID consists of 24 units of 3 TB Hard Disk Drives(HDD), Seagate ST33000650SS. Suddenly after October 2017, we encountered frequent failures of HDDs of these RAID6s. Because of the redundancy of the RAID6 system, RAID volume is healthy up to the simultaneous failure of two HDDs. However, we encountered successive failures of three HDDs, resulting in volume failure of the RAID. After the investigation, we noticed that the Seagate 3 TB HDD used in the RAID is very fragile.³⁾ Therefore, we decided to replace all the HDDs (72 units) of these RAID6s with reliable HGST 6 TB HDDs. This will be done by March 2018. After the replacement, the capacity of the RAID will double and reliability will increase.

The hosts *RIBFSMTP1/2* are the mail gateway, which are used for tagging spam mails and isolating virus-infected mails. The latest version of Sophos Email Protection-Advanced (PMX 6.4.1) has been installed. Figure 2 shows the mail trends in 2017. Approximately 39% of the incoming mails were blocked by PMX ip-blocker.

An anonymous ftp server, *FTP.RIKEN.JP*, is managed and operated at the RNC. Major Linux distributions, including Scientific Linux, Ubuntu, and CentOS, are mirrored daily for the convenience of their users and for facilitating high-speed access. An HP-DL380G6 server was installed in 2009, and it was replaced by HP-DL380G9 with SL7.4 OS in June 2017.

References

- 1) <https://ribf.riken.jp/comp/>
- 2) T. Ichihara *et al.*, RIKEN Accel. Prog. Rep. **50**, 226 (2017).
- 3) <https://www.backblaze.com/blog/hard-drive-reliability-stats-for-q2-2015/>