Higher-level processing of Apollo lunar seismometer data using JSS

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Abstract

To efficiently perform higher-level processing of data acquired by scientific satellites, or to conduct research and development for that purpose.

Reasons and benefits of using JAXA Supercomputer System

Scientific data files are typically divided into units such as daily segments, making it easier to scale processing speed through simple parallelization.

Achievements of the Year

Higher-level processing was performed to release lunar seismic data acquired by the Apollo program in the 1960s-1970s. Although the dataset is only about 100GB in size, processing the proprietary binary format requires multiple stages of conversion when trying to utilize legacy software assets, which takes significant processing time on local computing environments. By using JSS, we were able to complete the processing within one day without expending human resources on software rewrites. Thanks to this, the data release could be carried out smoothly.

- **Publications**

  N/A

- **Usage of JSS**

- **Computational Information**

Process Parallelization Methods	We converted the transformation of each file into a single command line and executed them in parallel using the job submission efficiency tool provided by JSS.
Thread Parallelization Methods	N/A
Number of Processes	20 - 50
Elapsed Time per Case	12 Hour(s)

- **JSS3 Resources Used**

Fraction of Usage in Total Resources[*1](%): 0.00

Details

Computational Resources		
System Name	CPU Resources Used (core x hours)	Fraction of Usage[*2](%)
TOKI-SORA	0.00	0.00
TOKI-ST	557.34	0.00
TOKI-GP	0.00	0.00
TOKI-XM	0.00	0.00
TOKI-LM	0.00	0.00
TOKI-TST	0.00	0.00
TOKI-TGP	0.00	0.00
TOKI-TLM	0.00	0.00

File System Resources		
File System Name	Storage Assigned (GiB)	Fraction of Usage*2 (%)
/home	22.50	0.02
/data and /data2	24,019.00	0.11
/ssd	1,747.00	0.09

Archiver Resources		
Archiver Name	Storage Used (TiB)	Fraction of Usage*2 (%)
J-SPACE	6.80	0.02

*1: Fraction of Usage in Total Resources: Weighted average of three resource types (Computing, File System, and Archiver).

*2: Fraction of Usage：Percentage of usage relative to each resource used in one year.

- **ISV Software Licenses Used**

ISV Software Licenses Resources		
	ISV Software Licenses Used (Hours)	Fraction of Usage*2 (%)
ISV Software Licenses (Total)	0.00	0.00

*2: Fraction of Usage：Percentage of usage relative to each resource used in one year.