Job execution order

In HOKUSAI system, the job execution order is decided by the priority of all jobs. The priority is evaluated by the following items.

Table　listcpu information

Evaluation order	Evaluation item	Overview
1	Fairshare value of project	Value to determine the priority of project. Calculate for each project based on the recovery rate and job execution history.
2	Fairshare value of user within a project	Value to determine the priority of users in same project.
3	Job priority	Priority of the user own job.
4	Job submission time	Execute by the submission order.

Because the evaluation result with smaller "Evaluation order" take priority, the job which belongs to the project with larger "Fairshare value of project" gets preference over the jobs which are submitted earlier. About "fairshare function" and "backfill function" are described in the following.

Fairshare function

In HOKUSAI system, job execution order is decided by the fairshare value of each project and each user within a project. Fairshare value is changed continuously by starting job or recovering with time. Jobs are preferentially executed in the order of fairshare value of project.

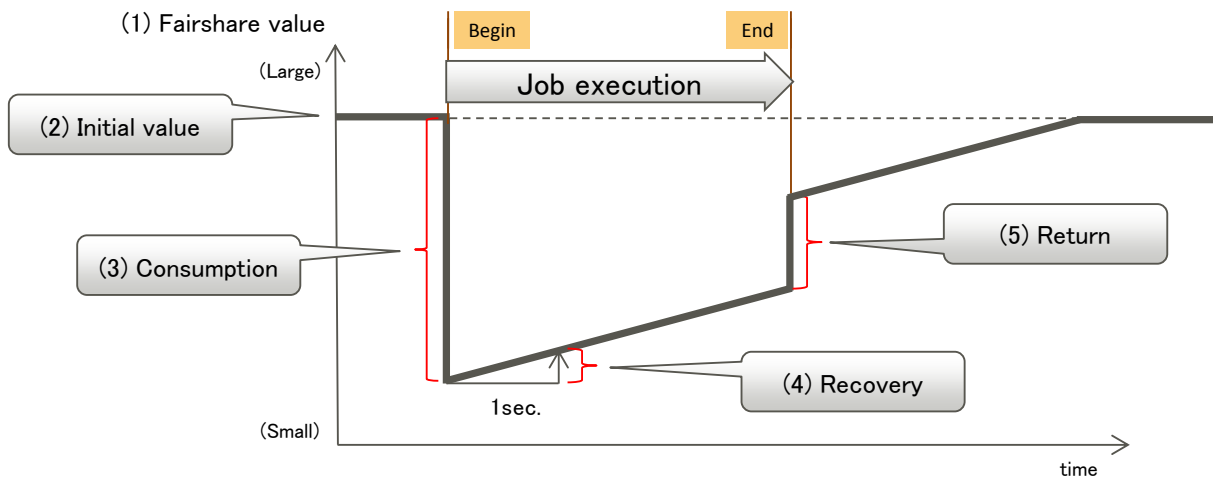The following figure indicates the behavior of fairshare value.

Figure エラー! 指定したスタイルは使われていません。 Behavior of fairshare value

Table 2 Term used in fairshare value

	Term	Meaning	Value in this system
(1)	Fairshare value	The priority of project	
(2)	Initial value	Initial and maximum value of fairshare value	1trillion
(3)	Consumption	Decrease from fairshare value at starting job	(Required number of cores) * (Elapse limit) [s]
(4)	Recovery	Add to fairshare value per second	Depending on the approved computation time of project
(5)	Return	Add value when the job is finished before reached to elapse limit	(Required number of cores) * (Elapse limit - Elapse time) [s]

The recovery values of "fairshare value of project" and "faireshare value of user with a project" are set the same value, depending on the approved computation time of project. In RICC system, however, the recovery of "fairshare value of user with a project" is set a small common value among all users.

⚠️ The priority rank of project can be checked by *pjstat -p* command. Fairshare value is managed inside of system, so users cannot check and change them.

Backfill function

In HOKUSAI system, the backfill function is available to effectively use computing resource. Some idle computing resource will arise during the resource allocation process by previously described fairshare function. The job which can fill such idle resource will be run at an early time in spite of existence of other higher priority jobs. Backfilled jobs can be checked by *pjstat* command (its "START_DATE" is marked by "<").
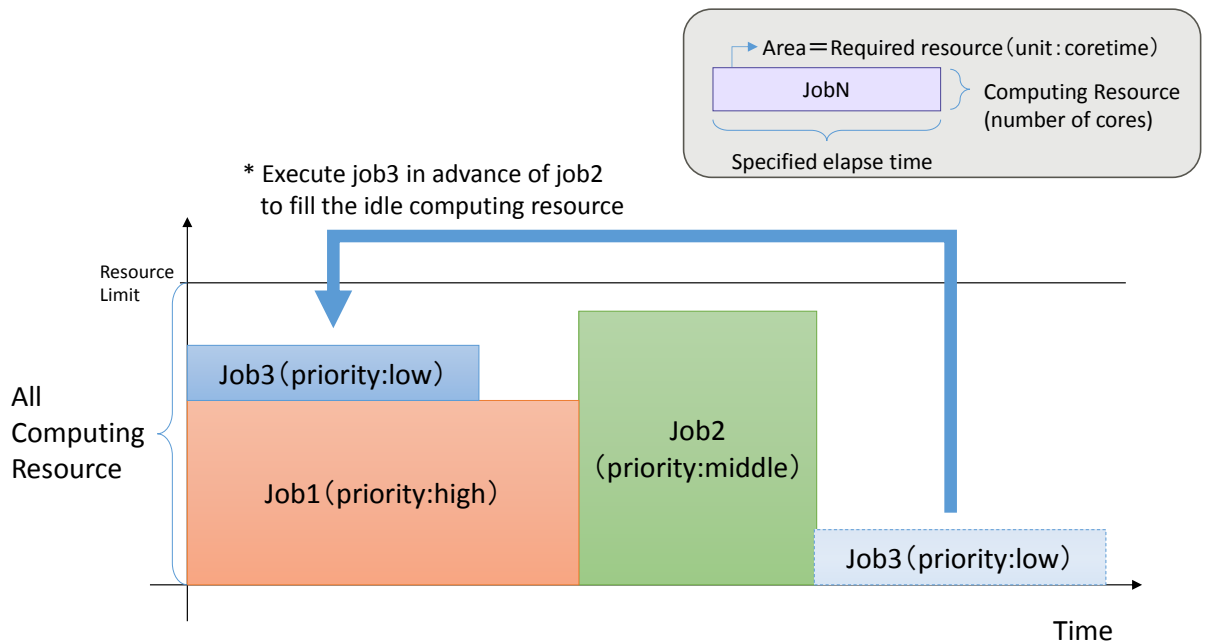

Figure 2 Behavior of backfill function