

Portable Batch System (PBS): Overview

Category: Running Jobs with PBS

All NAS facility supercomputers use the Portable Batch System (PBS) from Altair for batch job submission, job monitoring, and job management. Note that different systems may use different versions of PBS, so the available features may vary slightly from system to system.

Batch Jobs

Batch jobs run on compute nodes, not the front-end nodes. A PBS scheduler allocates blocks of compute nodes to jobs to provide exclusive access. You will submit batch jobs to run on one or more compute nodes using the `qsub` command from an interactive session on one of the front-end nodes (such as, `pfe[20-27]`, `bridge[1-4]` for Pleiades or `cfe2` for Columbia).

Normal batch jobs are typically run by submitting a script. A "jobid" is assigned after submission. When the resources you request become available, your job will execute on the compute nodes. When the job is complete, the PBS standard output and standard error of the job will be returned in files available to you.

Take careful note when porting job submission scripts from systems outside of the NAS environment or between the Pleiades and Columbia supercomputers you may need to make changes to your existing scripts to make them work properly on these systems.

Interactive Batch Mode

PBS also supports an interactive batch mode, using the `qsub -I`, where the input and output is connected to the user's terminal, but the scheduling of the job is still under control of the batch system.

Queues

The available queues on different systems vary, but all typically have constraints on maximum wall-time and/or the number of CPUs allowed for a job. Some queues may also have other constraints or be restricted to serving certain users or groups. In addition, to ensure that each NASA mission directorate is granted their allocated share of resources at any given time, mission directorate limits (called "shares") are also set on Pleiades and Columbia.

See **man pbs** for more information.

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