# Job Dependencies

Job dependencies are features of SLURM that are used to delay the start time of a job until specific job dependencies have been satisfied. SLURM will then run them in the proper order based on the conditions supplied.

This is useful when you want to use the output of a job, as the input of another job, without having to continuously check or create an automation that would execute this when the job is complete.

These features are typically initiated with the --dependency option to sbatch, salloc or srun.

## Command Line

The --dependency option is typically used on the command line when invoking slurm job related client commands.

$ sbatch --dependency=<type:job\_id[:job\_id][,type:job\_id[:job\_id]]> ...

| Dependency Type | Description |
| --- | --- |
| after:jobid[:jobid…] | Job can begin after the specified jobs have started |
| afterany:jobid[:jobid…] | Job can begin after the specified jobs have terminated |
| afternotok:jobid[:jobid…] | Job can begin after the specified jobs have failed |
| afterok:job\_id[:jobid…] | Job can begin after the specified jobs have run to completion with an exit code of zero (see the user guide for caveats). |
| singleton | Jobs can begin execution after all previously launched jobs with the same name and user have ended. This is useful to collate results of a swarm or to send a notification at the end of a swarm. |

Multiple job id’s can be appended to a dependency type and mulyiple dependency types can be added a job’s dependency.

**Example:**

[randall.white@login-02 ~]$ sbatch job\_submission1.sh  
Submitted batch job 11719432  
[randall.white@login-02 ~]$ squeue -u $USER  
 JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)  
 11719432 preview send\_msg randall. R 2:13 1 cpu-c-1  
[randall.white@login-02 ~]$ sbatch --dependency=afterany:11719432 job\_submission2.sh  
Submitted batch job 11719434  
[randall.white@login-02 ~]$ squeue -u $USER  
 JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)  
 11719434 preview send\_msg randall. PD 0:00 1 (Dependency)  
 11719432 preview send\_msg randall. R 2:37 1 cpu-c-1

## Job Script

The --dependency option is typically used on the command line when invoking slurm job related client commands.

#!/bin/bash  
  
#SBATCH --job-name=SimpleJobScript  
#SBATCH --time=1:00  
#SBATCH -p cpu  
#SBATCH --nodes=1  
#SBATCH --ntasks=1  
#SBATCH --dependency=afterany:11719432  
  
hostname

Submission

[randall.white@login-02 ~]$ sbatch job\_submission2.sh  
Submitted batch job 11719436  
[randall.white@login-02 ~]$ squeue -u $USER  
 JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)  
 11719436 preview send\_msg randall. PD 0:00 1 (Dependency)  
 11719432 preview send\_msg randall. R 6:43 1 cpu-c-1

## Tips and Tricks for Working With Dependencies

### Capturing JOBID for use with subsequent dependent jobs

[john.hanks@login-01 ~]$ JOBID=$(sbatch --parsable --wrap "sleep 300")  
[john.hanks@login-01 ~]$ JOBID=$(sbatch --parsable --dependency=afterok:${JOBID} --wrap "sleep 300")  
[john.hanks@login-01 ~]$ JOBID=$(sbatch --parsable --dependency=afterok:${JOBID} --wrap "sleep 300")  
[john.hanks@login-01 ~]$ JOBID=$(sbatch --parsable --dependency=afterok:${JOBID} --wrap "sleep 300")  
[john.hanks@login-01 ~]$ squeue -u $USER  
 JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)  
 11598986 cpu wrap john.han PD 0:00 1 (Dependency)  
 11598985 cpu wrap john.han PD 0:00 1 (Dependency)  
 11598984 cpu wrap john.han PD 0:00 1 (Dependency)  
 11598983 cpu wrap john.han R 1:22 1 cpu-c-1

## Official Slurm Documentation

[SBATCH - Dependencies](https://slurm.schedmd.com/srun.html#OPT_dependency)