

# Useful System Reporting and Information Available To The User in ASPIRE2A

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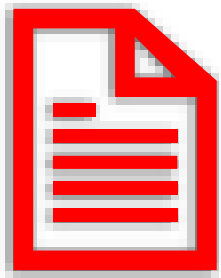
23 July 2021 20:06:09 - 02 Jul 2022

# Outline

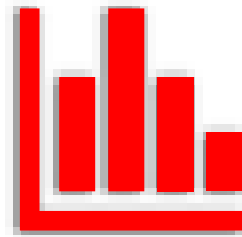
1. Types of reporting available
2. For each reporting:
  - a. Function and how to access
  - b. Current Limitation
  - c. Future Improvement

# Types of reporting available to the user in ASPIRE2A

3 main type of reporting in ASPIRE2A:



Job Reporting

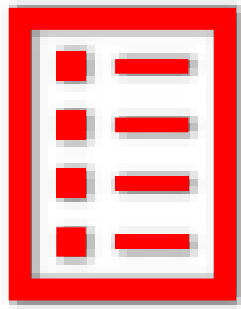


Usage Reporting



Storage Usage  
Reporting

# Types of Job Reporting



Job History



Basic Job Details

# Job Reporting – Job History

1. Show the list of the jobs that has been finished (including success and failed jobs)
2. How to access the job history:
  - a. Command: “qstat -H”
  - b. Command to include running jobs: “qstat -x”
  - c. Command to history in specific queue: “qstat -H <queue>”
  - d. Command with further details: “qstat -xwa”

# Job Reporting – Job History

```
pbs101:
```

Job ID	Username	Queue	Jobname	SessID	NDS	TSK	Req'd Memory	Req'd Time	S	Elap Time
38445.pbs101	ngkg	qdev	Test_job	851926	1	2	2gb	01:00	F	00:00
38456.pbs101	ngkg	qdev	Test_job	12591*	1	2	2gb	01:00	F	00:00
38457.pbs101	ngkg	qdev	Test_job2	12594*	1	2	2gb	01:00	F	00:00
38458.pbs101	ngkg	qdev	Test_job	12648*	1	2	2gb	01:00	F	00:00
38459.pbs101	ngkg	qdev	Test_job2	12650*	1	2	2gb	01:00	F	00:00
38460.pbs101	ngkg	qdev	Test_job3	12683*	1	2	2gb	01:00	F	00:04

Output of “qstat -H” command

## 1. Current limitation:

- a. The user job history stored are only available for 12 hours once the job finished.
- b. Any user job history that exceed 12 hours will be removed by the system.
- c. To extend until 24 hours.

## 2. Future improvement:

- a. Custom script to show longer job history and incorporate to other reporting feature.

# Job Reporting – Basic Job Details

1. Show the details of a specific running job or finished job
2. How to access the job details:
  - a. Short resource usage summary on PBS output file.
  - b. Through email notification.
  - c. For running jobs: “qstat -f <job ID>”
  - d. For finished jobs: “qstat -xf <job ID>”
3. Useful to get the job information such as:
  - a. Job statistical data for job performance analysis.
  - b. Resource requested by job.
  - c. Job timeline.



# Job Reporting – Basic Job Details

```
=====
Resource Usage on 2022-07-18 14:06:44.778906:
```

```
JobId: 38462.pbs101
```

```
Project: 90000001
```

```
Exit Status: 0
```

```
NCPUs Requested: 2
```

```
NCPUs Used: 2
```

```
CPU Time Used: 00:03:02
```

```
Memory Requested: 2gb
```

```
Memory Used: 629376kb
```

```
Vmem Used: 226648kb
```

```
Walltime requested: 01:00:00
```

```
Walltime Used: 00:04:38
```

```
Execution Nodes Used: (x1001c0s0b0n0:mem=2097152kb:ncpus=2:ngpus=0)
```

```
=====
```

Short summary on job output file

# Job Reporting – Basic Job Details

```
root adm@asp2a-altair-asp2a-pbs01.asp2a.nscs.sg via sendgrid.net  
to me ▼
```

```
PBS Job Id: 38713.pbs101
```

```
Job Name: Test_job
```

```
Execution terminated
```

```
Exit_status=0
```

```
resources_used.cpubercent=0
```

```
resources_used.cput=00:00:28
```

```
resources_used.mem=280328kb
```

```
resources_used.ncpus=2
```

```
resources_used.vmem=226648kb
```

```
resources_used.walltime=00:00:31
```

Email notification received after job finished

# Job Reporting – Basic Job Details

```
Job Id: 38462.pbs101
Job_Name = Test_job3
Job_Owner = ngkg@asp2a-login012.head.cm.asp2a.nscs.sg
resources_used.cpus = 65
resources_used.cput = 00:04:37
resources_used.mem = 864128kb
resources_used.ncpus = 2
resources_used.vmem = 226648kb
resources_used.walltime = 00:04:38
job_state = F
queue = qdev
server = pbs101
Checkpoint = u
ctime = Mon Jul 18 14:02:06 2022
Error_Path = asp2a-login012.head.cm.asp2a.nscs.sg:/home/users/astar/ares/ng
kg/testscript/errorfiles/Test_Job3.e
exec_host = x1001c0s0b0n0/1*2
exec_vnode = (x1001c0s0b0n0:mem=2097152kb:ncpus=2:ngpus=0)
Hold_Types = n
Join_Path = n
Keep_Files = n
Mail_Points = a
mtime = Mon Jul 18 14:06:56 2022
Output_Path = asp2a-login012.head.cm.asp2a.nscs.sg:/home/users/astar/ares/n
kg/testscript/outputfiles/Test_job3.o
Priority = 0
qtime = Mon Jul 18 14:02:06 2022
Rerunable = True
Resource_List.am_job_cache = {"job.walltime": 3600, "job.ngpus": 0.0,
"job.queue_charge_rate": 1.0, "job.ncpus": 2.0}
Resource_List.jobprio = 1
Resource_List.mem = 2gb
Resource_List.ncpus = 2
Resource_List.ngpus = 0
Resource_List.nodect = 1
Resource_List.place = pack
Resource_List.queue_charge_rate = 1
Resource_List.select = 1:mem=2gb:ncpus=2:ngpus=0
Resource_List.walltime = 01:00:00
```

qstat -xf <jobID>

# Job Reporting – Basic Job Details

```
stime = Mon Jul 18 14:02:06 2022
session_id = 1340566
jobdir = /home/users/astar/ares/ngkg
substate = 92
Variable_List = PBS_O_HOME=/home/users/astar/ares/ngkg,
  PBS_O_LANG=en_US.UTF-8,PBS_O_LOGNAME=ngkg,
  PBS_O_PATH=/app/apps/anaconda3/2021.11/bin:/app/apps/anaconda3/2021.11
  /condabin:/home/users/astar/ares/ngkg/.local/bin:/home/users/astar/ares
  /ngkg/bin:/opt/cray/pe/pals/1.1.6/bin:/opt/cray/pe/craype/2.7.15/bin:/o
  pt/cray/pe/cce/13.0.2/binutils/x86_64/x86_64-pc-linux-gnu/bin:/opt/cray
  /pe/cce/13.0.2/binutils/cross/x86_64-aarch64/bin:/opt/cray/pe/cce/13.0.
  2/utils/x86_64/bin:/opt/cray/pe/cce/13.0.2/bin:/opt/cray/pe/perftools/2
  2.04.0/bin:/opt/cray/pe/papi/6.0.0.14/bin:/opt/cray/libfabric/1.11.0.4.
  125/bin:/opt/clmgr/sbin:/opt/clmgr/bin:/opt/sgi/sbin:/opt/sgi/bin:/usr/
  local/bin:/usr/bin:/usr/local/sbin:/usr/sbin:/app/apps/local/bin:/opt/c
  3/bin:/usr/lpp/mmfs/bin:/opt/pbs/bin:/sbin:/bin:/opt/cray/pe/bin,
  PBS_O_MAIL=/var/spool/mail/ngkg,PBS_O_SHELL=/bin/bash,
  PBS_O_WORKDIR=/home/users/astar/ares/ngkg/testscript,
  PBS_O_SYSTEM=Linux,PBS_O_QUEUE=normal,
  PBS_O_HOST=asp2a-login012.head.cm.asp2a.nscg.sg
comment = Job run at Mon Jul 18 at 14:02 on (x1001c0s0b0n0:mem=2097152kb:nc
  pus=2:ngpus=0) and finished
etime = Mon Jul 18 14:02:06 2022
run_count = 1
Stageout_status = 1
Exit_status = 0
Submit_arguments = cpu_test3
history_timestamp = 1658124416
project = 90000001
Submit_Host = asp2a-login012.head.cm.asp2a.nscg.sg
```

There is so much information in the job detail, what to look for?

## Basic Job Information

- Job\_Name
- Job\_Owner
- queue
- server
- Project
- exec\_host
- Exit\_status, 0 = success, Non-zero = failed.

## The amount of resources that have been allocated to the job

- Resource\_List.mem
- Resource\_List.ncpus
- Resource\_List.ngpus
- Resource\_List.nodect
- Resource\_List.walltime

```
Resource_List.mem = 2gb  
Resource_List.ncpus = 2  
Resource_List.ngpus = 0  
Resource_List.nodect = 1  
Resource_List.place = pack  
Resource_List.queue_charge_rate = 1  
Resource_List.select = 1:mem=2gb:ncpus=2:ngpus=0  
Resource_List.walltime = 01:00:00
```

## The amount of resources that have been used by job:

- resource\_used.mem
- resource\_used.cput
- resource\_used.ncpus
- resource\_used.vmem
- resource\_used.cputercent
- resource\_used.walltime

```
resources_used.cputercent = 65  
resources_used.cput = 00:04:37  
resources_used.mem = 864128kb  
resources_used.ncpus = 2  
resources_used.vmem = 226648kb  
resources_used.walltime = 00:04:38
```

# Job Reporting – Basic Job Details

## Time attribute

Attribute	Description
ctime	Job Creation time
etime	The time when job become eligible to run
qtime	The time the job enter the queue
stime	The time the job started execution



## Other Useful Attributes

- Output\_Path
- Error\_Path
- Submit\_host
- Submit\_arguments
- Comments

# Job Reporting – Basic Job Details

```
Job Id: 38462.pbs101
Job_Name = Test_job3
Job_Owner = ngkg@asp2a-login012.head.cm.asp2a.nscs.sg
resources_used.cput = 00:04:37
resources_used.mem = 864128kb
resources_used.ncpus = 2
resources_used.vmem = 226648kb
resources_used.walltime = 00:04:38
job_state = F
queue = qdev
server = pbs101
Checkpoint = u
ctime = Mon Jul 18 14:02:06 2022
Error_Path = asp2a-login012.head.cm.asp2a.nscs.sg:/home/users/astar/ares/ng
             kg/testscript/errorfiles/Test_Job3.e
exec_host = x1001c0s0b0n0/1*2
exec_vnode = (x1001c0s0b0n0:mem=2097152kb:ncpus=2:ngpus=0)
Hold_Types = n
Join_Path = n
Keep_Files = n
Mail_Points = a
mtime = Mon Jul 18 14:06:56 2022
Output_Path = asp2a-login012.head.cm.asp2a.nscs.sg:/home/users/astar/ares/n
             gkg/testscript/outputfiles/Test_job3.o
Priority = 0
qtime = Mon Jul 18 14:02:06 2022
Rerunable = True
Resource_List.am_job_cache = {"job.walltime": 3600, "job.ngpus": 0.0,
                              "job.queue_charge_rate": 1.0, "job.ncpus": 2.0}
Resource_List.jobprio = 1
Resource_List.mem = 2gb
Resource_List.ncpus = 2
Resource_List.ngpus = 0
Resource_List.nodect = 1
Resource_List.place = pack
Resource_List.queue_charge_rate = 1
Resource_List.select = 1:mem=2gb:ncpus=2:ngpus=0
Resource_List.walltime = 01:00:00
```

# Job Reporting – Basic Job Details

```
stime = Mon Jul 18 14:02:06 2022
session_id = 1340566
jobdir = /home/users/astar/ares/ngkg
substate = 92
Variable_List = PBS_O_HOME=/home/users/astar/ares/ngkg,
  PBS_O_LANG=en_US.UTF-8,PBS_O_LOGNAME=ngkg,
  PBS_O_PATH=/app/apps/anaconda3/2021.11/bin:/app/apps/anaconda3/2021.11
  /condabin:/home/users/astar/ares/ngkg/.local/bin:/home/users/astar/ares
  /ngkg/bin:/opt/cray/pe/pals/1.1.6/bin:/opt/cray/pe/craype/2.7.15/bin:/o
  pt/cray/pe/cce/13.0.2/binutils/x86_64/x86_64-pc-linux-gnu/bin:/opt/cray
  /pe/cce/13.0.2/binutils/cross/x86_64-aarch64/bin:/opt/cray/pe/cce/13.0.
  2/utils/x86_64/bin:/opt/cray/pe/cce/13.0.2/bin:/opt/cray/pe/perftools/2
  2.04.0/bin:/opt/cray/pe/papi/6.0.0.14/bin:/opt/cray/libfabric/1.11.0.4.
  125/bin:/opt/clmgr/sbin:/opt/clmgr/bin:/opt/sgi/sbin:/opt/sgi/bin:/usr/
  local/bin:/usr/bin:/usr/local/sbin:/usr/sbin:/app/apps/local/bin:/opt/c
  3/bin:/usr/lpp/mmfs/bin:/opt/pbs/bin:/sbin:/bin:/opt/cray/pe/bin,
  PBS_O_MAIL=/var/spool/mail/ngkg,PBS_O_SHELL=/bin/bash,
  PBS_O_WORKDIR=/home/users/astar/ares/ngkg/testscript,
  PBS_O_SYSTEM=Linux,PBS_O_QUEUE=normal,
  PBS_O_HOST=asp2a-login012.head.cm.asp2a.nscg.sg
comment = Job run at Mon Jul 18 at 14:02 on (x1001c0s0b0n0:mem=2097152kb:nc
  pus=2:ngpus=0) and finished
etime = Mon Jul 18 14:02:06 2022
run_count = 1
Stageout_status = 1
Exit_status = 0
Submit_arguments = cpu_test3
history_timestamp = 1658124416
project = 90000001
Submit_Host = asp2a-login012.head.cm.asp2a.nscg.sg
```

# Job Reporting – Basic Job Details

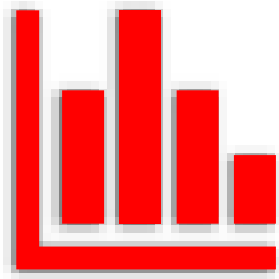
## 1. Current limitation:

- a. The user job history stored are only available for 12 hours once the job finished.
- b. Any user job history that exceed 12 hours will be removed by the system.
- c. Currently to extend until 24 hours.
- d. User need to manually save the job details.

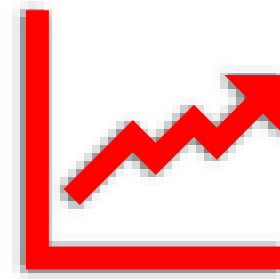
## 2. Future improvement:

- a. Custom script to directly pull user job details from PBS accounting log for finished job.

# Usage reporting



Individual usage reporting



Project usage reporting

# Usage reporting – Individual usage reporting

1. Show the individual usage in ASPIRE2A:
  - a. Past 7 days usage
  - b. Past 30 days usage
  - c. Overall usage
2. Usage in CPU and GPU Hour
3. Individual usage is updated 3 times a day, once every 8 hours.
4. How to access:
  - a. Command: **“myusage”**

# Usage reporting – Individual usage reporting

```
Your usage as of 19/07/2022-08:45:14
```

Time Range	Resource	Num of Jobs	Core/Card Hours
Past 7 days	CPU	18	1.256
	GPU	0	0.000
Past 30 days	CPU	18	1.256
	GPU	0	0.000
Overall	CPU	18	1.256
	GPU	0	0.000

## Future improvement:

- a. Provide up to date individual usage reporting.
- b. Allow users to query specific date range.
- c. Incorporate job history and job resource usage.  
(Something like bank statement)



# Usage reporting – Project usage reporting

1. Show summary usage and the remaining balance of the project in ASPIRE2A.
2. Project usage is updated 3 times a day, once every 8 hours.
3. How to access:
  - a. Command: **“myprojects”**

# Usage reporting – Project usage reporting

```
Project : 90000001
ExpDate : 2032-12-31
Members : hiewnh fsg1 satriamt chungsy leety1 zidarj1 wilsonnt ngkg
```

```
Project balance as of 19/07/2022-08:30:02
```

Unit	Grant	Used	Balance
SU	9777561600.000	1685078.115	9775790420.552
CPU	100000000000.000	1684042.600	99998229856.067
GPU	100000000000.000	1035.515	99999998964.485

## Future improvement:

- a. Provide up to date project usage reporting.
- b. Incorporate project job history and allocation transaction, this include project members job and its usage. (Something like bank statement)
- c. Allow users to specify the date range to query usage based on the range of date.

# Storage quota reporting

1. Show the individual and project storage quota in ASPIRE2A.
2. Shows home and scratch directory quota.
3. How to access:
  - a. Command: “myquota”
4. Still in development.

<https://forms.gle/2xtPGoR6YNPEtbeh6>



# Thank You

You may reach us at: [contact@nscg.sg](mailto:contact@nscg.sg)