

A distributed system to monitor experiment's execution and resources usage across multiple platforms in a graphical interface

EC EARTH MEETING 2021

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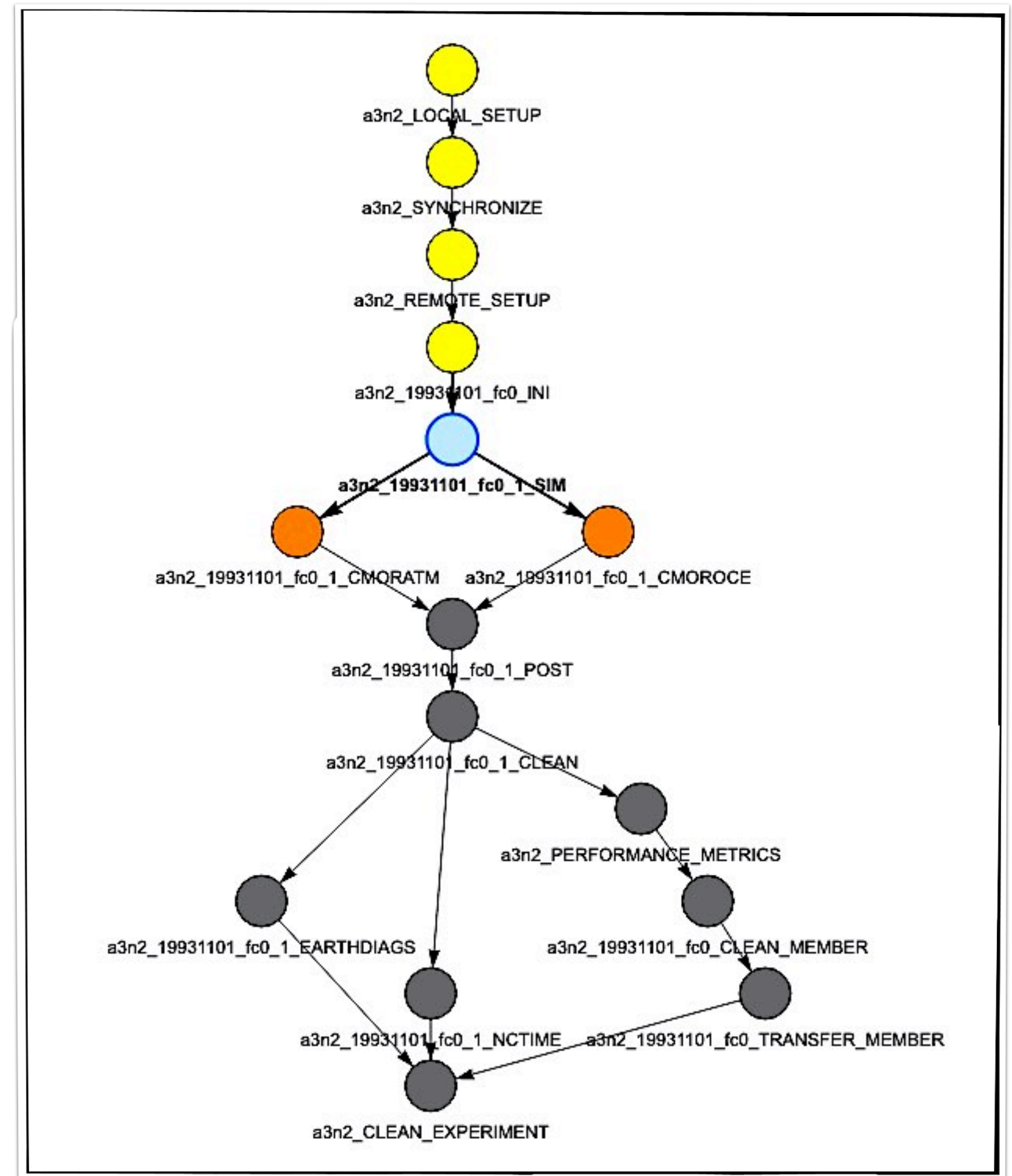


Autosubmit

A workflow manager

- Autosubmit is a workflow manager to orchestrate complex tasks, mainly in scientific environments. It runs on the **terminal**. It can manage experiments running on HPC clusters, **remote platforms**, or a local workstation.
- The user provides a **configuration** for Autosubmit to start executing the experiment. Autosubmit will produce **logs**, execution tracking, and report any failure.
- Autosubmit is massively used in **BSC-ES** to run different model workflows (**EC-Earth**, **NEMO4**, **MONARCH**, **HERMES...**) and data downloads, among others.

A small experiment



We needed a way to improve our workflow manager while also providing a **friendlier interface** to our users. Moreover, not only the results of an experiment are useful, but the **execution process** itself generates **data** that can have some utility.

It doesn't have to be a single workflow manager that is in charge of everything, but **many systems** interacting with each other.

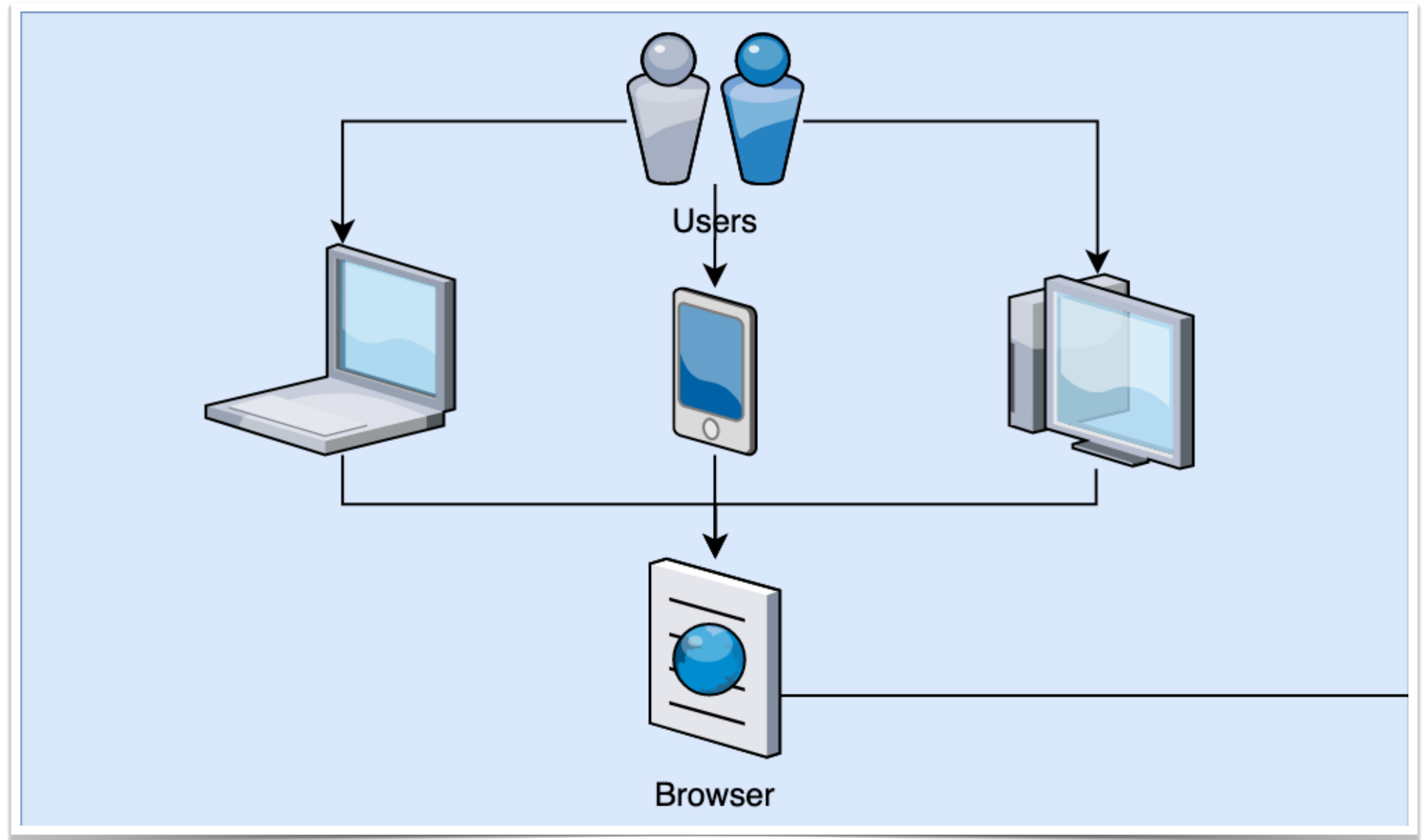
A distributed system.

Graphical User Interface

<https://autosubmitgui.bsc.es/presentation/>

Graphical User Interface

- Our main objective is to provide users **easy access** and **visualisation** of the **progress** of their experiments.
- Provide relevant information.
- Users can access the interface through any **browser**.
- The GUI presents the processed information in an **intuitive** and **interactive** way.



Main Window

Autosubmit Searcher Home About News **esarchive** 48.10 MB/s 2.08 s LOGIN

Test Experiment All Only Active SEARCH ACTIVE EXPS

SHOW DETAILED DATA CLEAR 29

1 2 3 From 1 to 12 Order By: TOTAL JOBS + COMPLETED JOBS + NAME + QUEUING JOBS RUNNING JOBS FAILED JOBS WRAPPER

a2al 444 444 / 1086 ACTIVE Owner: jgarci1 HPC: marenostrom4 GRAVITOCAST atmosphere-only run 3.11.0-hotfix	a3nv 2 418 418 / 1111 ACTIVE Owner: ojoba HPC: marenostrom4 cams50 mugwort pollen debug 3.13.0	a3vg 802 802 / 2605 ACTIVE Owner: acarreri HPC: marenostrom4 HR seasonal forecast system - ERA5-HR-forcing/ORAS5-restoring/EN4-nudging ocean-sea ice IC and ERA5 atm IC - a2ye tuning - Branch 3.3.3.1, RES account 3.13.0
a3is 0 / 20 ACTIVE Owner: msamso HPC: nord3 dl-cmip6 3.13.0	a3p4 2 14 14 / 52 ACTIVE Owner: ojoba HPC: marenostrom4 debug pm10 diagnostics and igbp 3.13.0	a3y4 1422 1422 / 2777 ACTIVE Owner: rgaratac HPC: marenostrom4 ISAM 2015 EU-3 3.11.0
a3lx 1 0 / 4 ACTIVE Owner: msamso HPC: nord3 dl-cmip6 3.13.0	a3pe 1 4 4 / 42 ACTIVE Owner: eferre1 HPC: marenostrom4 Test experiment save inidata, runtime, restarts new flags 3.13.0	a3yq 2 1 391 391 / 457 ACTIVE Owner: eexarcho HPC: marenostrom4 experiment is reconstruction nemo forced by a2ya piControl - for perfect model experiments of TRIATLAS with T/S nudging

Tree Representation

CLEAR TREE SUMMARY ACTIVATE SELECTION MODE REFRESH START JOB MONITOR

Filter string FILTER CLEAR CHANGE STATUS Total #Jobs: 47 | Chunk unit: month | Chunk size: 12

- 47 a41x_19580101
 - 46 a41x_19580101_fc00 12 / 42 COMPLETED 1 RUNNING 1 QUEUING
 - 10 SIM
 - a41x_19580101_fc00_4_SIM #RUNNING ~ (0:00:11) + 0:13:49
 - a41x_19580101_fc00_1_SIM #COMPLETED ~ (0:00:01) + 0:37:10
 - a41x_19580101_fc00_2_SIM #COMPLETED ~ (0:00:00) + 0:37:39
 - a41x_19580101_fc00_3_SIM #COMPLETED ~ (0:00:36) + 0:37:48
 - a41x_19580101_fc00_5_SIM #WAITING
 - a41x_19580101_fc00_6_SIM #WAITING
 - a41x_19580101_fc00_7_SIM #WAITING
 - a41x_19580101_fc00_8_SIM #WAITING
 - a41x_19580101_fc00_9_SIM #WAITING
 - a41x_19580101_fc00_10_SIM #WAITING
 - 10 CMOR
 - a41x_19580101_fc00_3_CMOR #QUEUING ~ (0:14:00) TARGET
 - a41x_19580101_fc00_1_CMOR #COMPLETED ~ (0:00:01) + 0:00:04 TARGET
 - a41x_19580101_fc00_2_CMOR #COMPLETED ~ (0:38:27) + 0:00:16 TARGET
 - a41x_19580101_fc00_4_CMOR #WAITING TARGET
 - a41x_19580101_fc00_5_CMOR #WAITING TARGET
 - a41x_19580101_fc00_6_CMOR #WAITING TARGET
 - a41x_19580101_fc00_7_CMOR #WAITING TARGET
 - a41x_19580101_fc00_8_CMOR #WAITING TARGET
 - a41x_19580101_fc00_9_CMOR #WAITING TARGET
 - a41x_19580101_fc00_10_CMOR #WAITING TARGET
 - 10 POST
 - 10 CLEAN

a41x_19580101_fc00_INI

Start: 1958 01 01 End: 1958 01 01

Section: INI

Member: fc00 Chunk:

Platform: marenostrom4 QoS: debug Id: 18356757

Processors: 1 Wallclock: 00:30

Queue: 00:00:01 Run: 00:01:20

Status: COMPLETED OUT: 1 IN: 1

/esarchive/autosubmit/a41x/tmp/LOG_a41x/a/ COPY OUT

/esarchive/autosubmit/a41x/tmp/LOG_a41x/a/ COPY ERR

Submit: 2021-11-10 16:10:00

Start: 2021-11-10 16:10:01

Finish: 2021-11-10 16:11:21

Graph Representation

CLASSIC DATE-MEMBER STATUS SUMMARY ACTIVATE SELECTION MODE REFRESH START JOB MONITOR

Job Name (e.g. fc0_1_< SEARCH BY JOB NAME CHANGE STATUS HIDE PANEL Max out: 3 | Max in: 5 | Total #Jobs: 47 | Chunk unit: month | Chunk size 12

Selection Wrappers

a41x_COMPILATION

Start: End:
Section: COMPILATION
Member: Chunk:
Platform: marenostrum4 QoS: bsc_es Id: 18356660
Processors: 4 Wallclock: 2:00
Queue: 00:00:01 Run: 00:21:34
Status: **COMPLETED** OUT: 1 IN: 1
/esarchive/autosubmit/a41x/tmp/LOG_a41x COPY OUT
/esarchive/autosubmit/a41x/tmp/LOG_a41x COPY ERR
Submit: 2021-11-10 15:48:07
Start: 2021-11-10 15:48:08
Finish: 2021-11-10 16:09:42

Navigation buttons: WAITING READY PREPARED SUBMITTED QUEUING RUNNING COMPLETED FAILED SUSPENDED UNKNOWN HOLD SKIPPED

Direct Access to out and err logs

Log /esarchive/autosubmit/a41x/tmp/LOG_a41x/a41x_COMPILATION.20211110154909.err

```
compile_nemo ${nem_contid} ${nem_grid} ${outclass_extra_nemo_compilation_keys-}
```

Log /esarchive/autosubmit/a41x/tmp/LOG_a41x/a41x_COMPILATION.20211110154909.out

```
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnxt.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcrad.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcsbc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trczdf.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trctrp.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcwri_age.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcwri_c14.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcwri_cfc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcwri_my_trc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcwri_piscs.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcwri.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcstp.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/zdfosm.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/zdfevd.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/zdfiwm.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/zdftric.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/zdfsh2.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/zdfswm.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/zdfphy.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/step_oce.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/step.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/step_c1d.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcice_age.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcice_c14.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcice_cfc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcice_my_trc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcice_piscs.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcice.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnam_age.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnam_c14.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnam_c14.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnam_cfc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcini_c14.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnam_cfc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcini_cfc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnam_my_trc.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnam_piscs.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcini_piscs.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcnam.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trcini.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/trdini.done
touch /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/done/nemogcm.done
fcml_internal load:F nemo nemo.o nemo.exe
mpifort -o nemo.exe /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/obj/nemo.o -L/gpfs/scratch/
->Make: 834 seconds
->TOTAL: 855 seconds
Build command finished on Wed Nov 10 16:09:42 2021.
/gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/sources/nemo-4/cfgs
Finished compiling
```

Showing last 150 lines.

```
es/nemo-4
sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/bin/*.exe'
new.'
CE_PISCES -d 'OCE ICE TOP' add_key ' key_si3 key_top' del_key '' -j 4
es/nemo-4/mk/arch.history: No such file or directory
ources/nemo-4/mk/arch_nemo.fcm: LINE 48:
expanded
mo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/ppsrc/nemo/obs_aver_g_h2d.f90(99): warning #6843:
oints )
mo/sources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/tmp/lib__fcm__nemo.a
/nemo/namelist/ORCA1L75/namelist_cfg ']'
nemo/namelist/ORCA1L75/namelist_cfg /gpfs/scratch/bsc32/bsc32882/a41x/auto-nemo/so
ources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/BLD/bin/nemo.exe ']'
0/namelist_* ${CURRENT_ROOTDIR}/ctrl
ources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/EXP00/namelist_cfg /gpfs/scratch/bsc32/bsc3
0/*xml ${CURRENT_ROOTDIR}/ctrl
ources/nemo-4/cfgs/ORCA1L75_ICE_PISCES/EXP00/axis_def_nemo.xml /gpfs/scratch/bsc32
x_COMPILATION_COMPLETED
```

Showing last 150 lines.

Experiment Log Visualisation

HIDE LOG

Logfile: 20211110_154534_run.log (1636565054.8644512) Last Modified: 2021-11-10 17:24:14

```
2021-11-10 18:22:43,927 Updating FAILED jobs
2021-11-10 18:22:43,927 Updating WAITING jobs
2021-11-10 18:22:43,927 Update finished
2021-11-10 18:22:43,927
Job Name          Job Id      Job Status  Job Platform  Job Queue
2021-11-10 18:22:43,927 a41x_19580101_fc00_2_POST 2345      COMPLETED  transfer_node  no-scheduler
2021-11-10 18:22:43,927 a41x_19580101_fc00_3_POST 42930     COMPLETED  transfer_node  no-scheduler
2021-11-10 18:22:43,927 a41x_19580101_fc00_1_CLEAN 23165     COMPLETED  transfer_node  no-scheduler
2021-11-10 18:22:43,927 a41x_19580101_fc00_2_CLEAN 10368     COMPLETED  transfer_node  no-scheduler
2021-11-10 18:22:43,927 a41x_19580101_fc00_3_CLEAN 49497     COMPLETED  transfer_node  no-scheduler
2021-11-10 18:22:43,927 a41x_19580101_fc00_4_SIM 18359760  RUNNING    marenostrum4  debug
2021-11-10 18:22:43,928 a41x_19580101_fc00_3_CMOR 18359761  QUEUING    marenostrum4  debug
2021-11-10 18:22:43,931 Saving JobList: /esarchive/autosubmit/a41x/pkl/job_list_a41x.pkl
2021-11-10 18:22:43,932 Job list saved
2021-11-10 18:22:43,943 Updating FAILED jobs
2021-11-10 18:22:43,943 Updating WAITING jobs
2021-11-10 18:22:43,943 Update finished
2021-11-10 18:23:43,998 Reloading parameters...
2021-11-10 18:23:44,011 Loading parameters...
2021-11-10 18:23:44,012 Loading project parameters...
2021-11-10 18:23:44,012
31 of 47 jobs remaining (18:23)
2021-11-10 18:23:44,013 Sleep: 60
2021-11-10 18:23:44,013 Number of retrials: 0
2021-11-10 18:23:44,013 WRAPPER CHECK TIME = 60
2021-11-10 18:23:44,013 Checking jobs for platform=transfer_node
2021-11-10 18:23:44,013 Checking jobs for platform=login_0
2021-11-10 18:23:44,014 Checking jobs for platform=marenostrum4
2021-11-10 18:23:44,014 Checking all jobs at once
2021-11-10 18:23:45,284 Successful check job command
2021-11-10 18:23:47,711 Job a41x_19580101_fc00_3_CMOR is QUEUING
2021-11-10 18:23:47,711 Job a41x_19580101_fc00_4_SIM is RUNNING
2021-11-10 18:23:47,712 End of checking
2021-11-10 18:23:47,713 Updating FAILED jobs
2021-11-10 18:23:47,713 Updating WAITING jobs
2021-11-10 18:23:47,713 Update finished
2021-11-10 18:23:47,713
Job Name          Job Id      Job Status  Job Platform  Job Queue
2021-11-10 18:23:47,714 a41x_19580101_fc00_2_POST 2345      COMPLETED  transfer_node  no-scheduler
2021-11-10 18:23:47,714 a41x_19580101_fc00_3_POST 42930     COMPLETED  transfer_node  no-scheduler
2021-11-10 18:23:47,714 a41x_19580101_fc00_1_CLEAN 23165     COMPLETED  transfer_node  no-scheduler
2021-11-10 18:23:47,714 a41x_19580101_fc00_2_CLEAN 10368     COMPLETED  transfer_node  no-scheduler
2021-11-10 18:23:47,714 a41x_19580101_fc00_3_CLEAN 49497     COMPLETED  transfer_node  no-scheduler
2021-11-10 18:23:47,714 a41x_19580101_fc00_4_SIM 18359760  RUNNING    marenostrum4  debug
2021-11-10 18:23:47,714 a41x_19580101_fc00_3_CMOR 18359761  QUEUING    marenostrum4  debug
2021-11-10 18:23:47,717 Saving JobList: /esarchive/autosubmit/a41x/pkl/job_list_a41x.pkl
2021-11-10 18:23:47,718 Job list saved
2021-11-10 18:23:47,727 Updating FAILED jobs
2021-11-10 18:23:47,727 Updating WAITING jobs
2021-11-10 18:23:47,727 Update finished
```

Showing last 150 lines

Visualise Configuration

[REFRESH DATA](#) [CLEAR DATA](#)

The current run configuration in the historical database is different than the current configuration in the file system.

autosubmit_conf [expdef_conf](#) [jobs_conf](#) [platforms_conf](#) [proj_conf](#)

Current Run Configuration (Historical Database)

[communications]

Setting	Value
API	paramiko

[config]

Setting	Value
AUTOSUBMIT_VERSION	3.13.0
EXPID	a3rd
MAXWAITINGJOBS	3
OUTPUT	pdf
PRESUBMISSION	FALSE
RETRIALS	0
SAFETYSLEEPTIME	10
TOTALJOBS	6

[mail]

Setting	Value
NOTIFICATIONS	False
TO	

[migrate]

Setting	Value
TO_USER	

[storage]

Setting	Value
---------	-------

Current FileSystem Configuration

[communications]

Setting	Value
API	paramiko

[config]

Setting	Value
AUTOSUBMIT_VERSION	3.13.0
EXPID	a3rd
MAXWAITINGJOBS	3
OUTPUT	pdf
PRESUBMISSION	FALSE
RETRIALS	0
SAFETYSLEEPTIME	10
TOTALJOBS	6

[mail]

Setting	Value
NOTIFICATIONS	False
TO	

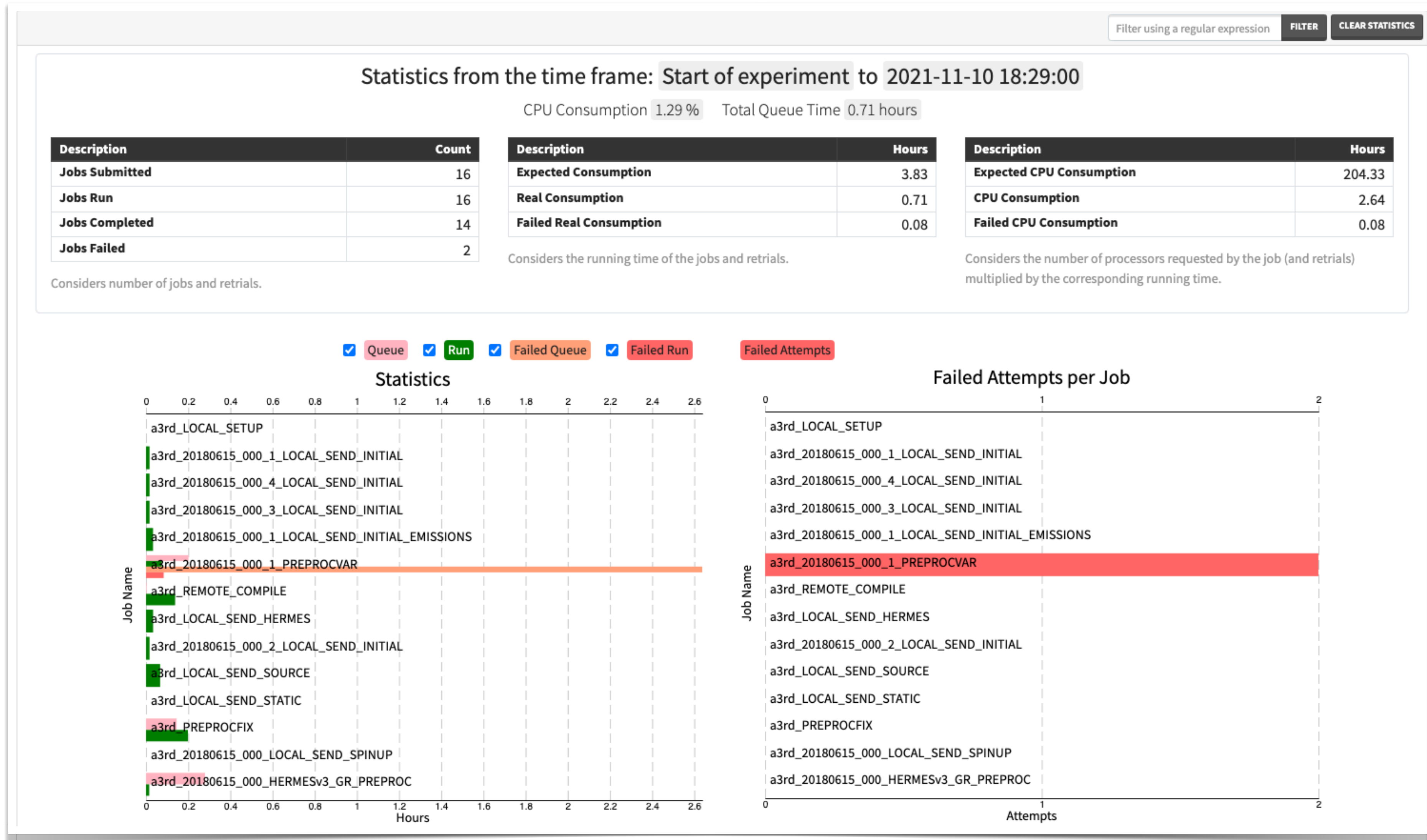
[migrate]

Setting	Value
TO_USER	

[storage]

























Setting	Value
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Statistics




Quick View






















42327 COMPLETED 235 FAILED 0 RUNNING 0 QUEUING SIM FILTER Showing 6710 of 42705 total jobs. CLEAR RESULT

 a3w5_19761101_fc08_6_SIM	#COMPLETED	Wrapped 16320772116542
 a3w5_20021101_fc02_5_SIM	#COMPLETED	Wrapped 16338542159508
 a3w5_20071101_fc06_8_SIM	#COMPLETED	Wrapped 16339168874706
 a3w5_19981101_fc08_10_SIM	#COMPLETED	Wrapped 1633490561721
 a3w5_20111101_fc02_2_SIM	#COMPLETED	Wrapped 16343652483481
 a3w5_19791101_fc04_6_SIM	#COMPLETED	Wrapped 1632071738807
 a3w5_20191101_fc05_7_SIM	#COMPLETED	Wrapped 1635164680510
 a3w5_19711101_fc05_8_SIM	#COMPLETED	Wrapped 16330513888964
 a3w5_19651101_fc08_1_SIM	#COMPLETED	
 a3w5_19861101_fc05_4_SIM	#COMPLETED	Wrapped 16326068202680
 a3w5_19931101_fc09_10_SIM	#COMPLETED	Wrapped 16332256139390
 a3w5_20111101_fc00_7_SIM	#COMPLETED	Wrapped 16343197582509
 a3w5_20021101_fc07_1_SIM	#COMPLETED	Wrapped 16338542153448
 a3w5_19871101_fc05_1_SIM	#COMPLETED	Wrapped 16326072627164
 a3w5_19751101_fc01_6_SIM	#COMPLETED	
 a3w5_20151101_fc04_1_SIM	#COMPLETED	
 a3w5_19831101_fc09_9_SIM	#COMPLETED	Wrapped 16321340197963
 a3w5_20171101_fc07_7_SIM	#COMPLETED	Wrapped 16347137025508
 a3w5_20121101_fc03_8_SIM	#COMPLETED	Wrapped 16343652488454
 a3w5_19981101_fc00_5_SIM	#COMPLETED	Wrapped 16334905615602
 a3w5_19611101_fc06_5_SIM	#COMPLETED	Wrapped 16311966133035
 a3w5_20011101_fc05_4_SIM	#COMPLETED	Wrapped 1633650158746
 a3w5_19941101_fc08_1_SIM	#COMPLETED	Wrapped 16332340562368
 a3w5_19961101_fc09_5_SIM	#COMPLETED	Wrapped 1633490562368

Visualise Previous Experiment Runs

Runs of **t07r** (The first row represents the current run.)

About News **a3hd** **ACTIVE**  CHANGE

RunId	Created	Finish	Submitted	Queuing	Running	Failed	Suspended	Completed	Total	ChunkUnit	ChunkSize
 2107140947	2021-07-14-09:47:49	2021-07-14-12:47:18	0	0	0	0	0	17	17	day	1
 2107131655	2021-07-13-16:55:25	2021-07-13-20:12:47	0	0	0	0	0	17	17	day	1
 2105061844	2021-05-06-18:44:14	2021-05-06-21:35:57	0	0	0	0	0	17	17	day	1
 2105051821	2021-05-05-18:21:49	2021-05-06-09:57:33	0	0	0	0	0	17	17	day	1
 2104201713	2021-04-20-17:13:59	2021-04-20-21:09:36	0	0	0	0	0	17	17	day	1
 2104201709	2021-04-20-17:09:55		0	0	0	0	0	0	17	day	1
 2104161417	2021-04-16-14:17:15	2021-04-16-15:52:57	0	0	0	0	0	17	17	day	1
 2104141643	2021-04-14-16:43:42	2021-04-15-12:23:55	0	0	0	0	0	17	17	day	1
 2103111757	2021-03-11-17:57:30	2021-03-11-18:49:05	0	0	0	0	0	17	17	day	1
 2103051809	2021-03-05-18:09:04	2021-03-11-11:09:01	0	0	0	0	0	17	17	day	1
 2102111924	2021-02-11-19:24:26	2021-02-11-21:25:17	0	0	0	0	0	17	17	day	1
 2102111716	2021-02-11-17:16:21		0	0	0	1	0	5	17	day	1
 2101281826	2021-01-28-18:26:49	2021-02-01-09:29:19	0	0	0	0	0	17	17	day	1
 2101151133	2021-01-15-11:33:30		0	0	0	2	0	7	17	day	1
 2101111406	2021-01-11-14:06:10	2021-01-11-18:00:40	0	0	0	0	0	17	17	day	1
 2012151311	2020-12-15-13:11:04	2020-12-15-15:42:57	0	0	0	0	0	17	17	day	1
 2011251019	2020-11-25-10:19:06	2020-12-14-14:02:14	0	0	0	0	0	17	17	day	1
 2011241013	2020-11-24-10:13:54	2020-11-24-11:01:55	0	0	0	0	0	17	17	day	1
 2011230910	2020-11-23-09:10:07	2020-11-23-10:30:49	0	0	0	0	0	17	17	day	1
 2011201245	2020-11-20-12:45:26	2020-11-20-16:02:08	0	0	0	0	0	17	17	day	1
 2011161758	2020-11-16-17:58:34		0	0	0	1	0	6	19	day	1

CLOSE

Visualise Previous Job Runs

t07r_20120101_000_1_SIM 

Start: 2012 01 01 End: 2012 01 02

Section: SIM

Member: 000 Chunk: 1

Historical data for t07r_LOCAL_SEND_STATIC 

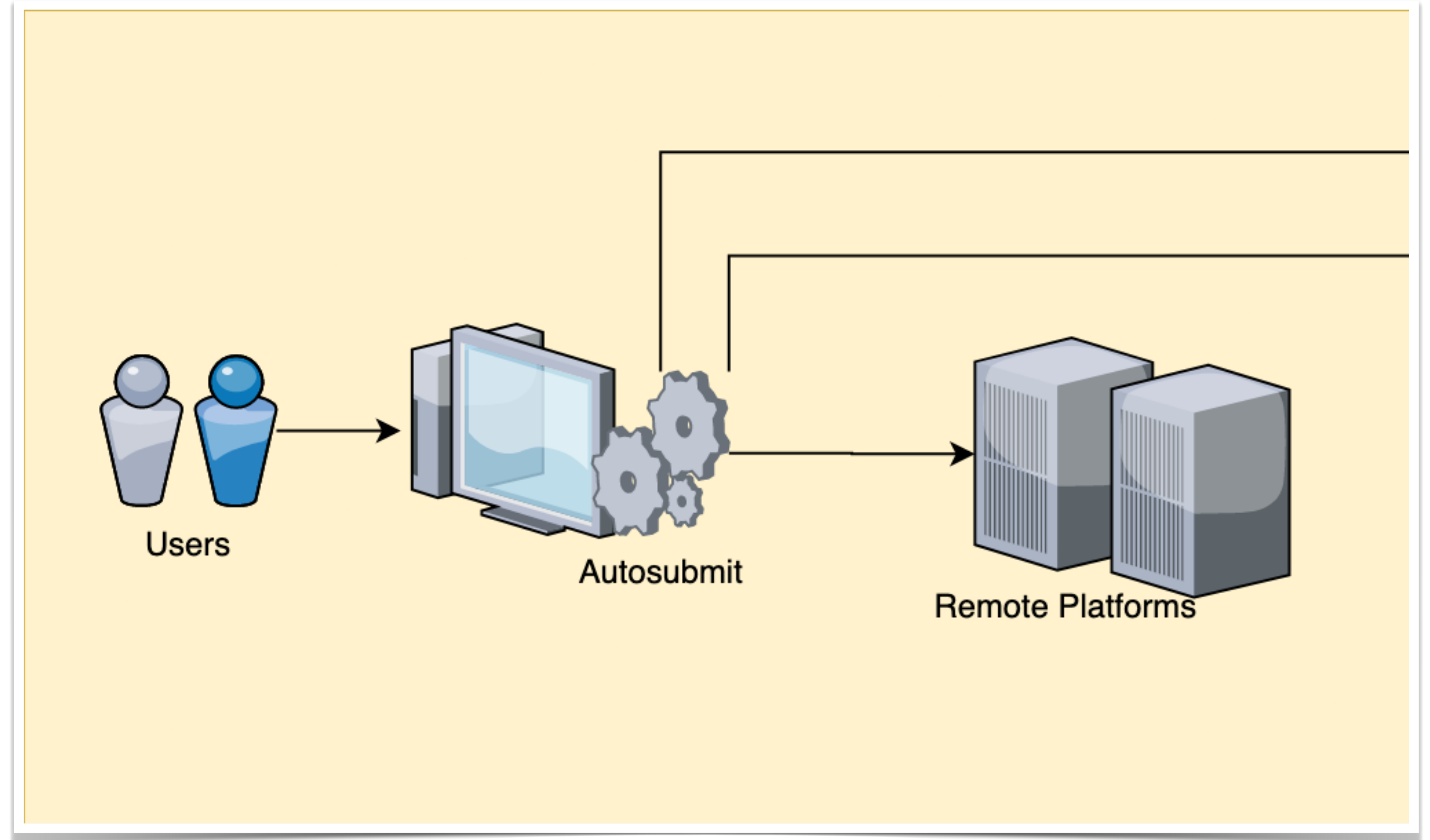
RunId	Counter	JobId	Submit	Start	Finish	Queue	Run	Status	Energy	Wallclock	NCpus	NNodes
2107140947	26	16644742	2021-07-14-12:33:22	2021-07-14-12:43:15	2021-07-14-12:44:04	0:09:53	0:00:49	COMPLETED	72K	00:40	144	3
2107131655	25	16641397	2021-07-13-19:49:05	2021-07-13-19:54:07	2021-07-13-19:55:00	0:05:02	0:00:53	COMPLETED	72K	00:40	144	3
2105061844	24	15659665	2021-05-06-21:19:10	2021-05-06-21:30:54	2021-05-06-21:31:48	0:11:44	0:00:54	COMPLETED	74K	00:40	144	3
2105051821	23	15646464	2021-05-05-22:47:02	2021-05-05-22:48:33	2021-05-05-22:49:25	0:01:31	0:00:52	COMPLETED	70K	00:40	144	3
2104201713	21	15372879	2021-04-20-20:36:12	2021-04-20-20:59:21	2021-04-20-21:00:47	0:23:09	0:01:26	COMPLETED	94K	00:40	144	3
2104161417	20	15307077	2021-04-16-15:44:22	2021-04-16-15:44:32	2021-04-16-15:45:37	0:00:10	0:01:05	COMPLETED	74K	00:40	144	3
2104141643	19	15259444	2021-04-14-18:03:16	2021-04-14-18:08:18	2021-04-14-18:10:11	0:05:02	0:01:53	COMPLETED	89K	00:40	144	3
2103111757	18	14695839	2021-03-11-18:45:51	2021-03-11-18:45:52	2021-03-11-18:46:49	0:00:01	0:00:57	COMPLETED	73K	00:40	144	3
2103051809	17	14691306	2021-03-11-10:18:21	2021-03-11-10:30:02	2021-03-11-10:30:57	0:11:41	0:00:55	COMPLETED	72K	00:40	144	3
2102111924	16	14189587	2021-02-11-21:11:18	2021-02-11-21:20:30	2021-02-11-21:21:33	0:09:12	0:01:03	COMPLETED	70K	00:40	144	3
2101281826	14	13940058	2021-01-28-19:32:21	2021-01-28-19:45:01	2021-01-28-19:46:04	0:12:40	0:01:03	COMPLETED	74K	00:40	144	3
2101111406	12	13653937	2021-01-11-17:43:06	2021-01-11-17:57:31	2021-01-11-17:58:46	0:14:25	0:01:15	COMPLETED	71K	00:40	144	3
2012151311	11	13309128	2020-12-15-15:01:32	2020-12-15-15:39:25	2020-12-15-15:40:25	0:37:53	0:01:00	COMPLETED	71K	00:40	144	3
2011251019	10	13287788	2020-12-14-13:52:44	2020-12-14-13:59:02	2020-12-14-13:59:56	0:06:18	0:00:54	COMPLETED	71K	00:40	144	3
2011241013	9	12730607	2020-11-24-10:57:54	2020-11-24-10:57:57	2020-11-24-10:58:50	0:00:03	0:00:53	COMPLETED	71K	00:40	144	3
2011230910	8	12692689	2020-11-23-10:14:02	2020-11-23-10:26:22	2020-11-23-10:27:20	0:12:20	0:00:58	COMPLETED	69K	00:40	144	3
2011201245	7	12601698	2020-11-20-15:48:43	2020-11-20-15:57:05	2020-11-20-15:58:06	0:08:22	0:01:01	COMPLETED	74K	00:40	144	3
NA	5	11110770	2020-07-29-19:17:58	2020-07-29-19:18:37	2020-07-29-19:19:35	0:00:39	0:00:58	COMPLETED	NA	00:40	136	0
NA	4	11106566	2020-07-29-13:18:28	2020-07-29-13:19:05	2020-07-29-13:19:58	0:00:37	0:00:53	COMPLETED	NA	00:40	136	0
NA	3	11091393	2020-07-28-19:16:33	2020-07-28-19:27:36	2020-07-28-19:28:37	0:11:03	0:01:01	COMPLETED	NA	00:40	136	0
NA	2	11080617	2020-07-28-10:52:59	2020-07-28-10:54:00	2020-07-28-10:54:57	0:01:01	0:00:57	COMPLETED	NA	00:40	136	0

CLOSE

Where it all starts

Autosubmit

- Our users interact with Autosubmit through their **terminals**.
- Autosubmit interacts with remote platforms. It submits jobs, checks their status, retrieves logs, and other useful tasks.
- This **process generates information**.



Autosubmit

```
Scripts OK
Autosubmit is running with v3.13.0b
Checking the connection to all platforms in use
[transfer_node] Connection successful to host bscearth000
[transfer_node] Correct user privileges for host bscearth000
[marenostrum4] Connection successful to host mn1.bsc.es
[marenostrum4] Correct user privileges for host mn1.bsc.es

590 of 590 jobs remaining (10:42)
a29z_LOCAL_SETUP submitted

590 of 590 jobs remaining (10:42)
Job a29z_LOCAL_SETUP is RUNNING

590 of 590 jobs remaining (10:42)
Job a29z_LOCAL_SETUP is RUNNING

590 of 590 jobs remaining (10:43)
Job a29z_LOCAL_SETUP is COMPLETED
a29z_REMOTE_SETUP submitted
```

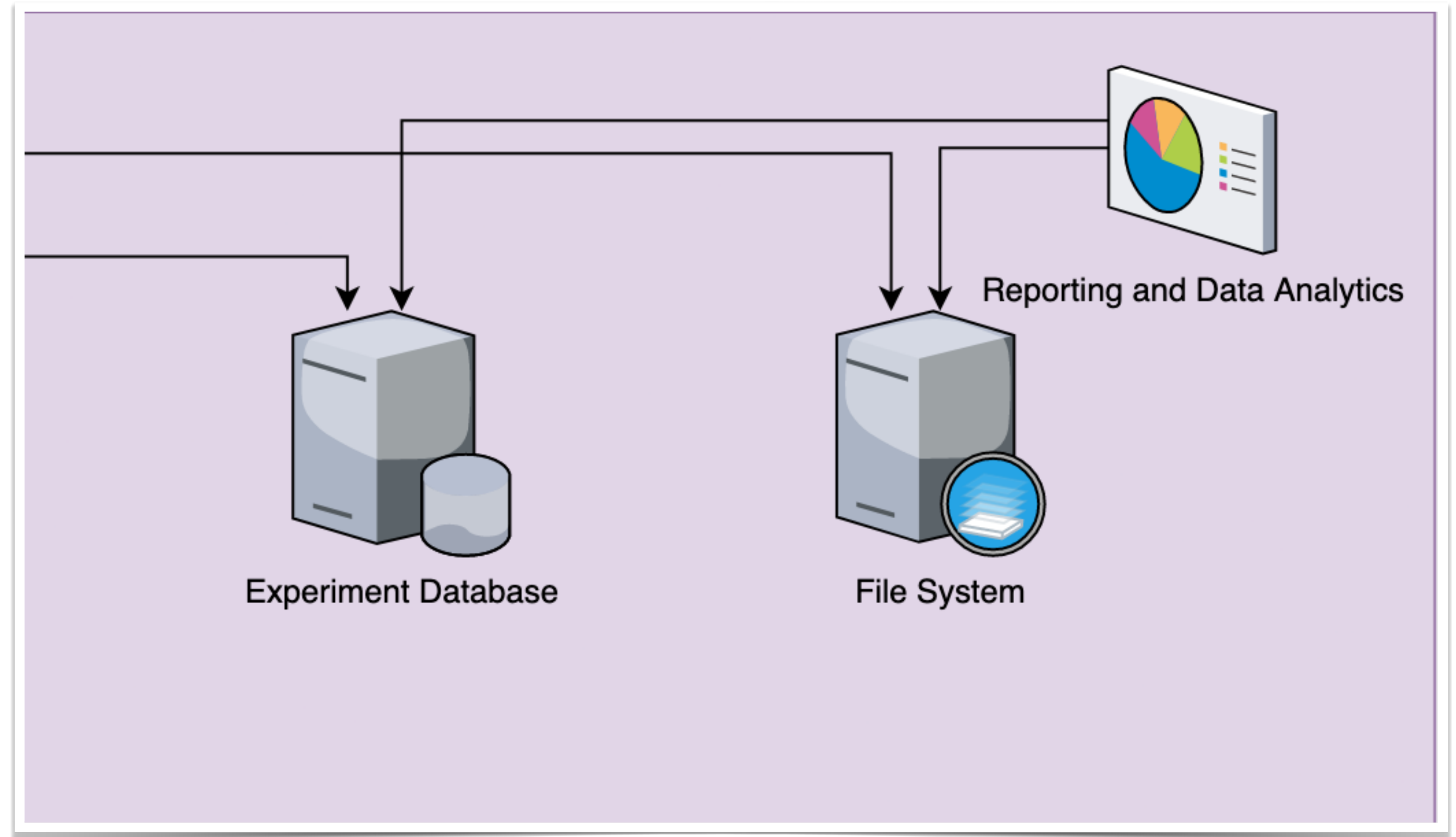
```
# DATELIST = 20000101 19[60-65]
DATELIST = 20000101 20000102
# Supply the list of members. Format fcX
# You can also use an abbreviated syntax for multiple members: fc[0 1 2] <=> fc0 f
# fc[0-2] <=> fc0 fc1 fc2
# MEMBERS = fc0 fc0 fc1 fc2 fc3 fc4
# MEMBERS = fc0 fc[0-4]
MEMBERS = fc[0-6]
# Chunk size unit. STRING = hour, day, month, year
CHUNKSIZEUNIT = month
# Chunk size. NUMERIC = 4, 6, 12
CHUNKSIZE = 12
# Total number of chunks in experiment. NUMERIC = 30, 15, 10
NUMCHUNKS = 12
# Initial chunk of the experiment. Optional. DEFAULT = 1
CHUNKINI =
# Calendar used. LIST: standard, noleap
CALENDAR = standard
# TEST
RUN_ONLY_MEMBERS =

[project]
# Select project type. STRING = git, svn, local, none
# If PROJECT_TYPE is set to none, Autosubmit self-contained dummy templates will
PROJECT_TYPE = none
# Destination folder name for project. type = STRING, default = leave empty,
PROJECT_DESTINATION =

# If PROJECT_TYPE is not git, no need to change
[git]
# Repository URL STRING = 'https://github.com/torvalds/linux.git'
PROJECT_ORIGIN =
# Select branch or tag, STRING, default = 'master', help = {'master' (default), '
PROJECT_BRANCH =
# type = STRING, default = leave empty, help = if model branch is a TAG leave emp
PROJECT_COMMIT =
# type = STRING, default = leave empty and will load all submodules, help = loadT
PROJECT_SUBMODULES =
```

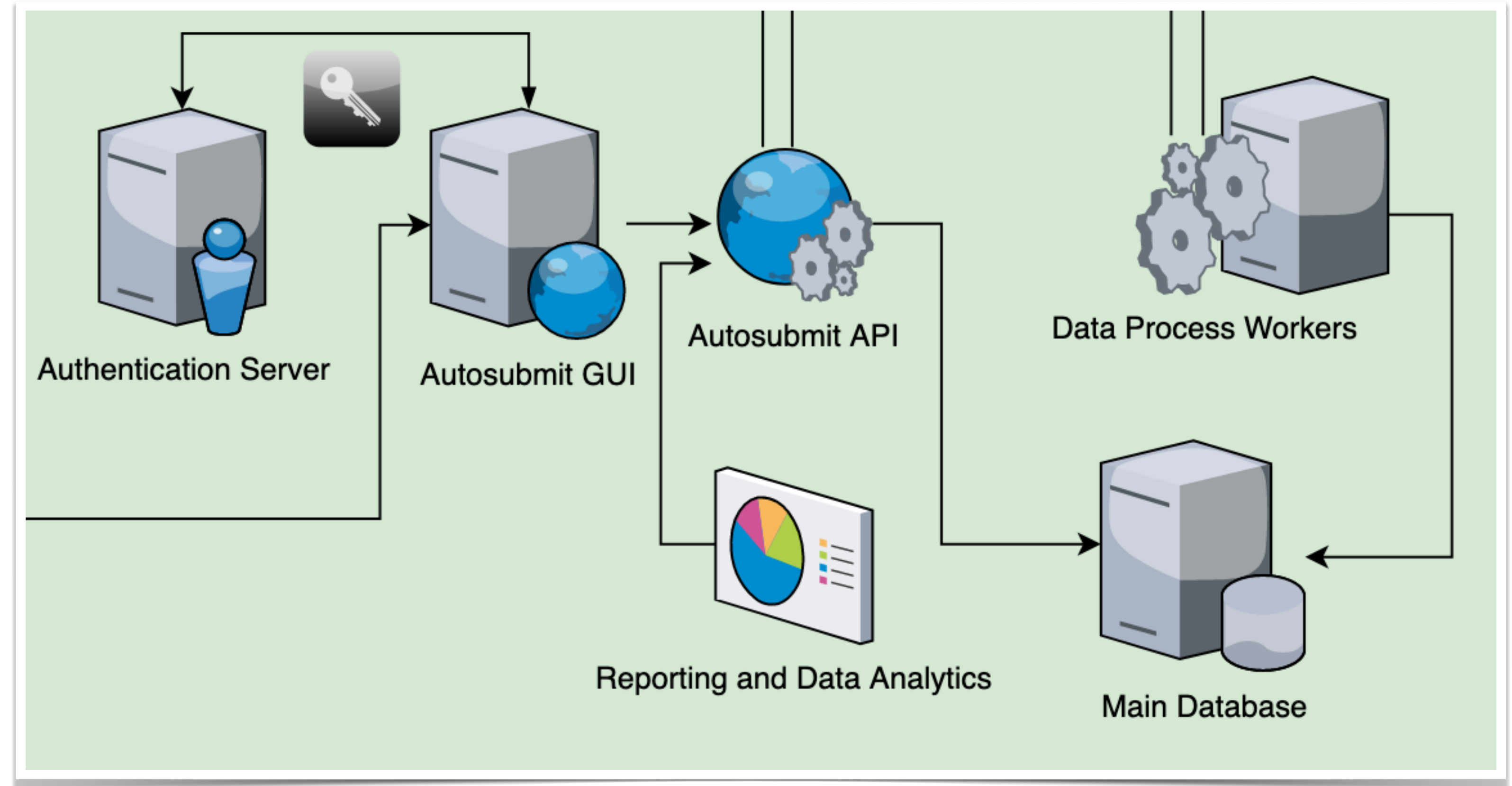

An experiment's execution generates data

- The configuration of an experiment.
- Submit, start, finish, queuing, and running times per job run.
- Number of processors requested, nodes, energy, etc.
- Store information incrementally.

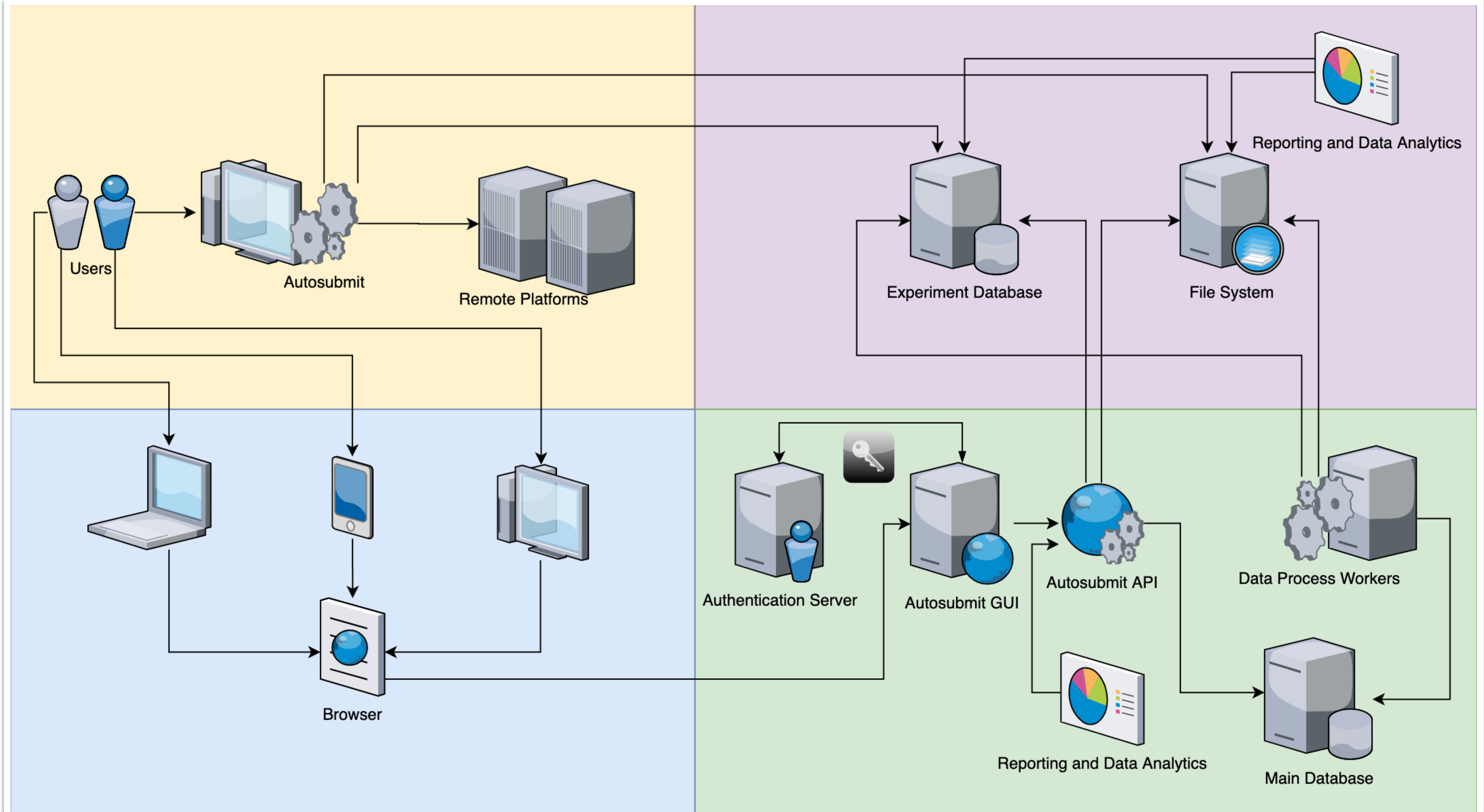


Data Process and Serve

- Automated workers process the information and save it in a **structured** way.
- Our **API** uses the structured information but can also access raw data if necessary.
- Our **GUI** makes **requests** to the **API** and then **presents** the information.
- The users are authenticated through a **Central Authentication Service**.



The Big Picture



Conclusions

- Having a **workflow manager** and a **graphical interface** facilitates the **visibility** and **management** of an experiment.
- We can use the collected information from **many executions** of an experiment to **compare** these executions under a single framework.
- We can use the collected information to provide **consumption metrics**, e.g. Computation hours spent by our users in some **period of time**.
- Users can quickly identify if **changes in the implementation** of a job have resulted in longer running times, **loss of optimisation**.
- Users can **access** the **logs** of their jobs through the interface.
- We provide a quick way to **visualise** all **currently running** experiments, and their **progress**, under our workflow manager.

Next Steps

- Allow the user to **directly perform actions** (create, run, modify, etc.) on the experiment through their browsers by using the **GUI**. This feature implies the addition of further security measures.
- Continue **decoupling** the systems that are part of the distributed system.
- Allow the user to further compare runs of the same experiment.
- Support for **command-output** parsing for more **scheduling** managers. Currently, we support SLURM.
- Improved **database solutions** for specific purposes. Querying certain information can be **computationally expensive** for large experiments under the current schema. We can improve performance by using **specific** database architectures, e.g. key-value databases.

Thank you



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<https://autosubmitgui.bsc.es/presentation/>

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