

## **Production Operations Procedure: Running DIRAC SAM Test Suite**

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**Description:** Running site functional tests using DIRAC SAM suite, how to recover problematic sites.

### **Tools To Use:**

dirac-lhcb-sam-submit-all  
dirac-lhcb-sam-submit-ce  
dirac-admin-site-info  
dirac-admin-ban-site  
dirac-admin-allow-site

### **Useful Links:**

SAM Test Page - <https://lcg-sam.cern.ch:8443/sam/sam.py>  
DIRAC Monitoring - <https://lhcbweb.pic.es/>

### **Procedure:**

Summary of the typical SAM related activities:

- SAM status machine and test description
- Submission of all SAM jobs by hand
- Debugging problematic SAM jobs
- Resolving problematic sites
- Description of SAM Configuration Options

Note: Running SAM tests is restricted to Grid Operators having the lcgadmin VOMS role. The DIRAC3 'SGMEnv' script should be used to obtain the correct execution environment for the procedures outlined below.

This is a first attempt to document the new SAM framework in DIRAC3. A few outstanding actions include:

- Automate SAM job submission in an Agent
- Track jobs that remain perpetually in the waiting state and publish result to the SAM DB
- Maintain list of eligible CEs in the DIRAC CS via regular updates from the BDII and SAM DB.

## SAM Status Machine & Test Description

The SAM status codes with a brief description for the results of our tests are as follows:

- OK 10 - Site has passed all tests
- Info 20 - Not used
- Notice 30 - Not all tests ran, see below
- Warning 40 - Site queue length requirement is not satisfied
- Error 50 - There was a problem during execution of the tests
- Critical 60 - Critical problem found during execution
- Maintenance 100 - Eventually will be set by a SAM agent

The current list of tests we perform start with a check on the presence of a 'lock file' in the shared area. This allows SAM tests to run at multiple CEs with only one being able to write into the shared area. If an existing SAM lock file is detected the software installation test is disabled and the lock test is set to 'Notice'.

SAM Test Name	Description	Log File
CE-lhcb-lock	Places a lock on the shared area	sam-lock.log
CE-lhcb-os	Performs checks on the local system	sam-os.log
CE-lhcb-queues	Checks the site batch queues	sam-queues.log
CE-lhcb-install	Installs the LHCb software	sam-install.log
CE-lhcb-job-<Project>	Runs the <Project> e.g. Gauss, Boole,...	sam-job-<Project>-<Version>.log

A summary of the installed software at the site is given in the SAM test results page and in case of errors, direct links to the log files and LogSE directory are provided.

## Submission of all SAM jobs by hand ( `dirac-lhcb-sam-submit-all` )

There is a pre-prepared DIRAC script to submit SAM jobs to all sites. Executing the following script without any arguments will submit all SAM tests.

```
dirac-lhcb-sam-submit-all
```

If problematic sites are discovered they can be excluded from the daily SAM test submissions by adding the DIRAC site name to the following CS option:

```
/Operations/SAM/BannedSites
```

Eventually this will be automated via an agent that will also track the submitted jobs and report to the SAM DB if jobs are perpetually waiting to start on a given CE.

CERN is a special case for the BannedSites option since tests are normally run by hand for this site.

## Debugging problematic SAM jobs

SAM jobs that are not in the 'OK' status should be carefully checked. Errors for a specific test may be easily spotted but in case this is not clear (often when a more profound error occurs) other available information should be exploited, e.g.

- SAM Results Page
  - o JobID and DIRAC setup
  - o LogSE directory
  - o DIRAC site name
- WMS job information
  - o Sandbox e.g. std.out and std.err
  - o Job logging information
  - o Job Parameters

Anything that is not properly handled should be reported back such that the modules can be updated.

Errors such as incorrect user mappings or shared area permission problems should be immediately flagged and a GGUS ticket opened for the site. Normally these problems should be classed as 'Critical'.

## Resolving problematic sites ( dirac-lhcb-sam-submit-ce )

If a SAM job fails for the following reasons:

- Clear failures during installation
- Project execution fails e.g. missing libraries, options or executable

The procedure to follow is:

- Ban the site (also adding the site to the SAM banned sites list)
- Submit a targeted job to the affected site (any CE)

```
$ dirac-lhcb-sam-submit-ce --help
2008-07-31 17:21:08 UTC Framework INFO: Usage:
2008-07-31 17:21:08 UTC Framework INFO: scripts/dirac-lhcb-sam-submit-ce (<options><|<cfgFile>)*
2008-07-31 17:21:08 UTC Framework INFO: Options:
2008-07-31 17:21:08 UTC Framework INFO: -o: --option= : Option=value to add
2008-07-31 17:21:08 UTC Framework INFO: -s: --section= : Set base section for relative parsed options
2008-07-31 17:21:08 UTC Framework INFO: -c: --cert= : Use server certificate to connect to Core Services
2008-07-31 17:21:08 UTC Framework INFO: -h --help : Shows this help
2008-07-31 17:21:08 UTC Framework INFO: - --ce= : Computing Element to submit to (must be in DIRAC CS)
2008-07-31 17:21:08 UTC Framework INFO: - --removeLock= : Force lock removal at site (True/False)
2008-07-31 17:21:08 UTC Framework INFO: - --deleteSharedArea= : Force deletion of the shared area at site
(True/False)
2008-07-31 17:21:08 UTC Framework INFO: - --enable= : Enable flag, set to False for debugging (True/False)
2008-07-31 17:21:08 UTC Framework INFO: - --logUpload= : Log file upload flag (True/False)
2008-07-31 17:21:08 UTC Framework INFO: - --publishResults= : Publish results to SAM DB flag (True/False)
2008-07-31 17:21:08 UTC Framework INFO: - --mode= : Job submission mode (set to local for debugging)
```

In the case of a shared area corruption the targeted job should specify, e.g.

- CE of the site (e.g. --ce = ce101.cern.ch)
- Whether an existing lock file should be forcibly removed (e.g. --removeLock = True)
- Deletion of the shared area (e.g. --deleteSharedArea = True)

For a shared area corruption the cleanest solution is to specify e.g.

```
$ dirac-lhcb-sam-submit-ce --ce=<CE> --removeLock=True --deleteSharedArea=True
```

- After a successful SAM job the site should then be unbanned.

It is important to note that only one corrective job should be sent to the site at a time. Otherwise the removeLock option will allow two jobs to simultaneously write into a shared area.

To quickly obtain the list of CEs for a given DIRAC site name, the following DIRAC script is available:

```
$ dirac-admin-site-info LCG.Bristol.uk
{'CE': 'lcgce01.phy.bris.ac.uk',
'Coordinates': '-02.6021:51.4585',
'Name': 'UKI-SOUTHGRID-BRIS-HEP'}
```