

Job Management

Bordeaux, 28-29/01/2015



DIRAC JDL

DIRAC Commands

Tutorial Exercises

What do you have learned?

JDL is the language used to specify the characteristics and resources required by the job.

For example:

Executable to run and its parameters.

Files to be moved to and from the Worker Node

- ▶ Input files

- ▶ Grid files

and any requirements.

- ▶ JDL is a *de facto* Grid standard for job description

Differences with gLite JDLs

DIRAC is not using JDLs internally, DIRAC transforms the user JDL to DIRAC internal conventions.

Using DIRAC specific matching mechanism for job to resources mapping

Not all the JDLs attributes are allowed in DIRAC.

In particular, there is no Requirements JDL attribute.

Some attributes are interpreted as requirements

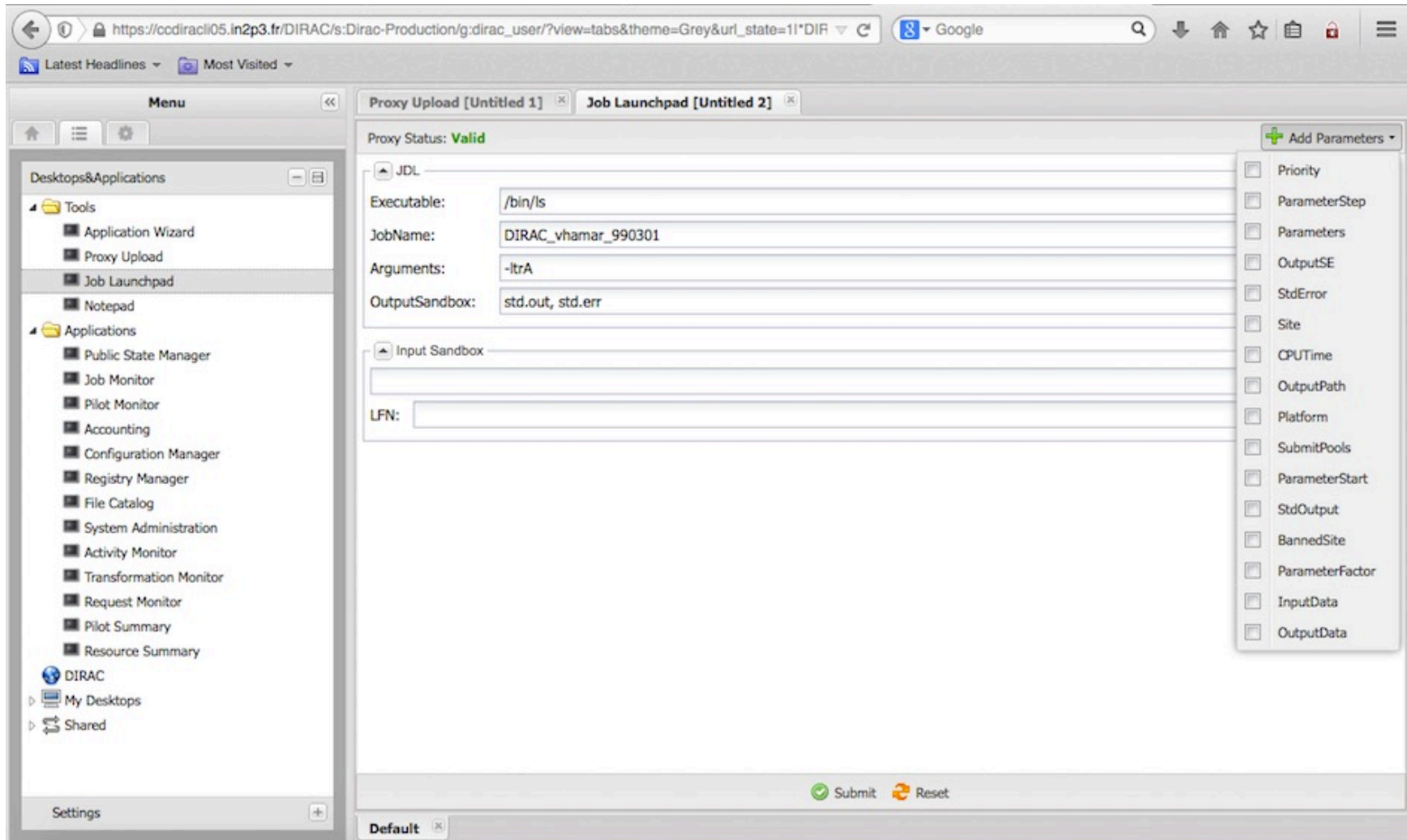
E.g. Site, CPUTime

The JDL syntax consists of statements ended by a semicolon, like:

attribute = value;

Literal strings (for values) are enclosed in double quotes.

Site = "LCG.CPPM.fr";



The screenshot shows the DIRAC Job Launchpad interface in a web browser. The browser address bar shows the URL: `https://ccdiracl05.in2p3.fr/DIRAC/s:Dirac-Production/g:dirac_user/?view=tabs&theme=Grey&url_state=11*DIR`. The interface has a left-hand menu with categories like "Desktops&Applications", "Tools", and "Applications". The "Tools" section is expanded, showing "Application Wizard", "Proxy Upload", and "Job Launchpad". The "Job Launchpad" is selected, and the main area displays the configuration for a job. The "Proxy Status" is "Valid". The "JDL" section contains the following fields:

- Executable: `/bin/lis`
- JobName: `DIRAC_vhamar_990301`
- Arguments: `-ltrA`
- OutputSandbox: `std.out, std.err`

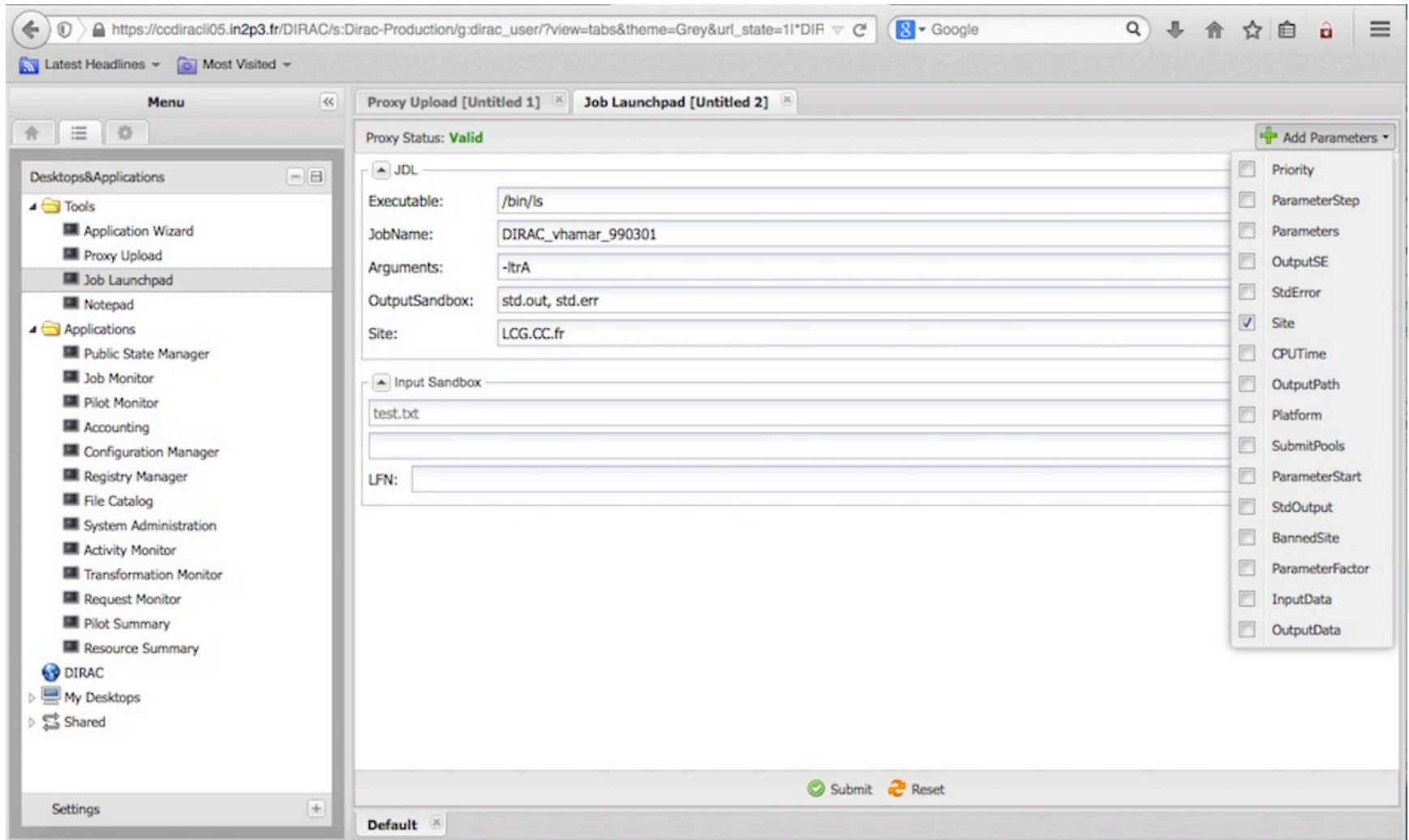
Below the JDL section is an "Input Sandbox" section with an empty text area and an "LFN:" label. On the right side, there is a "Add Parameters" dropdown menu with the following options:

- Priority
- ParameterStep
- Parameters
- OutputSE
- StdError
- Site
- CPUTime
- OutputPath
- Platform
- SubmitPools
- ParameterStart
- StdOutput
- BannedSite
- ParameterFactor
- InputData
- OutputData

At the bottom of the interface, there are "Submit" and "Reset" buttons. The "Submit" button has a green checkmark icon, and the "Reset" button has an orange circular arrow icon.

```
[  
JobName = "Simple_Job";  
Executable = "/bin/ls"; *  
Arguments = "-ltr";  
StdOutput = "StdOut"; *  
StdError = "StdErr"; *  
OutputSandbox = {"StdOut", "StdErr"}; *  
]
```

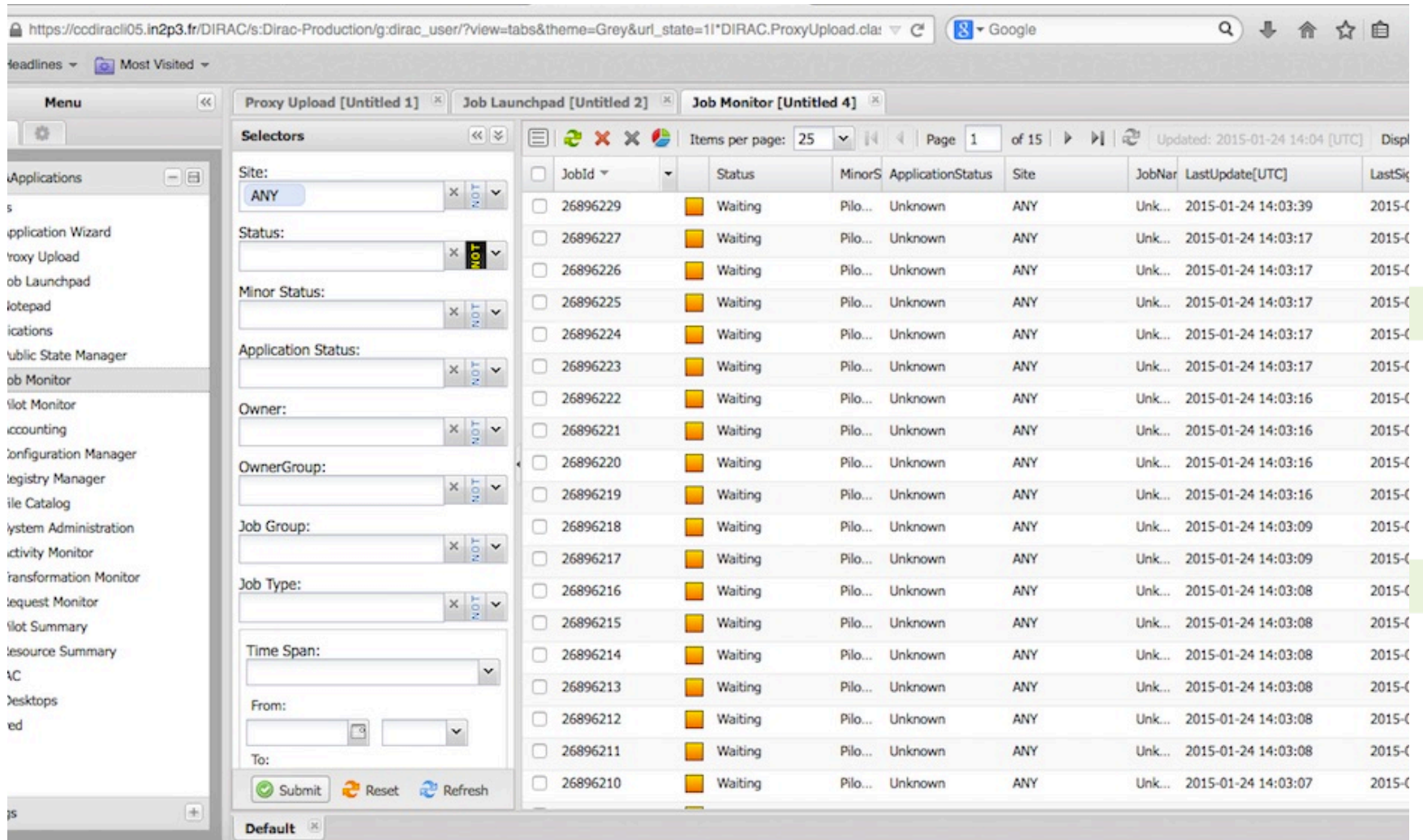
* Mandatory attributes



The screenshot shows the DIRAC Job Launchpad interface. The browser address bar displays the URL: `https://ccdiracl05.in2p3.fr/DIRAC/s:Dirac-Production/g:dirac_user/?view=tabs&theme=Grey&url_state=11*DIR`. The interface includes a menu on the left with categories like Desktops&Applications, Tools, and Applications. The main area is titled "Job Launchpad [Untitled 2]" and shows a "Proxy Status: Valid". The JDL configuration is as follows:

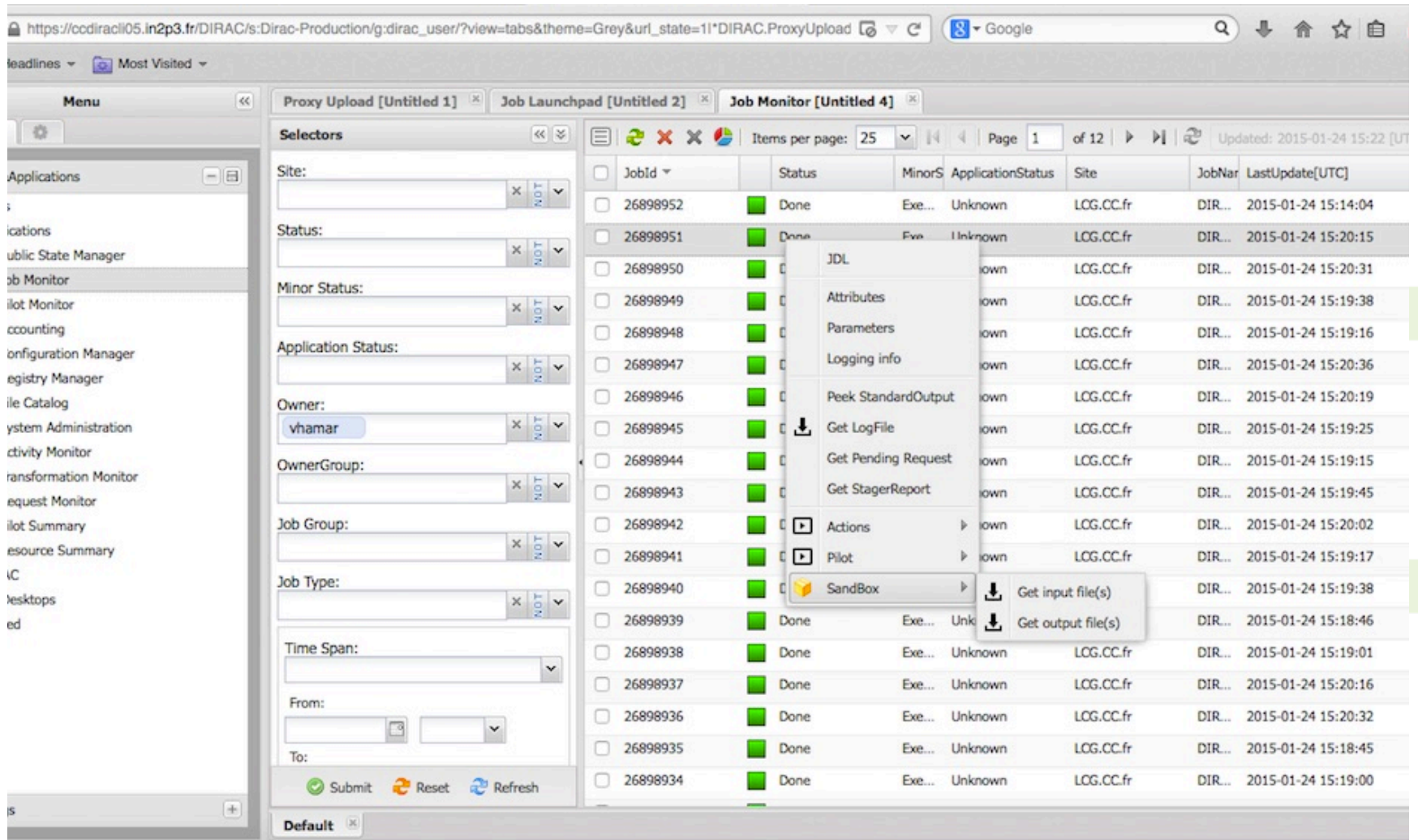
- Executable: `/bin/lis`
- JobName: `DIRAC_vhamar_990301`
- Arguments: `-ltrA`
- OutputSandbox: `std.out, std.err`
- Site: `LCG.CC.fr`

Below the JDL configuration is an "Input Sandbox" section with a file named `test.txt` and an "LFN:" field. A "Submit" button (with a green checkmark) and a "Reset" button (with a red circular arrow) are located at the bottom of the form. A "Default" tab is visible at the bottom left. On the right side, a "Add Parameters" dropdown menu is open, showing a list of parameters with checkboxes: Priority, ParameterStep, Parameters, OutputSE, StdError, Site (checked), CPUTime, OutputPath, Platform, SubmitPools, ParameterStart, StdOutput, BannedSite, ParameterFactor, InputData, and OutputData.



The screenshot shows the DIRAC Job Monitor interface. On the left is a navigation menu with various system management tools. The main area is divided into a 'Selectors' panel on the left and a job list table on the right. The 'Selectors' panel includes filters for Site (ANY), Status, Minor Status, Application Status, Owner, OwnerGroup, Job Group, Job Type, and Time Span. The job list table displays the following data:

JobId	Status	MinorS	ApplicationStatus	Site	JobNar	LastUpdate[UTC]	LastSig
26896229	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:39	2015-01-24 14:03:39
26896227	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:17	2015-01-24 14:03:17
26896226	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:17	2015-01-24 14:03:17
26896225	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:17	2015-01-24 14:03:17
26896224	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:17	2015-01-24 14:03:17
26896223	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:17	2015-01-24 14:03:17
26896222	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:16	2015-01-24 14:03:16
26896221	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:16	2015-01-24 14:03:16
26896220	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:16	2015-01-24 14:03:16
26896219	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:16	2015-01-24 14:03:16
26896218	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:09	2015-01-24 14:03:09
26896217	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:09	2015-01-24 14:03:09
26896216	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:08	2015-01-24 14:03:08
26896215	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:08	2015-01-24 14:03:08
26896214	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:08	2015-01-24 14:03:08
26896213	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:08	2015-01-24 14:03:08
26896212	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:08	2015-01-24 14:03:08
26896211	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:08	2015-01-24 14:03:08
26896210	Waiting	Pilo...	Unknown	ANY	Unk...	2015-01-24 14:03:07	2015-01-24 14:03:07



The screenshot shows the DIRAC Job Monitor interface. On the left, there is a 'Menu' sidebar with various application management tools. The main area is divided into 'Selectors' and a 'Table'.

Selectors:

- Site: [Dropdown]
- Status: [Dropdown]
- Minor Status: [Dropdown]
- Application Status: [Dropdown]
- Owner: vhamar [Dropdown]
- OwnerGroup: [Dropdown]
- Job Group: [Dropdown]
- Job Type: [Dropdown]
- Time Span: [Dropdown]
- From: [Date Picker]
- To: [Date Picker]

Table:

JobId	Status	MinorS	ApplicationStatus	Site	JobNar	LastUpdate[UTC]
26898952	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:14:04
26898951	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:20:15
26898950	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:20:31
26898949	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:38
26898948	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:16
26898947	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:20:36
26898946	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:20:19
26898945	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:25
26898944	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:15
26898943	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:45
26898942	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:20:02
26898941	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:17
26898940	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:38
26898939	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:18:46
26898938	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:01
26898937	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:20:16
26898936	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:20:32
26898935	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:18:45
26898934	Done	Exe...	Unknown	LCG.CC.fr	DIR...	2015-01-24 15:19:00

Context Menu (for Job 26898940):

- JDL
- Attributes
- Parameters
- Logging info
- Peek StandardOutput
- Get LogFile
- Get Pending Request
- Get StagerReport
- Actions
- Pilot
- SandBox
 - Get input file(s)
 - Get output file(s)

In the directory *scripts* of your DIRAC installation there are a lot of commands that can be used for different purposes:

Job Management

Data Management

Proxy Management

Administration of the system

DIRAC WMS

- dirac-wms-job-attributes
- dirac-wms-job-delete
- dirac-wms-job-get-input
- dirac-wms-job-get-jdl
- dirac-wms-job-get-output
- dirac-wms-job-get-output-data
- dirac-wms-job-kill
- dirac-wms-job-logging-info
- dirac-wms-job-parameters
- dirac-wms-job-peek
- dirac-wms-job-reschedule
- dirac-wms-job-status
- dirac-wms-job-submit
- dirac-wms-jobs-select-output-search
- dirac-wms-select-jobs

DIRAC ADMIN

- dirac-admin-add-group
- dirac-admin-add-host
- dirac-admin-add-site
- dirac-admin-add-user
- dirac-admin-allow-catalog
- dirac-admin-allow-se
- dirac-admin-allow-site
- dirac-admin-ban-catalog
- dirac-admin-ban-se
- dirac-admin-ban-site
- dirac-admin-bdii-ce
- dirac-admin-bdii-site
- dirac-admin-ce-info
- dirac-admin-delete-user
- dirac-admin-externals-versions

DIRAC DMS

dirac-dms-catalog-metadata
dirac-dms-change-replica-status
dirac-dms-check-file-integrity
dirac-dms-clean-directory
dirac-dms-data-size
dirac-dms-filecatalog-cli
dirac-dms-fts-monitor
dirac-dms-fts-submit
dirac-dms-get-file
dirac-dms-get-storage-directories
dirac-dms-lfn-accessURL
dirac-dms-lfn-logging-info
dirac-dms-lfn-metadata
dirac-dms-lfn-replicas
dirac-dms-pfn-accessURL
dirac-dms-pfn-metadata
dirac-dms-remove-catalog-files

DIRAC PROXY

dirac-proxy-get-uploaded-info
dirac-proxy-info
dirac-proxy-init
dirac-proxy-upload

DIRAC UTILITIES

dirac-platform
dirac-rss-reassign-token
dirac-rss-renew-token
dirac-service

We will be using COMDIRAC style commands

dsub /bin/hostname

26897474

Job ID

dsub -J Simple.jdl

26897538

Job ID

Options:

- J --JDL <value> : JDL file or inline
- N --JobName <value> : job name
- E --StdError <value> : job standard error file
- O --StdOutput <value> : job standard output file
- --OutputSandbox= : job output sandbox
- --InputSandbox= : job input sandbox
- --OutputData= : job output data
- --InputData= : job input data
- --OutputPath= : job output data path prefix
- --OutputSE= : job output data SE
- --CPUtime= : job CPU time limit (in seconds)
- --Site= : job Site list
- --BannedSite= : job Site exclusion list
- --Platform= : job Platform list
- --Priority= : job priority
- --JobGroup= : job JobGroup
- --Parametric= : comma separated list or named parameters or integer loops (in the form <start>:<stop>[:<step>])
- --ForceExecUpload : Force upload of executable with InputSandbox
- v --verbose : verbose output


```
> dsub
```

```
echo Hello from ` /bin/hostname -f `
```

```
<Ctrl d>
```

```
26898185
```

>dstat

<i>JobID</i>	<i>Owner</i>	<i>JobName</i>	<i>OwnerGroup</i>	<i>JobGroup</i>	<i>Site</i>	<i>Status</i>	<i>MinorStatus</i>	<i>SubmissionTime</i>
26897824	vhamar	testJob.sh	dirac_user	NoGroup	LCG.IN2P3.fr	Waiting	Pilot Agent Submission	2015-01-24 14:48:45

>dlogging 26898185

<i>Status</i>	<i>MinorStatus</i>	<i>ApplicationStatus</i>	<i>Time</i>	<i>Source</i>
Received	Job accepted	Unknown	2015-01-24 14:59:12	JobManager
Checking	JobSanity	Unknown	2015-01-24 14:59:12	JobPath
Checking	JobScheduling	Unknown	2015-01-24 14:59:12	JobSanity
Waiting	Pilot Agent Submission	Unknown	2015-01-24 14:59:12	JobScheduling


```
>doutput 26898185
```

```
>cd 26898185/
```

► Options:

-D --OutputDir <value>: destination directory

--Data: donwload output data instead of output sandbox

--Sandbox: donwload output sandbox, even if data was required

-v --verbose: verbose output

-n --NoJobDir: do not create job directory

-g --JobGroup <value>: Get output for jobs in the given group

All the DIRAC commands are following the UNIX notation for passing arguments to the command

Some options are common to all the commands:

-o to pass any configuration option, e.g.

-o /DIRAC/Setup=DIRAC-Production

-d, -dd, -ddd to choose various levels of the output verbosity

-h to show help message for the command

In the following there are some examples of commonly used commands

Submit “Hello World” job with Web Launchpad

Monitor it

Get results in the Web browser

Submit “Hello World” job with command line tools and COMDIRAC

Edit JDL

Monitor it

Get results with command line tools

Goals

Understand job description

Understanding job Web monitoring and manipulation tools

- ▶ DIRAC Web Portal

<https://dirac.in2p3.fr>

- ▶ Job Submission

<http://diracgrid.org/files/docs/UserGuide/GettingStarted/UserJobs/index.html>

- ▶ COMDIRAC Job Management

<https://github.com/DIRACGrid/COMDIRAC/wiki/Job-Management>



Back-up slides

- ▶ The command used to submit jobs using DIRAC is:

```
dirac-wms-job-submit <JDL>
```

```
$ dirac-wms-job-submit Simple.jdl
```

```
JobID = 11
```



Job ID

The command used to get the job status is:

```
dirac-wms-job-status <Job_ID>
```

```
$ dirac-wms-job-status 11  
JobID=11 Status=Waiting;  
MinorStatus=Pilot Agent Submission;  
Site=ANY;
```

To retrieve job outputs use the command:

```
dirac-wms-job-get-output [ --dir output_dir ] <Job_ID> [<Job_ID>]
```

```
$ dirac-wms-job-get-output --dir this_dir 470 469 468
```

```
$ ls -la this_dir/
```

```
total 20
```

```
drwxr-xr-x 5 hamar dirac 4096 Oct 26 19:02 .  
drwxr-xr-x 3 hamar dirac 4096 Oct 26 19:02 ..  
drwxr-xr-x 2 hamar dirac 4096 Oct 26 19:02 468  
drwxr-xr-x 2 hamar dirac 4096 Oct 26 19:02 469  
drwxr-xr-x 2 hamar dirac 4096 Oct 26 19:02 470
```