



# “ALICE Grid/Analysis Tutorial” Exercise-Solutions

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# Exercise 1 Installation



1. Install your GLOBUS certificate in `$HOME/.globus`
  - Convert to a `userkey.pem` and `usercert.pem` file, if you have only one pk12 certificate file
2. Install the ALICE GRID client software
  - Download the alien-installer
  - Run the alien-installer and install the lightweight GRID client packages from release version 2.12 (gShell,xrootd,root) into `$HOME/alien-v2.12`
3. Setup your `PATH` and `LD_LIBRARY_PATH` environment variable:
  - Modify your `.bashrc` or `.tcshrc` files (or similar)
  - Add `$HOME/alien-v2.12/api/bin` to `PATH`
  - Add `$HOME/alien-v2.12/api/lib` to `LD_LIBRARY_PATH`

# Exercise 2

## Authentication



1. Obtain an token by using alien-token-init
  - Don't forget to put your ALICE user name as the 1<sup>st</sup> argument
  - If you are prompted for the GRID passphrase, put the password connected to your GLOBUS certificate
2. Inspect the token environment file /tmp/gclient\_env\_\$\$UID
3. Inspect the token file /tmp/gclient\_token\_\$\$UID
4. Check your token with alien-token-info

# Exercise 3

## aliensh - basics



- Start aliensh
  1. Change into your home directory (3 ways possible)
  2. Get your username
  3. Try to see, who is connected
  4. Get your current working directory with a shell command
  5. List all the files in your homedirectory
  6. Try the tab completion (f.e. ls /ali [tab] )
  7. Navigate through the file catalogue with relative and absolute path names – use also “..” “-” “~” “/”
  8. Create the directories
    - ~/bin ~/jdl ~/var ~/xml ~/test
  9. Remove the ~/test directory

# Exercise 4.1

## File/Data Management



1. Copy the file `/alice/cern.ch/tutorial-asia/bin/bin/batch.sh` into the `bin` directory in your home directory
  - Verify the location of the physical file using the “whereis” command
2. Look at `batch.sh` using “cat”, “more” & “less”
3. Get information about
  - File permissions
  - GUID
  - MD5 sum
4. Erase your copy and copy the file again into the storage element `ALICE::CERN::se01`
  - Verify the location of the physical file using the “whereis” command
5. Set your `EDITOR` environment variable to your editor of choice
6. Open the file `~/bin/batch.sh` with the `aliensh` editor
  - Add an empty line in the end and save the file
  - Try to find the previous version of the file in the file catalogue
  - Clean-up the previous version of the file using the “purge” command

# Exercise 4.2

## File/Data Management



1. Copy the file `~/bin/batch.sh` into your local `/tmp` directory
2. Copy the file `~/bin/batch.sh` into your local working directory
3. Erase the file `~/bin/batch.sh`
4. Copy a local `batch.sh` file to the GRID file `~/bin/batch.sh` stored in `ALICE::CERN::se01`
5. Query all files under the path `/alice/cern.ch/tutorial-asia`
  - by printing on the screen
  - pipe the output into the local file `/tmp/querytest`
  - Count the number of files using the shell pipe mechanism and `'wc -l'`

# Exercise 5

## GRID access from ROOT



1. Download the ROOT startup script 'root.sh' from the file catalogue to your local home directory
  - **aliensh: /alice/cern.ch/tutorial-asia/root/root.sh**
2. Run the root.sh script to startup ROOT
3. Try to authenticate in ROOT using
  - **root> TGrid::Connect("alien://");**
4. Try to open directly an ALICE GRID file
  - **root> TFile::Open("alien:///alice/cern.ch/tutorial-asia/root/AliESDs.root");**
5. Try to inspect the open file with the ROOT Browser
  - **root> new TBrowser();**

# Exercise 6.1

## Job Management Commands



1. Get a list of available software packages
2. Check your priorities in the queue system
3. Get the 10 highest ranked jobs presently in the queue
4. Display the status of all sites

# Exercise 6.2

## Job Management



- Prepare an analysis job example in your home directory
  1. Change into the directory `/alice/cern.ch/tutorial-asia/batch`
  2. Copy all files from `var/ xml/ jdl/` to your home directories (`~/bin ~/var ~/xml ~/jdl`) into storage element `ALICE::CERN::se01`
  3. Edit the JDL file `~/jdl/batch-analysis.jdl`
  4. Correct the paths in `InputFile` & `InputDataCollection` to the proper paths in your home directory
  5. Submit the edited JDL file
  6. Follow the progress of the job
    - Monitor with the 'ps' command
    - Retrieve your job JDL with the 'ps' command
    - Get a job trace with the 'trace' command
    - When the job runs, spy on the output of the stdout file in the job sandbox
  7. Find the output of the job in the `/proc` directory
    - Download all output files to your local computer

## Exercise 6.3 Job Management



1. Modify the JDL to split into 5 sub jobs
2. Submit the Job
3. Wait for your jobs to finish
4. Merge all ROOT output files using the 'histomerge.C' macro