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CRAB Prerequisites

Grid certificate

Get a Grid certificate and the registration to CMS VO

CRAB submits jobs to the Grid (LCG), so you need to run it from an User Interface, with a valid certificate, issued by your appropriate Certification Authority, and have a valid proxy. You need also to be registered on VORMS server. To get a certificate from CERN CA and register to CMS VO, you can find detailed instruction in the SWGuideLcgAccess page. If you get a certificate from another Certification Authority, the procedure to register to CMS VO with your certificate should be the same.

Setup your certificate for LCG

See instructions in this Offline Workbook page

Test your grid certificate

1. Is your personal certificate able to generate Grid proxies? To find out, after having setup your environment run this command:

   ```
   grid-proxy-init -debug -verify
   ```

   In case of failure, the possible causes are:

   - the certificate/key pair is not installed in `$HOME/.globus/usercert.pem` `$HOME/.globus/userkey.pem` (a.k.a. "pem files")
   - the certificate has expired
   - the certificate and the private key do not match

   In the first case, you either do not have a certificate at all or have to install it on the UI; in the second case, you should get a new certificate; in the third case you probably have incorrectly installed your certificate.

2. Are you a member of the CMS VO? To see if this is the case, you can execute this command:

   ```
   voms-proxy-init -voms cms
   ```

   If you get an error, chances are that you did not register to the CMS VO, or your registration expired. In this case, please follow the instructions in the SWGuideLcgAccess page

3. You can verify the expiration date of your certificate with:

   ```
   openssl x509  -subject -dates -noout  -in $HOME/.globus/usercert.pem
   ```

4. see also: https://twiki.cern.ch/twiki/bin/view/CMSPublic/SWGuideVomsFAQ

SiteDB registration

There is no such need since end of 2018. Forget about SiteDB

CMSSW

Get CMSSW

Please refer to section Access CMSSW Code of the CMS Offline WorkBook.

Test the code locally

Before launching a million event analysis job on Grid, be sure to test your code locally in a clean area.

1. Build a new CMSSW area (for example, CMSSW_7_4_15_...; pick as appropriate to your job):

   ```
   cmsrel CMSSW_7_4_15
   cd CMSSW_7_4_15/src
   cmsenv
   ```
2. Check-out from the cvs repository only the code or configuration files you need to modify, and build your local libraries including your analysis code.
3. Make sure that the code you check-out is compatible with the CMSSW version you are using.
4. Make sure that the CMSSW version you are using is compatible with the data you intend to read.
5. Prepare a test job accessing the data you will access in your Grid job. There are several ways to read the proper data:
   - The easiest way is to use the xrootd service to read data directly from a remote site. How to do this is explained in Using Xrootd Service for remote Data Accessing.
   - You can also use the xrootd service to copy a data file from a suitable dataset to your local machine (to work w/o network e.g.), as explained in File download with command-line tools.
   - If no suitable files exist, you can generate some events using the configuration file which is available from the DAS⧉ service.
6. Test your CMSSW configuration file locally in order to avoid problems with the ParameterSet parsing.
7. Run the job interactively (e.g. at CERN on lxplus):

   ```
   cmsRun your-pset-config-file.py
   ```

Validate a CMSSW config file

In CRAB2, a user can validate its CMSSW configuration file by launching `crab -validateCfg` after creating the task with `crab -create`. In this way the configuration file will be controlled and validated by a corresponding python API. Note that it is **not** enough to check that the configuration file runs interactively, because in interactive mode CMSSW is too tolerant with python errors in that configuration file. At times a user may worry that the problem is in CRAB or CRAB validation rather than in the configuration file; in this case, one can use the following test, which does not involve CRAB:

```
edmConfigHash your-pset-config-file.py
```

Note that this is needed, but not necessarely sufficient, to have a valid CMSSW configuration file. Other problem could be related to some hidden charatecters (^M) in the configuration file, overall if it was downloaded from the web. To discover them you can use the command

```
cat -v your-pset-config-file.py
```

and remove them with the command

```
perl -pi -e 'tr/\cM//d;' your-pset-config-file.py
```

Then you can revalidate the configuration file again.

Figuring out what data to analyze

This section is documented in chapter Locating Data Samples of the CMS Offline WorkBook.

CRAB client installation and setup the environment

Use CRAB at CERN

please see SWGuideCrab, in particular :
https://twiki.cern.ch/twiki/bin/view/CMSPublic/CRAB3CheatSheet#Environment_setup

Use CRAB outside CERN

Preferred way: use CVMFS

1. Setup the Grid UI according to your site directions
2. Follow same instructions as at CERN (CVMFS is globally available)

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-- MarcoCalloni - 28-Jan-2010

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