Overview of DIRAC efforts in WP3

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Outline

- DIRAC interware

- CORSIKA application in DIRAC: **Con**tainers for **COR**SIKA on **DI**RAC

- Other recent development of possible interest for WP5

DIRAC Interware

- DIRAC workload management with the GRID infrastructure

- Job submission/management/monitoring

- Bookkeeping

- File catalog

Why CORSIKA?

- Widely used in the astroparticle community

- Different scenarios for its usage are foreseable

    - Starting point for many possible analysis at different observatories

    - Common production inputs could be of interest

- Provide a common framework for generation of simulated data

CORSIKA on DIRAC - 1ˢᵗ trial

- Starting point: CORSIKA singularity containers on the ESCAPE gitlab **escape_corsika** with basic scripts to run simulations interactively and on the GRID with DIRAC

  - Docker containers + singularity files produced via WebGUI prepared by **Daniele Zito**

    - ~20 containers available with some common options for CORSIKA compilation

    - Singularity container built beforehand in sandbox and collected in the git repo

  - Instructions to run DIRAC jobs using the (dockerised) dirac-client for EGI are provided

    - Requires grid certificate and DIRAC auth

1ˢᵗ DIRAC application for CORSIKA

- Python script job launcher:

  - Choose among one of the available CORSIKA container options

    (containers are currently identified by a numerical ID – prepare beforehand by Daniele Zito using WebGUI and compilation options tracked on a .csv file)

    - According to the list available on gitlab

    - Script -h provides descriptions of the containers

  - Provide runtime inputs

    - Basic CORSIKA input provided, can be expanded by user

    - Requires some knowledge of CORSIKA

  - Prepare the parametric DIRAC job and submit it

  - https://gitlab.in2p3.fr/escape-corsika/demo-containers-for-corsika/-/blob/dirac_corsika/corsika_for_dirac/corsika.py

  - Under test – will be further developed after feedbacks from users (D. Nieto, S.M. Stellacci, D. Spisso)
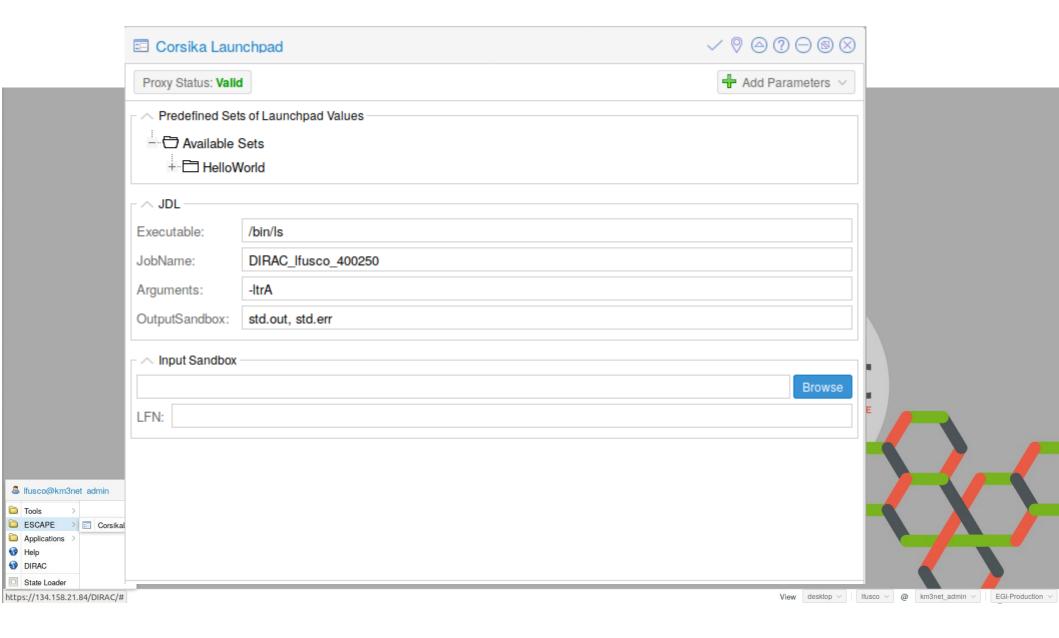
DIRAC application for CORSIKA - GUI

- GUI development started

  - Entire application development within DIRAC

  - *EscapeDIRAC* extension to the DIRAC framework that contains a **CorsikaLaunchpad** web application

    - Services being implemented

      1) CORSIKA container creation/management – porting of the current WebGUI developed by D. Zito being finalised

      2) CORSIKA runtime inputs definition

      3) CORSIKA on DIRAC job description – launcher – management

    - Development following DIRAC guidelines and structures

DIRAC application for CORSIKA - GUI

What does it look like on the dev machine at https://134.158.21.85/DIRAC

DIRAC application for CORSIKA - GUI

Corsika compilation options tab

Select an already prepared container

Detector configuration

Hadronic model

LE EM model

...

Corsika inputs preparation

Select an already prepared inputfile

Primary nucleus

Energy range

Energy Spectrum

...

Submit DIRAC job(s)

Both simple submit (i.e. run the current corsika.py) and "expert" options (for tests/debug and large scale productions)

– Allow usage from both unexperienced and experts
– Take into account use-cases from various experiments (e.g. KM3NeT and CTA)
– Metadata both for container generation and production applications (e.g. possibility to retrieve inputs for past simulations, already prepared containers etc.)
– Provide control plots, consistency checks etc.
– ...

Further developments

- Notebook based DIRAC interface available – development being finalised

- It should be possible to have this in next DIRAC releases