

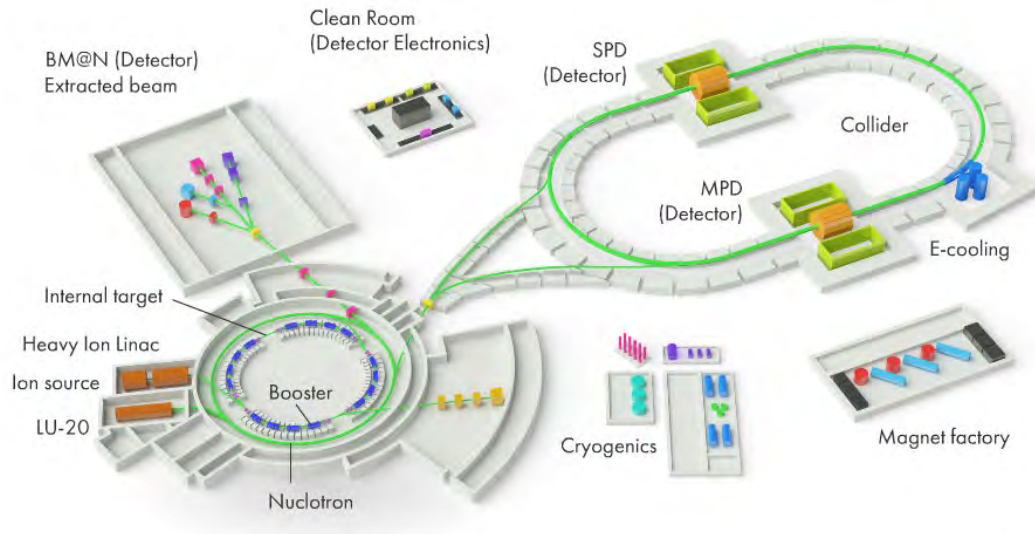


Usage of DIRAC workload management system for distributed data processing in the BM@N experiment

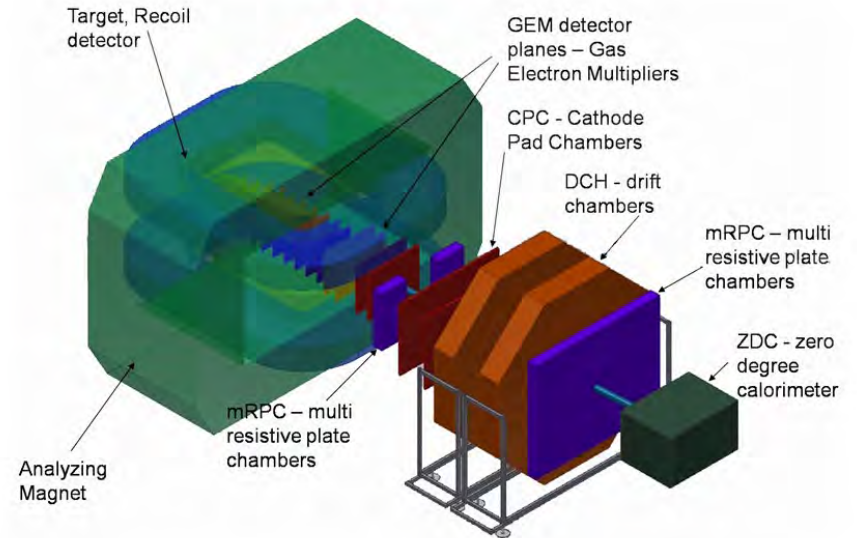
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Baryonic Matter @ Nuclotron



Structure of the NICA facility



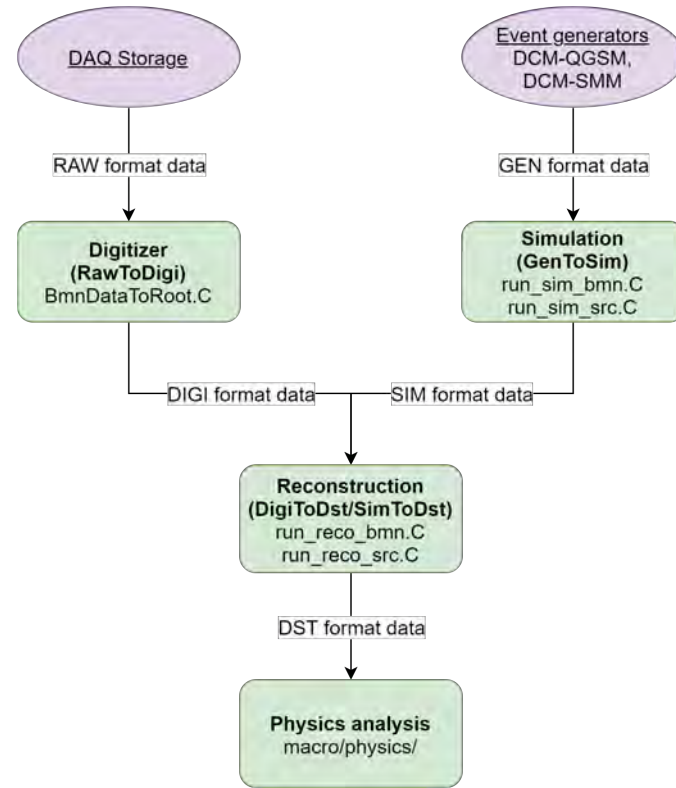
BM@N detector

BM@N stored data types

Type	Description
RAW	Binary event data written by DAQ
DIGI (digits)	Detector digits after digitizer macro
DST _{EXP}	Hits, tracks, vertex and other reconstructed events data
GEN	Simulated events description
DST _{SIM}	Reconstructed events + model information for comparison

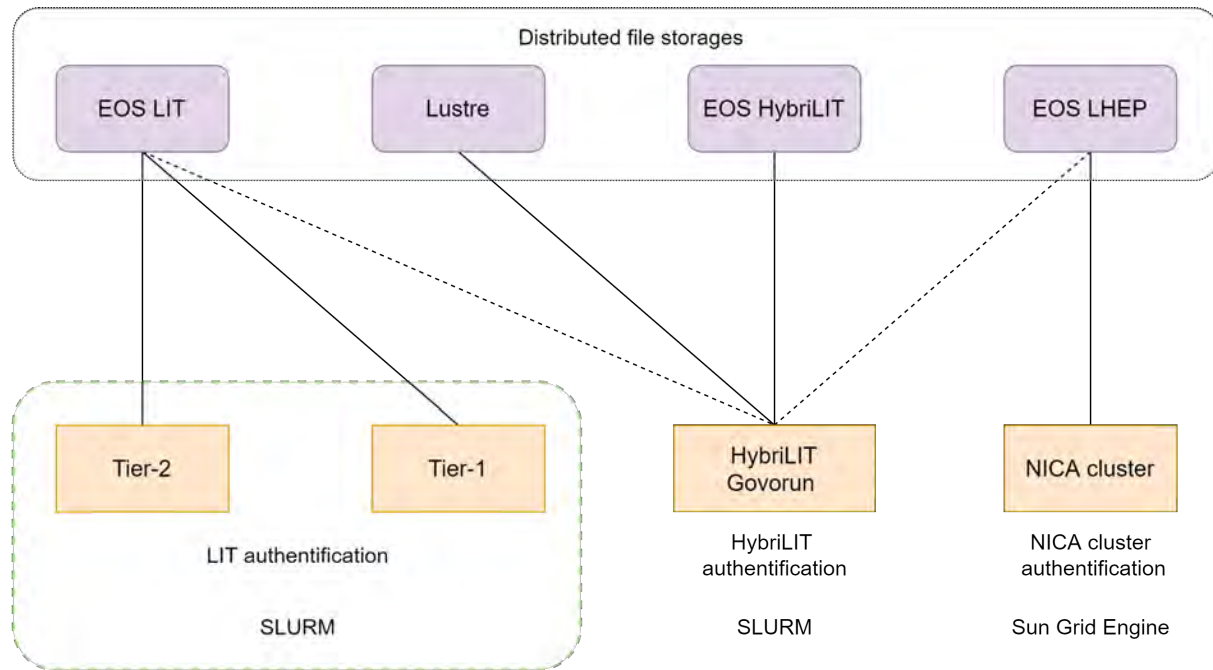
Event data processing workflow

The BmnRoot software contains all the macros necessary for event data processing of the BM@N experiment.



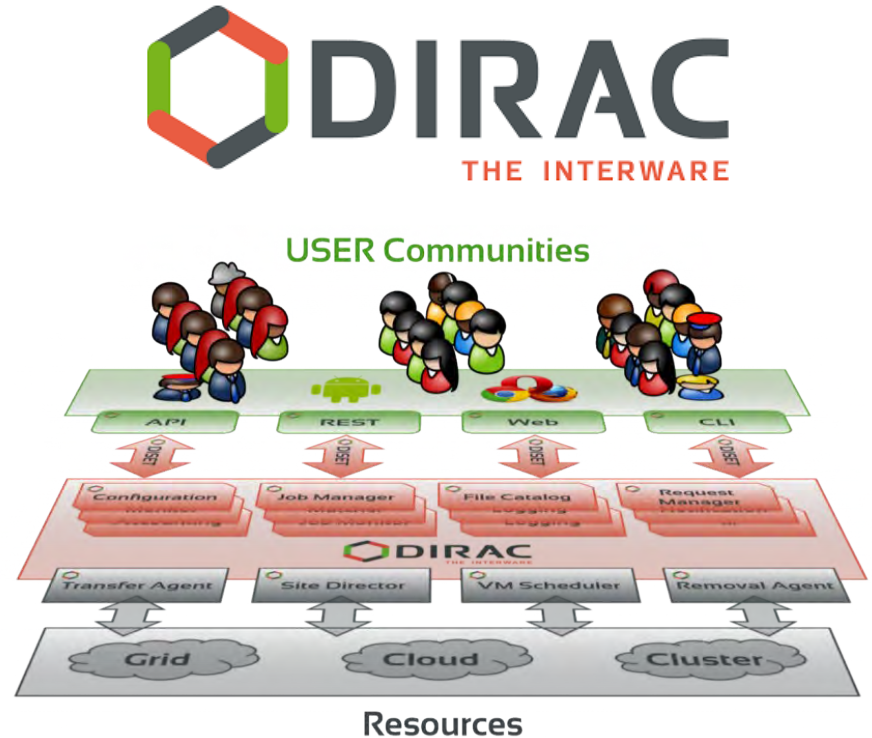
Available computing resources

- JINR MICC (Multifunctional Information and Computing Complex):
 - 1) Tier-1 and Tier-2 GRID centers
 - 2) "Govorun" supercomputer
- NICA offline cluster

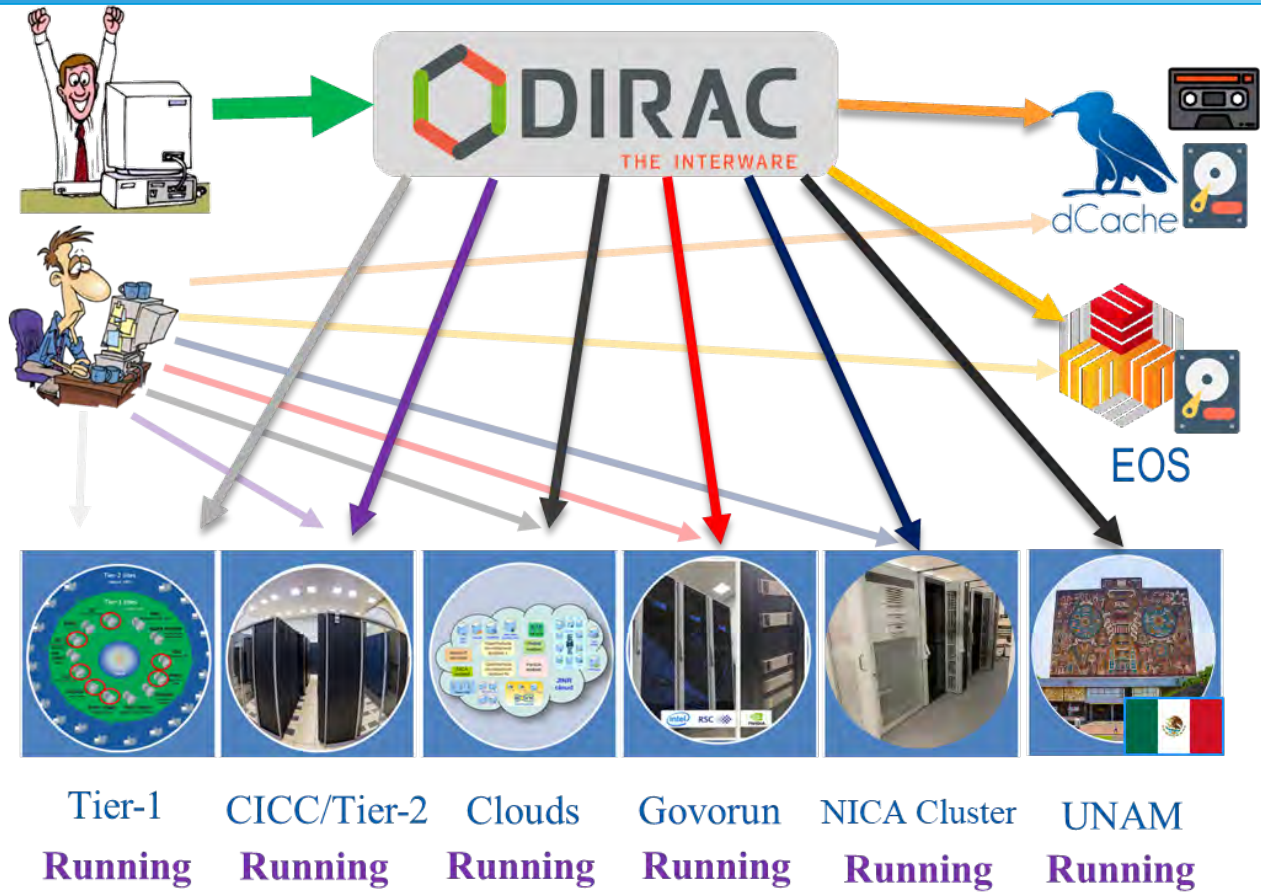


DIRAC Interware

DIRAC provides all the necessary components to build ad-hoc grid infrastructures interconnecting computing resources of different types, allowing interoperability and simplifying interfaces.

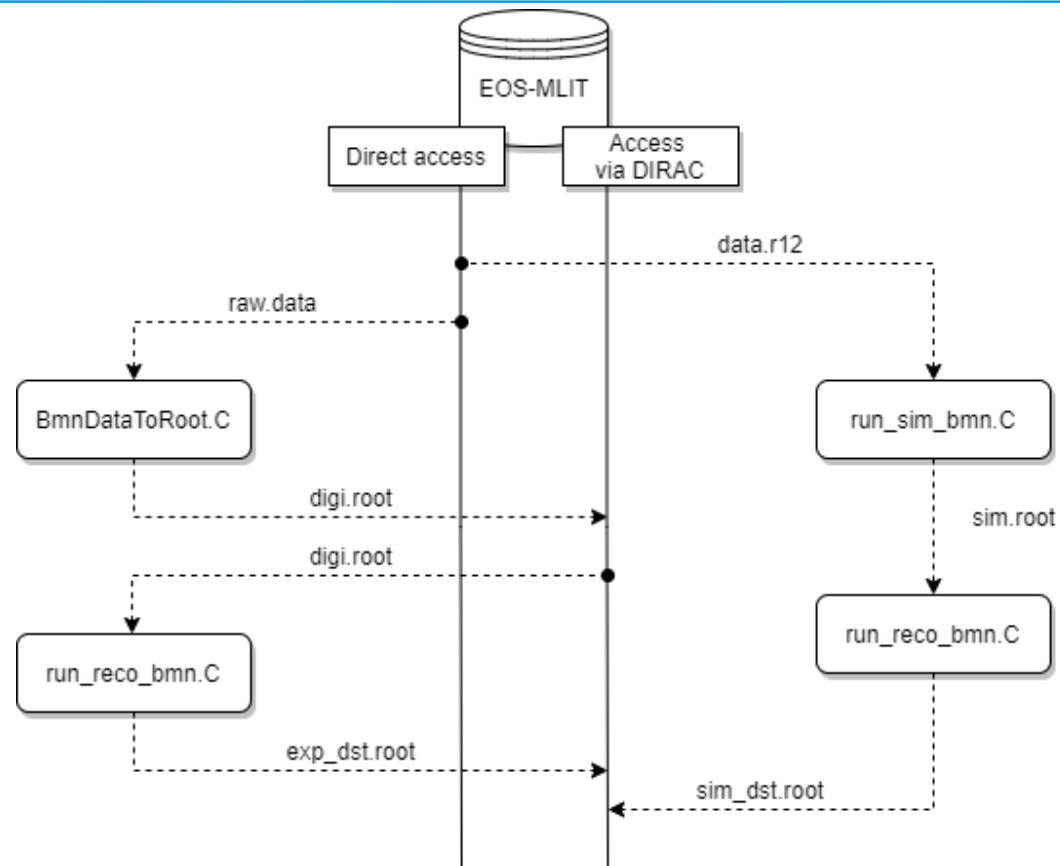


DIRAC @ JINR



General DIRAC job workflow

- 1) Initial software configuration
- 2) Downloading input data from EOS using root protocol or DIRAC
- 3) Processing data with BmnRoot macros
- 4) Uploading result files to EOS over DIRAC



Test DIRAC jobs results

- At present time RawToDigi jobs now can only be performed on "Govorun" supercomputer due to a huge size of input files.
- Cloud resources can potentially perform all workload, but are not tested yet.

	Tier-1	Tier-2	Govorun	NICA cluster	Clouds
RawToDigi					Not tested
DigiToDst					Not tested
GenToSim					Not tested
SimToDst					Not tested

Current status

- All types of BM@N jobs have been tested on different JINR computing resources.
- Monte-Carlo simulation:
 - 1) ~ 55M events were simulated and reconstructed.
 - 2) All resources can be used for MC production, but NICA cluster at the moment is not used due to some technical problems.
- Experimental data processing:
 - 1) digitalization of all experimental files from Run7/4720-5186_BMN_Krypton was performed on Govorun.
 - 2) RawToDigi jobs now can only be performed on "Govorun" supercomputer.

Thank you for your attention!

