

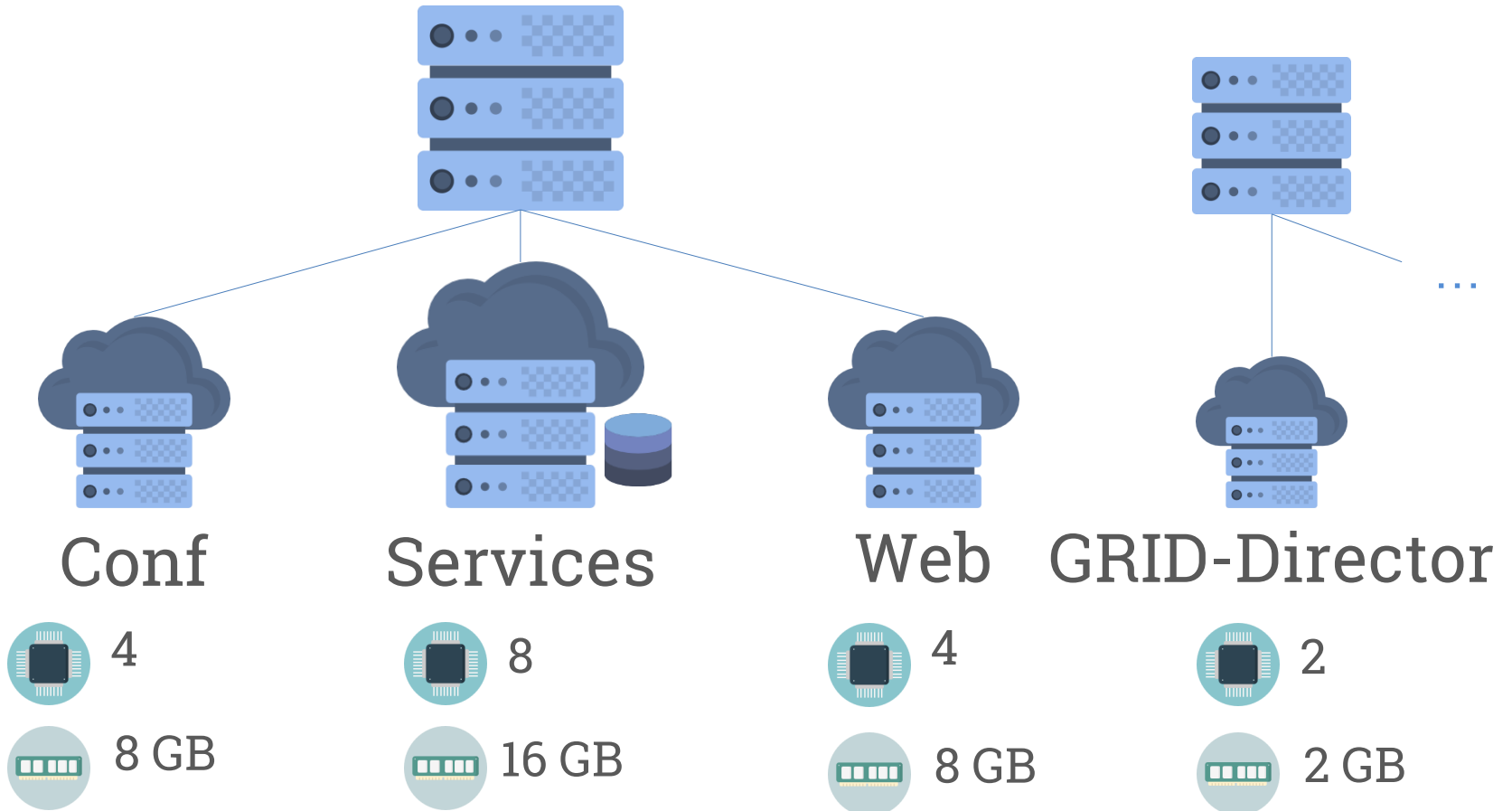


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The 9th DIRAC Users' Workshop



DIRAC@JINR now





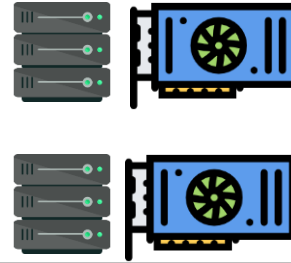
DIRAC@JINR resources



torque



CREAM-CE



slurm
workload manager



Clouds

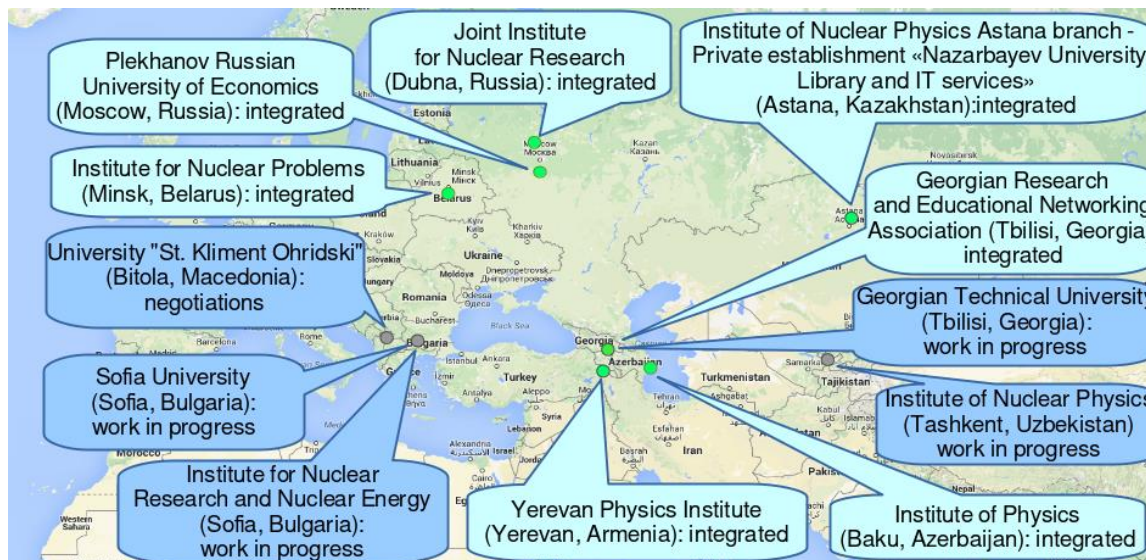
DIRACSE



dCache
Over SRM



“Cloud bursting”



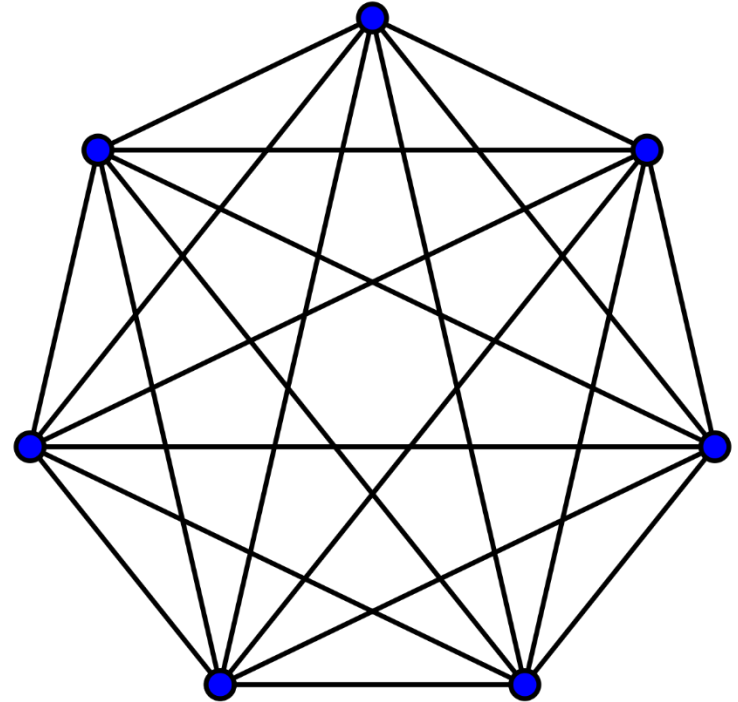
To join resources for solving common tasks as well as to distribute a peak load across resources of partner organizations to speed up receiving of scientific results.

Most of clouds are based on OpenNebula platform.



“Cloud bursting”

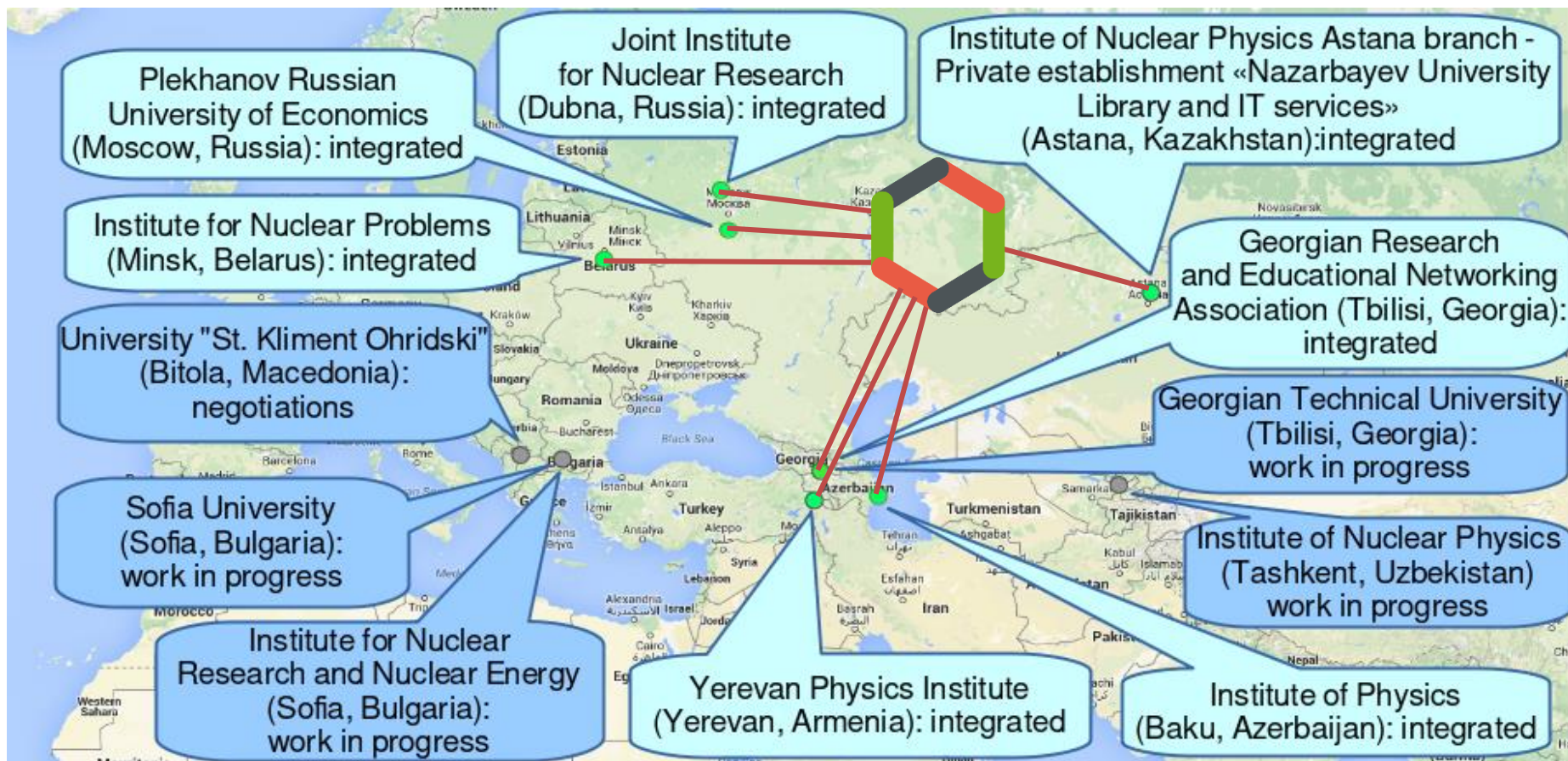
- Cloud bursting is a model in which the local resources of a Private Cloud are combined with resources from remote Cloud providers.
- All the clouds should be aware about each other.
- Complexity of the system grows significantly with increasing number of participants.



Schema of 7 clouds connected



Integration via DIRAC



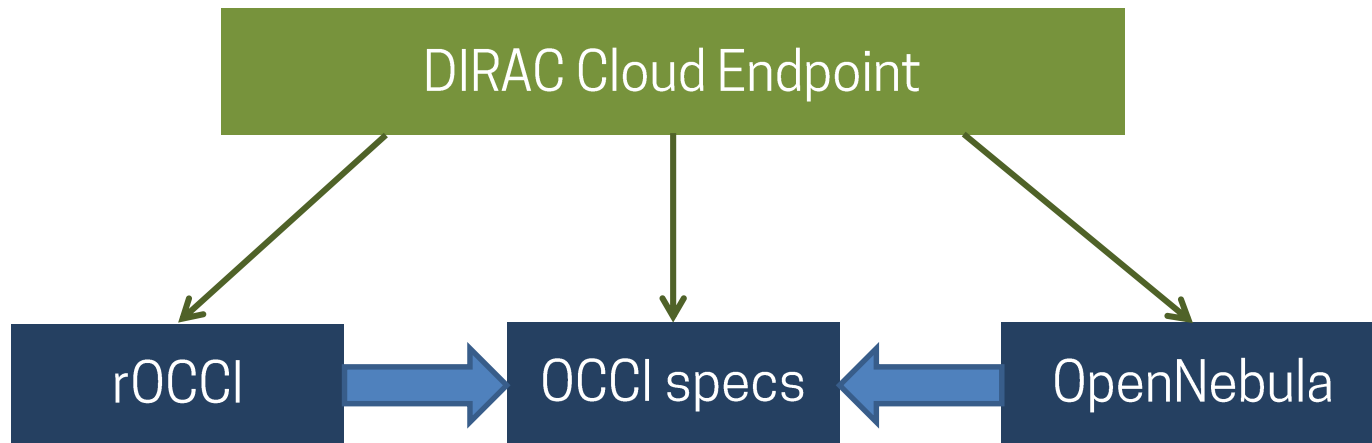


Clouds integration

In order to make it real we had to choose the technology for talking with the clouds.

rOCCI – has been there for a long time.

OCCI – had just been developed and we tested it.


















OpenNebula Endpoint

 atsareg Merge pull request #112 from rkuchumov/integration ...

Latest commit 1ff57e0 on Dec 12, 2018

..

 tests	test example for travis	2 years ago
 CloudEndpoint.py	add 'ex_config_drive' to use config drive to transfer metadata to clo...	2 years ago
 ConfigHelper.py	Introduce VMType instead of Image	a year ago
 EC2Endpoint.py	Several bug fixes in cloud drivers	3 years ago
 Endpoint.py	Code rearrangement	a year ago
 EndpointFactory.py	Doc string	3 years ago
 KeystoneClient.py	New KeystoneClient class	a year ago
 OcciEndPoint.py	New Occi cloud endpoint implementation class	a year ago
 OpenNebulaEndpoint.py	Unused libs removed, AutoPEP8 performed	5 months ago
 RocciEndpoint.py	Several bug fixes in cloud drivers	3 years ago
 Utilities.py	UPDATE: additional manual ssh pub key placement(using userdata script)	9 months ago
 __init__.py	VMDIRAC 2.0 structure	3 years ago
 ec2_instance_type.json	EC2Endpoint work with boto3 API	3 years ago



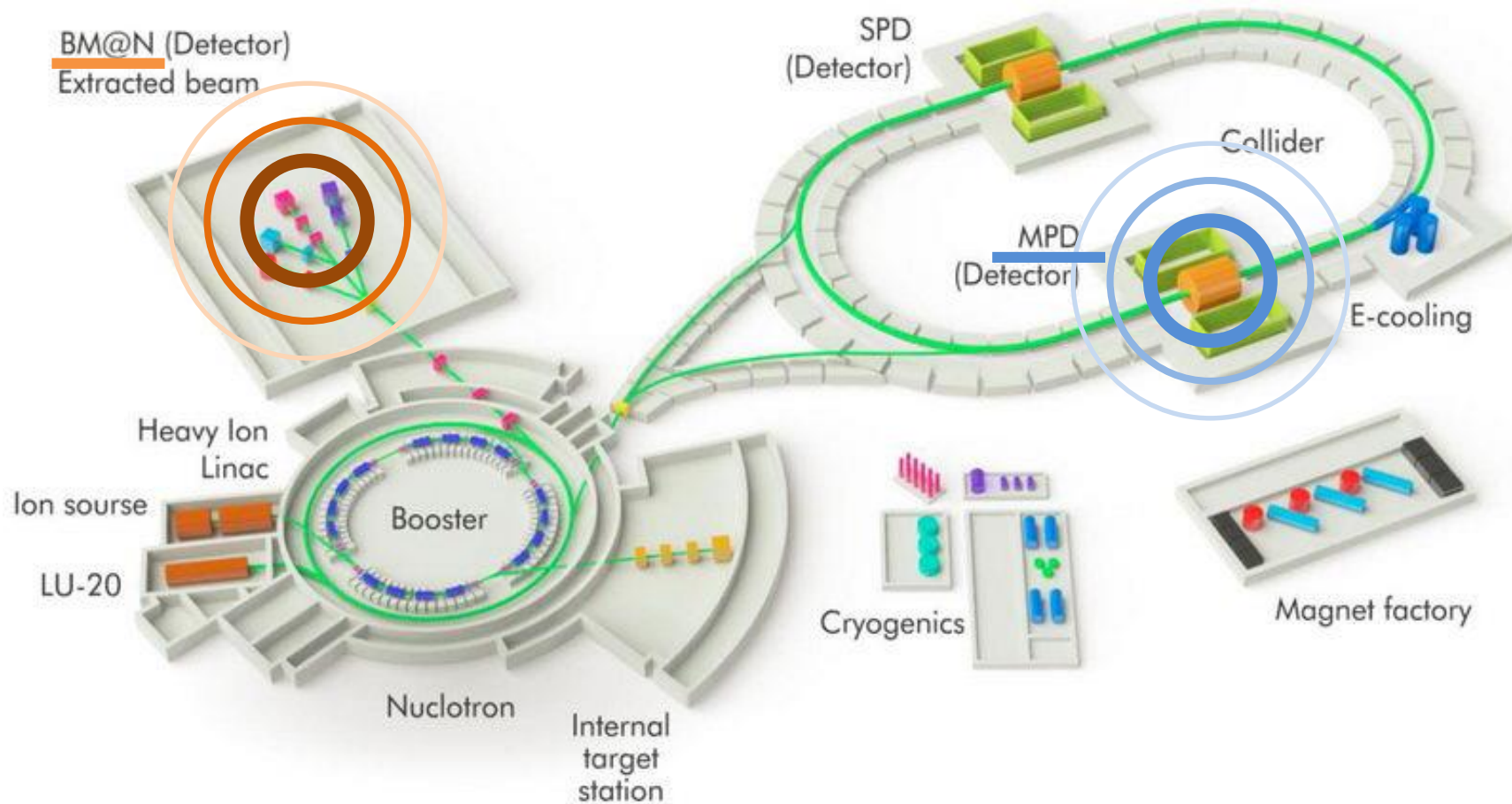
OpenNebula Endpoint

- OpenNebula XML-RPC endpoint created and tested
- All basic functionality are there. It was successfully used to integrate clouds.
- Some not-mandatory methods still have to be implemented.
- Thanks to Andrei Tsaregorodtsev for all the help.
- All in git:

VMDIRAC/Resources/Cloud/OpenNebulaEndpoint.py

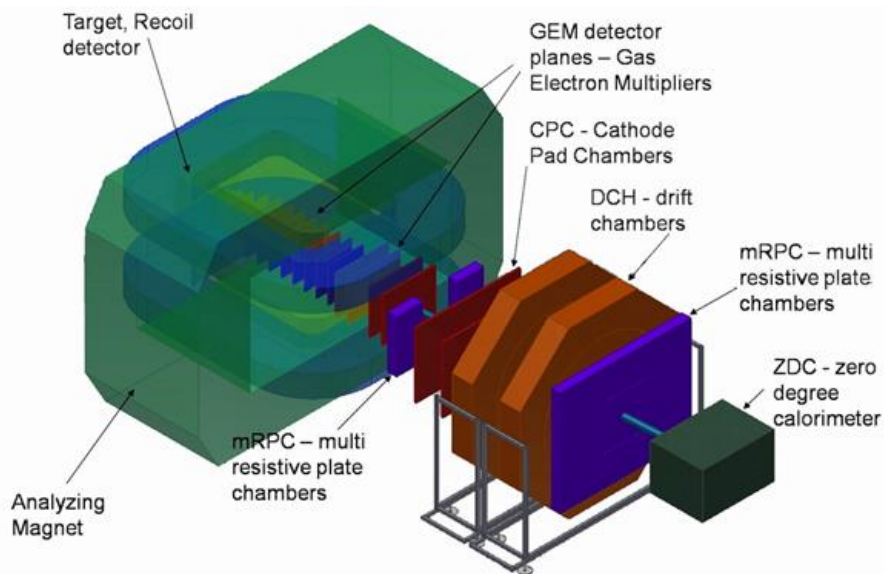


NICA





Baryonic Matter at Nuclotron



~150 TB
of raw data

Size of files:
60KB - 800GB

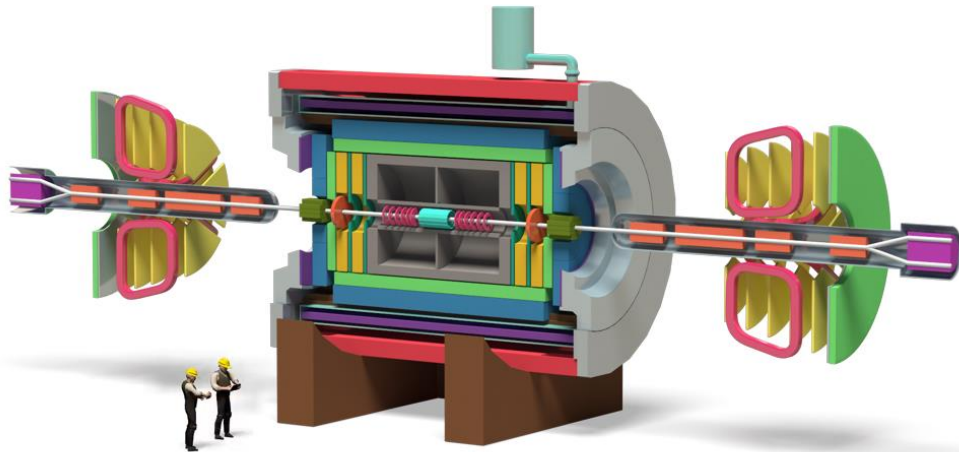
Software in CVMFS

Since BM@N have raw data, reconstruction software and heterogenous resources to store and process data we want to try to perform reconstructing within DIRAC setup.



MPD

Multi Purpose Detector



Only MC

We choose filesize

Software in CVMFS

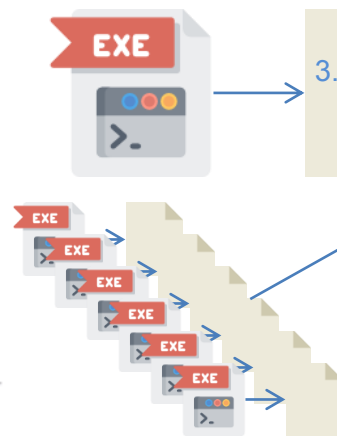
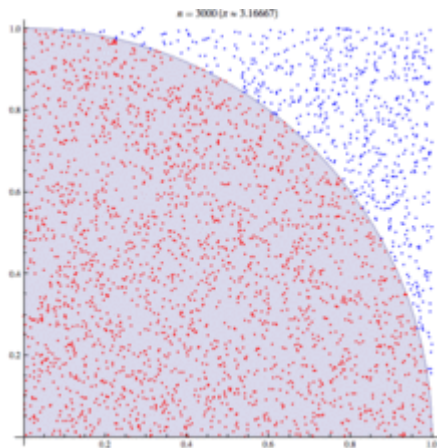
MPD is an experiment which will be built in the future. Now we can perform MC generation and reconstruction.



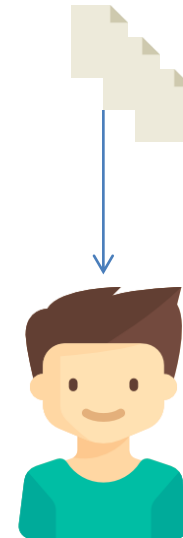
Trainings

- 3x2h practical trainings for JINR JUNO team.
- We are training groups of students with DIRAC installation

Get π number by using the Monte Carlo method



DIRACSE



3.141592...



Results

- DIRAC platform is deployed at JINR (so we train our “DIRAC administration” muscle).
- It was used to demonstrate the possibility to use for BM@N and MPD experiments.
- OpenNebula endpoint was developed for VMDIRAC. It was used to integrate JINR Member state clouds into JINR DIRAC infrastructure.
- DIRAC was extensively used for education purposes.
- The next big step is to perform full BM@N data reconstruction within DIRAC.
- And we would like to do that with transformation system!



Thank you for attention

