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5-9 July 2021

JINR Dubna

GRID'2021

- BY-NCPHEP grid site run by scientists and engineers of Laboratory of Fundamental Interactions, Institute for Nuclear Problems of Belarussian State University (INP BSU)
- Main activity:

data analysis of LHC experiments (CMS and Atlas) activity as NGI_BY Regional Staff local jobs (for Laboratory of Theoretical physics and Simulation of nuclear processes mostly)

Milestones

2008

Site was registered in GocDB as BY-NCPHEP

2011

Site was registered in CMS SiteDB as T3 BY-NCPHEP

2018

Integration to JINR cloud

Resources

servers

Dell PowerEdge 610/710 and Supermicro

physical cores, total

196 (most of them X5650 and E5-2620)

RAM, total





Resources

Storage I28 Tb:

2 x 24 slots and 1 x 8 slots chassis; Lustre (2 MegaRAID RAID6 nodes and 1 ZFS node) DRBD





Network Connectivity

- IGb LAN (2Gb bonded interface for storage)
- I00Mbit WAN
- GEANT up to 1Gb (since 2018)



GRID services

The only belarussian certified and production WLCG site at the moment



The Grid WLCG view shows the accounting data from all Grid Sites in the database in Belarus. Accounting information is only gathered from Sites that are certified in GOCDB. The metric shown is Total number of jobs, grouped by Site and Month, all VOs are shown.

	Site	May 2021	Jun 2021	Total	Percent
BY-NCPHEP		2,921	2,195	5,116	100%
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Total		2,921	2,195	5,116	
Percent		57.10%	42.90%		
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#### Belarus — Total number of jobs by Site and Month (All VOs)

Download JSON Data / Download CSV Data

# **GRID** services

- ARC CE (Torque/Maui)
- Squid Frontier and CVMFS
- StoRM SE
- SBDII
- > APEL
- VI VI
- Xrootd







# Cloud

#### Infrastructure based on Opennebula and Proxmox VE



# Cloud

Cloud is integrated in JINR cloud and participate in joint activity, like COVID-19 folding@home or NICA test data generation



Software supported

- WLCG and CMSVO software (CVMFS distribution model)
- ORCA, Quantum ESPRESSO (MPICH, OpenMPI, OpenMP)
- Virtual Labs (ROOT and pythia) for Belarussian State University students for Covid-19 pandemic period





## Installation and configuration managment

- PXE and kickstart (bare-metal servers)
- Opennebula one-context tool (VMs)
- Ansible and Git history control

- further JINR Cloud integration
- computational resources extension
- try containers instead of VMs (multicore jobs performance is lower than expected)