

BM@N Software Development Progress & Problems

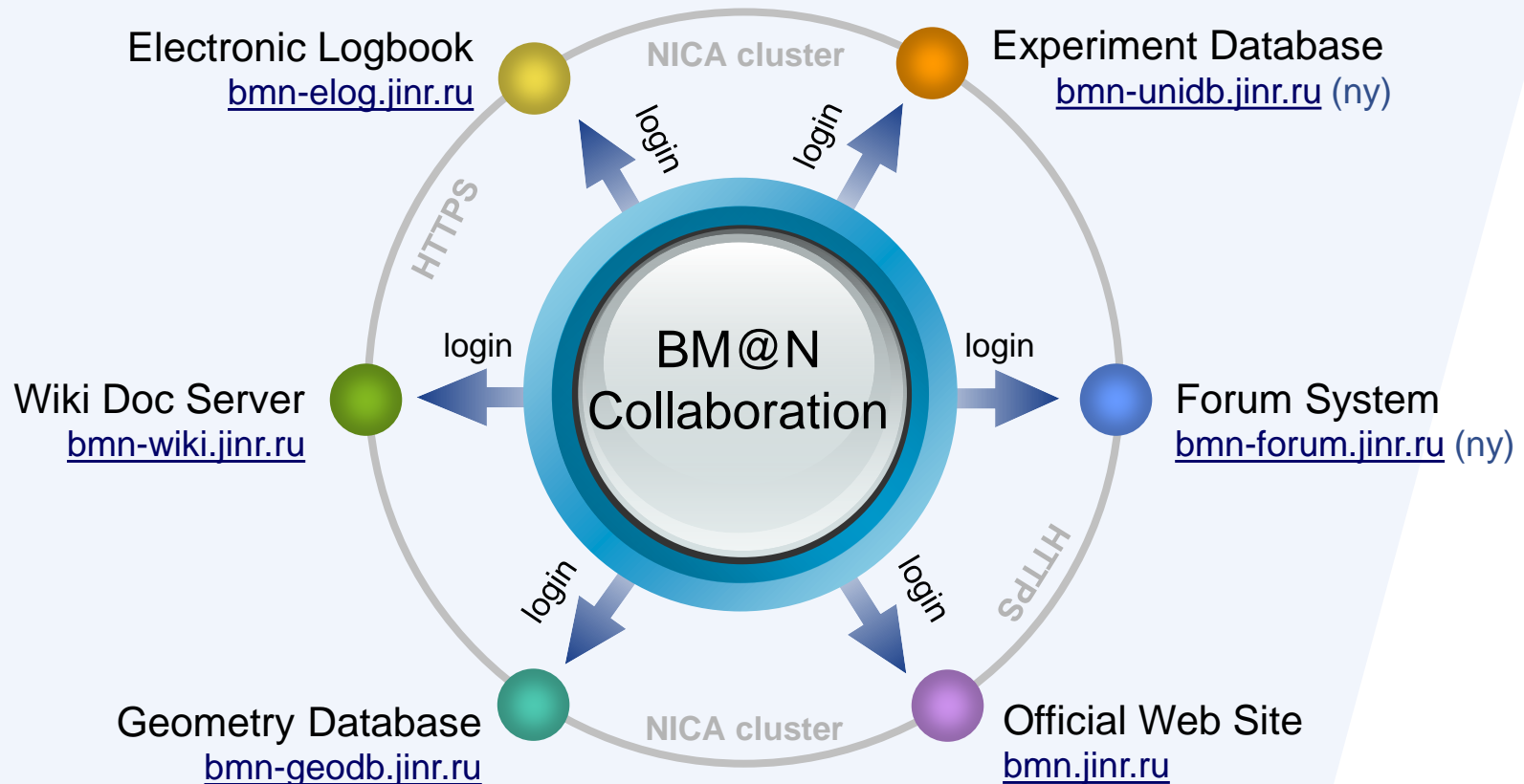
Konstantin Gertsenberger

Veksler and Baldin Laboratory of High Energy Physics, JINR, Dubna



Collaboration Services

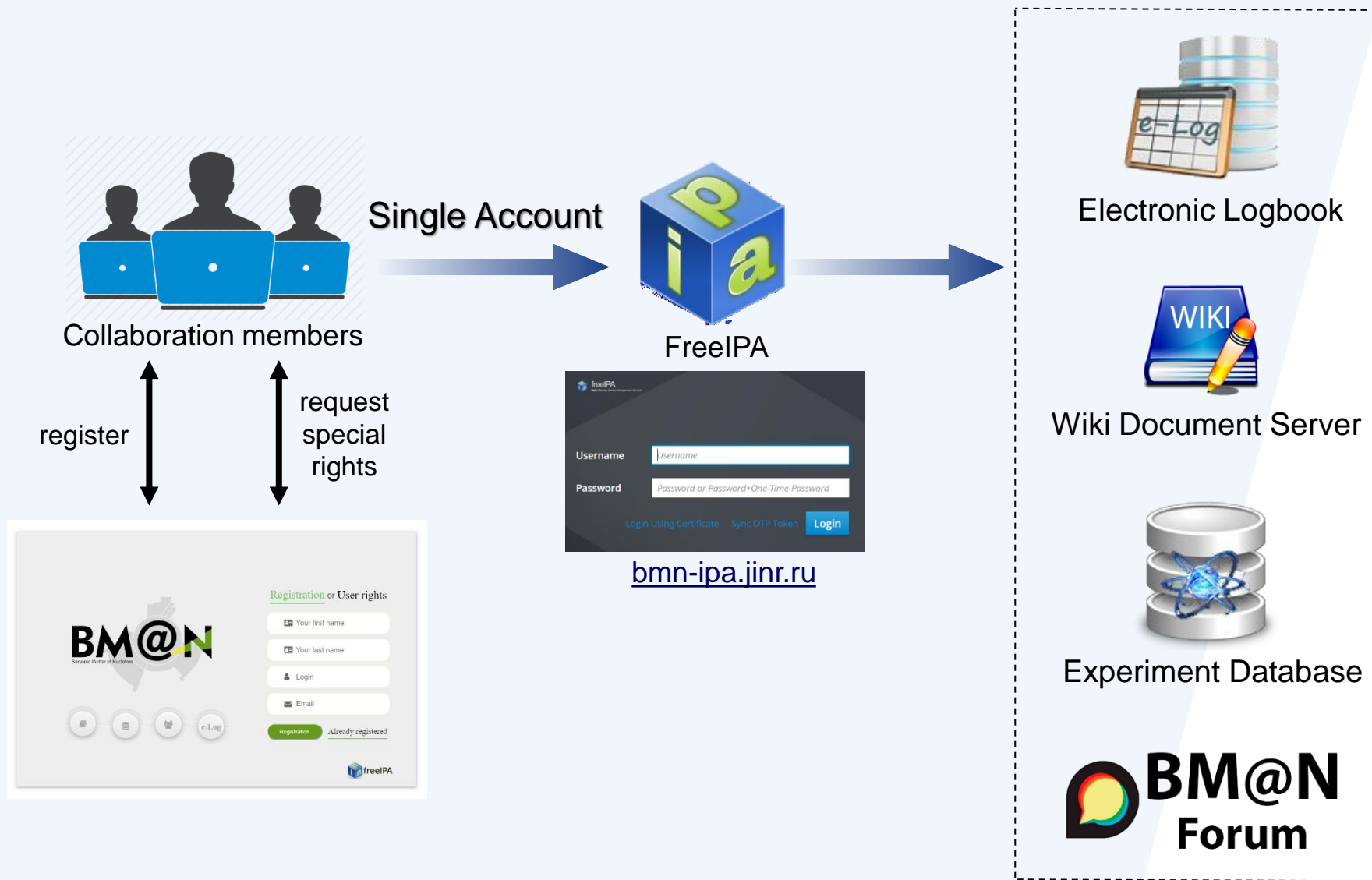
Evolution of the BM@N Information Services



Ivan Slepov (20 April 09:00)

New architecture of the information services for BM@N

FreeIPA: Single BM@N Authentication



BM@N Wiki Document Server

Menu

- 1. BM@N Subsystems
 - 1.1 Triggers
 - 1.2 DAQ
 - BM@N DAQ Electronics
 - More info
 - Raw Data Files
 - Raw Data Format
 - Software Packages
 - Software Source Code
 - User Access to Online Computers
 - 1.3 Magnets
 - 1.4 Detectors
- 2. Run Control
- 3. SRC @ BM@N
- 4. Documents
- 5. Reports
- 6. Software
- 7. Computing
- 8. Archive

More info

Last modified by Administrator on 2019/12/16 12:37

- BMN DAQ Project page: <https://afi-project.jinr.ru/projects/bmn/wiki>
- Electronics expert Wiki: <https://afi.jinr.ru/>

Tags:

Created by Administrator on 2019/12/16 12:37

Attachments (0) History

No attachments for this page

Recently Visited

- Addition to the SRC scheme
- ADC for big GEMs SRC
- More info
- BM@N DAQ Electronics
- BM@N Document Server

Recently Created

- Profile of shift shift
- Profile of Alexander Chebotov
- Profile of Ilia Slepnev
- PAC Meeting Winter 2020 (Poster) 2020

bm-n-wiki.jinr.ru

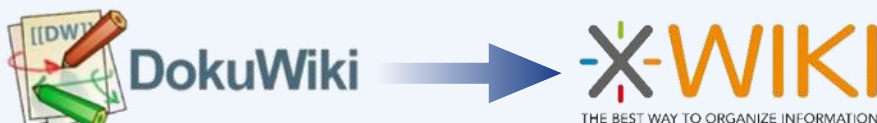
XWiki 11.10

Advantages of XWiki:

1. Open-source (free)
2. Hierarchical structure
3. Search by any criteria
4. Personalizing: favourites
5. Subscriptions
6. Adv. access control
7. Mapping IPA roles
8. Stable work
9. Active development

Disadvantages of XWiki:

1. Weak support
2. Hierarchical tree can be ordered as desired
3. Poorly designed templates



- Contains all documents
- Moved to the NICA cluster
- FreeIPA Authentication (Single Account)

BM@N Forum (work in progress)

The screenshot displays the BM@N Forum website. At the top, the logo 'BM@N' is visible. Below it, there are navigation links: 'all categories', 'Categories' (highlighted in red), and 'Latest'. On the right, there are search and menu icons. The main content area is a grid of topic boxes:

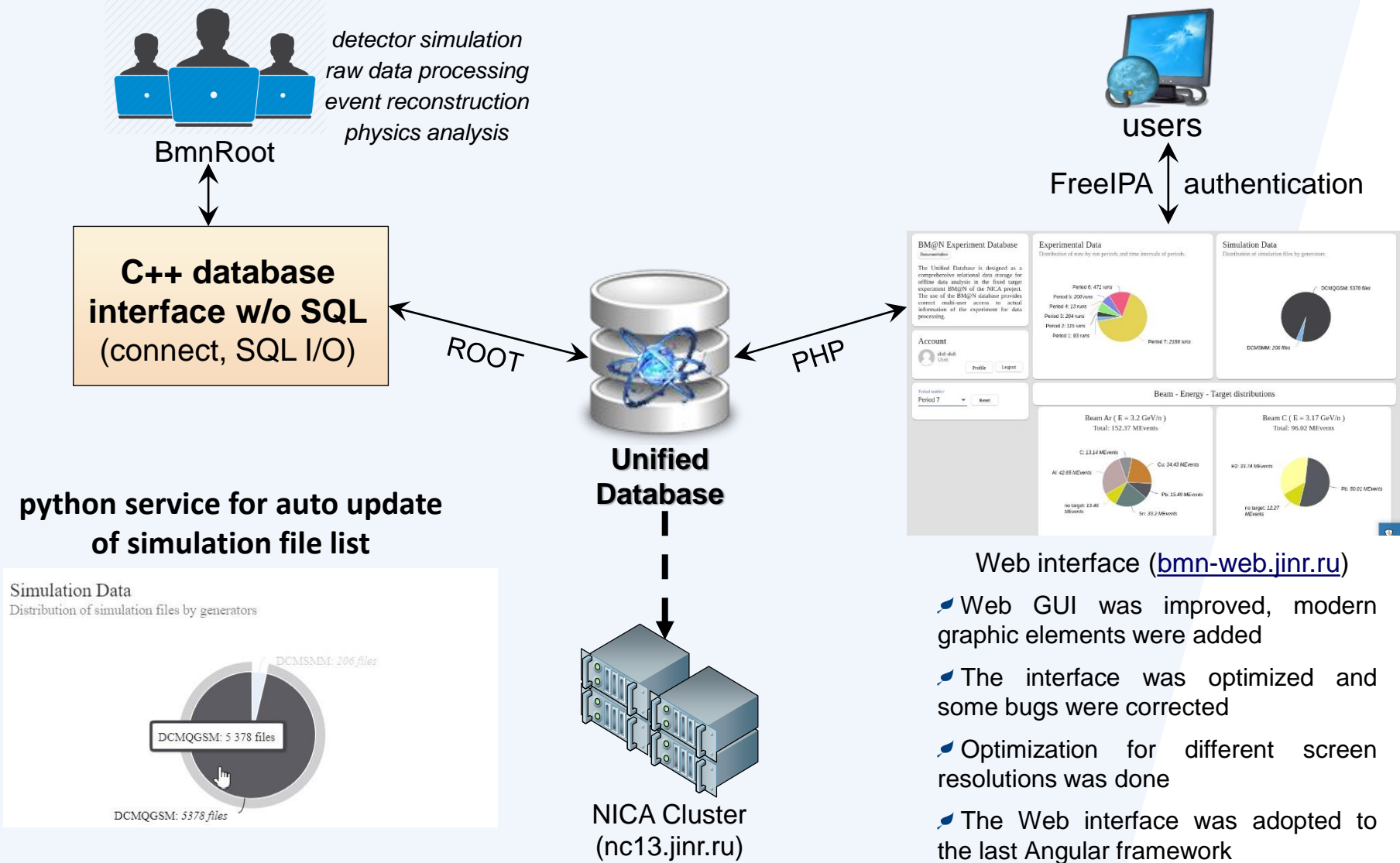
- Staff**: READ ME FIRST: Admin Quick Start Guide, Privacy Policy, FAQ/Guidelines.
- Site Feedback**: Confusing activation link, Non-secure connection, Change the server address.
- Collaboration News**
- Collaboration Support and Common Questions**: Ncx cluster state, alignment_innTracker.root failed to read the file type data, Mpd22.
- Software Development and Data Quality Check Group**: Suggestion to remove 'check_system', New Authorization System for BM@N services, Problem with ELog DB access.
- Event Reconstruction and Detector Simulation Group**: MWPC geometry.
- Particle Identification Group**
- ZDC & ECAL Data Analysis and Simulation Group**
- Hyperon Reconstruction and Simulation Group**
- SRC Data Analysis and Simulation Group**: DCH global tracks, Trigger setup, PID using DCH tracks.
- Physics Analysis Issues**

To the right of the grid, there is a diagram showing the migration of the forum. It starts with the 'BM@N Forum' logo, followed by the URL <http://se49-48.jinr.ru>, a large downward arrow, and the new URL bmn-forum.jinr.ru.

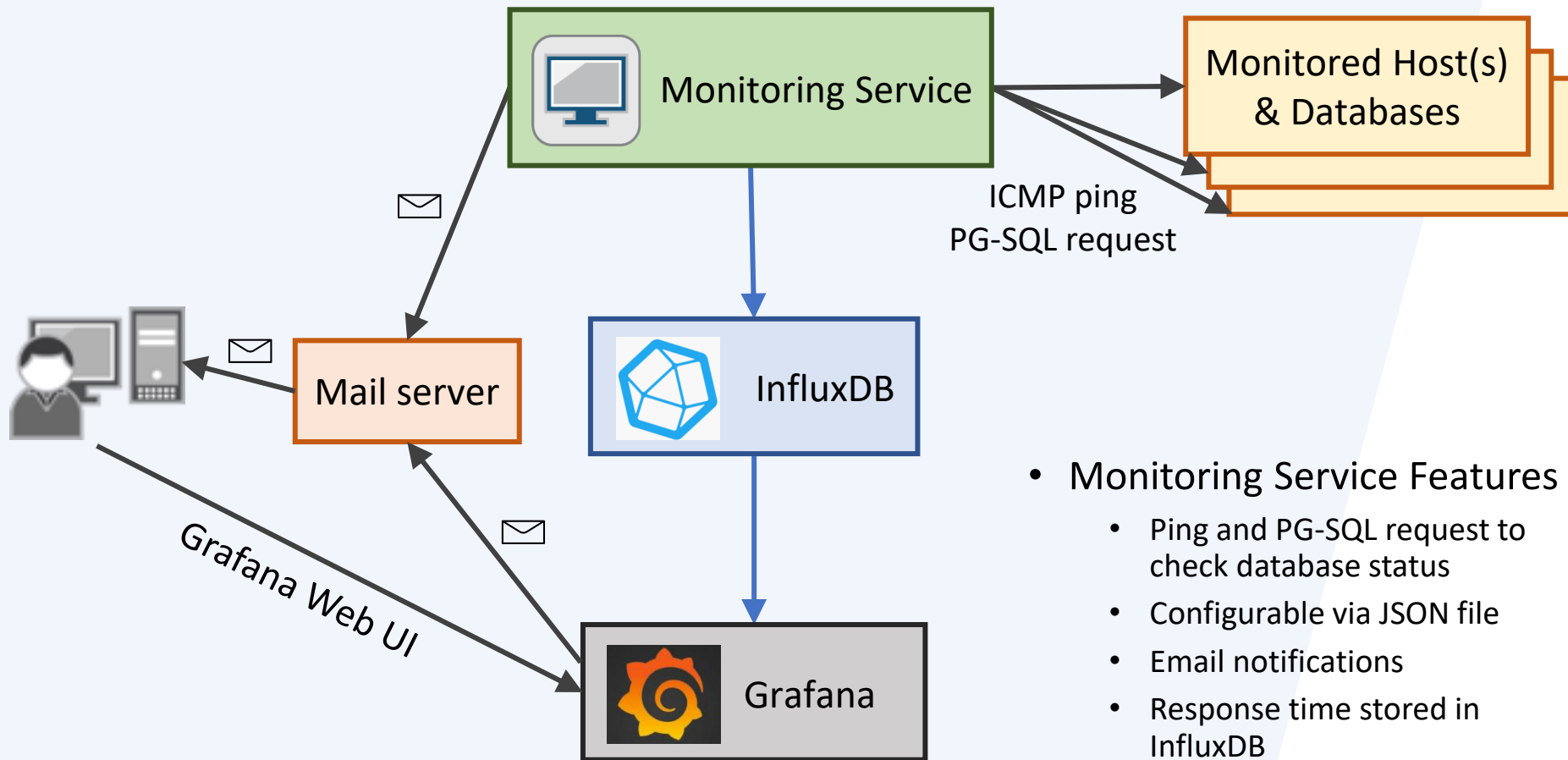
**BM@N Forum & News system for a quick communication and discussions
between collaboration members and groups:
various topics for different groups, subscriptions, comments...**

Information Systems

BM@N Database for offline processing



Monitoring Service



- **Monitoring Service Features**
 - Ping and PG-SQL request to check database status
 - Configurable via JSON file
 - Email notifications
 - Response time stored in InfluxDB
 - Use Grafana for visualization and additional alerting

Monitoring BM@N Database

Grafana View



Email Notifications

Unread Starred Contact Tags Attachment Filter these messages <Ctrl+Shift+K>

Subject	Correspondents	Date
[OK] PGSQL response time alert	Grafana	2:41 PM
Service Monitor on CentOS7: server1 - PGSQL state changed to UP	h@yandex.ru	2:40 PM
[Alerting] PGSQL response time alert	Grafana	2:01 PM
Service Monitor on CentOS7: server1 - PGSQL state changed to *** ...	h@yandex.ru	1:54 PM

From Grafana <h@yandex.ru> ☆

Subject [OK] PGSQL response time alert

To Me ☆

[OK] PGSQL response time alert

Grafana: Database monitoring warning!

PGSQL response time

0.12

e-Log Platform Improvement for future runs

BM@N Electronic Logbook

bmn-elog.jinr.ru

Logged in as shift

[Home](#) [New](#) [Find](#) [Last day](#) [Account](#) [Reference Book](#)

Page: 1 of 282

Number of items per page: 10 [Logout](#)

Date	Shift Leader	Type	No Run	Trigger	DAQ Status	SP-41, A	SP-57, A	VKM2, A	Beam	Energy, GeV	Target	Comment	Attachment
2018-04-05 11:47:06	Rumyantsev	Inform All	5185 per.7	Special Trigger	All	0	0	0	Kr	2.94	Cu (2 mm)	End of the RUN7	
2018-04-05 11:09:20	Rumyantsev	New Run	5184 per.7	Beam Trigger + Si >3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & Si>3 VKM2: I=125A, SP-57=50A, SP41=1250A; 100 k	
2018-04-05 08:12:35	Rumyantsev	New Run	5183 per.7	Beam Trigger + Si >3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & Si>2 VKM2: I=125A, SP-57=50A, SP41=1250A; 120 k	
2018-04-05 07:46:35	Babkin	New Run	5182 per.7	Beam Trigger + Si >3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & Si>3 VKM2: I=125A, SP-57=50A, SP41=1250A; 208 kev	
2018-04-05 07:41:29	Babkin	New Run	5180 per.7	Beam Trigger + Si >3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & Si>3; VKM2: I=125A, SP-57=50A, SP41=1250A; 201 kev	
2018-04-05 07:25:08	Babkin	New Run	5179 per.7	Beam Trigger + Si >3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & Si>3; VKM2: I=125A, SP-57=50A, SP41=1250A; 201 kev	
2018-04-05 06:01:07	Babkin	New Run	5178 per.7	Beam Trigger + Si >3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & Si>3; VKM2: I=125A, SP-57=50A, SP41=1250A; 201 kev	
2018-04-05 05:27:39	Babkin	New Run	5177 per.7	Beam Trigger + Si >3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & Si>3; VKM2: I=125A, SP-57=50A, SP41=1250A; 204 kev	
2018-04-05 05:27:06	Babkin	New Run	5176 per.7	Beam Trigger + BD>3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & BD>3; VKM2: I=125A, SP-57=50A, SP41=1250A; 150 kev	
2018-04-05 04:47:27	Babkin	New Run	5174 per.7	Beam Trigger + BD>3	All	1250	50	125	Kr	2.94	Cu (2 mm)	Cu target; Tr.= BC1 & BC2 & VC & BD>3; VKM2: I=125A, SP-57=50A, SP41=1250A; 213 kev	

2020 - software team (contact e-mail: gertsen@jinr.ru)

Common FreeIPA Authentication: 3 groups (administrator, editor, reader)

File Attachments (text description, photo)
Email Subscription to selected event types

Multi-Column Sorting
Logbook Monitoring

User Cabinet
NICA cluster

Geometry Database for the BM@N experiment

← → ↻ ⚠ Не защищено bmn-geodb.jinr.ru/main.php

Приложения ★ Bookmarks 🌐 Темы диссертаций... 📄 Серокубки в цифр... 📖 Флибуста | Книжн... VS | VegaSat.ru 📦 Open Source softw... 🌐 Directory Bind -...

New address of service

BM@N
Baryonic Matter
at Nuclotron
NICA

Geometry DataBase

Run 6 and Run7 available

Available Setups

Tag	Revision	Date	Description	Author	Status	Download
run6	2	2019-12-25	version 19.04.0 with error description	aleksand@jinr.ru	Approved	📄
run6	1	2018-07-26	version 17.04.0	aleksand@jinr.ru	Approved	📄
run7	1	2020-04-19	run7 uploaded 19.04.2020	aleksand@jinr.ru	Approved	📄

View Setups

View Setup Modules

View Files

View Materials

Download GeometryDB

- 1) New address of service: bmn-geodb.jinr.ru
- 2) New setups available:
- 3) Bug fix and some improvements.

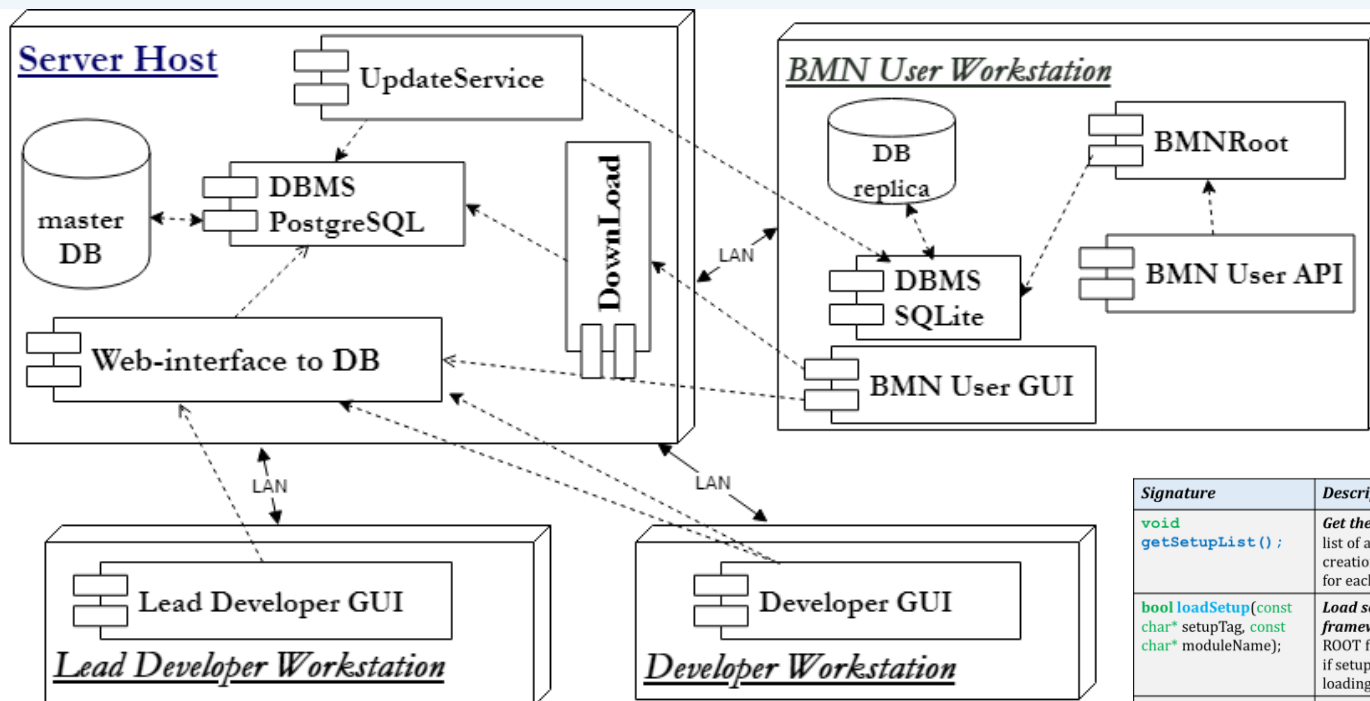
GUI Functions:

View

Edit

Download

API Interface of the Geometry Database



Evgeny ALEKSANDROV
(20 April 10:40)

Status of Geometry
Database development for
the BM@N experiment

API (Application Programming Interface)

implemented as macros of the ROOT environment

Signature	Description	Call Example	Comment
<code>void getSetupList();</code>	Get the list of available setups. Print the list of available setups including tag, date of creation, author and description parameters for each approved setup.	<code>getSetupList.c();</code>	Return the available setups' list
<code>bool loadSetup(const char* setupTag, const char* moduleName);</code>	Load setup into the BM@N ROOT framework. The Geometry can be used in ROOT framework afterwards. Return FALSE if setup is not loaded, and TRUE if the loading is successful.	<code>bool res = loadSetup("run6", "");</code>	** - all setup modules to be loaded
<code>bool loadSetup(const char* setupTag, int moduleId);</code>	Load setup into BM@N ROOT environment by module Id to load setup into the CBM ROOT framework. The Geometry can be used in ROOT framework afterwards. Return FALSE if setup is not loaded, and TRUE if loading is successful.	<code>bool res = loadSetup("run6",- 1);</code>	
<code>bool loadSetup(const char* setupTag, const char* moduleName, const char* xml);</code>	Load setup into the ROOT environment. Geometry can be used in the ROOT environment after this operation. User can use xml file in order to move any setup module during loading. Return false if setup was not loaded because of errors and true if load is successful.	<code>loadSetup("run6", "","local.xml")</code>	xml file contains information on the setup modules and their shifts.

BM@N Information Ecosystem

Alexander CHEBOTOV
(20 April 10:55)

Online Electronic Logbook
Improvement for the future
BM@N runs

Logbook IS

Configuration IS

Event Indexing IS

Online & Offline
BmnRoot
BM@N Systems

Geometry IS

Condition IS

Evgeny ALEKSANDROV
(20 April 10:40)

Status of Geometry
Database development for
the BM@N experiment

RFBR Grant 2019 – 2021: Development of Information Systems for Online and Offline Data Processing for the Experimental Setups of the NICA Complex

BmnRoot Framework

BmnRoot Development

DAQ Storage

raw data in binary format

raw_run.data

RAW binary format

RAW digits format

digitizer

BmnDataToRoot.C

run_digi.root

Geant 3/4

simulation

run_sim_bmn.C
run_sim_src.C

evetest.root

SIM format

Event Generators

UrQMD, QGSM, Pythia...

generator.dat

reconstruction

run_reco_bmn.C
run_reco_src.C

bmndst.root

DST format

physics
analysis

macro/physics/

Sergei MERTS
(21 April 11:10)

Status of the BM@N
simulation and data
reconstruction

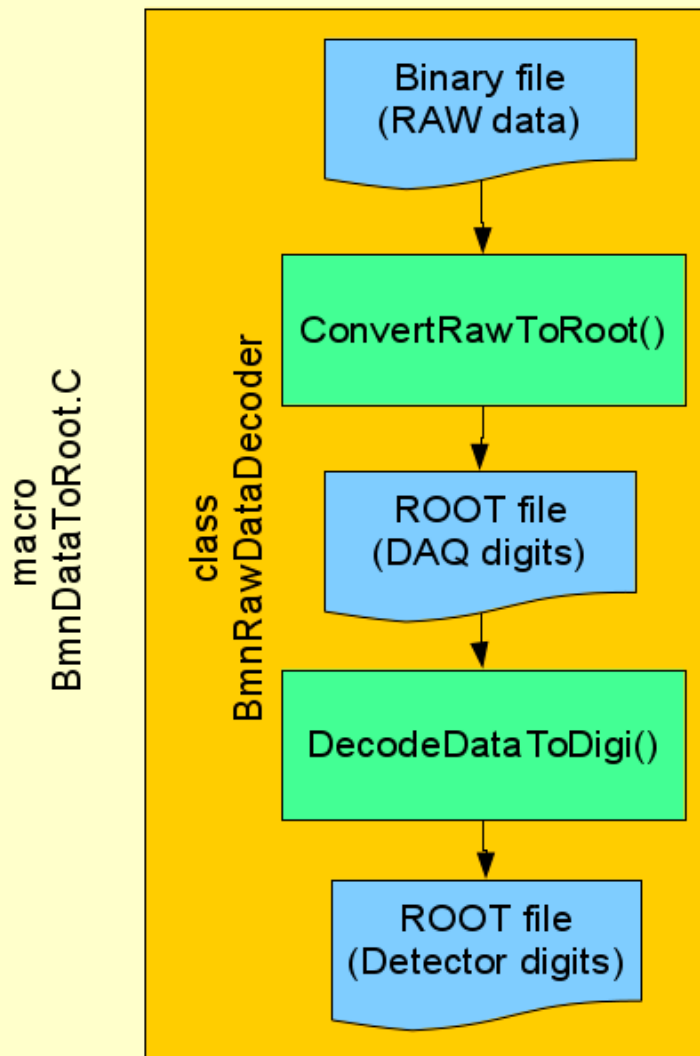
Convener: Alexander ZINCHENKO
(20 April 10:00 - 13:45)

Analysis Section

Julian KAHLBOW
(21 April 12:00)

Status of the SRC analysis

New BmnRoot Release for production: 20.02.0



- ✓ Raw Data Converter has been corrected and improved. New spill information was added.
- ✓ Finally, the latest version of the Converter has worked without errors.
- ✓ New detectors, geometries and configurations were added for BM@N and SRC setup (future silicon detectors, SP57 magnet, arm triggers...).
- ✓ First version of PID for SRC was developed.
- ✓ TOF700 calibration with proton hits was implemented.
- ✓ Embedding Tasks were included.
- ✓ DCM-SMM Generator was added to repo.
- ✓ The manual run prefix for SRC reconstruction has been replaced by auto defining run numbers.
- ✓ Default 'evetest.root' simulation files were renamed to 'bmnsim.root' and 'srcsim.root' correspondingly.
- ✓ Monitoring Service was added by MIPT group.
- ✓ New tests for SRC macros were included in GIT CI.
- ✓ etc...

Mass production of BM@N detector digits for Run 7 has been done at SC Govorun

Using Dockers for BmnRoot development

✦ User Docker Containers with BmnRoot software

- base image = OS + FairSoft + FairRoot
- Great for short-period students and fast analysis
- Users do not need to install software – just run container
- Hosting computer can potentially run any operating system
- Automatically built and published with GitLab CI (BmnRoot release)

✦ Dockers for testing BmnRoot in GitLab CI

- Simplify CI-infrastructure
- Quickly add any OS environments to CI pipelines

✦ Jupiter Notebooks for analysis

Nikita BALASHOV
(20 April 12:00)

Incorporating Docker
into BM@N software
development process

Distributed Data Processing

Status of Computing Clusters for BM@N

NICA Cluster
ncx[101-106].jinr.ru
 (LHEP, b.215, b.216)



OS: Scientific Linux 7.7
 Exp. software: Local

EOS: 6 PB (replicated)

GlusterFS: 116+174 TB (*replicated*)

Sun Grid Engine: 5 040 (Xeon cores)

MICC Tier1/2 Center
lx[pub,mpd-ui].jinr.ru
 (LIT, b.134)



OS: Scientific Linux 6.10
 Exp. software: CVMFS

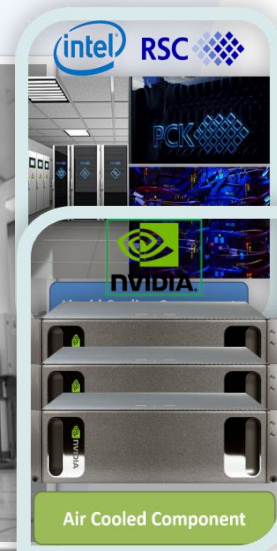
EOS: 4 PB

Torque/Maui:

Tier2: ~**300** (Xeon cores)

Tier1: ~**600** (Xeon cores)

HybriLIT platform (HPC Govorun)
hydra.jinr.ru
 (LIT, b.134)



OS: CERN CentOS 7.7
 Exp. software: CVMFS, **Modules**

ZFS 280 TB,

Fast Storage on Lustre 352 TB_{ssd}

SLURM: 8 448 (Xeon cores) + **6 048**
 (Xeon Phi cores) + **40 GPU** NVidia Tesla V

All external packages for BmnRoot are configured.

Automatic BmnRoot deployment on CVMFS with GIT CI is used.

Modernization of the supercomputer “Govorun”



Number of computing cores:

1440 → 4224

Capacity of UDSS:

120 TB → 288 TB

Data input/output rate

56 GB/s → 300 GB/s

First modification, 2018:
Total peak performance:
1 PFlops for single precision
500 TFlops for double precision

#10 in Top50
Second modification, 2019:
Total peak performance:
1.7 PFlops for single precision
860 TFlops for double precision

Modernized HybriLIT Platform for BM@N

OS: CERN CentOS 7.7

Storage

EOS:

for users: /eos/hybrilit.jinr.ru/user/

scratch: /eos/hybrilit.jinr.ru/scratch, /run/user/\$UID
/eos/eos.jinr.ru → MICC EOS (.../nica/bmn/[sim.exp]

ZFS: /zfs/store7.hydra.local (200 TB, temporary)

Lustre: 30 TB SSD, ultra fast, temporary

Software

CVMFS: distributed software FS

export MODULEPATH="/cvmfs/hybrilit.jinr.ru/sw/slc7_x86-64/modulefiles:/cvmfs/hybrilit.jinr.ru/sw/slc7_x86-64/NICA/modulefiles"

module avail – print all modules

FairSoft & FairRoot: **module add FairRoot/v18.2.0**

Computing

Batch System: **SLURM**

module add GVR/v1.0-1 → SuperComputer Govoron

Special queue (queue 'bmn'): 384 log. cores

Intel Xeon Platinum (queue 'cascadelake'): **5 664**

Intel Xeon Phi (queue 'knl'): **6048 log. cores**

Nvidia Tesla V (queue 'dgx'): **40 GPU cards**

(LIT, b.134)



BM@N collaboration on SC “Govorun”

- 19 BM@N users from JINR and other organizations
- an individual bmn group on supercomputer “Govorun”
- an individual computational queue (**384 CPU, ~800 Gb RAM**) with the possibility of enlargement
- access to experiment data at the EOS repository at JINR
- access to FS **ZFS** (home directory, 2 TB), **Luster** (computations, 256 TB) and **EOS** (storage, 300 TB)

Registration Form

*Full name

*Laboratory

*Country

*E-mail address

Phone number

*Funding source

You can find the Full names list of Funding source [here](#)

Project from the funding source

*Login (latin)

Max 8 symbols

*Name of the scientific project

*Summary of the scientific project

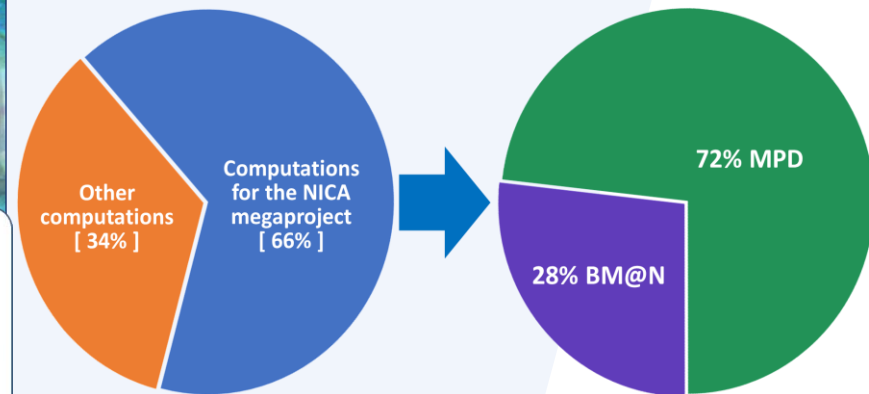
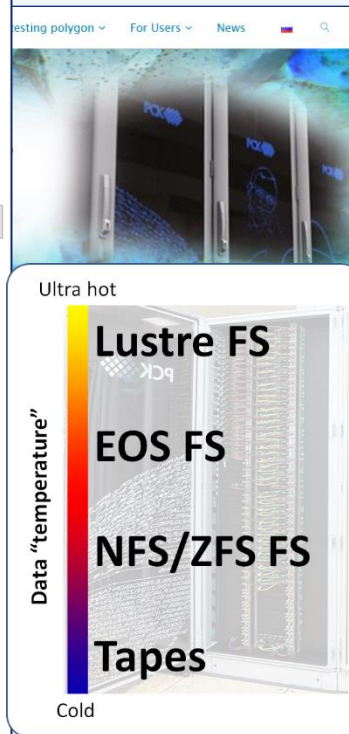
*Choose resource categories which are planned to be used

☐ CPU

☐ GPU

☐ Intel coprocessor

Write down a list of software packages that are planned to be used on the cluster



Maxim ZUEV (20 April 11:45)
Modernized Supercomputer Govorun
as a computing environment for
BM@N data processing

http://hlit.jinr.ru/for_users/registration/

HybriLIT platform: Application and Report

http://hlit.jinr.ru/en/about_govorun_eng/registration-at-the-govorun-supercomputer/

1. Application Form from the BM@N Collaboration once per year
2. Reporting Form from the BM@N Collaboration before the Application

http://hlit.jinr.ru/en/heterogeneous-cluster-hybrilit/users_publications_eng/

Users Publications

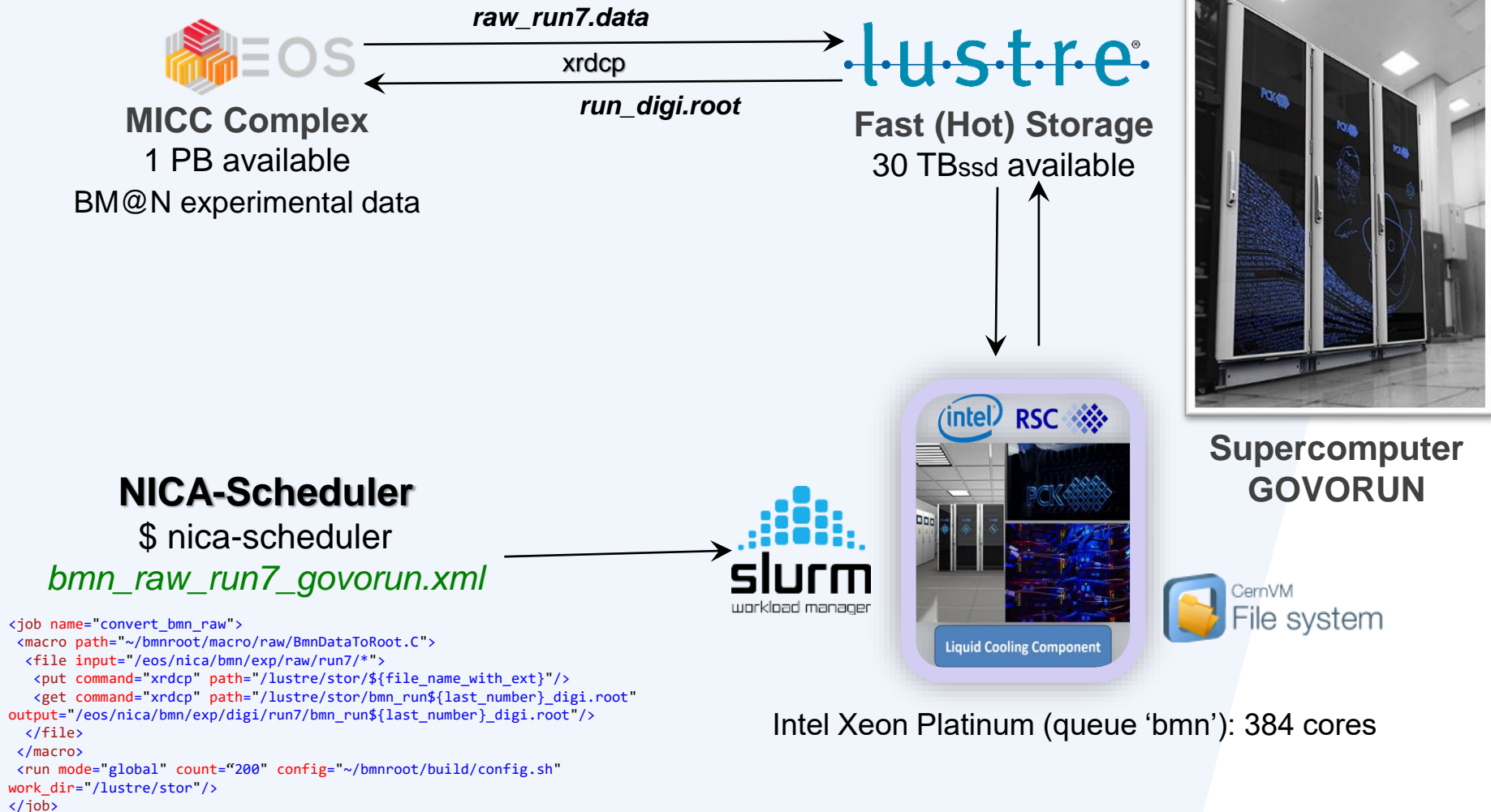
Authors should make references to the use of the resources of the heterogeneous platform in the following way:

Computations were held on the basis of the HybriLIT heterogeneous computing platform (LIT, JINR).

Please also use this link with the description of the heterogeneous platform:

Gh. Adam, M. Bashashin, D. Belyakov, M. Kirakosyan, M. Matveev, D. Podgainy, T. Sapozhnikova, O. Streltsova, Sh. Torosyan, M. Vala, L. Valova, A. Vorontsov, T. Zaikina, E. Zemlyanaya, M. Zuev. IT-ecosystem of the HybriLIT heterogeneous platform for high-performance computing and training of IT-specialists. Selected Papers of the 8th International Conference "Distributed Computing and Grid-technologies in Science and Education" (GRID 2018), Dubna, Russia, September 10-14, 2018, CEUR-WS.org/Vol-2267"

Mass digits production for Run 7 on Govorun



NICA-Scheduler Configurator

NICA Scheduler Configurator

Load config Choose File No file chosen Download as XML

NICA Job Scheme

+ Job

X

 [Job]: reco_job

+ Macro

X

 [Macro]:

+ File

X

 [File]: \$VMCWORKDIR/macro/mpd/evetest1.root

X

 [File]: \$VMCWORKDIR/macro/mpd/evetest2.root

X

 [File]: energy=3,gen=urqmd

Files To Process

Input type:

Simulation Database

Input Criteria:

energy=3,gen=urqmd

Output File Path:

~/mpdroot/macro/mpd/e

Start event:

Event count:

Parallel mode:

- Written as a Kotlin Multiplatform application
- Runs as JavaScript in browser, or in JVM
- Available at <https://bmn-scheduler.jinr.ru>

NICA Cluster for BM@N data processing

OS: Scientific Linux 7.7

(LHEP, b.215, b.216)



Cluster Administrator:
Schinov B. G.

Storage

EOS: 1 PB distributed FS (*replicated*)
sim. data: /eos/nica/bmn/sim/[gen,dst]
exp. data: /eos/nica/bmn/exp/[raw,digi,dst], e.g.
/eos/nica/bmn/exp/digi/run7/20.02.0
for users: /eos/nica/bmn/users/\$USER
GlusterFS: 116 TB (for NICA) (*replicated*)
for users: /nica/mpd[_{number}]/\$USER
scratch: /weekly/\$USER **174 TB**

Software

FairSoft:

/opt/fairsoft/bmn/pro → jun19p1

FairRoot:

/opt/fairroot/bmn/pro → v18.2.0

SetEnv.sh:
need correction!

Computing

Batch System: **Sun Grid Engine**

Intel Xeon: **5040 log. cores**

Registration & User Space Quotes

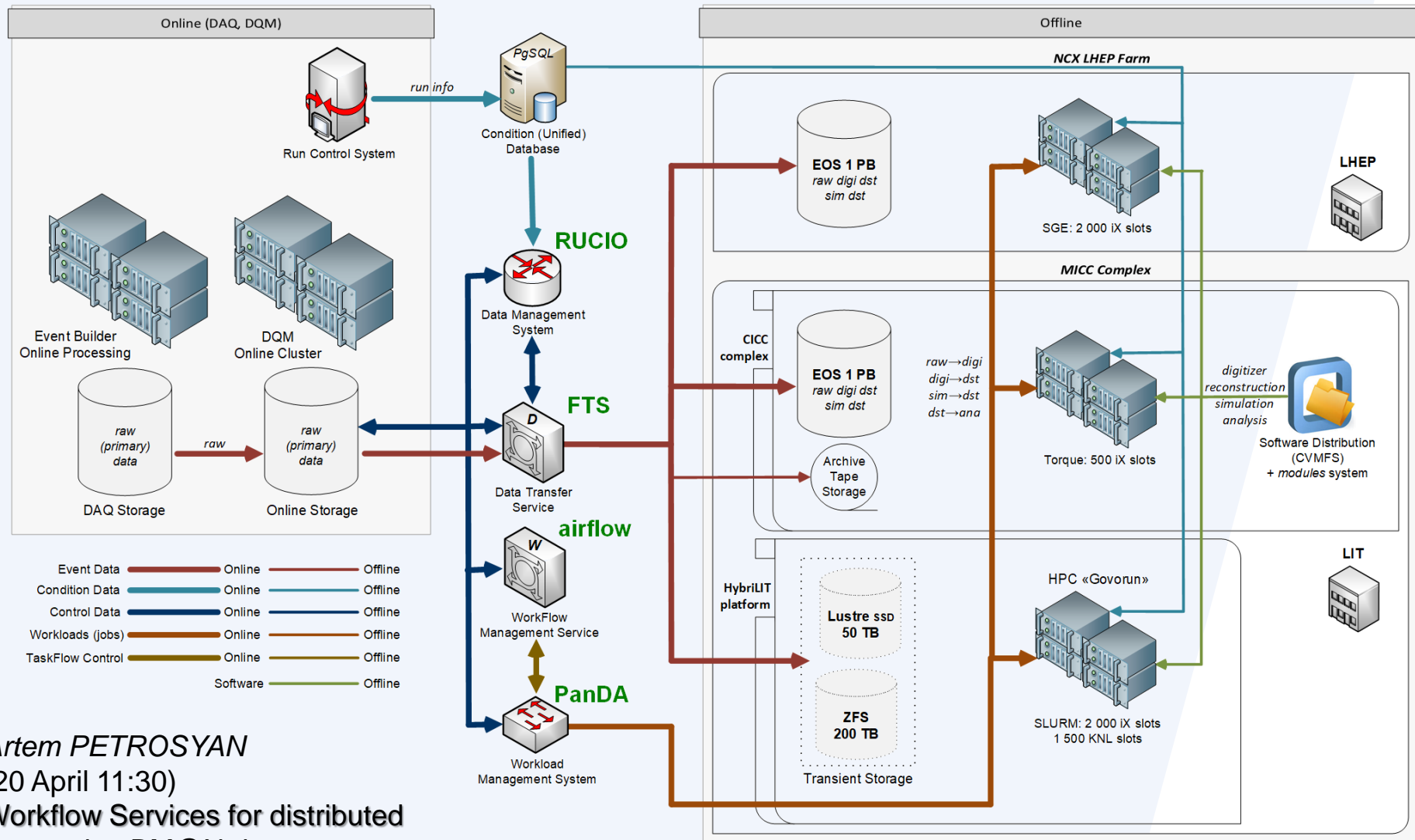
Email to the software coordinator with a detailed user info

Comparison of the NICA cluster and HybriLIT

	NICA Cluster	HybriLIT (Govorun)
Storage System	EOS, GlusterFS	EOS, NFS ZFS, Lustre
Storage Space	6 PB, 116 TB	4 PB, 280 TB, 352 TB
Software System	Local (on each machine)	CVMFS, <i>module</i> system
Batch System	Sun Grid Engine	SLURM
Processor Cores	5 060	8 448 + 6 048
Web-site	http://ncx.jinr.ru (no "how to": EOS, SGE...)	http://hybrilit.jinr.ru (all manuals, registration)
Notifications	nothing	E-Mail
Monitoring GUI	no	https://home-hlit.jinr.ru
Support Ticket System	ncx.jinr.ru forum (no administrator, frequent problems and some's remaining unsolved; storage instability)	https://pm.jinr.ru/projects/hybrilit-user-support (administrators, quick solutions, EOS stable work)

BM@N Workflow

BM@N WorkFlow Development

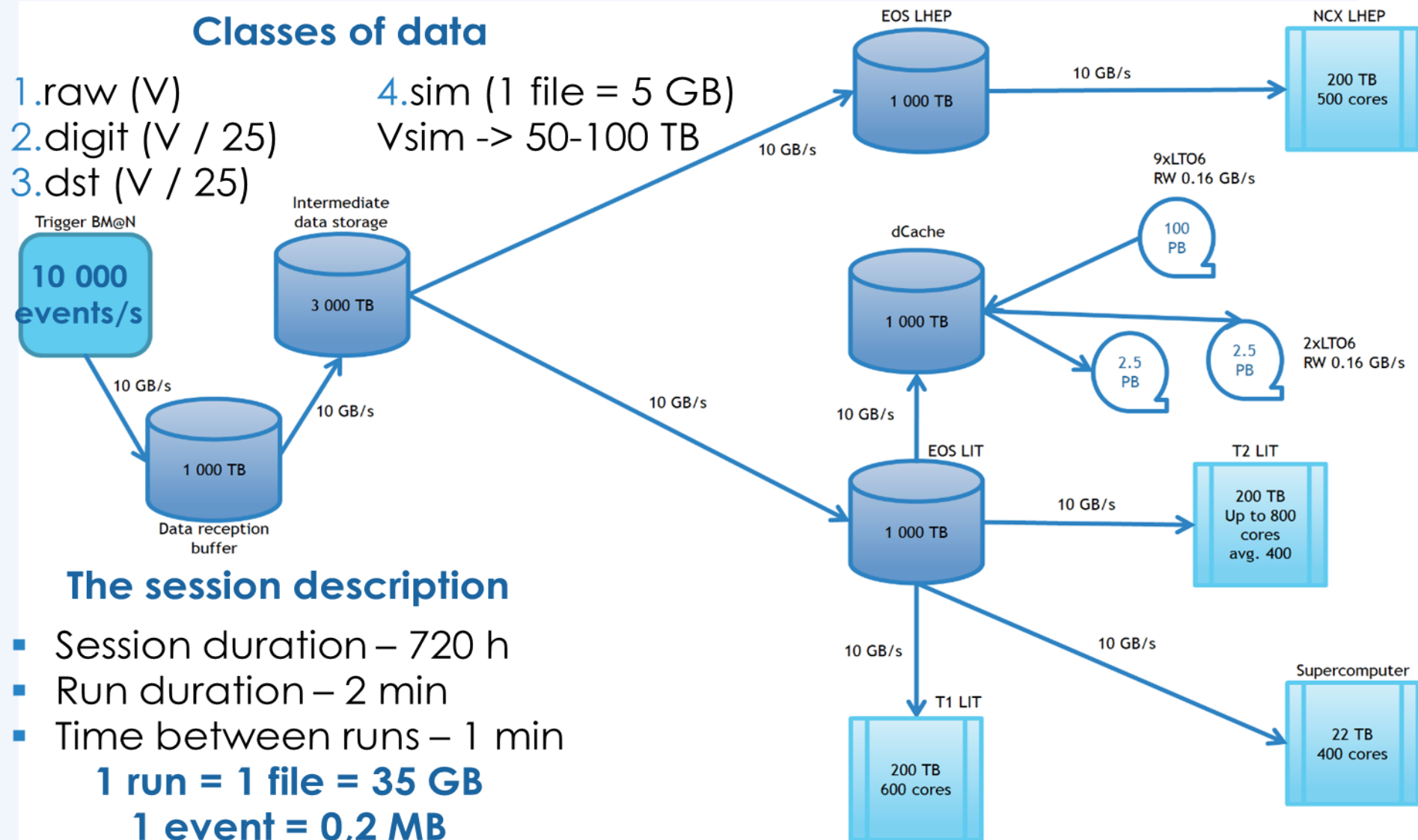


Artem PETROSYAN
(20 April 11:30)
Workflow Services for distributed
processing BM@N data

Data-Processing Simulation for BM@N

Classes of data

- 1.raw (V)
- 2.digit (V / 25)
- 3.dst (V / 25)
- 4.sim (1 file = 5 GB)
Vsim -> 50-100 TB



The session description

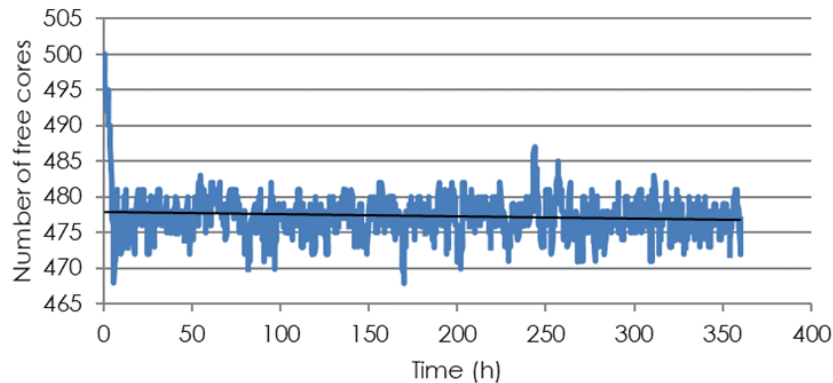
- Session duration – 720 h
- Run duration – 2 min
- Time between runs – 1 min

1 run = 1 file = 35 GB

1 event = 0,2 MB

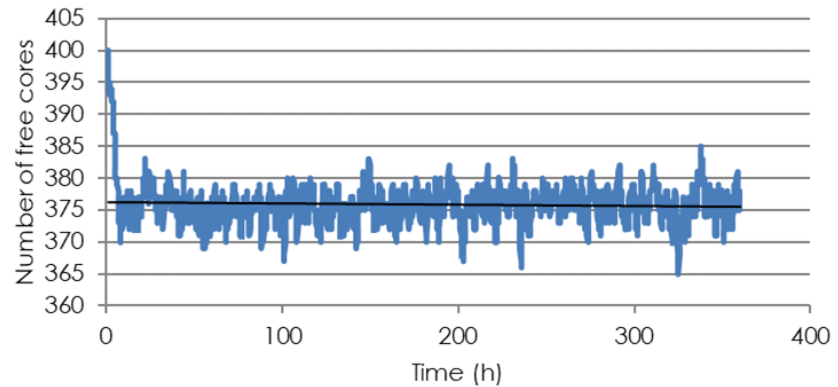
Simulation Results

LHEP free cores



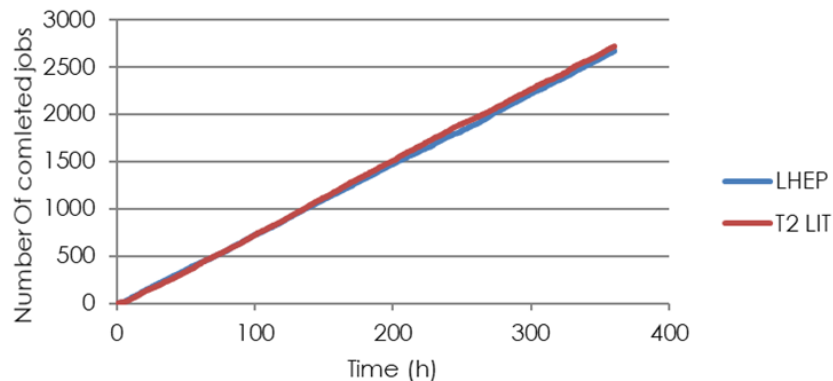
Avg.: 478 free slots

LIT T2 free cores



Avg.: 376 free slots

Completed jobs on farms



We can convert raw-data to digit,
taking up no more than 25 slots
on each farm.

Simulated time: 360 h
5000 jobs (RawToDigit)

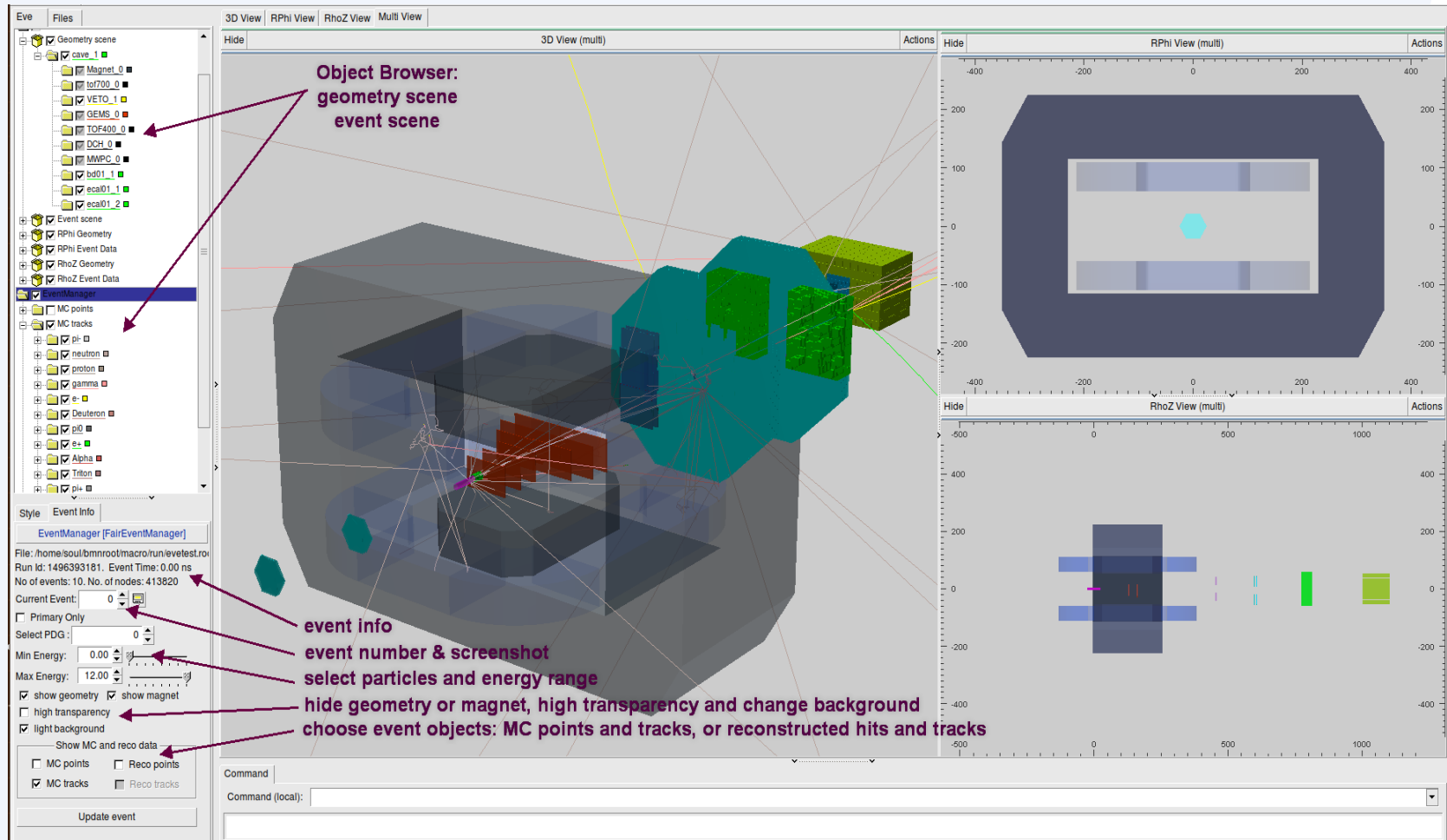
Daria PRYAHINA
(20 April 12:15)

Simulation of data processing centers for the BM@N
experiment on the basis of the probability approach

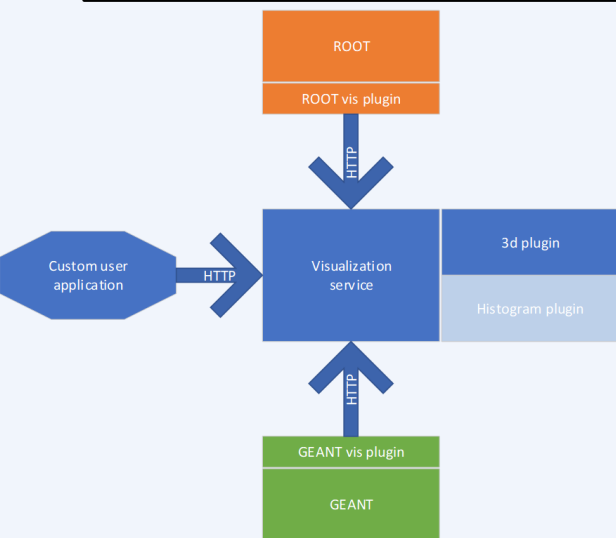
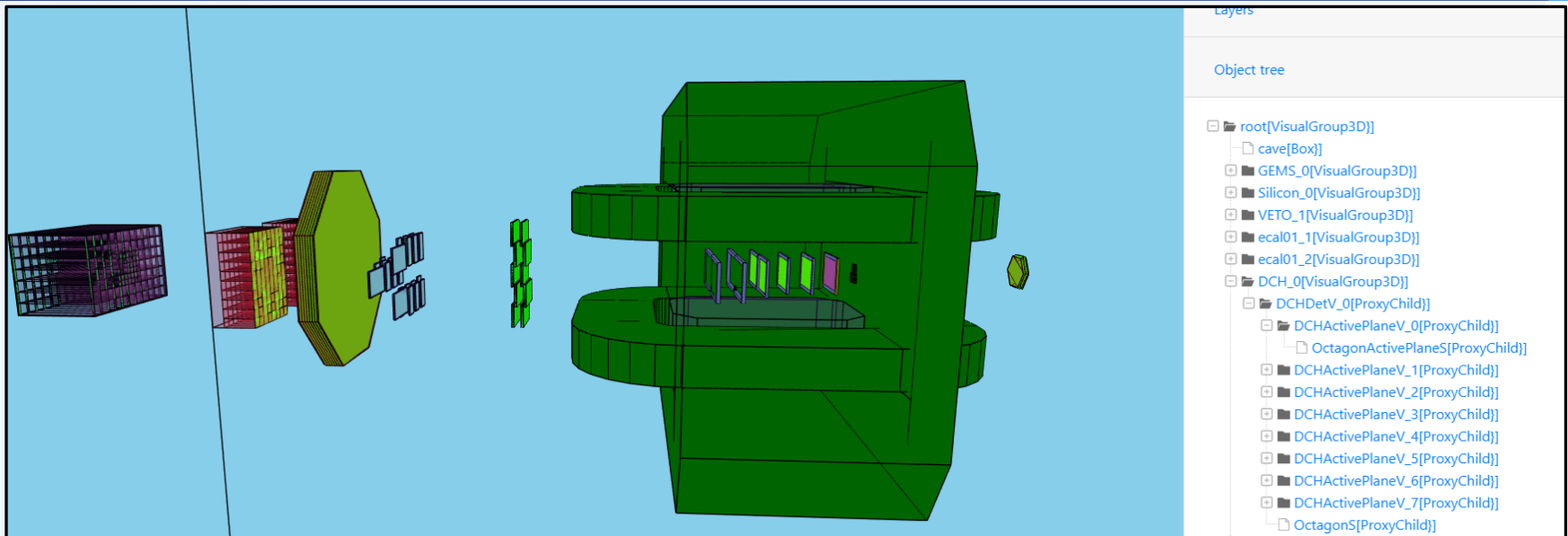
Event Display Next-Gen

ROOT Event Display for the BM@N experiment

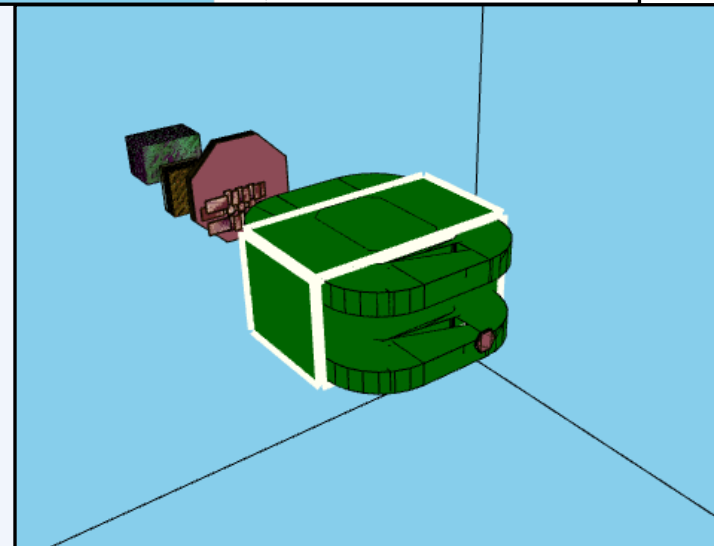
The Event Display can show/hide setup geometry, simulated and reconstructed data: **points**, **hits**, **tracks**, **calorimeter towers**, select event to display, select particles with definite PDG codes, set energy range and many other visualization options.



Event Display Next-Gen development



- Visualization runs as a stand-alone service
- It communicates with other services via HTTP
- The service itself uses plugin system to include new visualization types
- Adapters are made to convert ROOT/GEANT/whatever format into visualization tree



Software Group Status

Project Management via GIT Issues

19 issues had been completed in 2019

29 issues had been still open to be done

26 issues have been completed

30 issues are still open to be done

<https://git.jinr.ru/nica/bmnroot/issues>

GIT Issues:

Milestones → Issue List → Boards with Labels

Software Direction of the BM@N Experiment

***Heads of the BM@N Software Group:
Pavel BATYUK & Konstantin GERTSENBERGER***

Software Staff of the BM@N Software Group*:

Konstantin GERTSENBERGER: software coordinator

Alexander CHEBOTOV: software engineer in JINR since 2018 (24 years old)

*The Software Staff has no department connection with
Department of the BM@N experiment*

*members who are not almost full-time involved in reconstruction, identification and analysis of BM@N event data

BM@N Software Collaboration

Peter KLIMAI
(20 April 12:45)

Visualization and auxiliary tools
development in BM@N experiment



MIPT – NPM group (Head: Tagir AUSHEV)



**BM@N
Software
Contribution**

JINR LIT (Director: Vladimir V. KORENKOV)



Nikita BALASHOV: CVMFS Deployment, GitLab Services, Docker Containers

Irina FILOZOVA, Igor ALEXANDROV, Evgeniy ALEXANDROV: Geometry Database for the BM@N experiment

Dmitriy PODGAYNY (Head of the HybriLIT team), Oksana STRELTSOVA, Maksim ZUEV: HybriLIT and SC Govorun support

Danila OLEYNIK, Artem PETROSYAN: BM@N WorkFlow Services

BM@N Web-site: *bmn.jinr.ru*



COLLABORATION ▾ PHYSICS ▾ DETECTOR ▾ SOFTWARE ▾ COMPUTING ▾ WIKI FORUM VIDYO

1st experiment of the NICA project

Official BM@N collaboration web-site

NICA web-site

BM@N Project

git

BmnRoot code

BmnRoot GitLab repository

BmnRoot



Unified Database

BM@N Offline Database

BM@N DB



ReadMe first

BmnRoot Start Guide

Open Guide



- ✓ **Information**
- ✓ **Documents**
- ✓ **Software**
- ✓ **Databases**
- ✓ **Computing Section**
(NICA Cluster, MICC Complex, HybriLIT & Govorun)
- ✓ **Tests dashboard**
- ✓ **Guides**
- ✓ **Forum**
- ✓ **Vidyo**
- ✓ **BM@N Mail-lists**
(updates, errors...)
- ✓ **etc.**

Summary

- **Collaboration Services** have sufficiently been restructured and improved to simplify their use by members.
- **BmnRoot Release 20.02.0** has been issued with the latest BM@N and SRC simulation, reconstruction, analysis and software improvements. The mass production of the BM@N digits for Run 7 has been performed.
- The architecture of the BM@N mass data processing is under active development, and all related **workflow services** are under deployment now.
- **RFBR support** with the NICA three-year grant (18-02-40125) enables to significantly improve the Information Systems for BM@N data processing.
- The performance of the computing clusters has been significantly increased, but the situation with the **user support of the NICA cluster** is discouraging.
- **The lack of manpower** for full-time BM@N software development is a problem to be solved.

Thank you for your attention!

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Software Development Issues

Distributed and High-Performance Computing

Implementing WorkFlow Services for BM@N Distributed Data Flow
Workload Manager Implementation for BM@N (PaNDA, DIRAC, ALFA...)
NICA-Scheduler improvement
Parallelization in ROOT (RDataFrame, PROOF) and Geant4 (CUDA)
Search-profiling-parallelizing: OpenMP, MPI, CUDA/OpenCL...

Visualization

Corrections of the current BM@N Event Display
Event Display as a Web-service: offline & online systems...

Databases and User Interfaces

Selection of the framework for BM@N File Catalog: RUCIO...
Web-monitoring of the Critical Services (Databases, Hosts...)
Converting existing text and table data to the Database view...

Web-services & Online Systems

Online Monitoring System implementation via DDS system
Distributed Processing via the Web-service...

Simulation and Reconstruction

Global Tracking Completion
New methods for track reconstruction (GenFit...)
Implementation of fast event reconstruction for online processing
Global Alignment based on Millepede II...