

Information Systems for the BM@N experiment and Common Deployment Service

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Nuclotron-based Ion Collider fAcility



- Baryonic Matter at Nuclotron (BM@N)
 Multi-Purpose Detector (MPD)
- □ Spin Physics Detector (SPD)

- > Official site: bmn.jinr.ru
- Official site: mpd.jinr.ru
- > Official site: spd.jinr.ru

Baryonic Matter @ Nuclotron



- ♦ Session №51 (d,C)
- ✤ Session №52 (d)
- Session №53 (d, d[↑])
- Session №54 (C)
- Session №55 (C,Ar,Kr)
- ✤ Session №57 (Xe)

Feb. 22 – Mar. 15, 2015 June 29 – June 30, 2016 Dec. 9 – Dec. 23, 2016 Mar. 7 – Mar. 18, 2017 Mar. 3 – Apr. 05, 2018 Nov – Dec, 2022



e-Log platform

What is an e-Log and why is it needed?

- The online electronic logbook allows shift members to record information on current events, states of various systems, operation conditions of detectors., which are further used in processing and physics analysis of the particle collision events.
- The system provides collaboration members with tools for convenient viewing, managing and searching for the required information in the logbook.

Event	Subscription
New record of the 'Configuration' type.	
New record of the 'Inform All' type.	
New record of the 'New Run' type.	
New record of the 'Other' type.	
New record of the 'Problem Fixed' type.	
New record of the 'Problem report' type.	
New record of the 'Routine' type.	

Logbook Account

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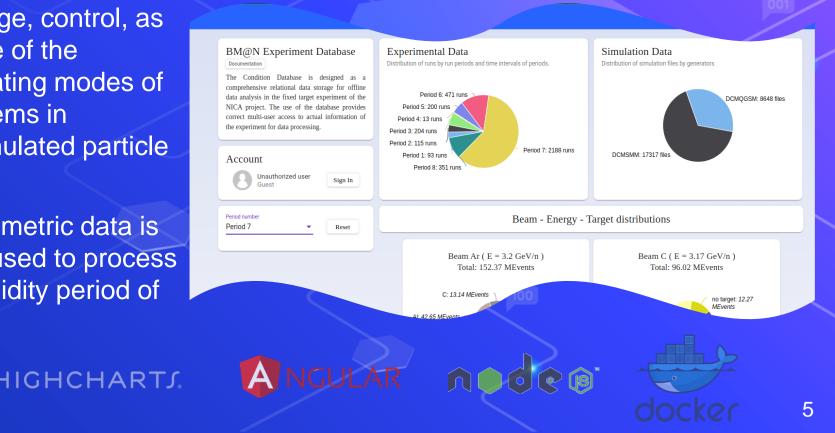
	4	Shift Leader 🔾	Туре 🔹	Ni Run 🔍	Trigger	0	DAQ Status 🔹	SP-41, A	SP-57, A 🔾	VKM2, A	O Beam O	Energy, GeV 🗢	Target 🔹	0
2022-03-15 1	17:01:41	Ksenia Alishina	New Run	1546 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	Lea
2022-03-15 1	16:57:14	Ksenia Alishina	New Run	1544 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	Lea
2022-03-15 1	16:54:46	Ksenia Alishina	New Run	1543 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	Lea
2022-03-15 1	16:54:28	Ksenia Alishina	New Run	1542 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	1
2022-03-15 1	16:53:20	Ksenia Alishina	New Run	1541 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	1
2022-03-15 1	16 52 01	Ksenia Alishina	New Run	1540 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	1
2022-03-15 1	16:49:34	Ksenia Alishina	New Run	1538 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	r
2022-03-15 1	16:49:16	Ksenia Alishina	New Run	1537 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	1
2022-03-15 1	16:48:52	Ksenia Alishina	New Run	1536 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3 mm)	1
2022-03-15 1	16:48:35	Ksenia Alishina	New Run	1535 per.8	ARM-OR + Laser		Without LAND and ToFCal ArmOr+Laser 10Hz on	1650	0	0	с	3.6	SRC Lead 3 (3	1



Condition Database



- This system is intended for storage, control, as well as search, selection and use of the necessary parameters and operating modes of detectors and experimental systems in processing experimental and simulated particle collision events.
- The main property of stored parametric data is that it changes over time and is used to process data collected only during the validity period of the corresponding parameter.



PostgreSQL

https://bmn-unidb.jinr.ru

Configuration information system

concerned by DEBD gravet NoTB-02-40125

What is a Configuration system?

- The Configuration Information System stories a set of various configuration parameters, such as those required for setting the detectors into operation modes, for instance, working voltage, and descriptions of a sequence of software tasks to be started.
- System starts the described software tasks in the a required sequence and allows managing them during sessions, including the transmission of messages between tasks and the update of some properties.

Select task 🔍 Select	setup 🗸 🗸	Select module	S	tarted	✓ Select host	× (FILTER RESET
Task Name	Setup:Run	Module	Status	Log	Start Time	End Time	Host
bmn_event_display_imit	BMN:7	OnlineControl	Started	-	2022-10-04 12:36:27		cbmdb.jinr.ru
Parameters:time 5messageFi /ersion: version1	ie britt_erent_disj						
fersion: version1 nstance: 1 25: centos Restart: yes 80ot: yes Properties: Name RecoMessProp	erty; Value read;						
Version: version1 nstance: 1 DS: centos Restart: yes Boot: yes Properties: Name RecoMessPropri- bmn_fast_event_reco_imit		OnlineControl	Started		2022-10-04 12:36:27		cbmdb.jinr.ru
Aersion: version1 nstance: 1 25: centos Restart: yes 30ot: yes Properties: Name RecoMessProp	erty; Value read;		Started Started		2022-10-04 12:36:27 2022-10-04 12:36:27		cbmdb.jinr.ru cbmdb.jinr.ru

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	Select Setup Run: BMN Run 7 🗸 🔶	Control panel	T			
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RATION MANAGER	Module Name	Working Directory		Actions		
ARY SET ~	OnlineControl		E	3		
	©Module Tasks Module Properties			433	ACCOUNTS TAK	
touch	Task Name	Host		Actions		
	three_event_alisplay_imit	[o-z]*[0-9]*[.][im[.]ru		B	×	
stantin Gertsenberger	bran fast_event_reco_imit	(a-z)*[0-9]*[.]jiw[.]ru		B 🕑		
	bran_online_histo_insit	[0-2]#[0-9]#[.][im[.]m			×	
	bmn_root_digl_imit	10-21*10-91*130w13ru			×	

Geometry information system

HOME

VIEW GEOMETRY

et in touch

ECAL

BmnEca

Konstantin Gertsenberger

What is a Geometry system?

- The developed geometry information system provides a centralized repository of experimental setup geometries and a set of convenient tools for managing individual components and assemblies of various versions.
- Different versions of setup geometries and constituent components are used to process obtained particle collision events in simulation and physics data analysis

Nuclotron

BM@N Geometry DataBase 🛛 🛓

Geometry DataBase

GENERAL INFORMATION

The Geometry Database is a part of the Geometry Information System, which provides a central stort convenient tools to manage the geometry modules and software assemblies of various versions of the se additional files containing a description of the magnetic field, detector materials and media. Two user interf Database of the experiment: the specialized Web interface and an application programming interface (API) and loading the setup geometry and its components into the experiment software for simulation, reconstrucollision events. The Geometry Database is intended for storing, processing and managing information of database provides the following functionality:

- viewing, adding and deleting files with geometry materials and magnetic fields;
- viewing and managing files with detector geometries of the setup, CERN ROOT
- viewing and managing geom rotation of the detect constructing and insformation Description Download Date Author viewing, loading 2021-09-20 aleksand SRCArmTriggers_Spring2018.root * BC RunSRCSpring20 {....} BmnBC 2021-09-20 aleksand * BC BC RunSRCSpring2018.root {⊞} geom BD det run6 2021-09-14 aleksand ±. BD BmnBd geom BD det run6.root {⊞} ± BD BmnBd geom_BD_det_v2 2021-09-13 aleksand geom_BD_det_v2.root {....} bd v1 run7 2021-07-27 aleksand bd_v1_run7.geo * BD BmnBd {::::} bd v1 run6 2021-07-20 aleksand * BD BmnBd bd v1 run6.geo {....} 2018-07-03 aleksand * CAVE FairCave init cave CSC_RunSRCSpring2 {ⅲ} CSC BmnCSC 2021-09-14 aleksand CSC RunSRCSpring2018.root * 018 {⊞} 2021-07-27 aleksand * CSC BmnCSC CSC RunSpring2018 CSC RunSpring2018.root DCH RunSpring2018 2021-07-27 aleksand DCH_RunSpring2018.root * BmnDch DCH RunWinter201 DCH BmnDch ECAL v3 run7 pos4 ECAL BmnEcal

Event metadata system

What is Event metadata?

The implemented information system is based on an event database called the Event Catalogue, which contains summary information about on particle collision events, allowing the user to quickly search for a set of events required for a particular physics analysis according to given criteria.



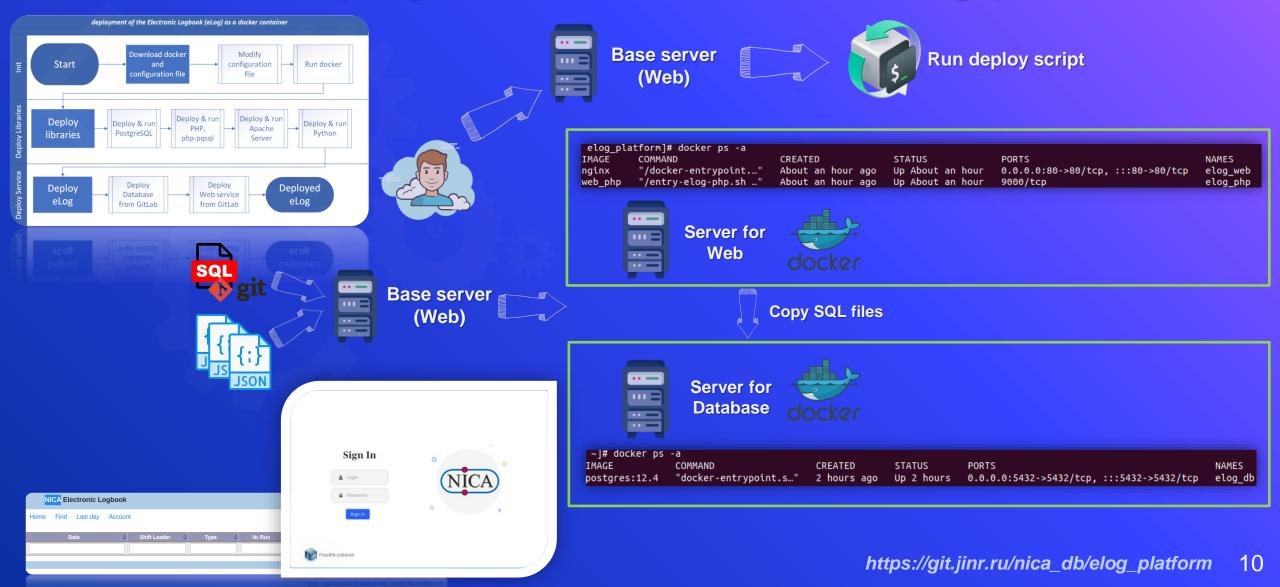
	S			Storage	File path	# Event	Software	Period	# Run	Total track num	Triggers (string)	Primary vertex
	parameters	Test Events		data1	/var/file1	150	19.1	7	5100	90	qwe	true
5	ram	Period Number	Ш	data1	/tmp/file4	1	19.1	7	5001	25	qwerty	true
DB prefilter		Run Number		data1	/tmp/file4	2	19.1	7	5001	77	qwerty1	false
bre	base	Beam Particle		data1	/tmp/file4	3	19.1	7	5001	25	qwerty	true
DB	P	Target Particle		data1	/tmp/file4	4	19.1	7	5001	25	qwerty	true
ion	ers	Energy, GeV	П.	data1	/tmp/file4	10	19.1	7	5001	25	qwerty	true
 Condition	met			data1	/tmp/file4	11	19.1	7	5001	77	qwerty1	false
Ö	parameters	Total track number	н	data1	/tmp/file4	12	19.1	7	5001	25	qwerty	true
		Triggers (string)		data1	/tmp/file4	13	19.1	7	5001	77	qwerty1	false
offset	Jure	Primary vertex 👻		data1	/tmp/file4	14	19.1	7	5001	25	qwerty	true
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and	8	Offset							•	1		
limits		Filter Reset					t metada					
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Common deployment services for e-Log platform

NICA		<pre>"addColumns" : [</pre>
{	Server for Database	"dbHost" : "db_host.jinr.ru", "dbHostUser" : "db_host_user", // host user for deployment of the Logbook database (remote or locally) "dbName" : "elog_db", "dbPort" : 5432, "dbBackup" : "", // e-Log database name // e-Log database port "dbBackup" : "", // regular e-Log database backup, if needed (several storages are
<pre>"administrator" : { "group": "elogadmin" }, "writer" : { "group": "elogwriter" },</pre>	<pre>"administrator" : { "login": "admin_user", "password": "admin_pass" }, "writer" : { "login": "writer_user",</pre>	<pre>"ipaAuth" : false, separated by semicolon) "ipaHost" : "", // authentication/authorization type: false - as database roles; true - IPA/LDAP authentication/authorization "addColumns" : [</pre>
"reader" : { "group": "elogreader" } } Accounts for IPA	<pre>"password": "writer_pass" }, "reader" : { "login": "reader_user", "password": "reader_pass" }</pre>	<pre>"expUrl" : "https://nica.jinr.ru", "notifySend" : true, "notifyServer" : "mail.jinr.ru", "notifyLogin" : "my_mail@jinr.ru", "notifyPass" : "my_mail_password", "notifyPass" : "my_mail_password", "contactEmail" : "contact_person@jinr.ru",</pre>
authorization	Accounts for database authorization	<pre>"useConditionDb" : false, "conditionDbHost" : "uni_db_host.jinr.ru", "conditionDbName" : "uni_db", "conditionDbName" : "uni_db", "conditionDbName" : "uni_db", "conditionDbVass" : "writer_user", "conditionDbPass" : "writer_pass" }</pre>

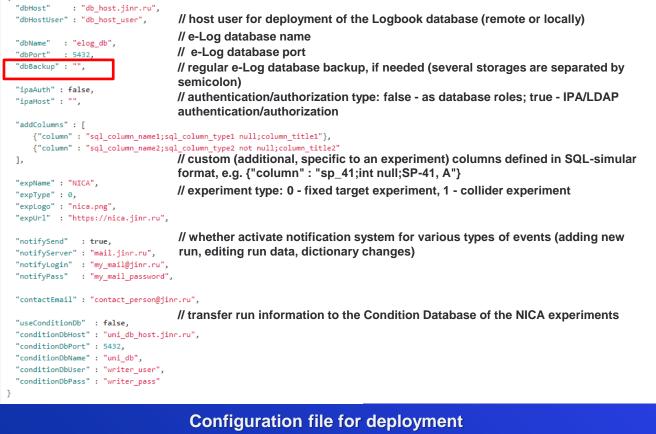
https://git.jinr.ru/nica_db/elog_platform

Common deployment services for e-Log platform



Common deployment services for e-Log platform

"dbBackup" : "~/backup; backup_user@backup_server.jinr.ru:~/backup"





Server for Database

https://git.jinr.ru/nica_db/elog_platform

Conclusions

- The complex of information systems have been developed that provides the collection, storage, organization of convenient, management of information necessary for processing and analyzing the data obtained throughout scientific research of the NICA megaproject.
- The e-Log platform is an information system for viewing, modifying and visualizing the information on the experiment sessions for shift crews.
- The Condition database system has been developed with an adaptive design, functional data selector and convenient tools for viewing and managing information.
- The Configuration system interface, which provides a set of necessary functions for monitoring active tasks, as well as for viewing, searching and managing information about the configuration of the experiment.
- The Geometry system for working with the geometry of experiment detectors has been implemented, designed to store, process and manage information about the geometric model of detectors.
- The Metadata system for particle collision events has been developed to automate the search and selection of only those events that are required to process the received data.
- A common installation system has been implemented for convenient deployment of the Electronic Logbook.

Thank you for your attention!