

Operations and plans - RDIG

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outline

- Structure
- Status of production in the last year
- Resources and funding in 2017
 - Current status
 - Sarov
- Network
- Federation
 - Federated Storage

RDIG Structure

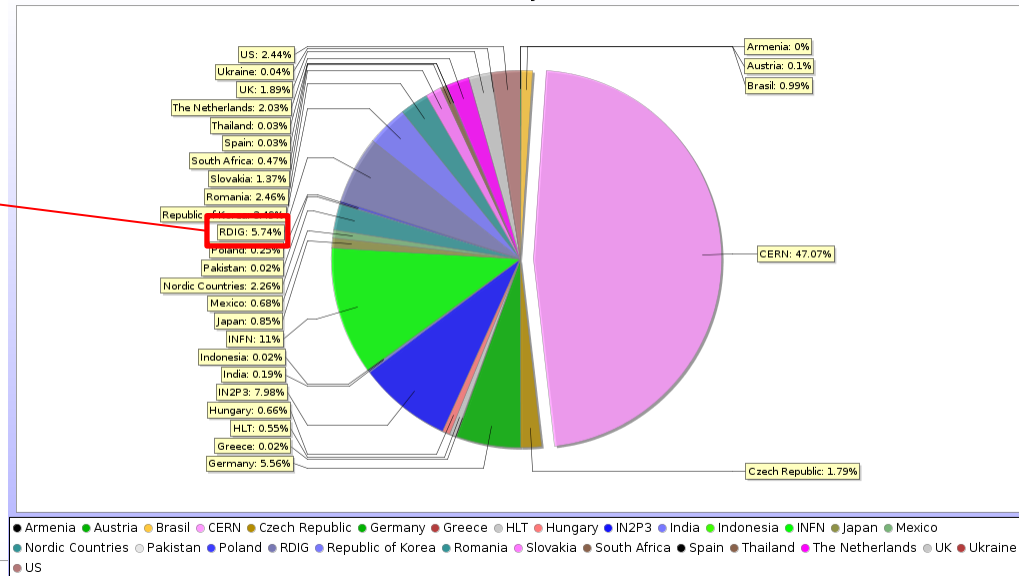
	NRC KI	WLCG (REBUS)	Works now
RRC-KI-T1	+	+	+
RRC-KI	+	+	+
JINR	+	+	+
IHEP	+	+	+
ITEP	+	+	+
PNPI	+	+	+
SPbSU		+	+
Troitsk		+	+
MEPhI			+
Sarov			

RDIG production in the last year (till April)

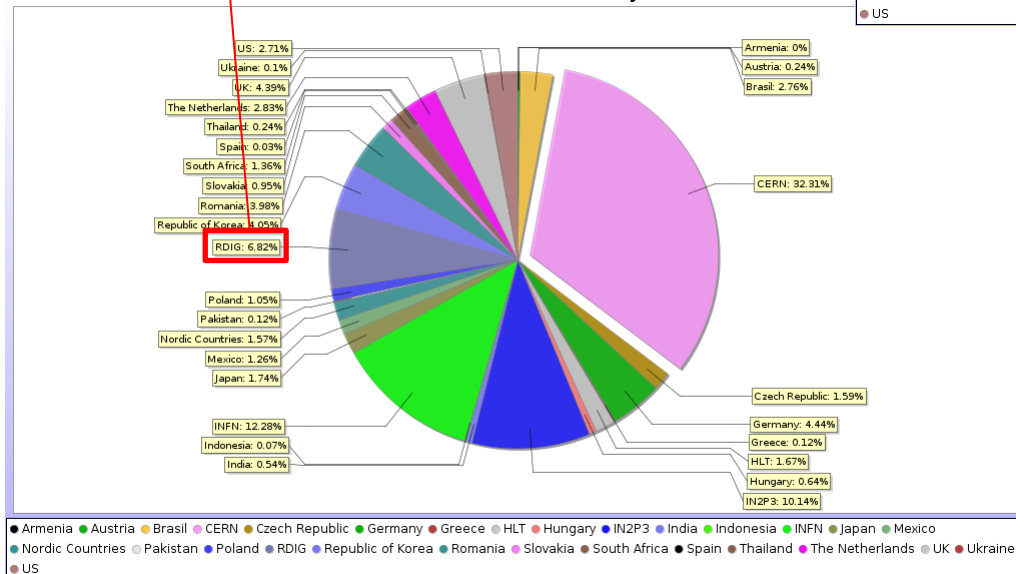
RDIG: 5.74%

RDIG: 6.82%

DONE jobs



Total CPU hours for ALICE jobs



- CPU usage: 6.82 vs 7.68% in 04.2015-04.2017
- Done jobs: 5.74 % vs 4.61% in 04.2015-04.2017

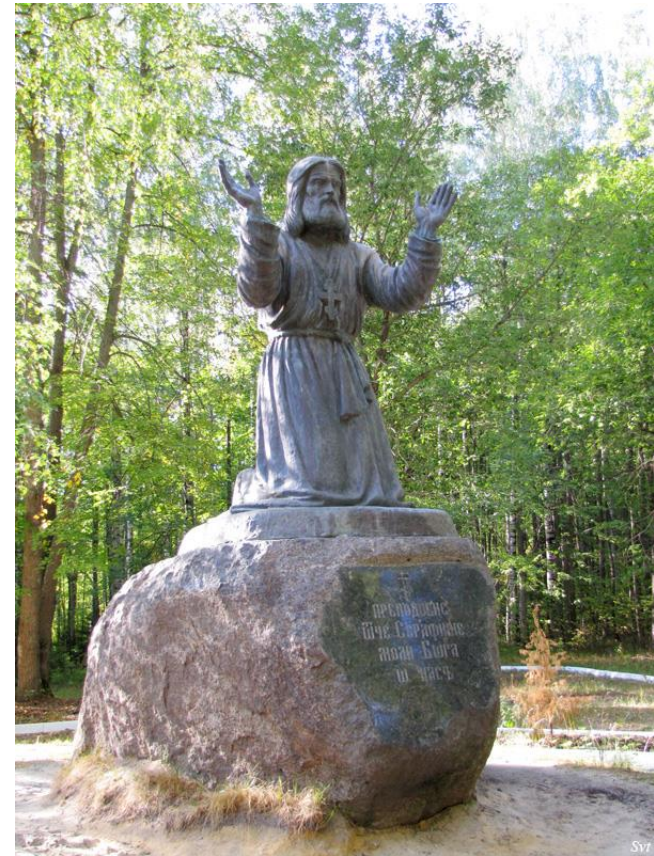
Resources 2017-2018

	2016-2017 CE HEPSPEC	2016-2017 SE TB	2018 CE HEPSPEC	2018 SE TB
RRC-KI-T1	32800	2520+2960 Type	? + Resources of SuperComputer	? + 600 Disk+ 600 Type
RRC-KI	4488	316	-	-
JINR	6500	438	-	-
IHEP	2631	297	-	-
ITEP	2124	200	-	-
PNPI	2640	44	-	-
SPbSU	4155	128	-	-
Troitsk	641	116	-	-
MEPhI	769	40	-	-
Sarov	0	0	~4320	~300
Total (T2)	23179(rebus)+769	1539(rebus)+40		

Sarov – VNIIEF (ALL-RUSSIAN RESEARCH INSTITUTE OF EXPERIMENTAL PHYSICS)

Sarov is a city in the Nizhny Novgorod region of Russia with a population around 100,000 people located 450 km from Moscow. It is one of the most famous spiritual centers of Russia. Since 1946 the city has a scientific research center VNIIEF for the development of the nuclear shield of the country with a staff more than 15,000 people. Since 1997 the organization participates in the ALICE experiment. It is responsible for the mechanical and design solutions of the PHOS detector, its cooling and temperature stabilization system, the software of the slow control system. Together with Sarov branch of the National Research Nuclear University VNIIEF conducts the creation of a GRID cluster for ALICE tasks.

<http://www.vniief.ru/>



Sarov – GRID cluster

- 2011-2012 : VNIIEF buys resources

- 2011 - 2017:

Solve problems

- Data center

- Network connection

- 2017: Beginning

of work. We hope to finish assembling of the hardware by June and install software by August



Network

	LHCONE	IPv6
RRC-KI-T1	+	technically supports . Now work of include to GRID.
RRC-KI	+	----- -----
JINR	+	Plan : finish migration to EOS Aquamarine (xrootd 3, does not support IPv6), update to EOS Citrine when it will be ready for production (xrootd 4, supports IPv6)
IHEP	+	Plan – start work on 2017
ITEP	+	Plan – start work on 2017
PNPI	+	Plan – start work on 2017
SPbSU	Plan on 2018 year	Plan – start work on 2017
Troitsk	+	-
MEPhI		-
Sarov	+ - ?	-?

Russian federated data storage project

In the fall of 2015 the “Big Data Technologies for Mega-Science Class Projects” laboratory at NRC “KI” has received a Russian National Science Foundation grant to evaluate federated disk storage technologies.

This work has been started with creation of a storage federation for geographically distributed data centers located in Moscow, Dubna, St. Petersburg, and Gatchina (all are members of Russian Data Intensive Grid and WLCG).

This project aims at providing a usable and homogeneous service with low requirements for manpower and resource level at sites for both LHC and non-LHC experiments.

Test goals, methodology and tools

Goals:

Set up a distributed storage and verify basic properties:

- Data access, reliability, replication

Tools:

Synthetic tests:

- Bonnie++: file and metadata I/O test for mounted file systems (FUSE)
- xrdstress: EOS-bundled file I/O stress test via xrootd protocol

Experiment-specific tests:

- ATLAS test: standard ATLAS TRT reconstruction workflow with Athena
- ALICE test: sequential ROOT event processing (thanks to Peter Hristov)

Network monitoring:

- Perfsonar: a widely-deployed and recognized tool for network performance measurements

Software components:

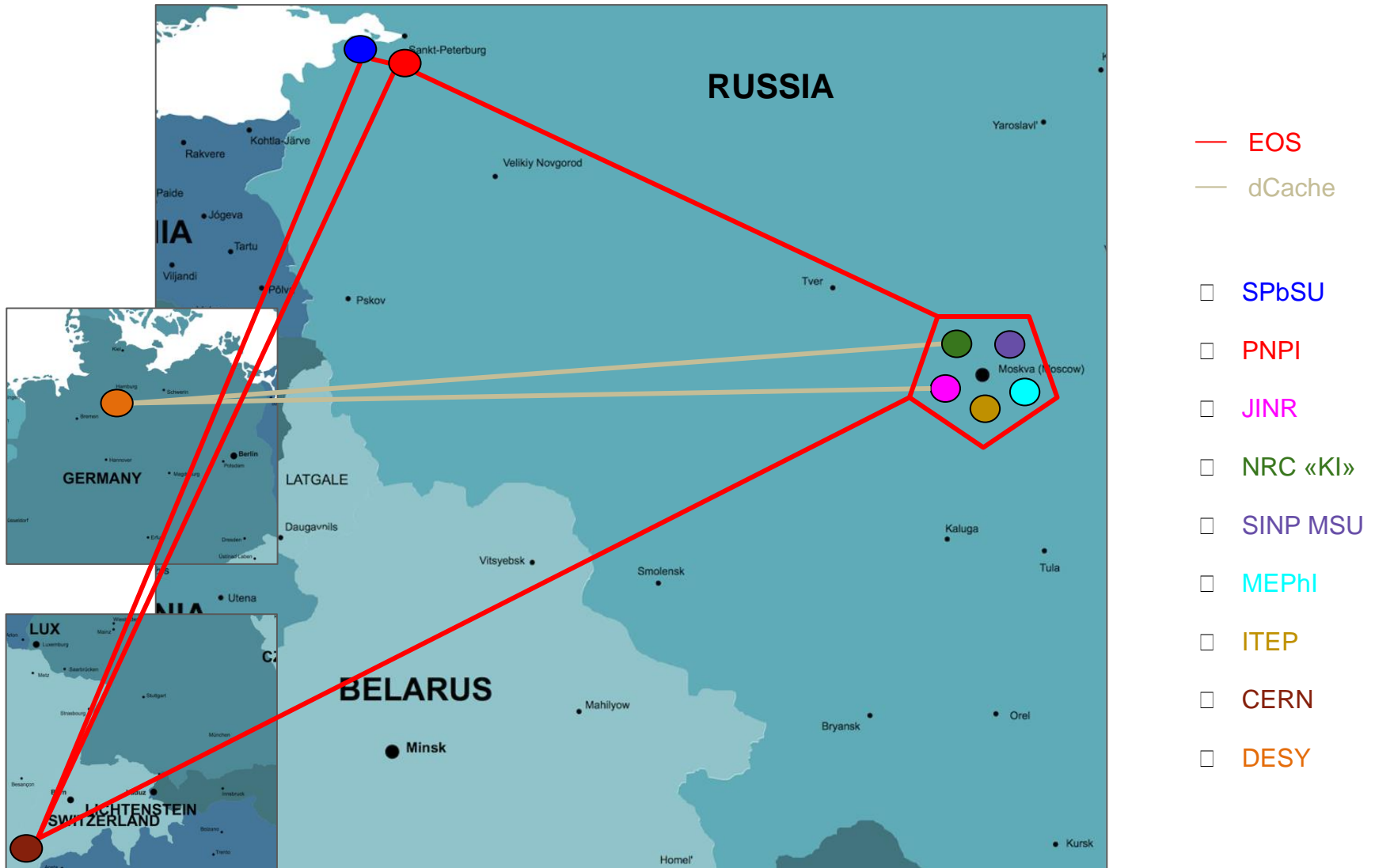
Base OS: CentOS 6, 64bit

Storage system: EOS Aquamarine, dCache 2.16

Authentication scheme: GSI / X.509

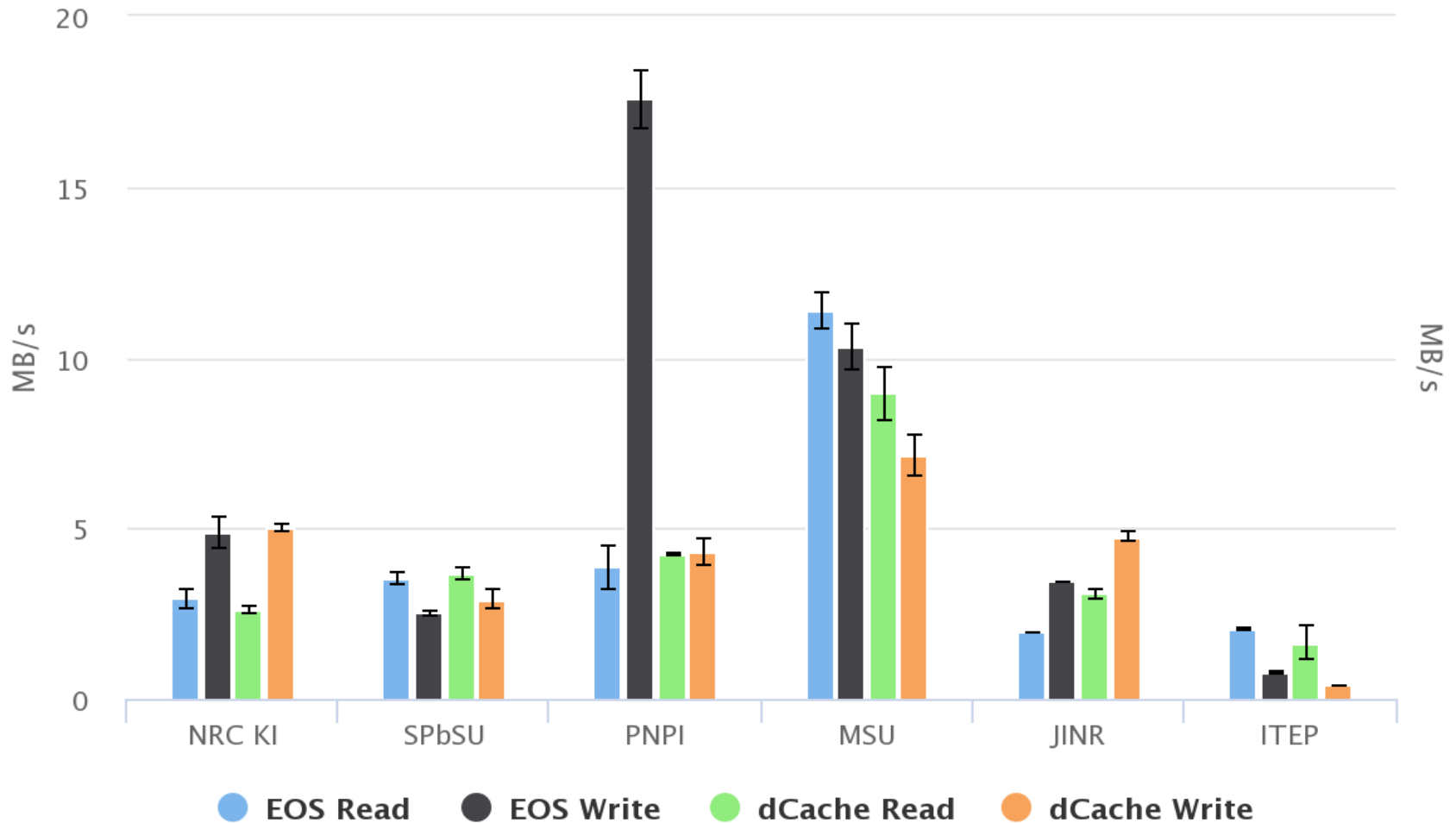
Access protocol: xrootd

Federation topology



Performance comparison

EOS and dCache read/write stress test



Status Federated storage on May 2017

- We have set up a working prototype of federated storage:
 - Seven Russian WLCG sites organized as one homogeneous storage with single entry point
 - All basic properties of federated storage are respected
- We have conducted an extensive validation of the infrastructure using :
 - Synthetic tests
 - Experiment-specific tests
 - Network monitoring
- We have exploited EOS as our first technological choice and we have enough confidence to say that it behaves well and has all the features we need
- We're in the middle of extensive testing with dCache, but our first results look very promising
- Yet we have other software solutions to exploit (HTTP-based federation and DynaFed)

Summary

- The quality of resources is growing.
- Till 2018 We can hope on new hardware only for T1 and on new site - VNIIEF (Sarov)
- Start work for support IPv6 on same sites.
- Sites mostly connected to LHCONE
- Work continues on the Federated Storage.

Thank you for your attention!