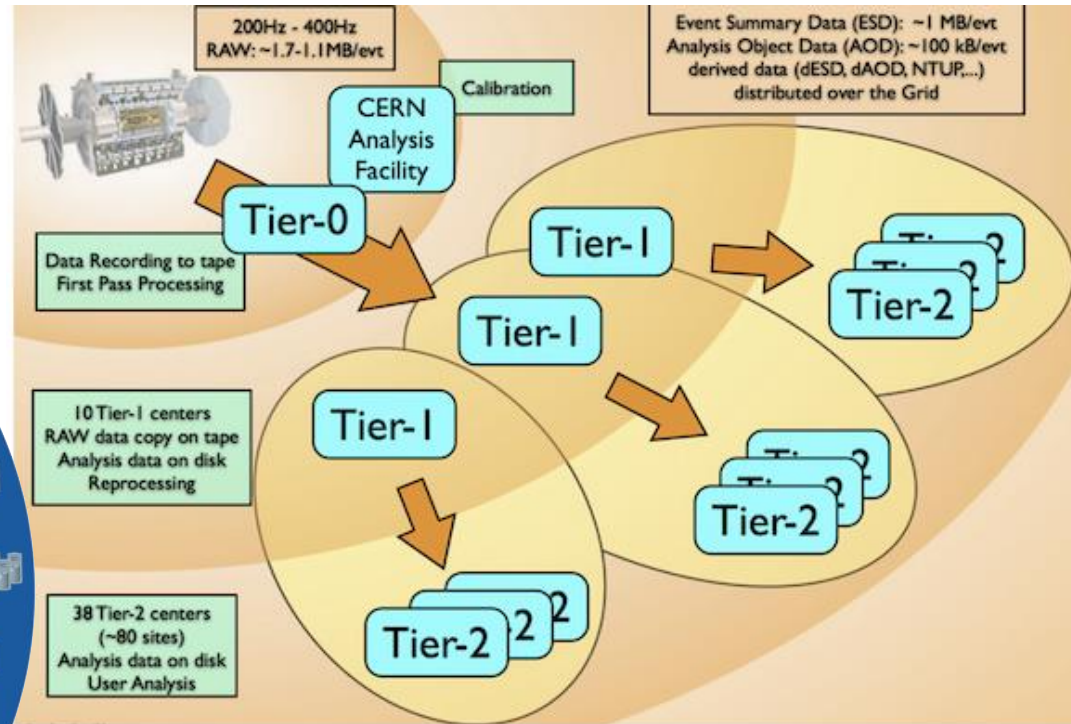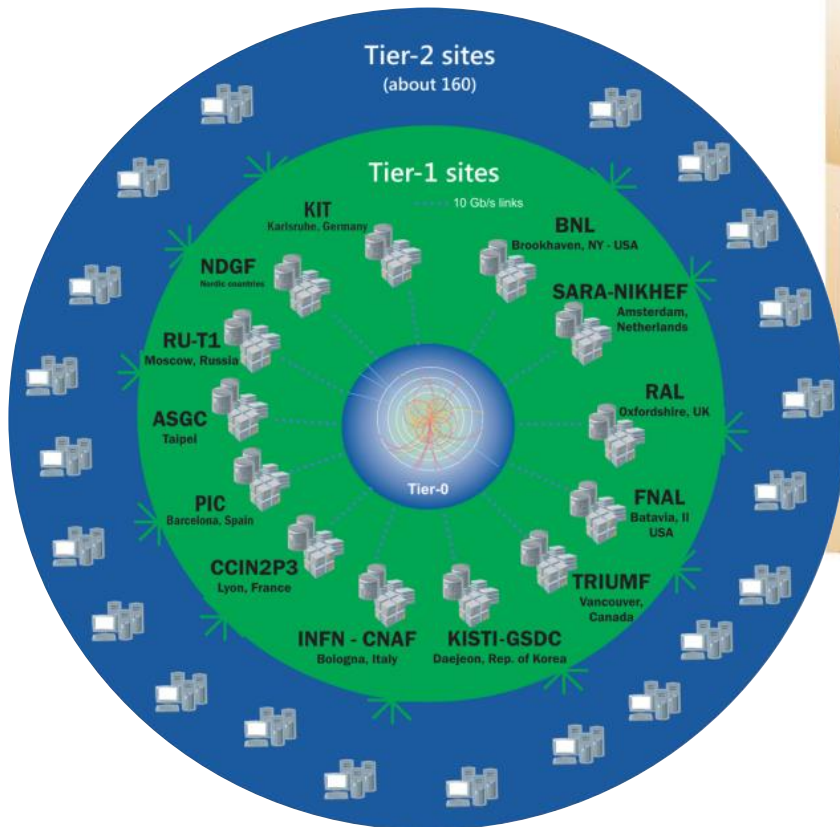# Using the experience of administering the Russian segment of ALICE WLCG to support NICA data processing system

Andrey Zarochentsev

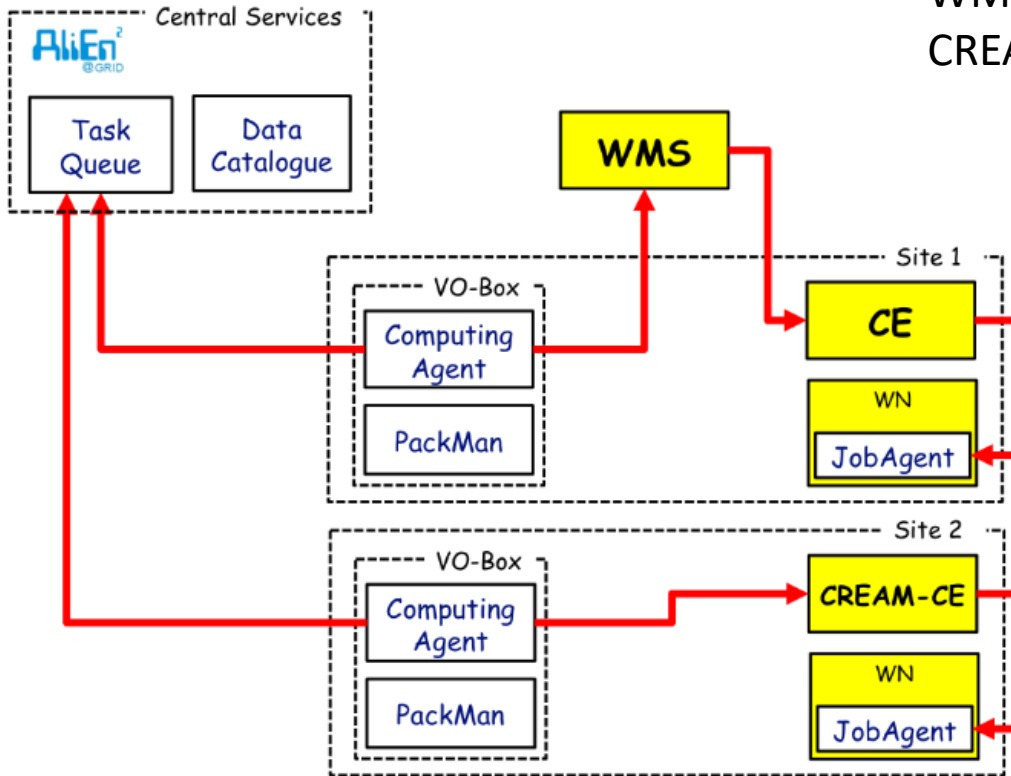SPbSU

Worldwide LHC Computing Grid

https://www.twgrid.org/wordpress/index.php/large-hadron-collider-lhc-experiments-atlas-and-cms-and-wlcg/

AliEn

A simplified schema of the ALICE workload management components. The job submission chain through
WMS ("Site 1", top) and through the CREAM CE ("Site 2", bottom) are shown

"The ALICE Workload Management System: Status before the
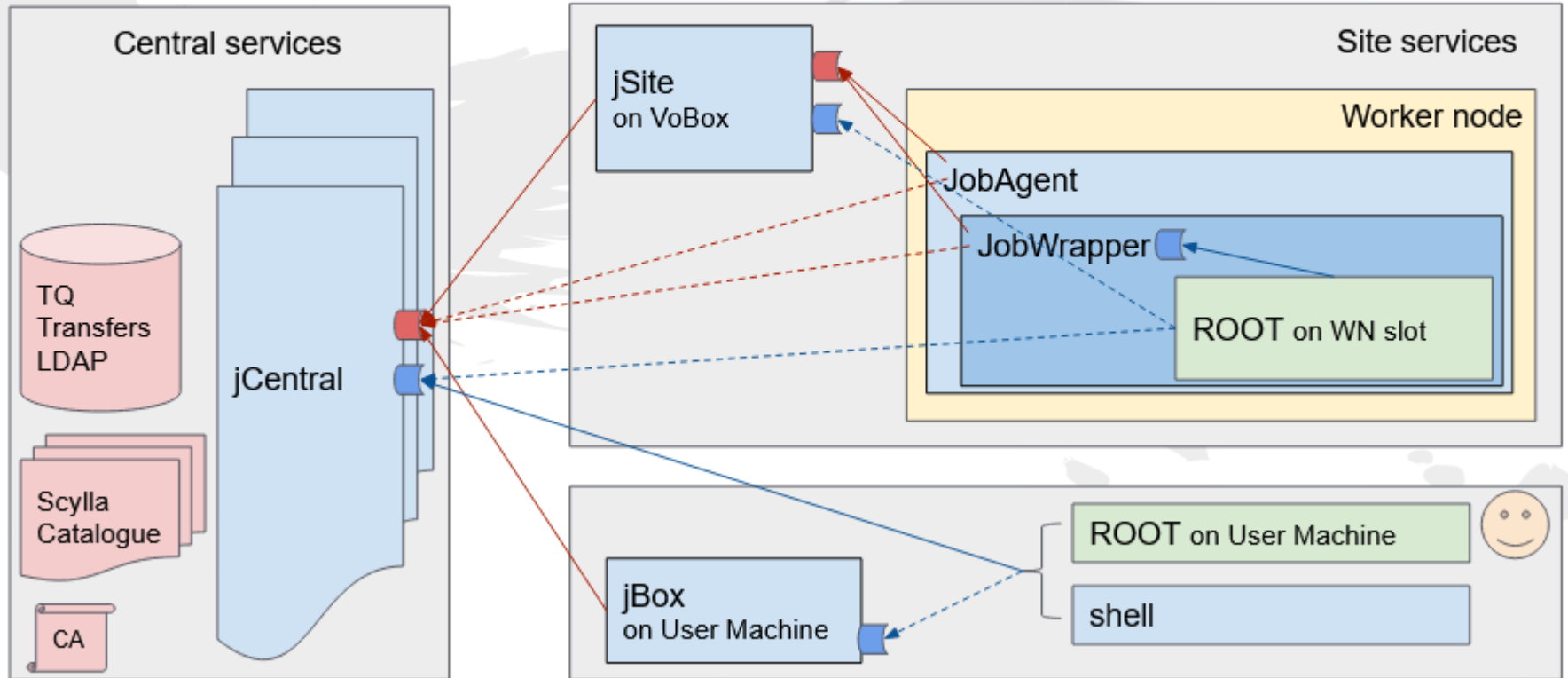real data taking" , CHEP09

JAliEn

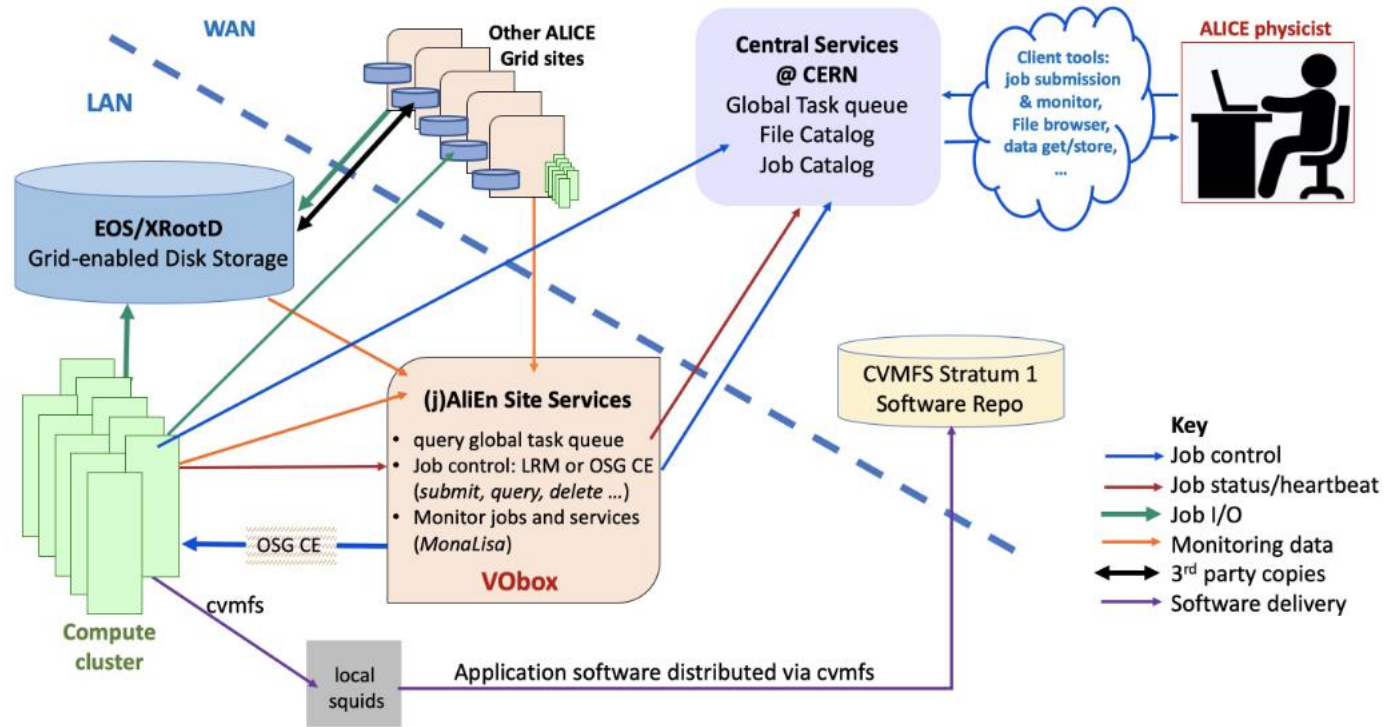JAliEn - T1/T2 workshop – 2019, *costin.grigoras@cern.ch*

Alice SITE

Schematic cartoon of ALICE Grid site internal topology and relative to the larger grid facility.

ALICE-USA Computing Project Proposal 2022-2024
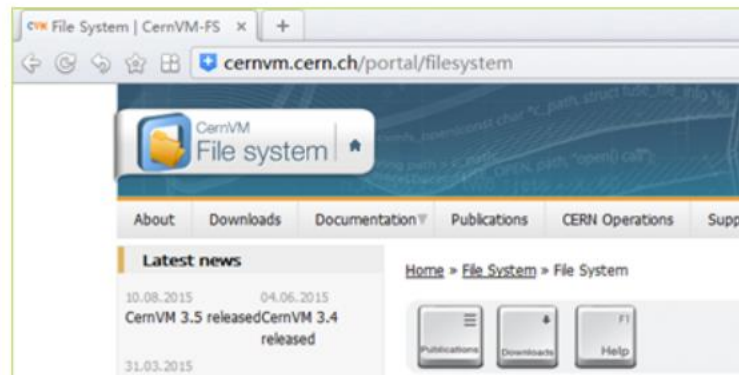
Shared file system for application software - CVMFS

What is CVMFS?

* CVMFS = CernVM File System

* POSIX read-only network file system based on HTTP

* designed and optimized for HEP software distribution

* official site: http://cernvm.cern.ch/portal/filesystem

Introduction to CVMFS, Tian Yan, 2015/09/09   *4*

Storage system - EOS

Flexible

EOS is a storage solution for central data recording, analysis and processing++

Adaptable and Scalable

EOS supports thousands of clients with random remote I/O patterns with multi protocol support WebDAV, CIFS, FUSE, XRootd, GRPC.

Over 500 PB at CERN

Designed for high capacity and low latency.

Security

EOS offers a variety of authentication methods:KRB5, X509, OIDC, shared secret, and JWT and proprietary token authorisation.

Sync & Share

EOS provides Sync&Share functionality for the **CERNBox** front-end services.

Tape Storage

EOS includes tape storage in combination with the **CTA** Cern Tape Archive software.

https://eos-docs.web.cern.ch/

Authorization

From X509 to WLCG tokens
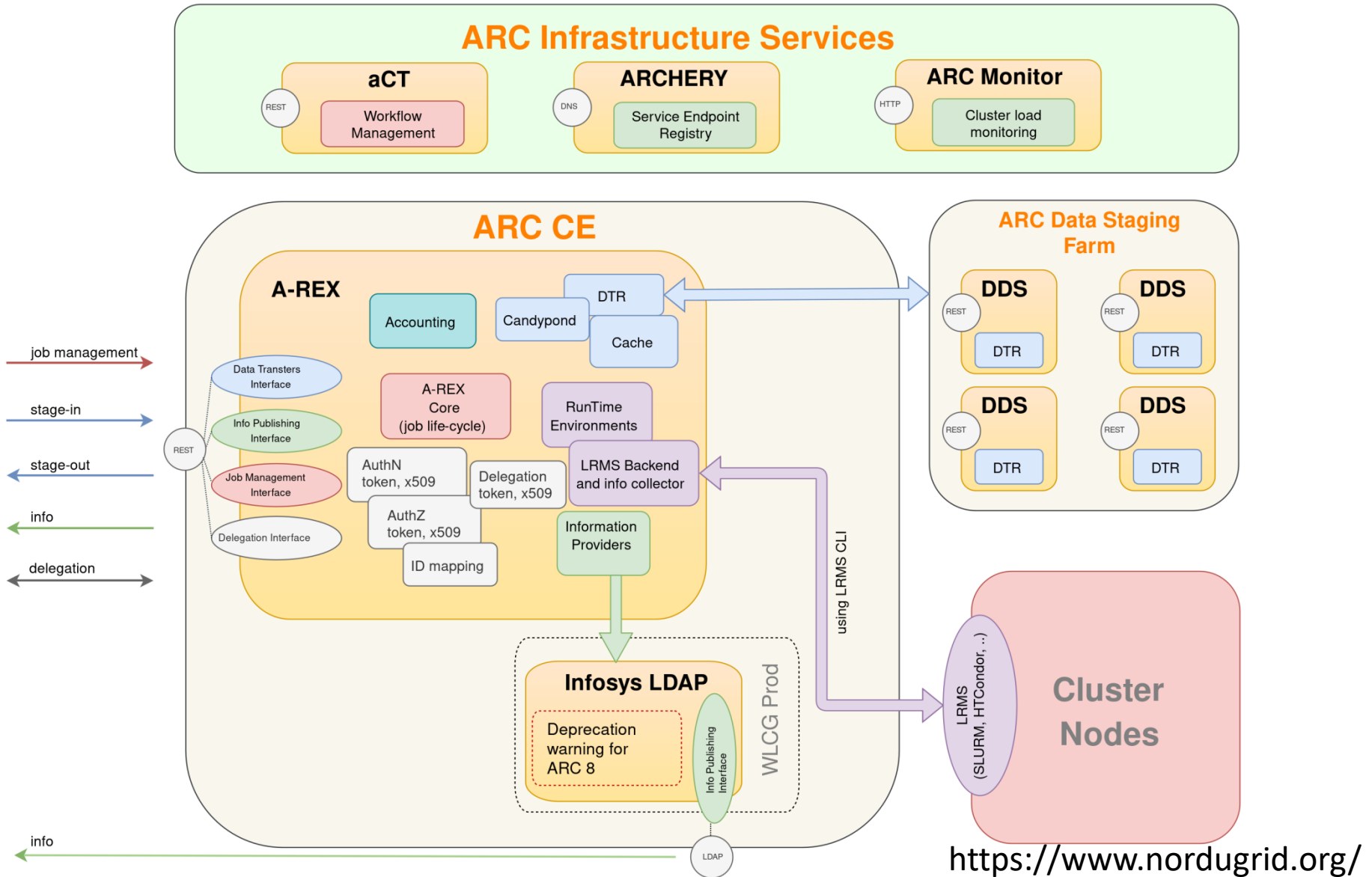
- WLCG Authorization WG is coordinating a transition from X509 + VOMS to WLCG tokens during Run 3 (link)
  - Inspired by the use of tokens in ALICE since many years!
  - And by common practice in industry and academia
    - To support federated identities and token standards

  WLCG Token Transition Timeline v1.0 published on August 22 on Zenodo

- VO management will go from VOMS-Admin to (INDIGO-) IAM
  - Identity and Access Management
  - Already being used in production by CMS and ATLAS   (see July GDB talk)
  - It can provide finely scoped tokens to trusted entities
  - It also has a VOMS endpoint for backward compatibility

- The first deadline that concerns us here is Feb 2023: EOL for GSI (X509 proxy) authentication in the HTCondor CE
  - The JAliEn CE is ready for using WLCG tokens – waiting for the ALICE IAM
  - A token renewal service will provide VOboxes with those securely
    - Already in production for JAliEn CE credential renewals

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ALICE Tier-1/Tier-2 Workshop 2022, "JAliEn deployment at sites", M. Litmaath

CE – ARC7

https://www.nordugrid.org/

Russian sites for Alice data processing
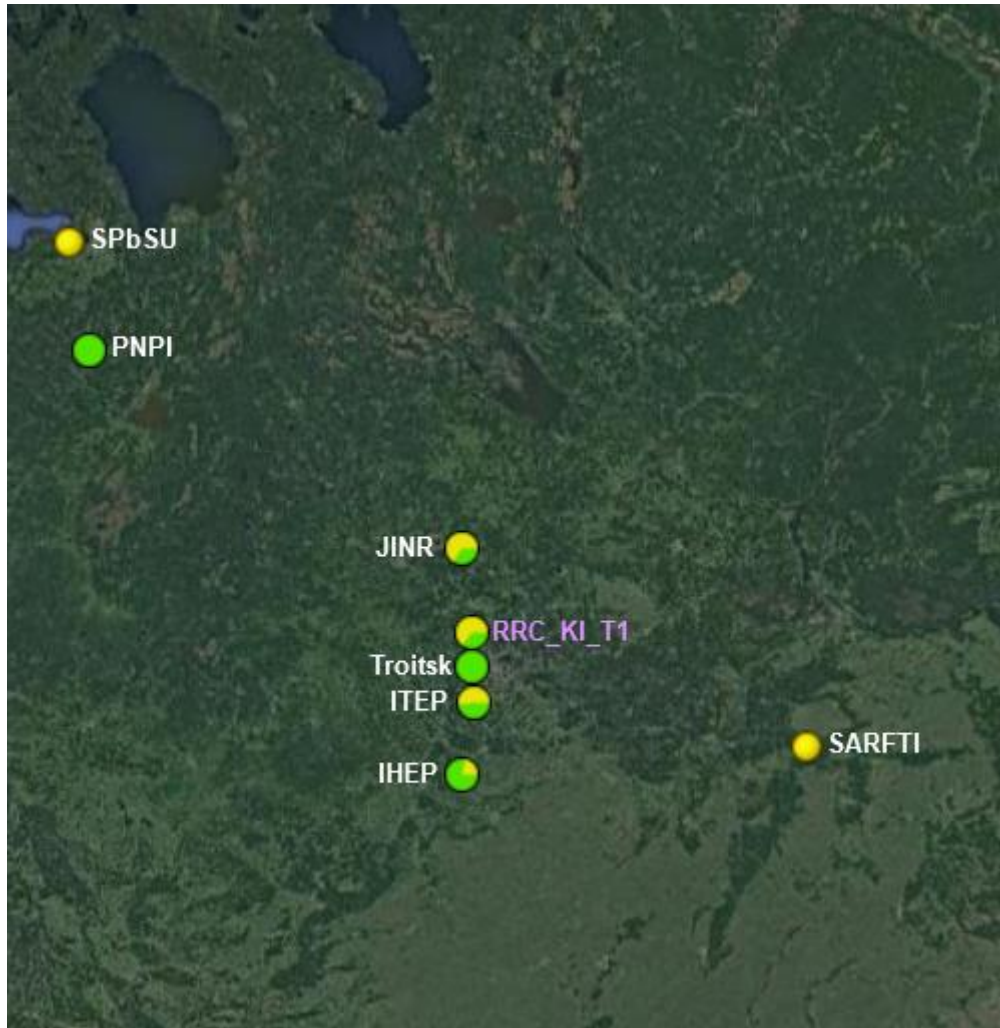
T1:

    RRC-KI-T1

T2

    JINR
    IHEP
    ITEP
    PNPI
    SPbSU
    Troitsk
    Sarov

http://alimonitor.cern.ch/map.jsp

Last activity on ALICE Russian sites

- Migration from CREAM-CE to ARC 6 (2020)
- Update EOS to EOS with QDB on xrootd.5 on some sites (2022)
- Installation ARC 7 on SARFTI (check WLCG tokens)
- Start 8 cores jobs on most sites
- Setting IPv6 on all sites (and WNs)

# Computing system components

- CRIC information system — the main integration component of the system: gathers info about all computing and storage resources, access protocols, entry points, and many other things in one place and distributes this info via API to all other components mentioned below
- PanDA WFMS/WMS — manages data processing at the highest level of chains of tasks and datasets or periods and campaigns, finds the best computing resource for task to be executed on, manages individual jobs (usually 1 job means 1 input file) processing
- Rucio DMS — responsible for data management, including data catalog, data integrity and data lifetime management strategies
- FTS DTS — enables massive data transfers

JINR, GRID 2023, "SPD Offline Computing System", A. Petrosyan
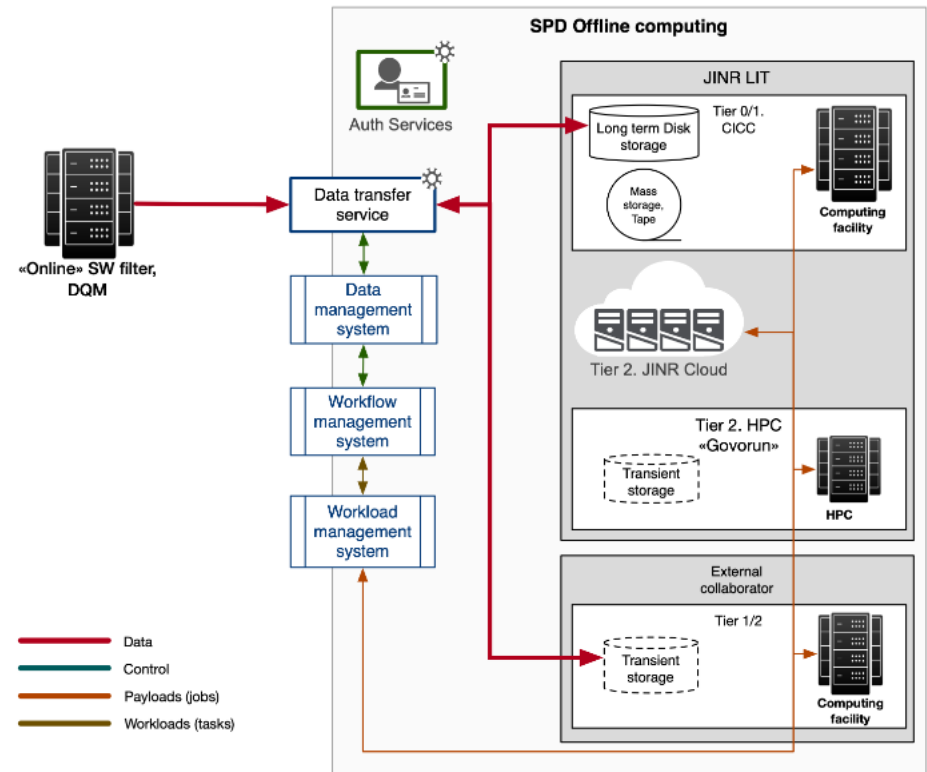
Central services from JINR

Resources and services provided by MLIT

- CA, VOMS/IAM, CVMFS

- MICC

  - Cloud (IaaS, dedicated VM, spinning disks and SSD)

  - CICC (Slurm batch, grid ARC6 CE)

  - Govorun HPC, HybriLIT

- Disk and tape storage (EOS, grid SE)

- GitLab, Indico, docdb, video conference, project management, etc.

- It would be great to organize a DBOD (Database On Demand) service at MLIT with support of popular RDBMS systems, for example, PostgreSQL and MariaDB

5

JINR, GRID 2023, "SPD Offline Computing System", A. Petrosyan

What does the site need to connect to NICA (SPD, MPD) structure

- Authorization: add VOMS packages for NICA VO (MPD,SPD..), optionally add users pool (Later – IAM setting)

- Software: add CVMFS configuration for NICA repository

- Storage: add special directory for NICA VO on EOS storage and setting permission for this directory.

- Contact with NICA VO admin --- Maybe you need to start with this ☺

Sites in NICA CRIC

Site Name	Alt name	State	RC Tier	Regional Center	Country	Status	Certification	core power	longitude	latitude
JINR	JINR	ACTIVE	0	JINR_NICA	Russia			10	0	0
PNPI	ru-PNPI	ACTIVE	2	RU-NICA	Russia			11	0	0
PRUE	REA	ACTIVE	2	RU-NICA	Russia			10	0	0
SPbSU	SPbSU	ACTIVE	2	RU-NICA	Russia			0	0	0
Site Name	**Alt name**	**State**	**RC Tier**	**Regional Center**	**Country**	**Status**	**Certification**	**core power**	**longitude**	**latitude**

Showing 1 to 4 of 4 entries

https://cric.jinr.ru/core/rcsite/list/

Summary

Most of Russian Alice sites are ready for work for NICA SPD. Principally.

Thank you!