THE SERVICE FOR PARALLEL APPLICATIONS BASED ON THE JINR CLOUD AND HYBRILIT RESOURCES

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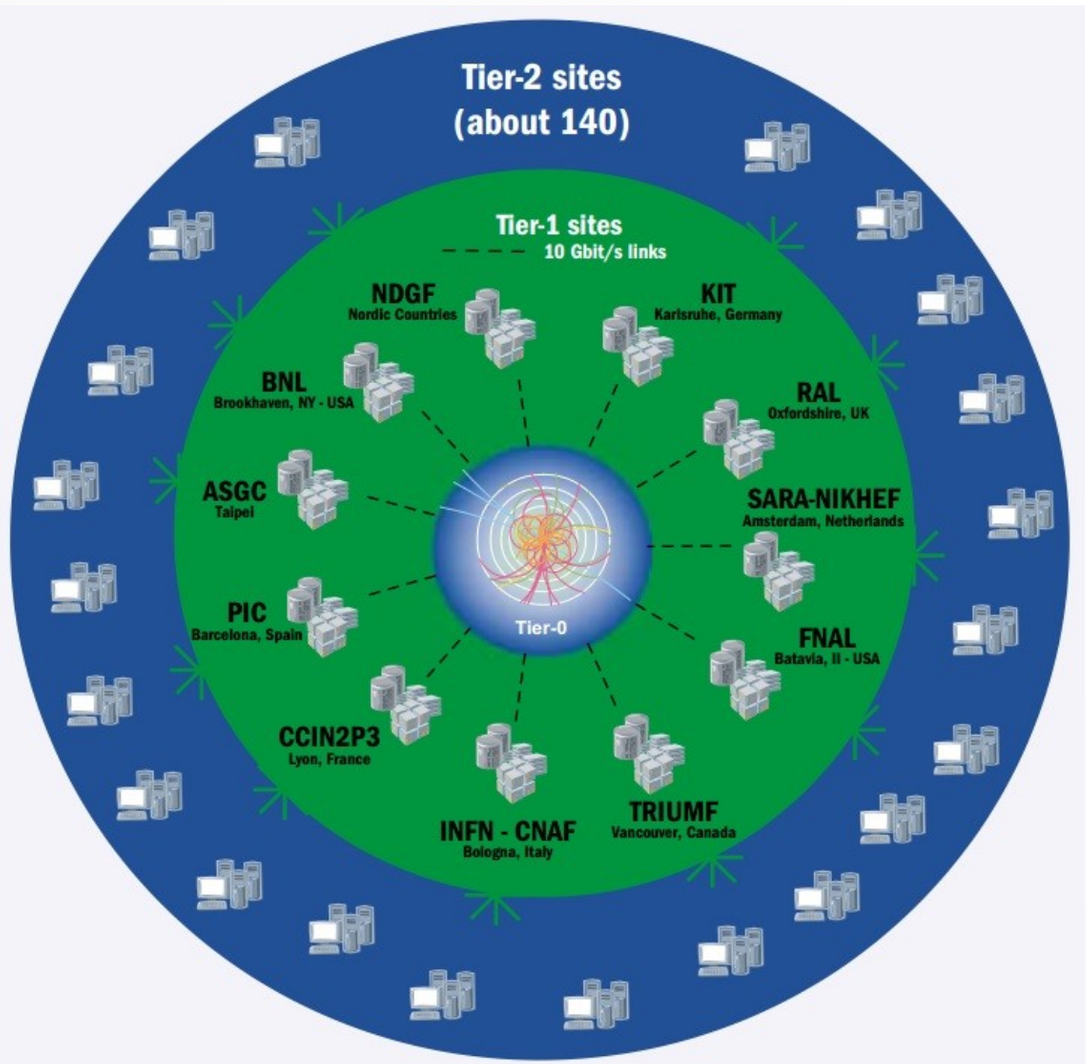
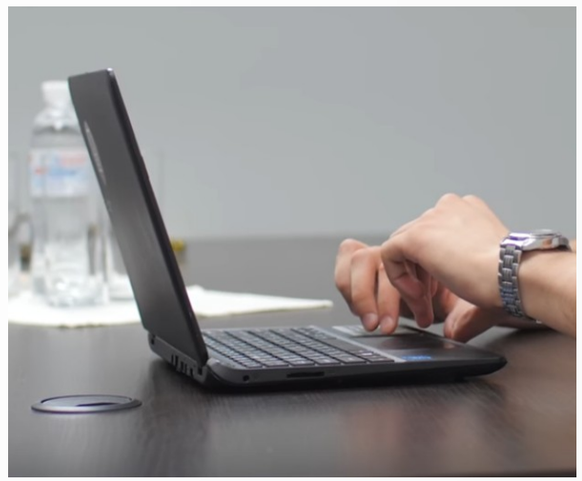
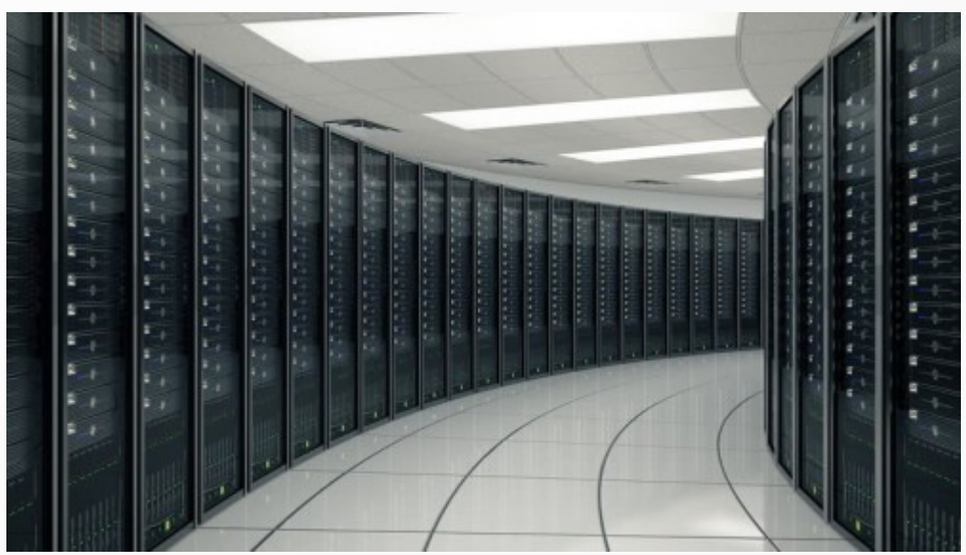
LIT, JINR

Introduction



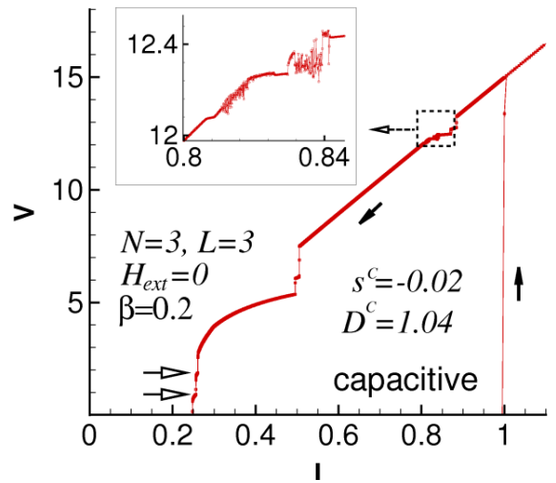


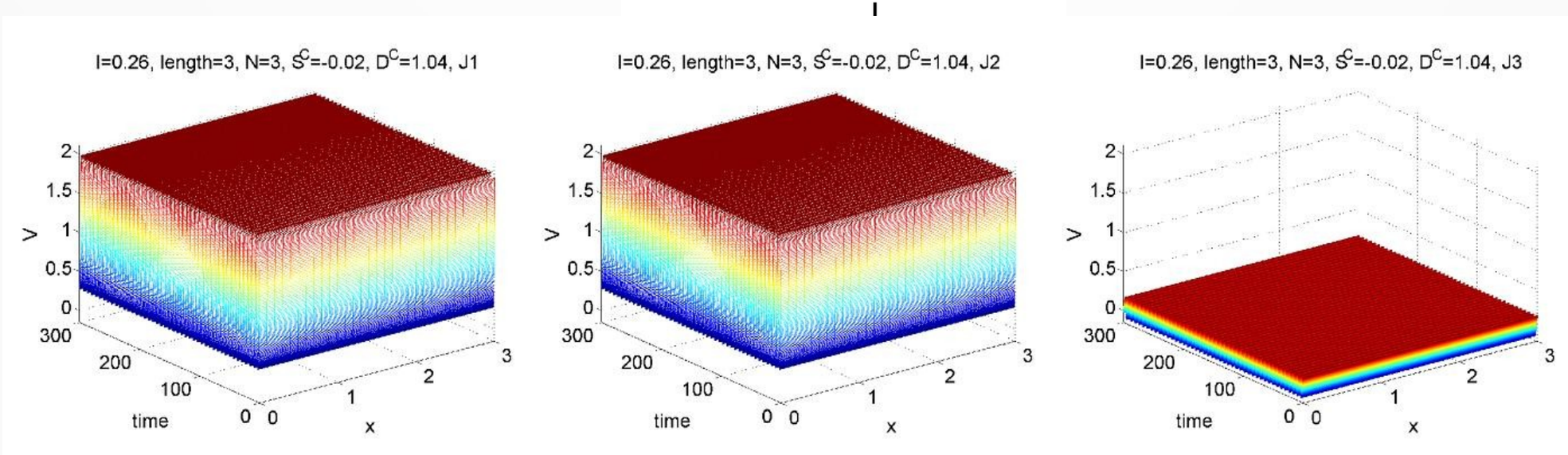


Drawbacks

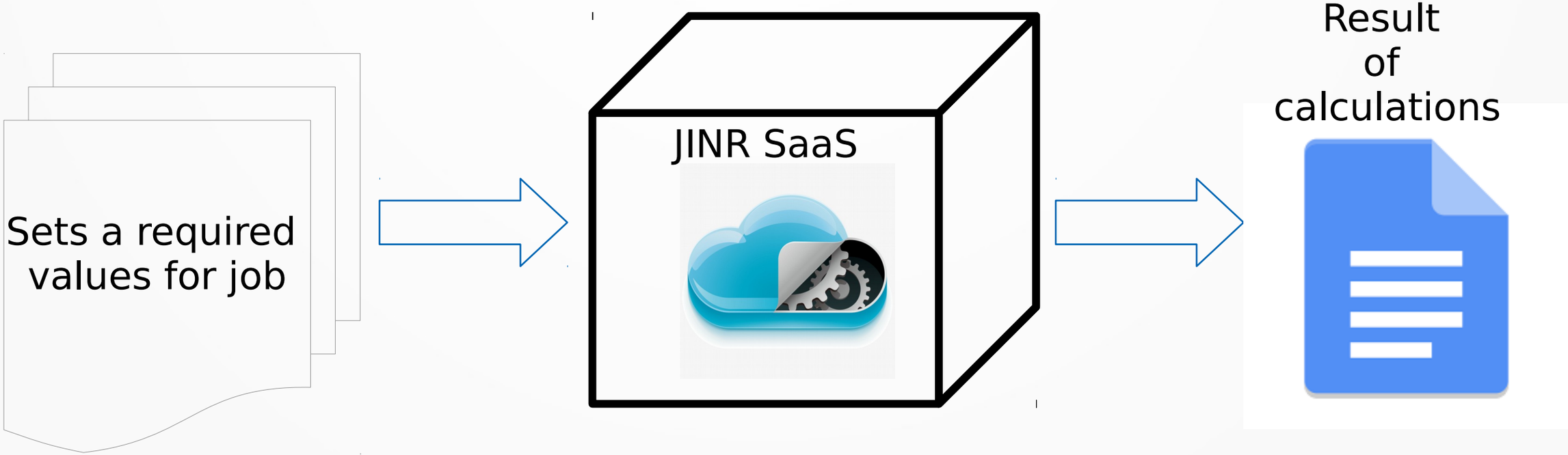
- Take care about proper environment for hardware
- Equipment maintenance
- Resources under-utilization
- Doesn’t always need all resources of modern multi-core CPUs servers

Long Josephson junctions simulation

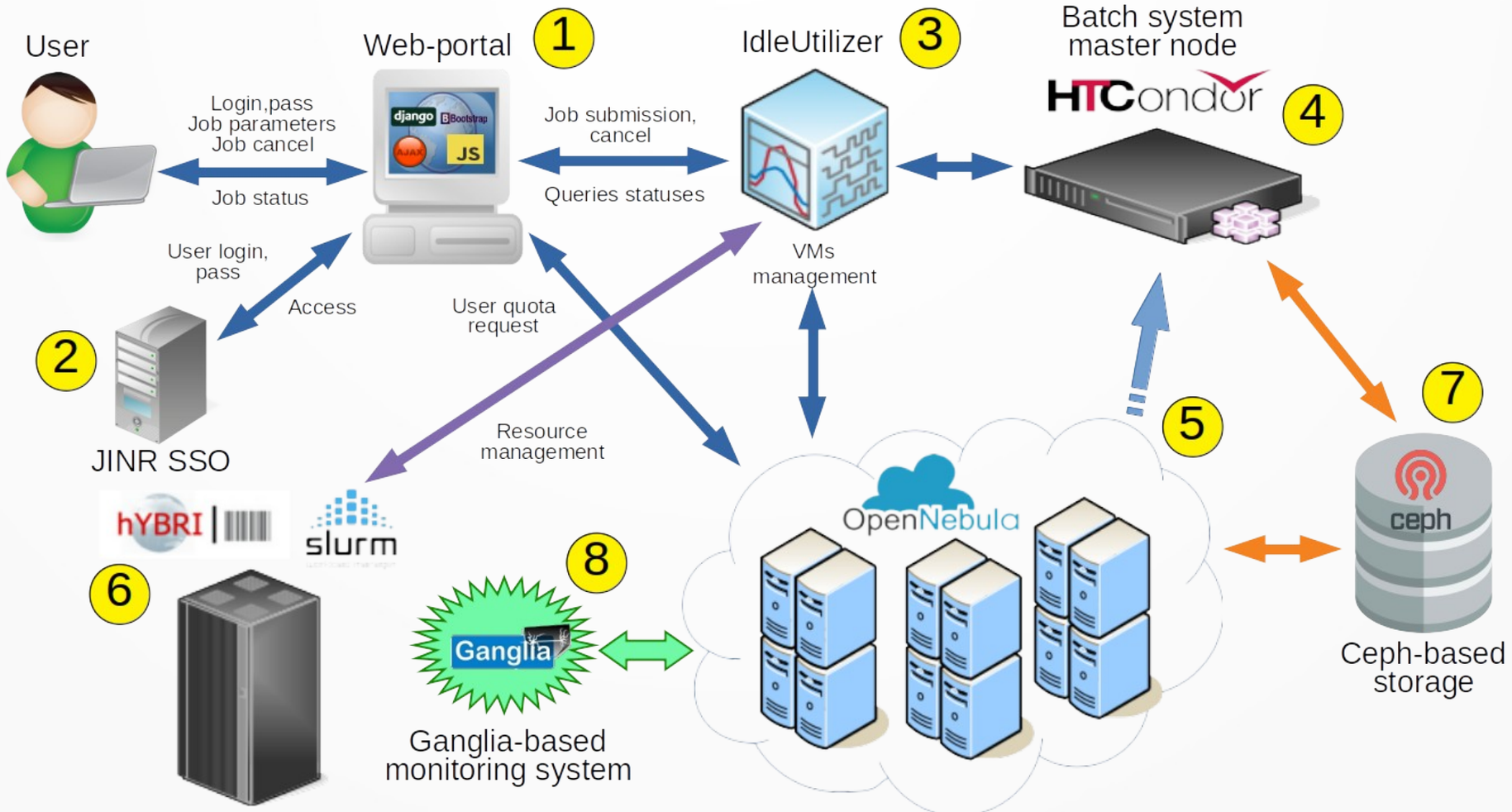




JINR SaaS


Sets a required values for job
JINR SaaS
Result of calculations

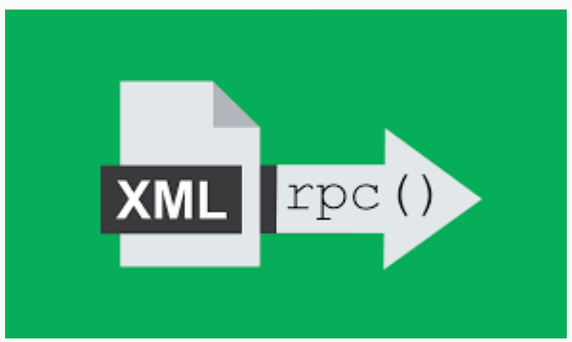
Basic schema of a workflow and main components



Web-portal

Client part

Server part

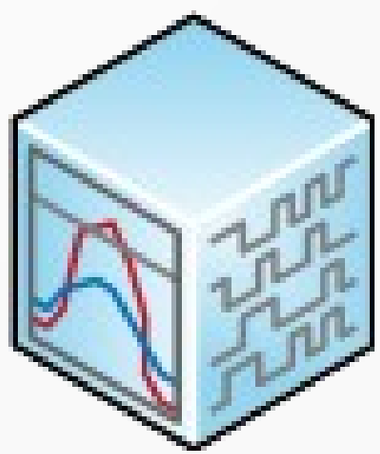


JINR Single Sing-on

IdleUtilizer

Main tasks:

- gets information defined by the user for computational jobs execution including characteristics of required resources as well as input parameters for computational job;
- manages VMs in the cloud (instantiates requests for VMs creation, checks requests status, deletes VMs, etc);
- manages resources in HybriLIT cluster;
- handles user jobs in a batch system (submits user job, checks its status, cancel submitted job upon user request and so on).

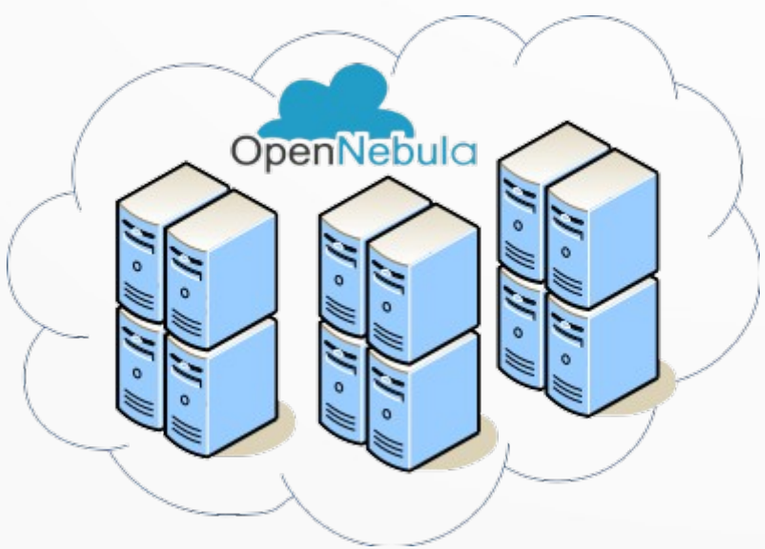


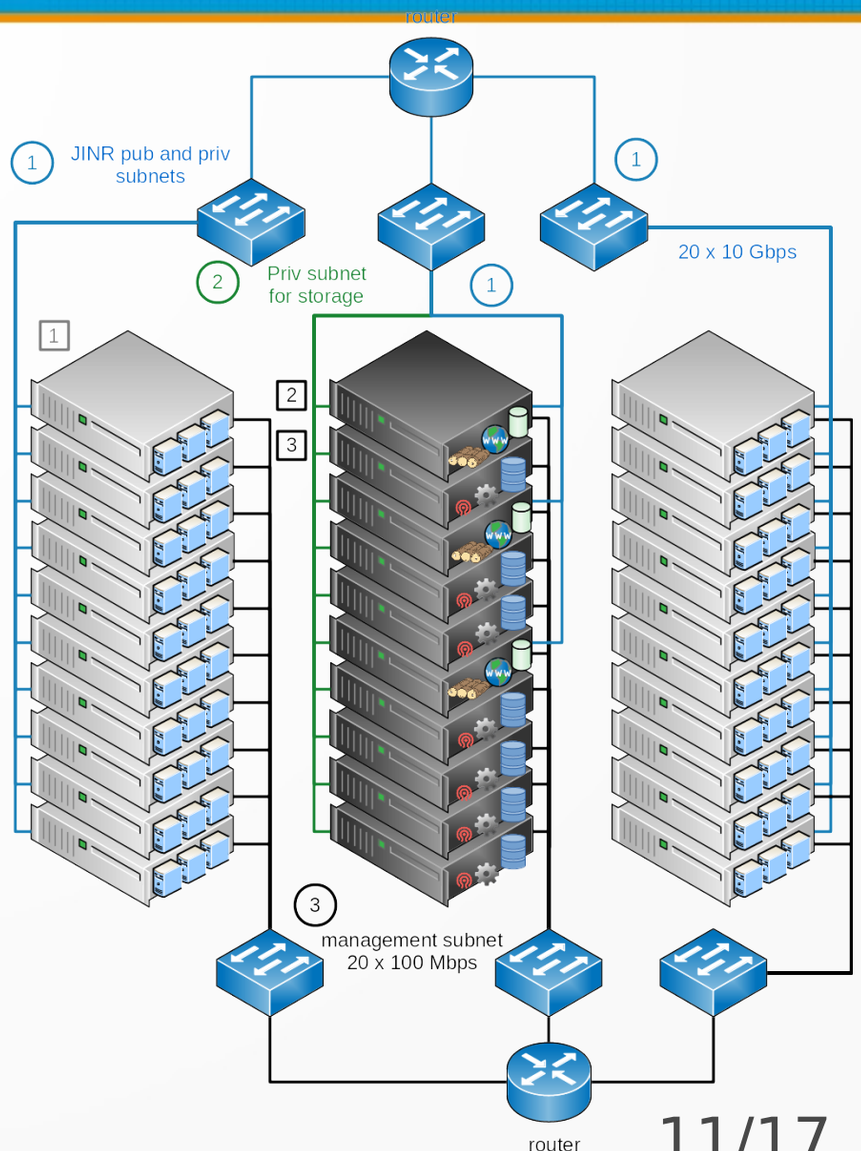
HTCondor batch system

HTCondor is a specialized workload management system for compute-intensive jobs. HTCondor provides a job queueing mechanism, scheduling policy, priority scheme, resource monitoring, and resource management.

JINR cloud

The JINR SaaS enables job submission to **OpenNebula-based clouds** where VMs are created for running a real workload.

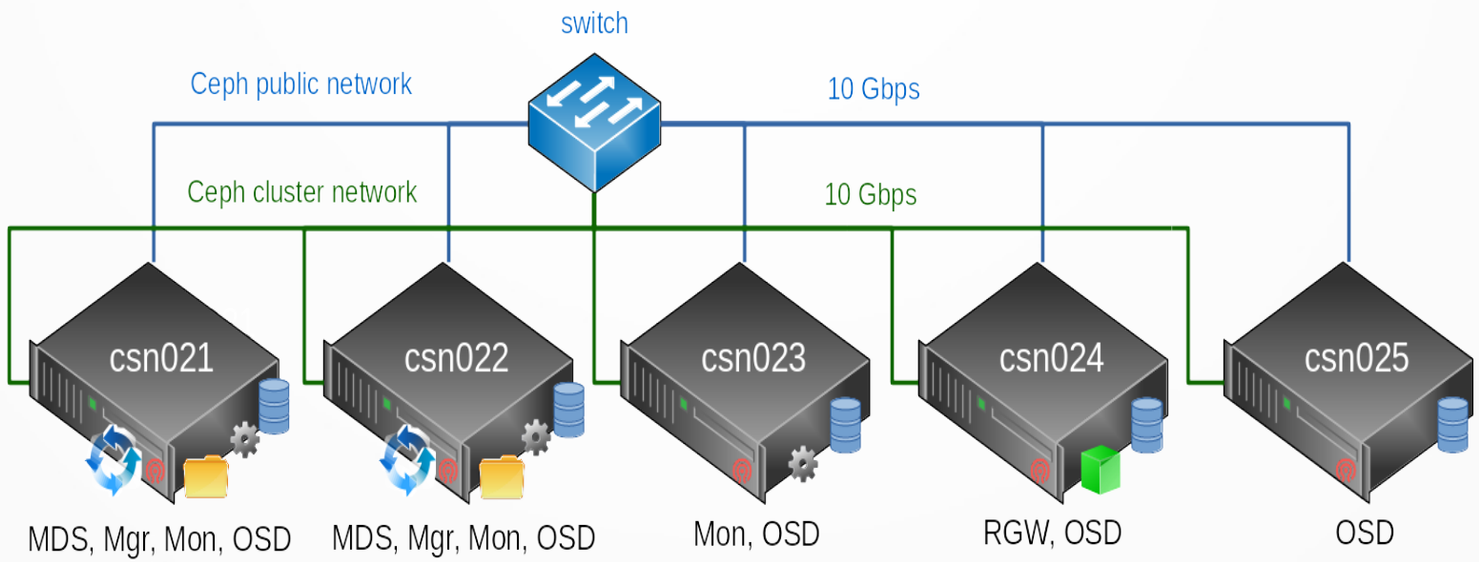




HybriLIT cluster

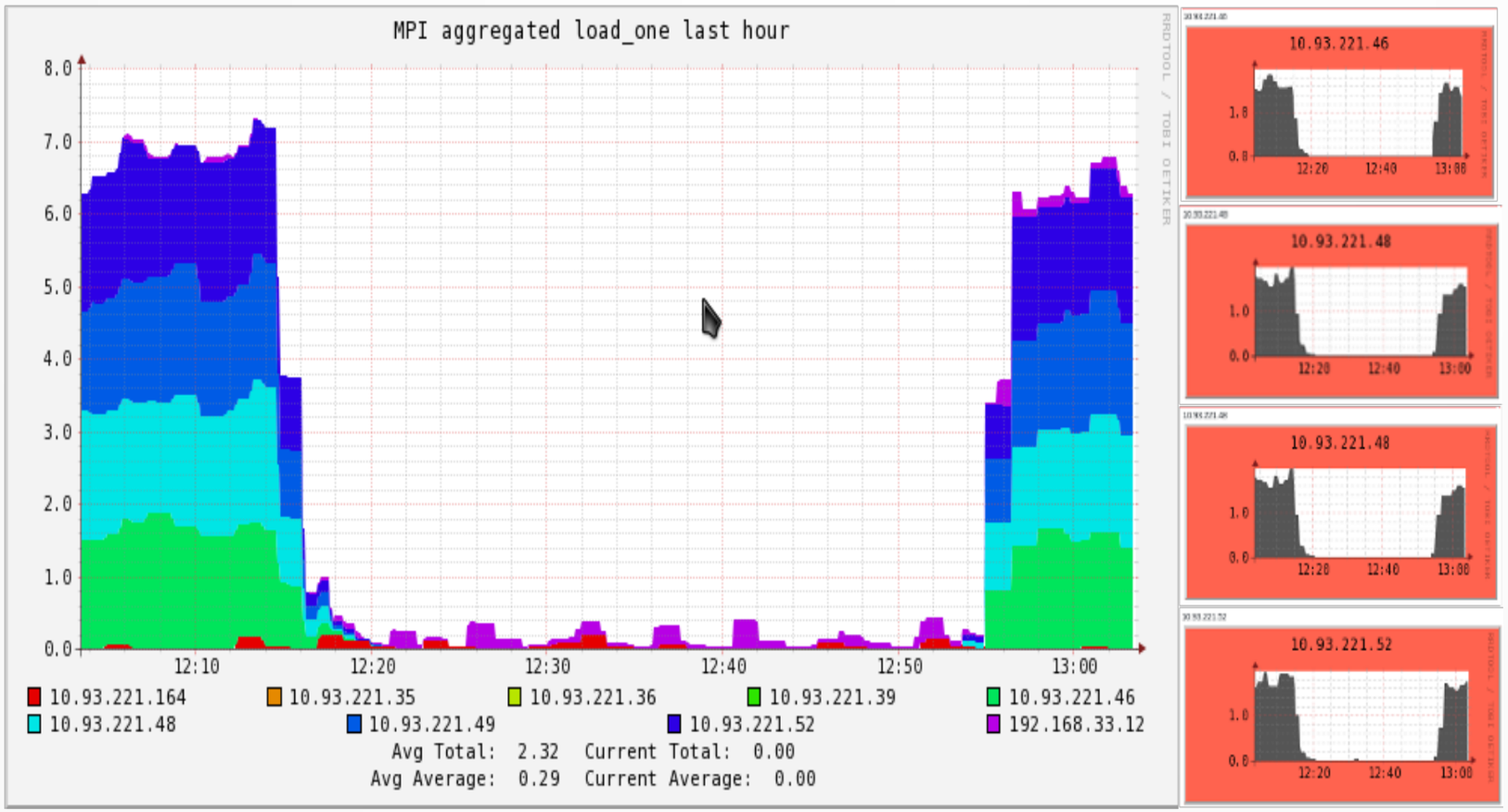
The HybriLIT heterogeneous cluster is a computation component of the Multifunctional center for data storage processing and analysis of LIT JINR, which contains a multicore component and computation accelerators: NVIDIA graphic processors and Intel Xeon Phi coprocessors. It uses batch system SLURM

Software-defined storage based on Ceph



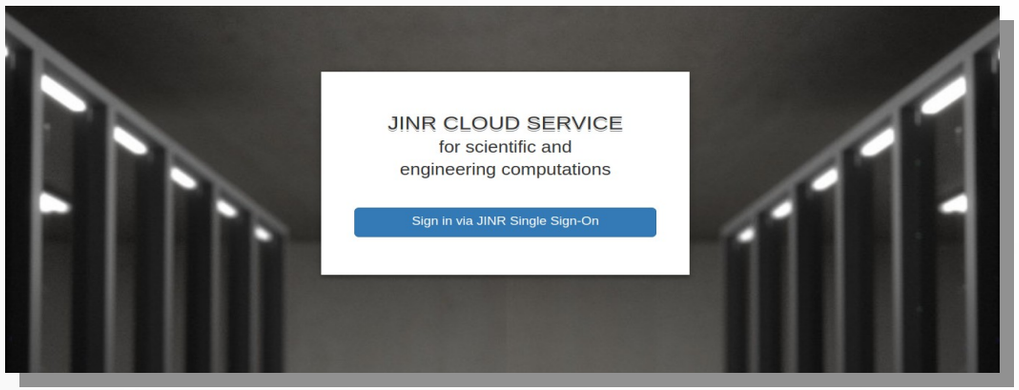
ceph

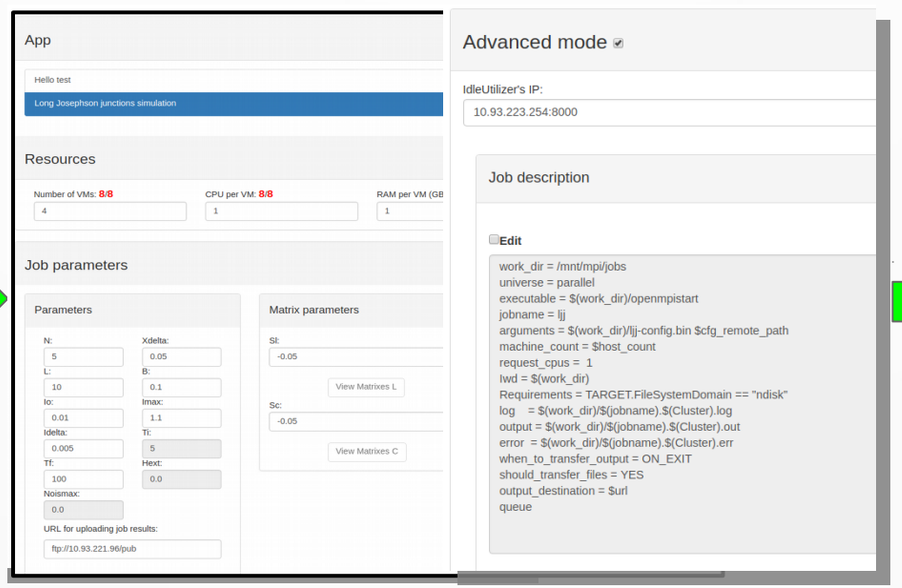
Ganglia

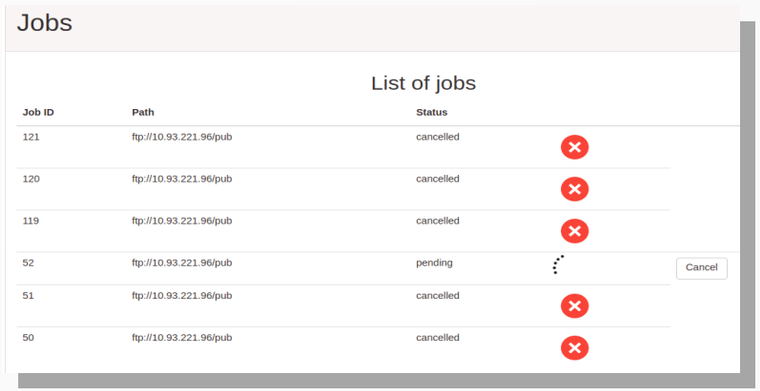

MPI aggregated load_one last hour
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
12:10
12:20
12:30
12:40
12:50
13:00
10.93.221.164
10.93.221.35
10.93.221.36
10.93.221.39
10.93.221.46
10.93.221.48
10.93.221.49
10.93.221.52
192.168.33.12
Avg Total: 2.32 Current Total: 0.00
Avg Average: 0.29 Current Average: 0.00
RRDTOOL / TOBI OETIKER

10.93.221.46
10.93.221.48
10.93.221.48
10.93.221.52

The scheme of interaction of the user with the system







Future plans

- Add more applications developed by research groups from JINR and its Member State organizations.
- Visualization of the results in the service web-interface.

Thank you for attention!!!