



Web service for analysis of experimental data on HPC platforms using package ROOT

Martin Vala^{1, 2}, Aleksandr Mayorov ¹

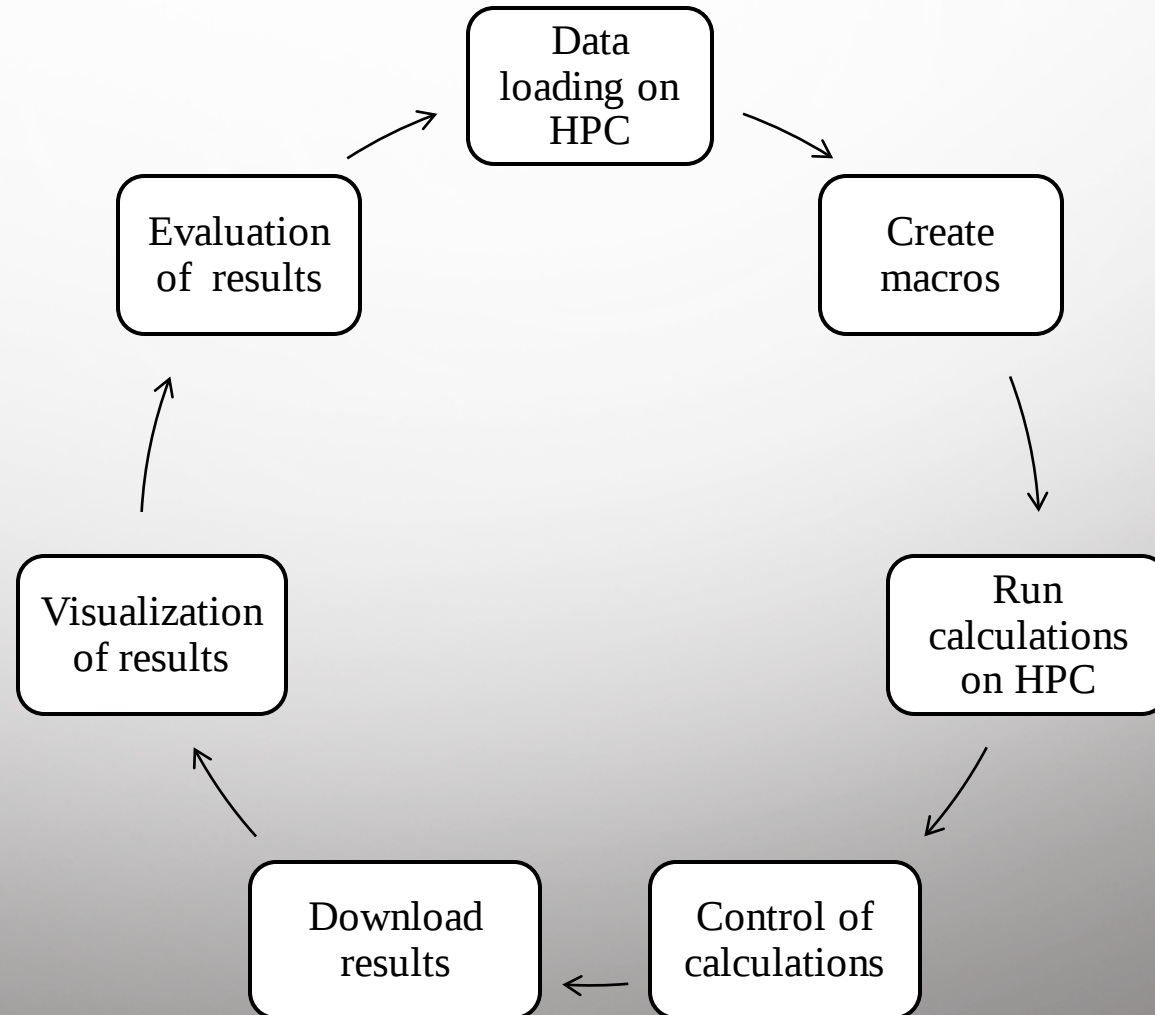
1. LIT JINR, Dubna, Russia

2. Institute of Experimental Physics, Kosice, Slovakia

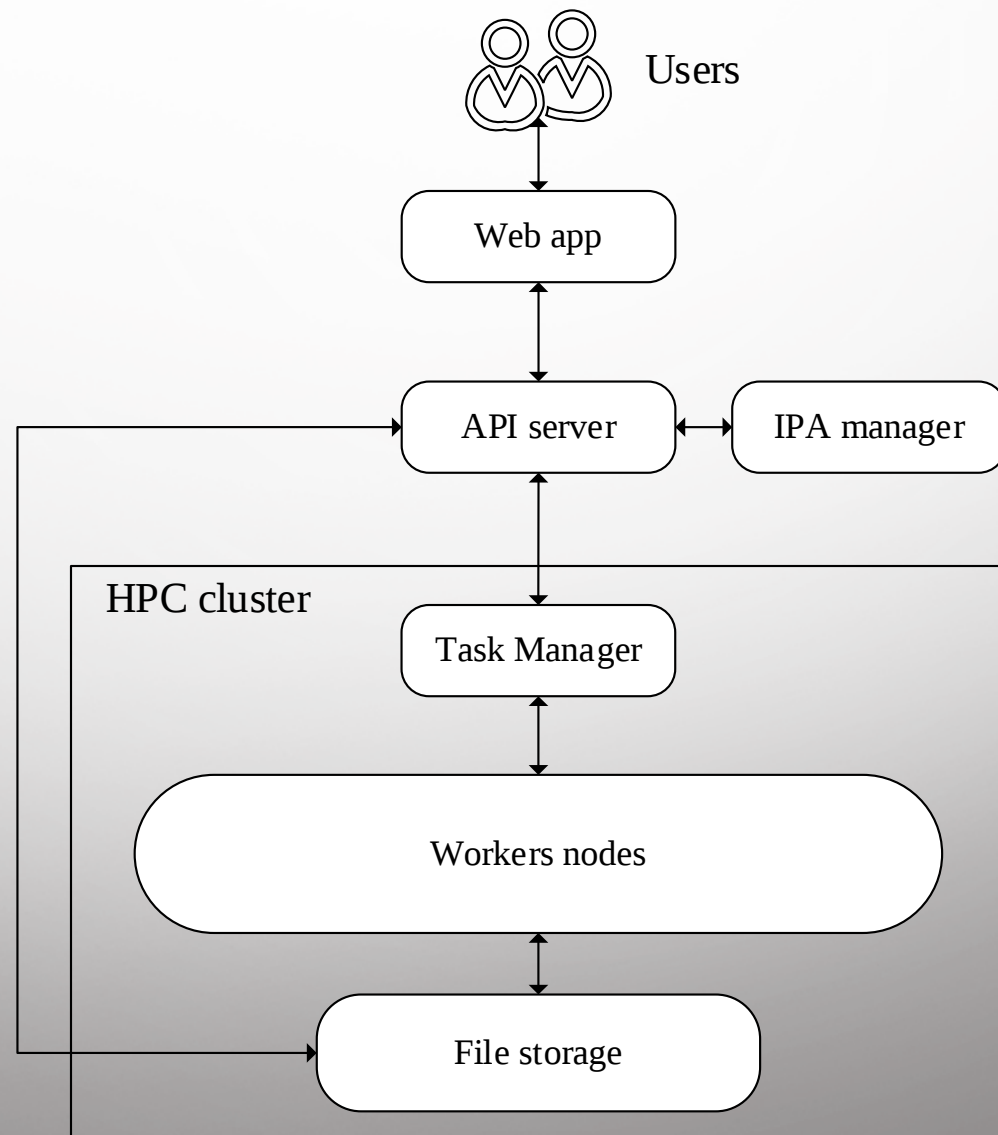
MMCP 2017, JINR Dubna

Motivation

Processing of experimental data:



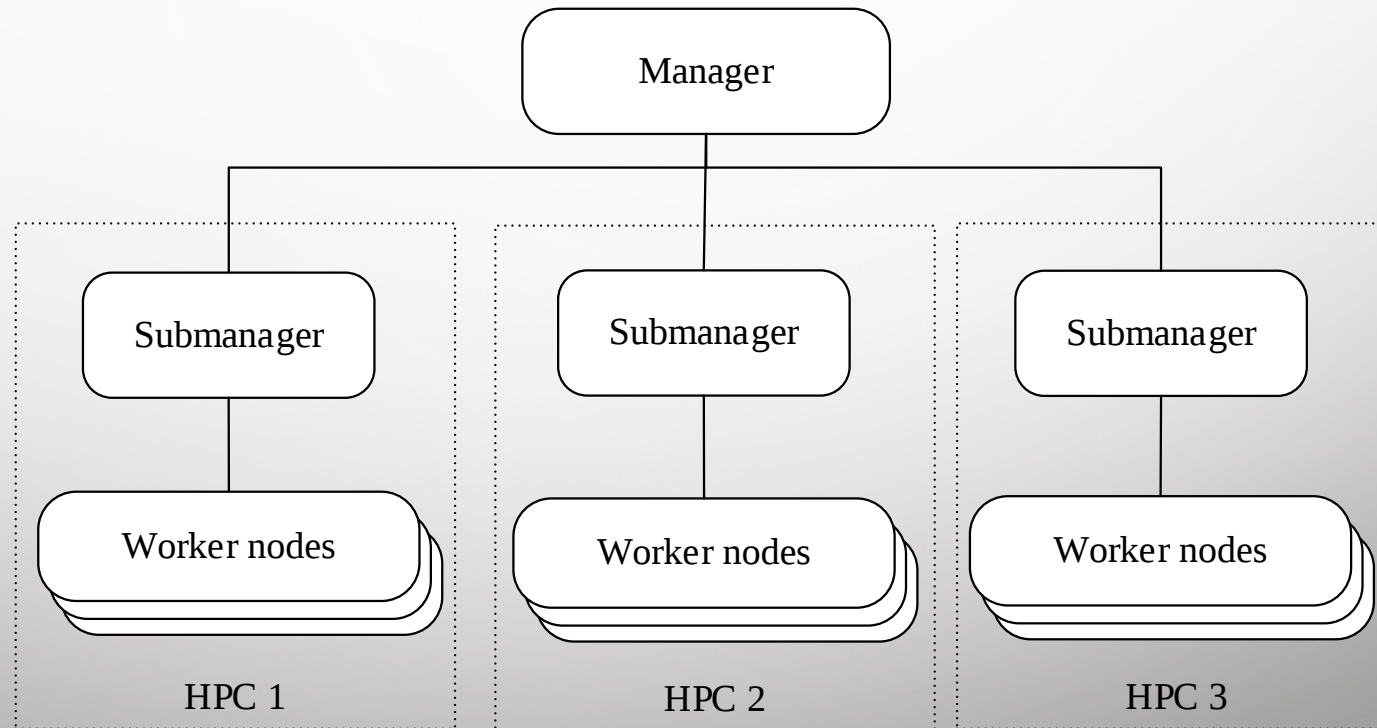
General structure



SALSA (Scalable Adaptive Large Structures Analysis)

Task manager

Multilevel system

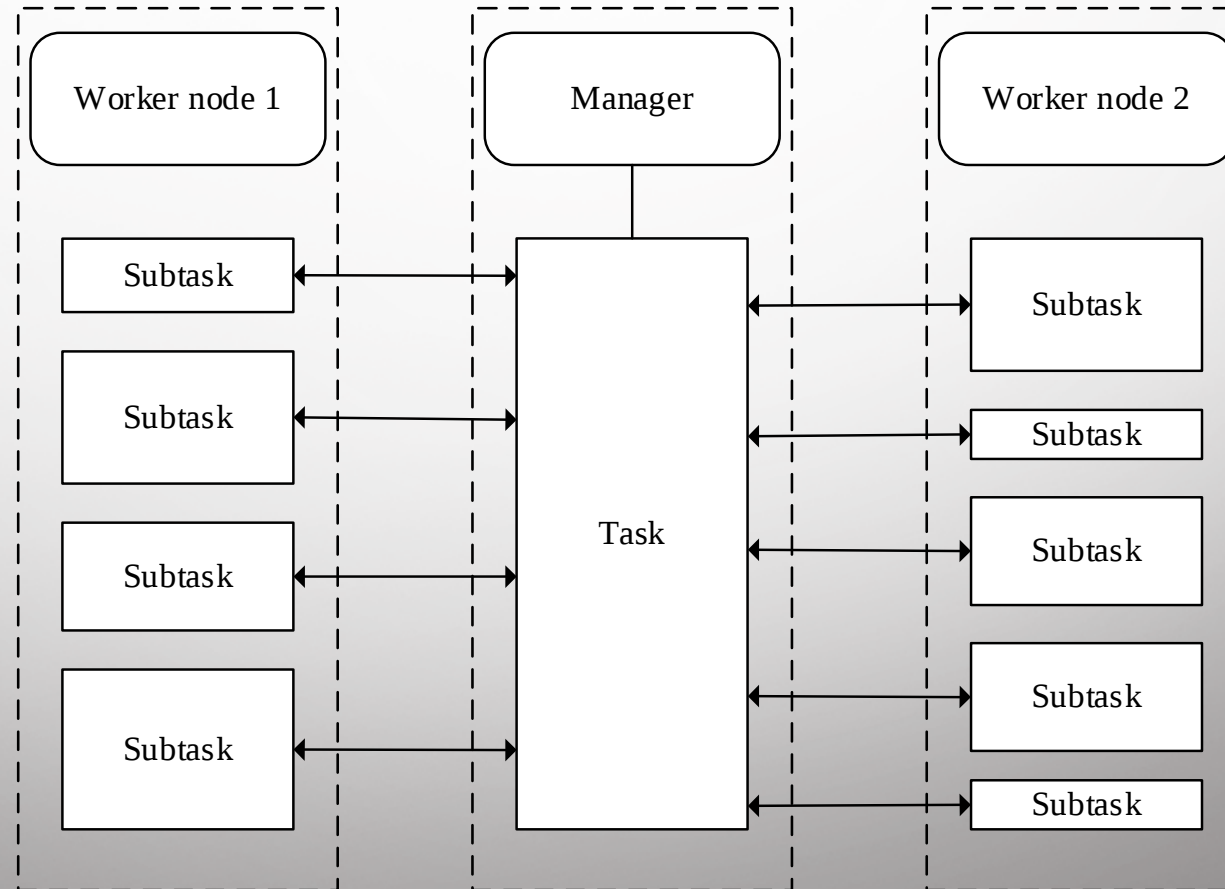


Link: <https://gitlab.openbrain.sk/salsa/SALSA>

SALSA (Scalable Adaptive Large Structures Analysis)

Task manager

Tasks are distributed upon request



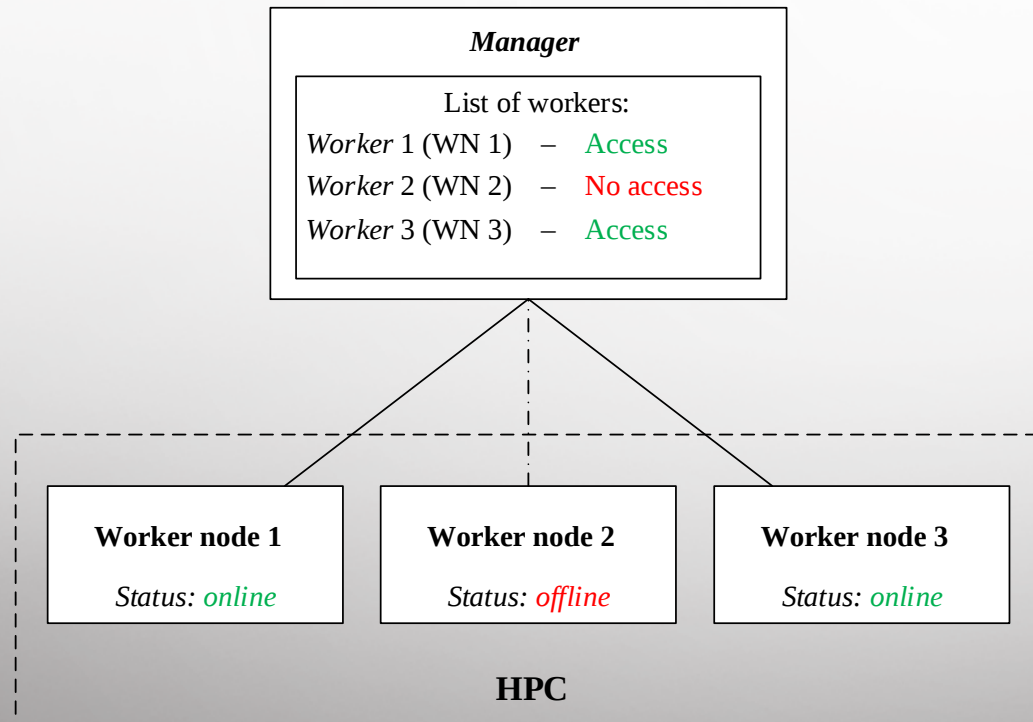
Link: <https://gitlab.openbrain.sk/salsa/SALSA>

SALSA (Scalable Adaptive Large Structures Analysis)

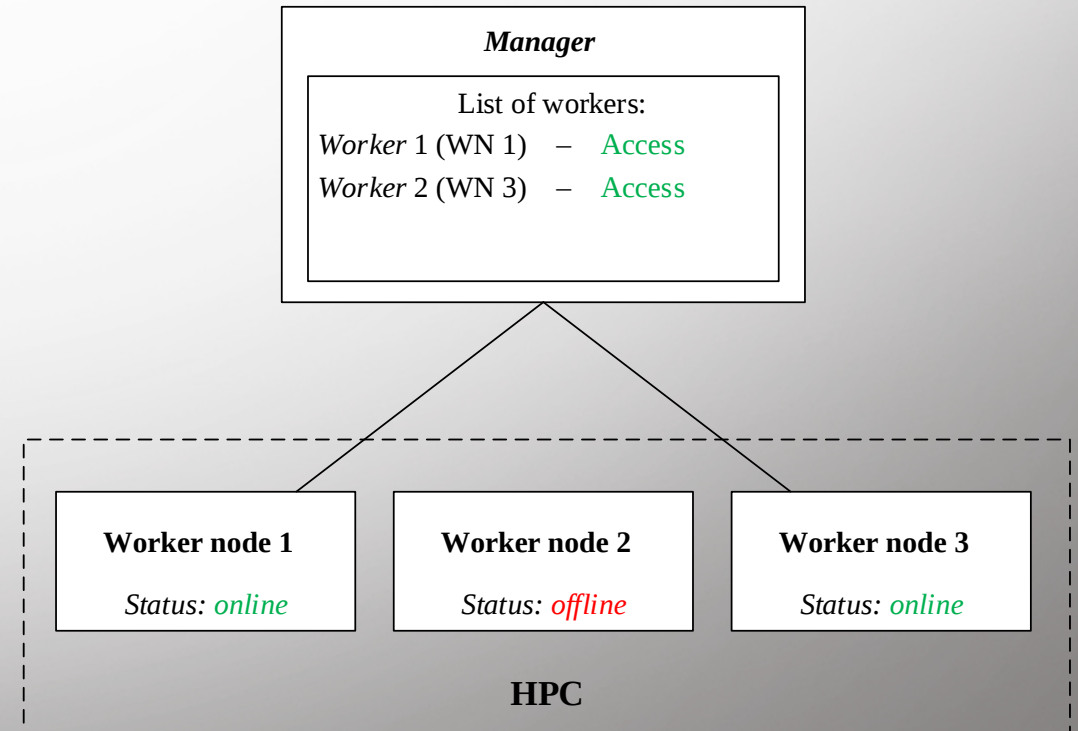
Task manager

Manager's interaction with workers:

Manager oversees the workers
(For example, SLURM)



Workers turn to manager
(SALSA)



Link: <https://gitlab.openbrain.sk/salsa/SALSA>

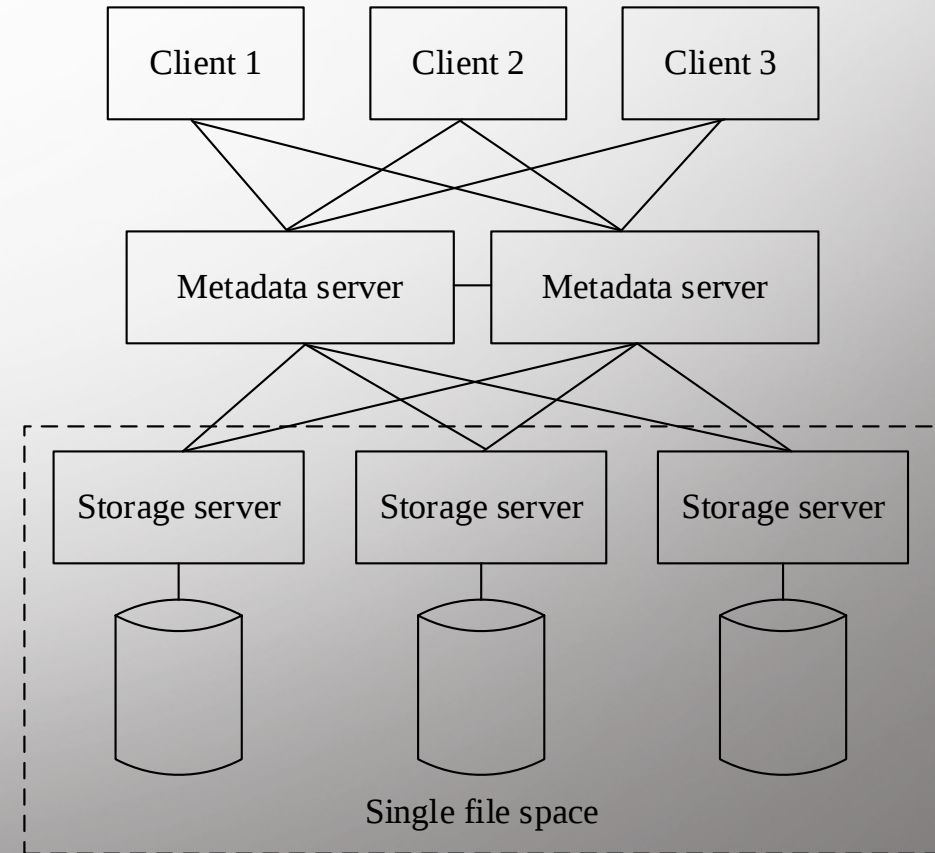
EOS

Distributed file system

Advantages:

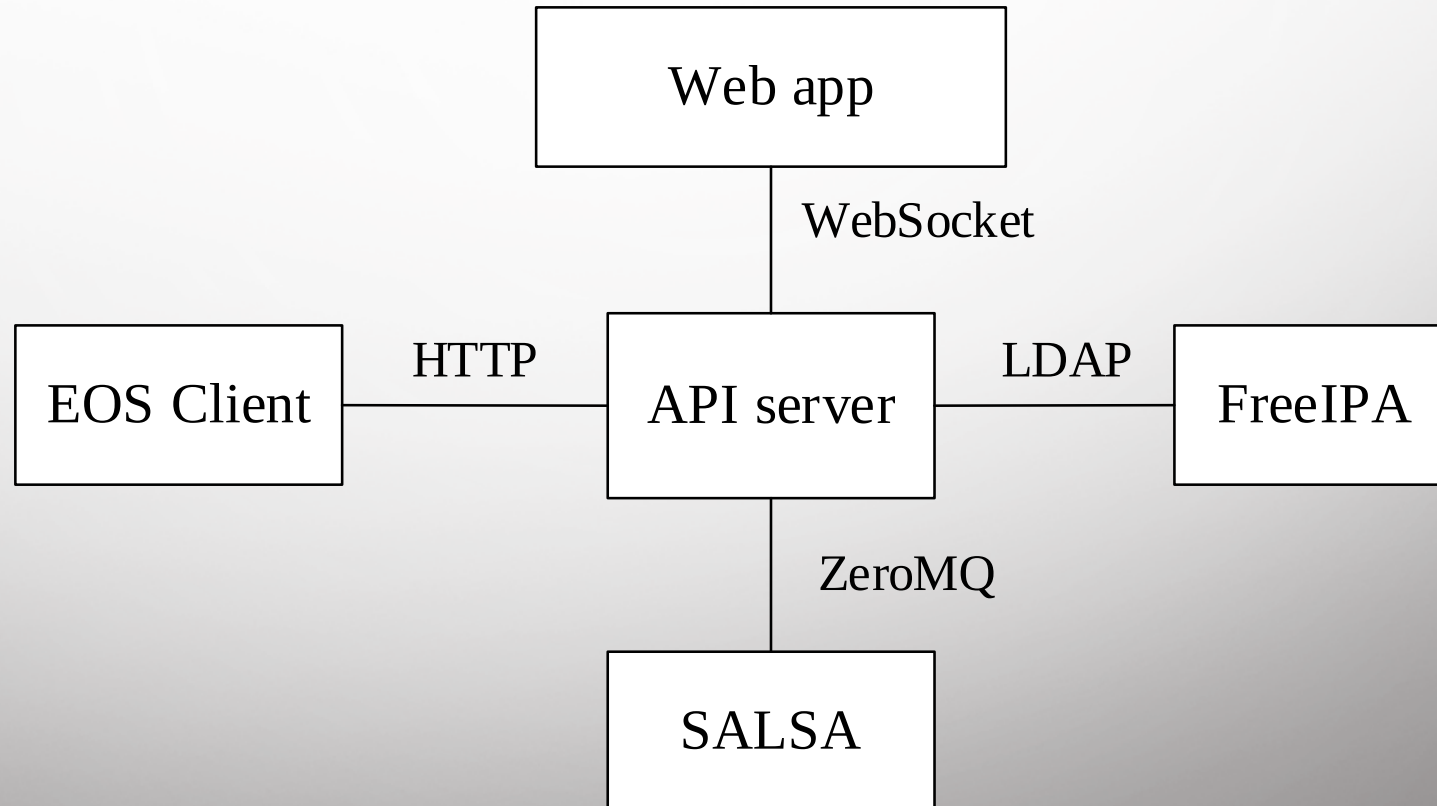
- Work with large data
- Built-in file duplication
- Integrated monitoring of hard disks
- Virtual RAID array
- Access to storage by HTTP and WebDAV protocols

Structure:



API server

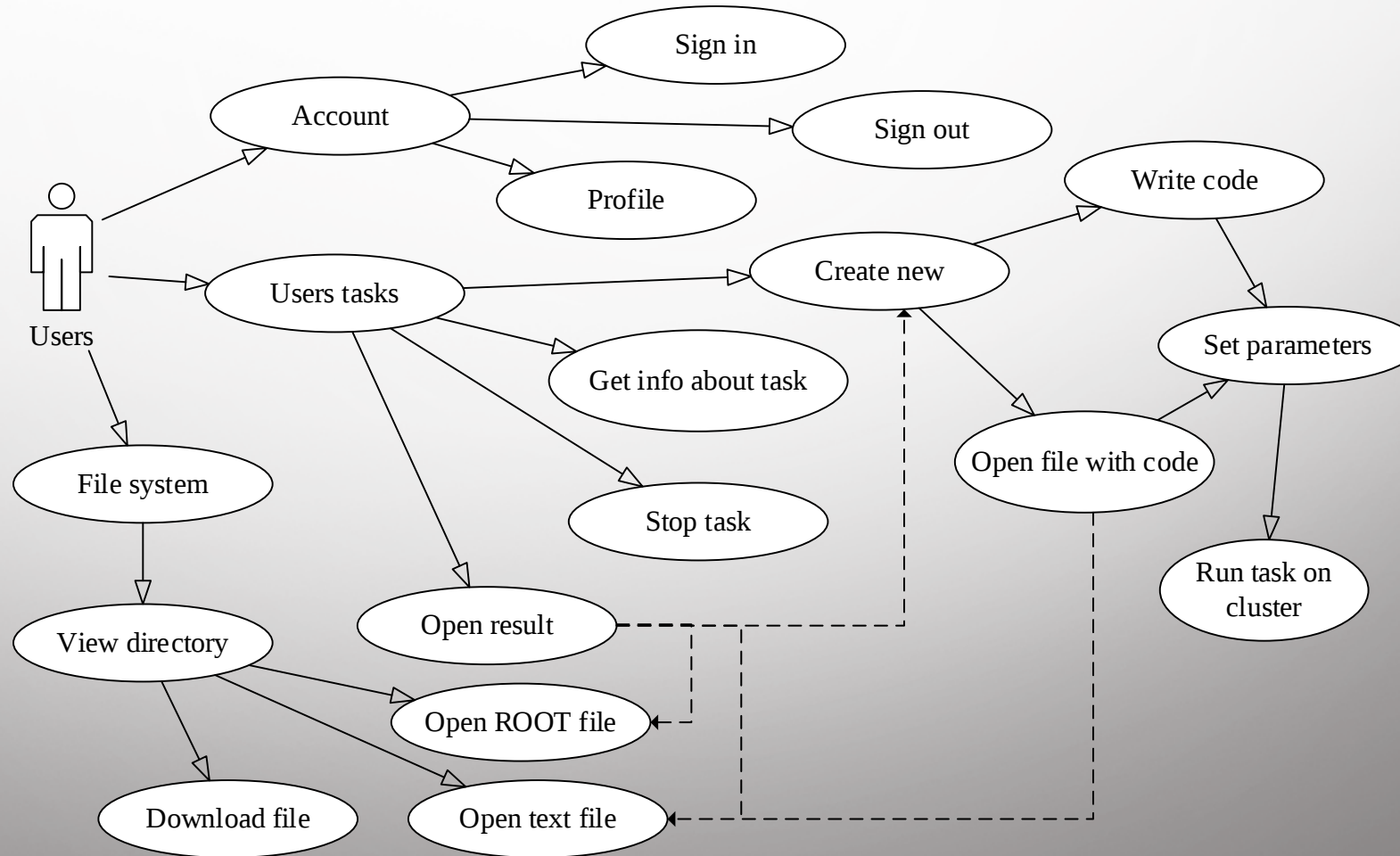
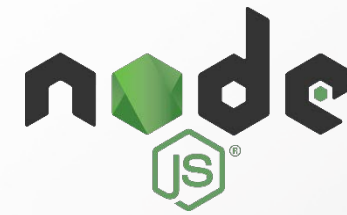
API server is created using NodeJS



Link: <https://gitlab.openbrain.sk/salsa/salsa-api>

Web app

Web app is created using Angular

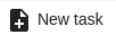


Link: <https://gitlab.openbrain.sk/salsa/salsa-webapp>

Office of tasks (Settings of tasks):

 SalsaWebapp  1  SALSA connection (tcp://127.0.0.1:5668) 

Aleksandr Mayorov 

Task 1



Script
echo \$1

Arrays (\$1)
1-10:1

☒ Remove duplicate items

Output
<https://alieos.saske.sk/eos/alike.saske.sk/task1.txt> 



Task 2



Script
echo \$1

Arrays (\$1)
1-10:1

☒ Remove duplicate items

Output
<https://alieos.saske.sk/eos/alike.saske.sk/scratch/task2.txt> 



Task 3



Script
echo \$1

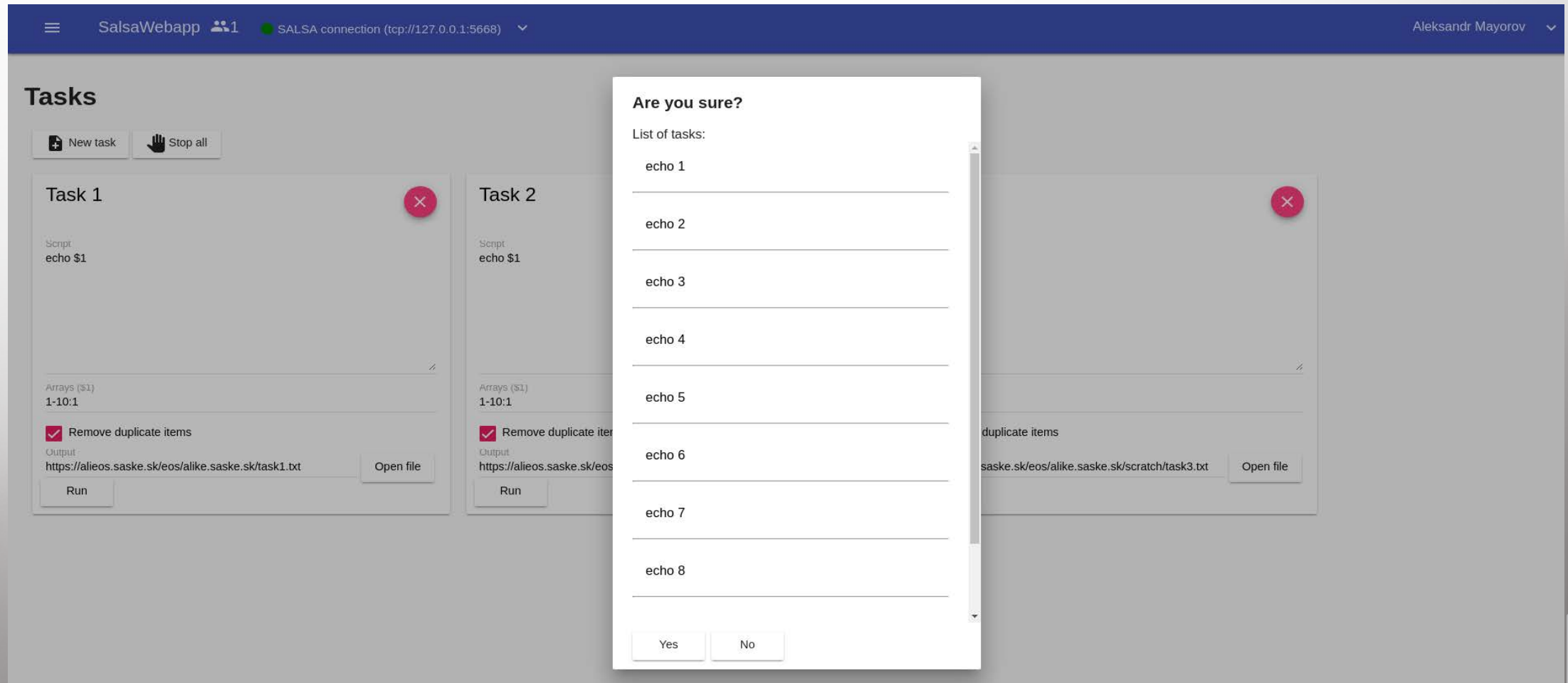
Arrays (\$1)
1-10:1

☒ Remove duplicate items

Output
<https://alieos.saske.sk/eos/alike.saske.sk/scratch/task3.txt> 



Office of tasks (Confirmation dialog):



Web app



Office of tasks (Process of computing):

SalsaWebapp 1 SALSA connection (tcp://127.0.0.1:5668) Aleksander Maiorov

Tasks

New task Stop all

Task 1

Script
echo \$1

Arrays (\$1)
1-10:1

☒ Remove duplicate items

Output
<https://alieos.saske.sk/eos/alike.saske.sk/task1>

Task 2

Progress

3 Running	40 Done	0 Failed	100 Total
---------------------	-------------------	--------------------	---------------------

Output
<https://alieos.saske.sk/eos/alike.saske.sk/scratch/task2>

Task 3

Script
echo \$1

Arrays (\$1)
1-10:1

☒ Remove duplicate items

Output
<https://alieos.saske.sk/eos/alike.saske.sk/scratch/task3>

Link: <https://gitlab.openbrain.sk/salsa/salsa-webapp>

Web app



Explorer of EOS storage:

☰

SalsaWebapp

Aleksandr Mayorov

EOS browser

FilesFile systemSpace infoNode info

/ eos / alike.saske.sk / scratch /

Name	Size	Created	Modified	Mode	Owner	Group	Copies (Online/Total)
..							
1db882c8-8cd6-4df1-941f-ce669bad3458.dat	1.05 GB	18.01.2017 19:01	18.01.2017 19:01	420	99	99	1 / 1
LHC15f_LHC15g3a3-results-final.root	8.4 MB	24.04.2017 09:04	05.04.2017 16:04	420	99	99	1 / 1
RTdgBkxGc.png	129.55 KB	10.05.2017 10:05	10.05.2017 10:05	420	99	99	1 / 1
ali.txt	246 B	24.03.2017 13:03	21.03.2017 16:03	436	99	99	1 / 1
default.local	166 B	22.12.2016 13:12	22.12.2016 13:12	420	99	99	1 / 1
ev1.root	237.6 MB	25.08.2016 16:08	25.08.2016 16:08	384	99	99	1 / 1
ev2.root	23.88 MB	25.08.2016 16:08	25.08.2016 16:08	384	99	99	1 / 1
ev3.root	23.91 MB	25.08.2016 16:08	25.08.2016 16:08	384	99	99	1 / 1
ev4.root	23.9 MB	25.08.2016 16:08	25.08.2016 16:08	384	99	99	1 / 1
ev5.root	23.88 MB	25.08.2016 16:08	25.08.2016 16:08	384	99	99	1 / 1
hk.root	12.3 MB	31.05.2016 15:05	31.05.2016 15:05	436	99	99	1 / 1
hsimple.root	414.24 KB	18.03.2016 15:03	18.03.2016 15:03	436	99	99	1 / 1

Link: <https://gitlab.openbrain.sk/salsa/salsa-webapp>

Web app



Explorer of EOS storage (Text file):

SalsaWebapp 1 SALSA connection (tcp://127.0.0.1:5668) Aleksandr Mayorov

ali.txt	246 B	24.03.2017 13:03	21.03.2017 16:03	436	99	99	1 / 1
default.local	166 B	22.12.2016 13:12	22.12.2016 13:12	420	99	99	1 / 1
ev1.root							1 / 1
ev2.root							1 / 1
ev3.root							1 / 1
ev4.root							1 / 1
ev5.root							1 / 1
hk.root							1 / 1
hsimple.root							1 / 1
image-test.jpg							1 / 1
task2.txt							1 / 1
v.C							1 / 1
ProofCluster							
ana							
mvala							
psdjf		15.12.2016 12:12	15.12.2016 12:12	0	99	99	
test		01.03.2016 12:03	15.12.2016 12:12	0	99	99	
test1		08.03.2016 17:03	08.03.2016 17:03	0	99	99	

task2.txt

text of file

```
echo 1
echo 2
echo 3
echo 4
echo 5
echo 6
echo 7
echo 8
echo 9
echo 10
```

Size: 254 B Created: 18.05.2017 00:05 Modified: 18.05.2017 00:05

Copies Online: 1 Total: 1

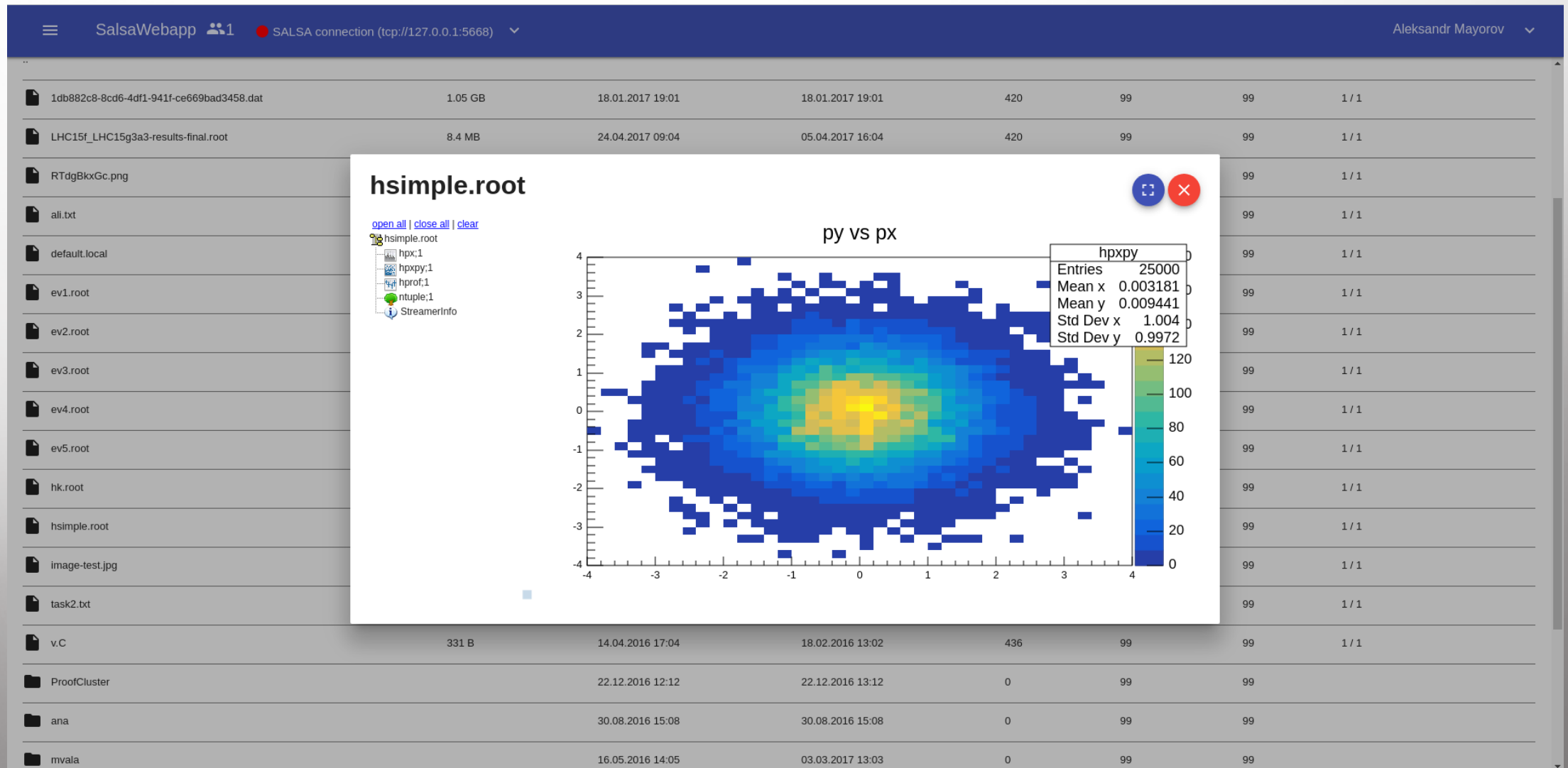
fsid	Host	Geotag	Mount point	Status
1	alieos0-iep-grid.saske.sk	saske.sk	/var/eos/fs/0	booted

Link: <https://gitlab.openbrain.sk/salsa/salsa-webapp>

Web app



Explorer of EOS storage (ROOT file):



Link: <https://gitlab.openbrain.sk/salsa/salsa-webapp>

Web app



Explorer of EOS storage (Info about file system):

SalsaWebapp 1 SALSA connection (tcp://127.0.0.1:5668)

Aleksandr Mayorov

EOS browser

Files

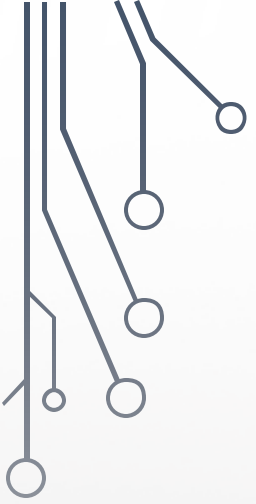
File system

Space info

Node info

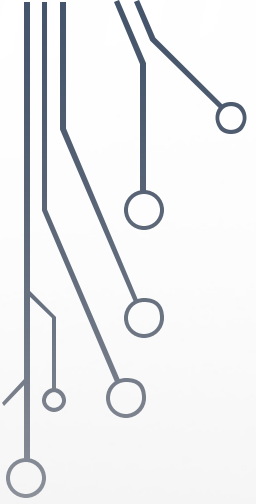
Host	Port	Id	Path	Capacity	Used	Schedgroup	Geotag	Boot	Configstatus	Drain	Active	Health
alieos0-iep-grid.saske.sk	1095	1	/var/eos/fs/0	2 TB	1.03 TB	default.0	saske.sk	booted	rw	nodrain	online	OK
alieos0-iep-grid.saske.sk	1095	2	/var/eos/fs/1	2 TB	988.98 GB	default.1	saske.sk	booted	rw	nodrain	online	OK

Link: <https://gitlab.openbrain.sk/salsa/salsa-webapp>



Future development

- Optimization of web service
- Fix bugs
- Creation of new task templates
- Creation personal account of user
- Adding new features for working with tasks
- Improvement of graphical interface



Thank you for your attention

