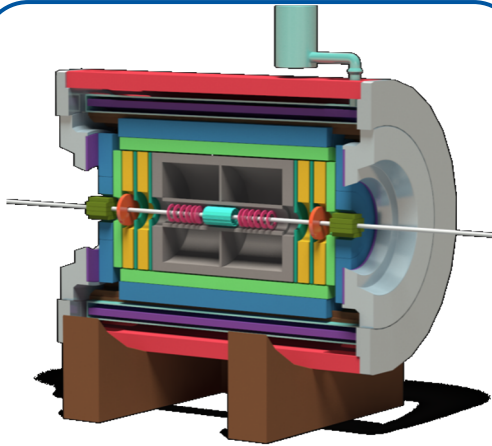


DUBNA

DIRAC@JINR report

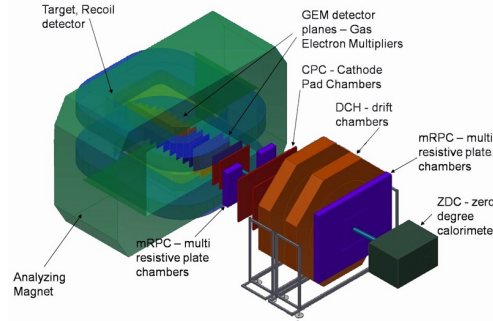
Speaker: Igor Pelevanyuk
Joint Institute for Nuclear Research

What do we use DIRAC for?



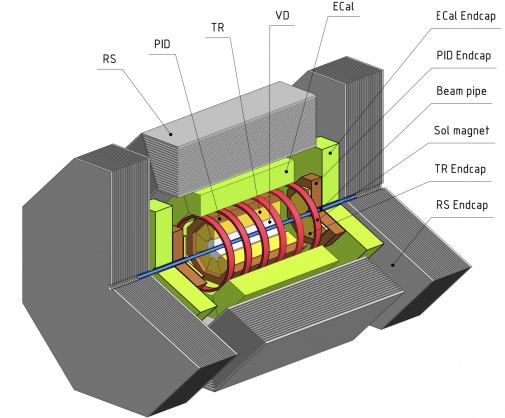
MPD@NICA

Monte-Carlo – **Real**
Analysis – **Maybe**



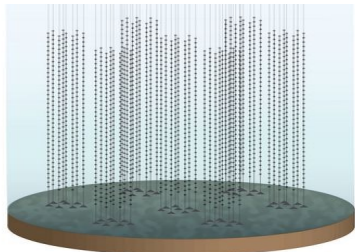
BM@N

Monte-Carlo – **Real**
Reconstruction – **Real**



SPD

Monte-Carlo – **Tests**
Analysis - **Tests**



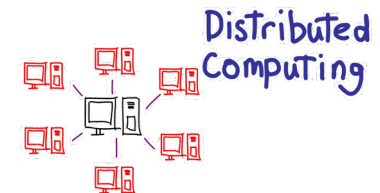
Baikal-GVD

Monte-Carlo – **Real**



**FOLDING
@HOME**

Folding@HOME



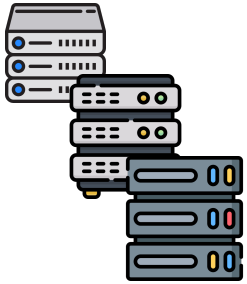
Teaching

Summary on users

Experiment	First usage	Jobs done	Consumed CPU, HS06 days	Consumed Walftime	Data generated, TB
MPD	Aug 2019	1.12 M	5.59 M	861 years	330
Baikal-GVD	Oct 2020	123000	590 k	90 years	40
F@H	May 2020	13000	137 k	23 years	n/a
BM@N	Jul 2021	22000	170 k	30 years	18
SPD	Nov 2021	33000	226 k	38 years	101

DIRAC features we use

Integration



ARC CE
Slurm
HTCondor
OpenNebula
SunGridEngine
EOS

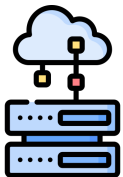
FileCatalog

Not so much MetaData

Multi-VO

Can't imagine life without it

VMDIRAC



Baikal-GVD and
Folding@HOME

MPD in a
smaller scope

WebApp



Mostly JobMonitor
and Accounting
(and Configuration)

DIRAC version: v7r0p27

DIRAC features we do not use

RSS

Once upon a time it did not worked out, maybe we should try again.

Interested

Request MS

We have just one SE really working. Will try it when there will be two of them.

Interested in future

Transformation S

MC transformation tested.

Waiting for a task

Any notable operations incident in the last year?

No major incidents from DIRAC

Do you have a DIRAC extension? Why?

We do not use extension

What is your biggest frustration with DIRAC?

To understand some nasty errors it is necessary to add `logger.debug()` in DIRAC code

You can magically add one feature to DIRAC, what is it?

To simplify configuration and debug of configuration would be great! But it is probably impossible.

To support your "Grid", do you have to use other systems than DIRAC?

- Ansible – restart all services/agents
- InfluxDB + Telegraf + Chronograf
for monitoring and some special use-cases like users' job monitoring, "zombie" VirtualMachines checks
- DIRAC CA – for educational purposes and Folding@HOME

Computing resources

JINR



Tier-1
920 slots

CICC/Tier-2
1000 slots

Cloud
80 slots

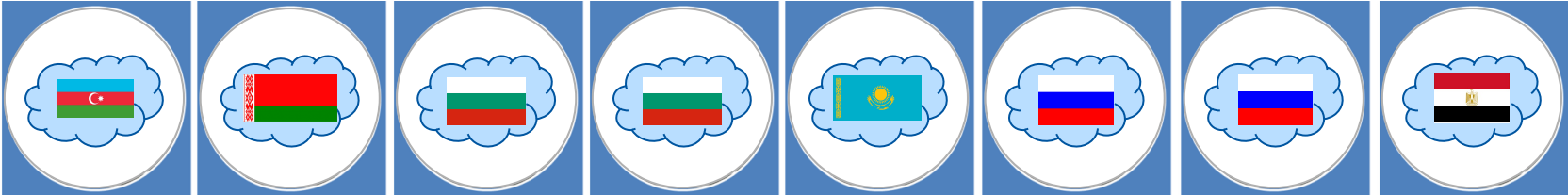
Govorun
184-870 slots

NICA Cluster
250 slots

UNAM
100 slots

MPD
collaboration

Clouds



IPANAS
16 slots

INP
132 slots

SU
48 slots

INRNE
20 slots

INP
50 slots

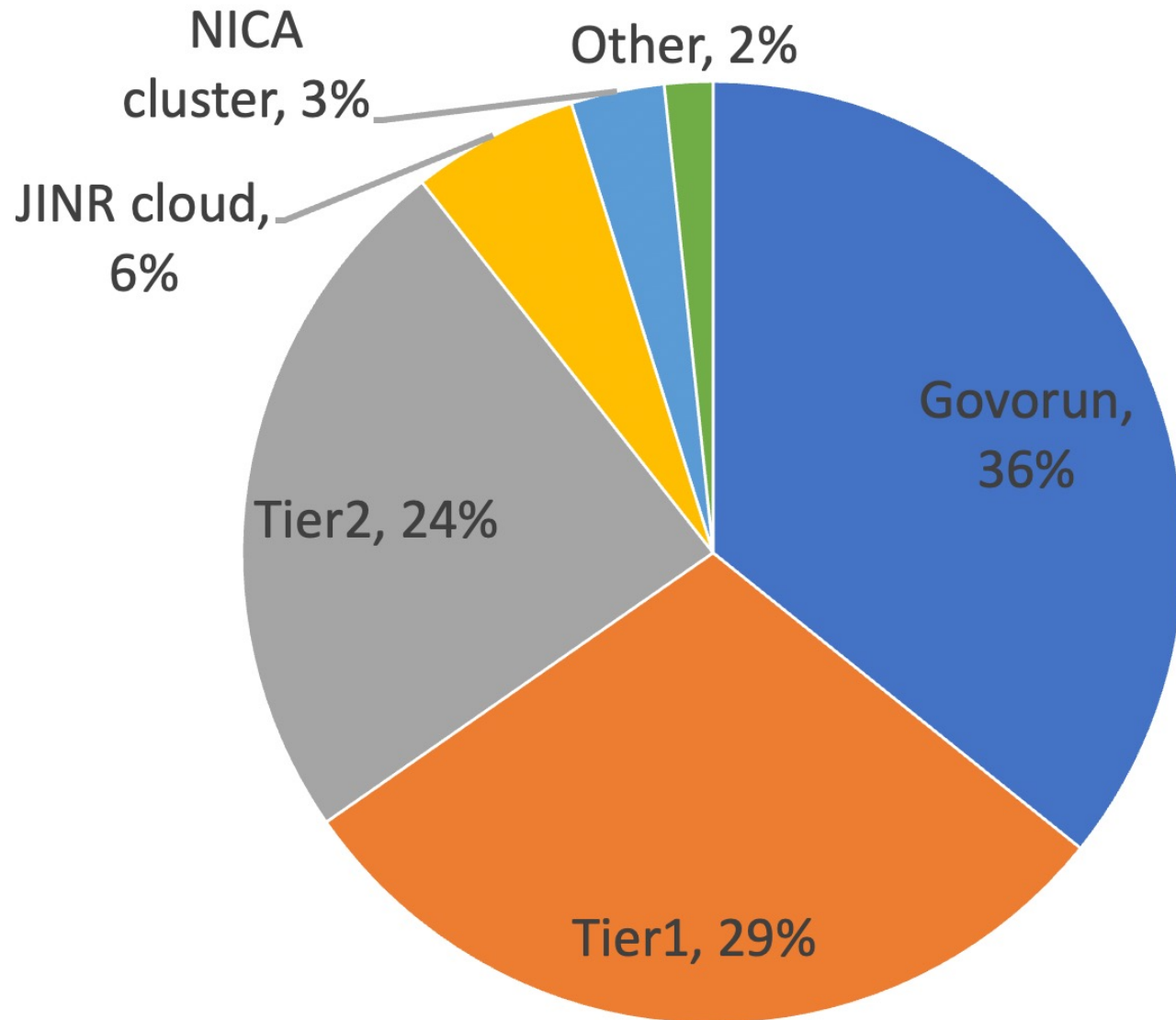
REA Plehanova
132 slots

NOSU
84 slots

STI-SCI
98 slots

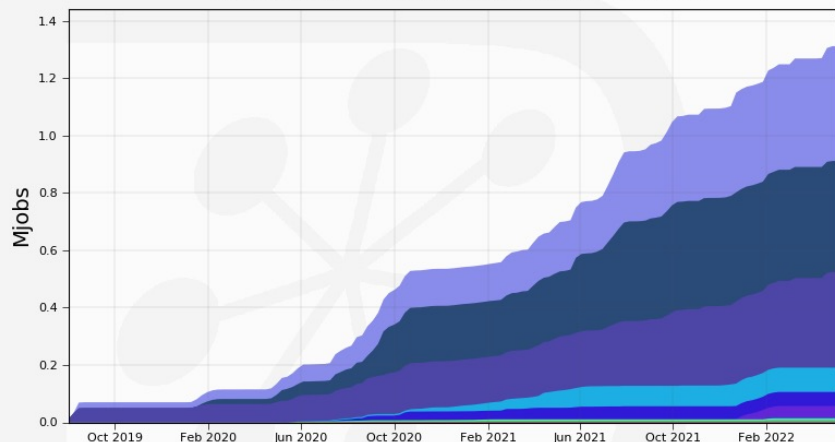
Total amount of cores exceeds 3000

Raitio between resources



DIRAC jobs done

Cumulative Jobs by Site
144 Weeks from Week 30 of 2019 to Week 18 of 2022

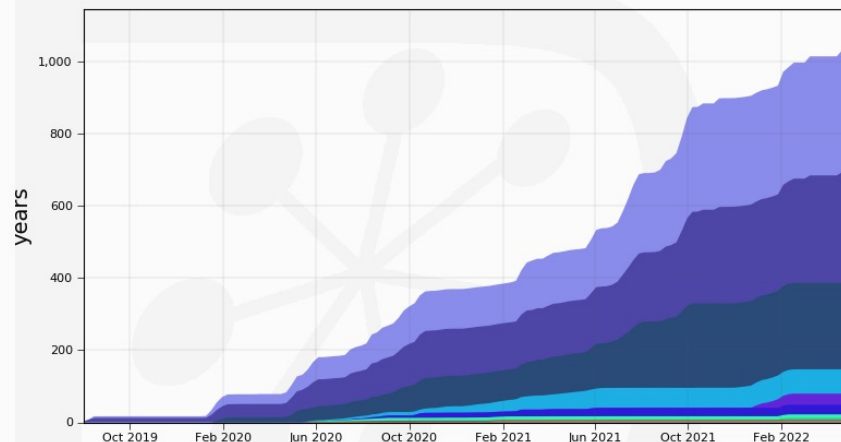


Max: 1.31, Min: 0.01, Average: 0.57, Current: 1.31

DIRAC.JINR-TIER.ru	0.4	CLOUD.PRUE.ru	0.0	CLOUD.STI-SCI.eg	0.0
DIRAC.GOVORUN.ru	0.4	DIRAC.NIKS-JSCC.ru	0.0	CLOUD.INP.kz	0.0
DIRAC.JINR-CREAM.ru	0.3	CLOUD.NOSU.ru	0.0	DIRAC.REA.ru	0.0
CLOUD.JINR.ru	0.1	DIRAC.UNAM.mx	0.0	CLOUD.INRNE.bg	0.0
DIRAC.JINR-LHEP.ru	0.0	CLOUD.IPANAS.az	0.0		
DIRAC.JINR-CONDOR.ru	0.0	CLOUD.INP.by	0.0		

Generated on 2022-05-09 08:27:29 UTC

Cumulative wall time by Site
144 Weeks from Week 30 of 2019 to Week 18 of 2022



Max: 1,042, Min: 2.17, Average: 425, Current: 1,042

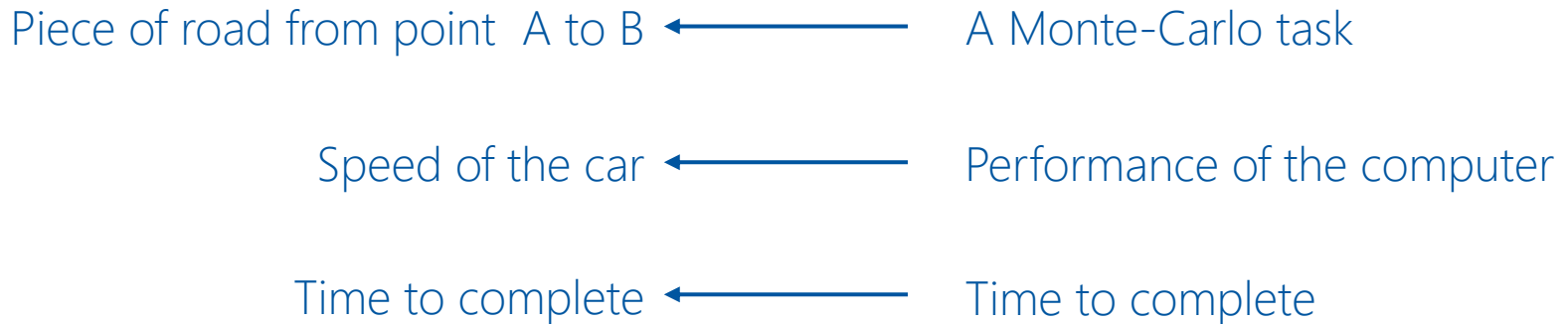
DIRAC.JINR-TIER.ru	343.2	CLOUD.PRUE.ru	9.2	CLOUD.STI-SCI.eg	0.7
DIRAC.JINR-CREAM.ru	313.2	DIRAC.NIKS-JSCC.ru	4.9	CLOUD.INP.kz	0.2
DIRAC.GOVORUN.ru	239.0	CLOUD.NOSU.ru	2.3	CLOUD.INRNE.bg	0.2
CLOUD.JINR.ru	67.4	CLOUD.IPANAS.az	2.0	DIRAC.REA.ru	0.2
DIRAC.JINR-CONDOR.ru	31.0	DIRAC.UNAM.mx	1.3		
DIRAC.JINR-LHEP.ru	26.6	CLOUD.INP.by	1.0		

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Developments in JINR

Performance monitoring

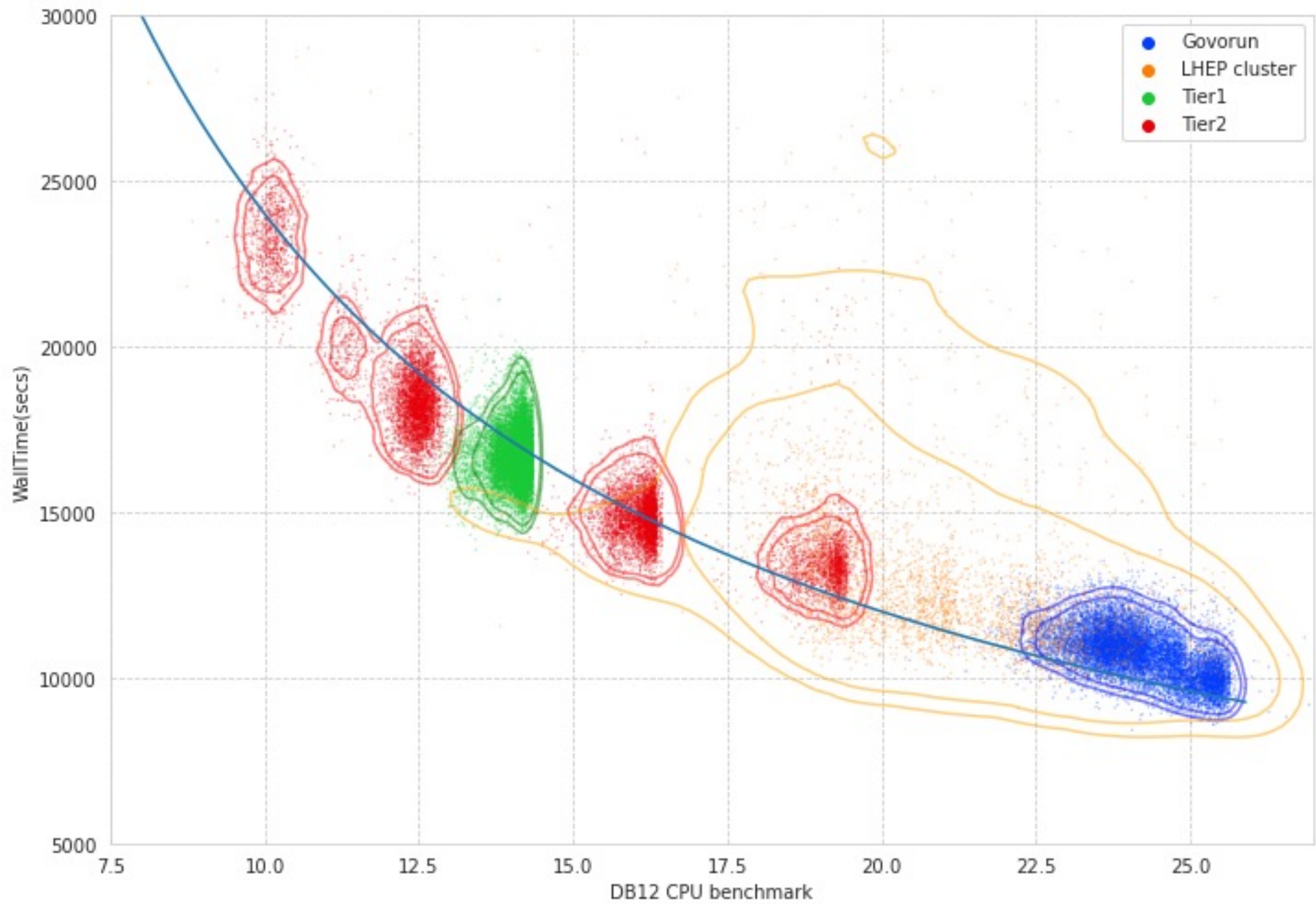
DB12 benchmark study



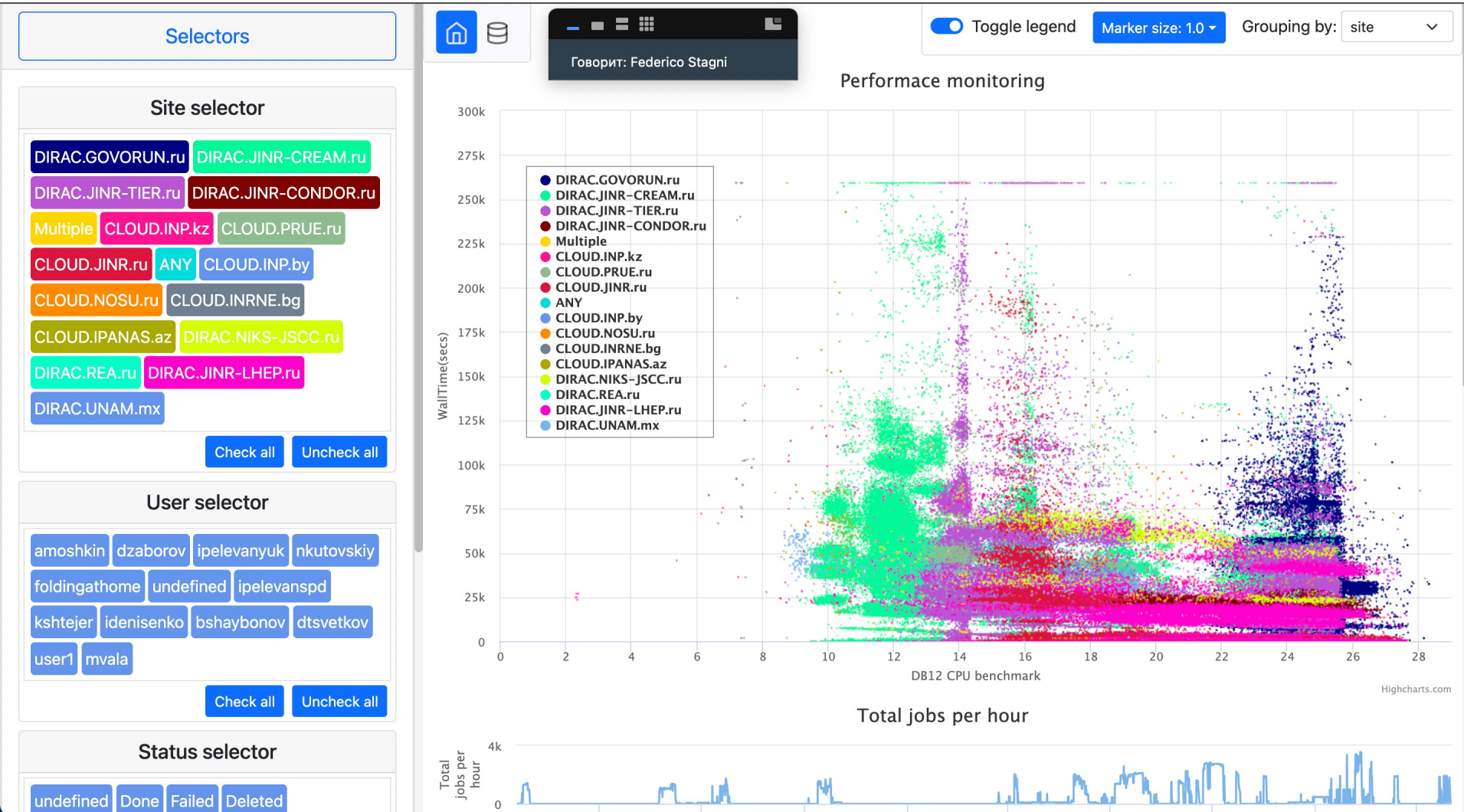
$$Time = \frac{Amount\ of\ work}{Speed\ of\ computer}$$

DB12 gives results like: 10(old slow core), 17 (standard server core), 27 (high performance core)

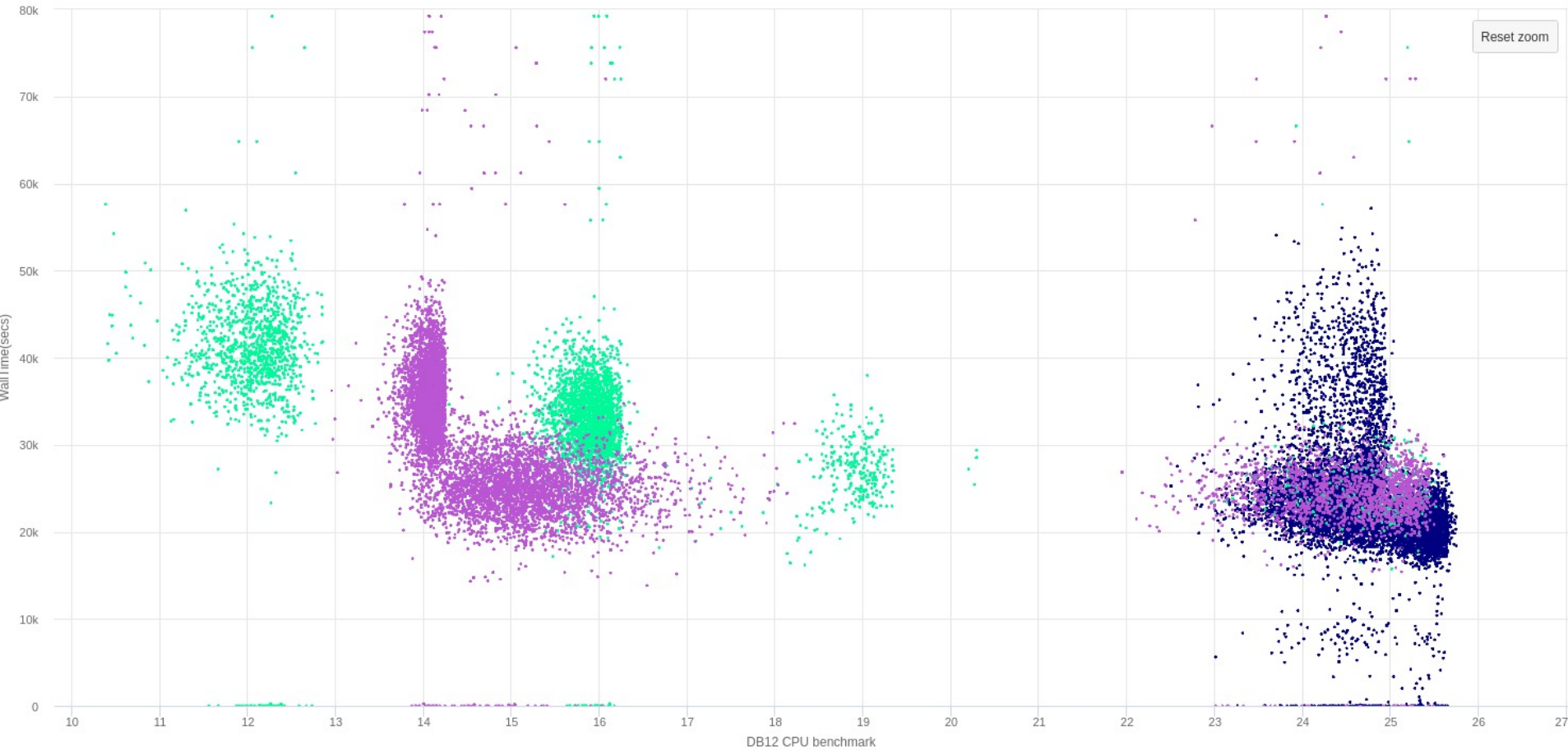
What if we build a plot, where X is DB12 result, Y is time in seconds. Then, every point on the plot represent one job. It would be mostly useless if all jobs were unique and different. But, in the real life there are usually many similar jobs.



Performance monitoring



Discoveries done



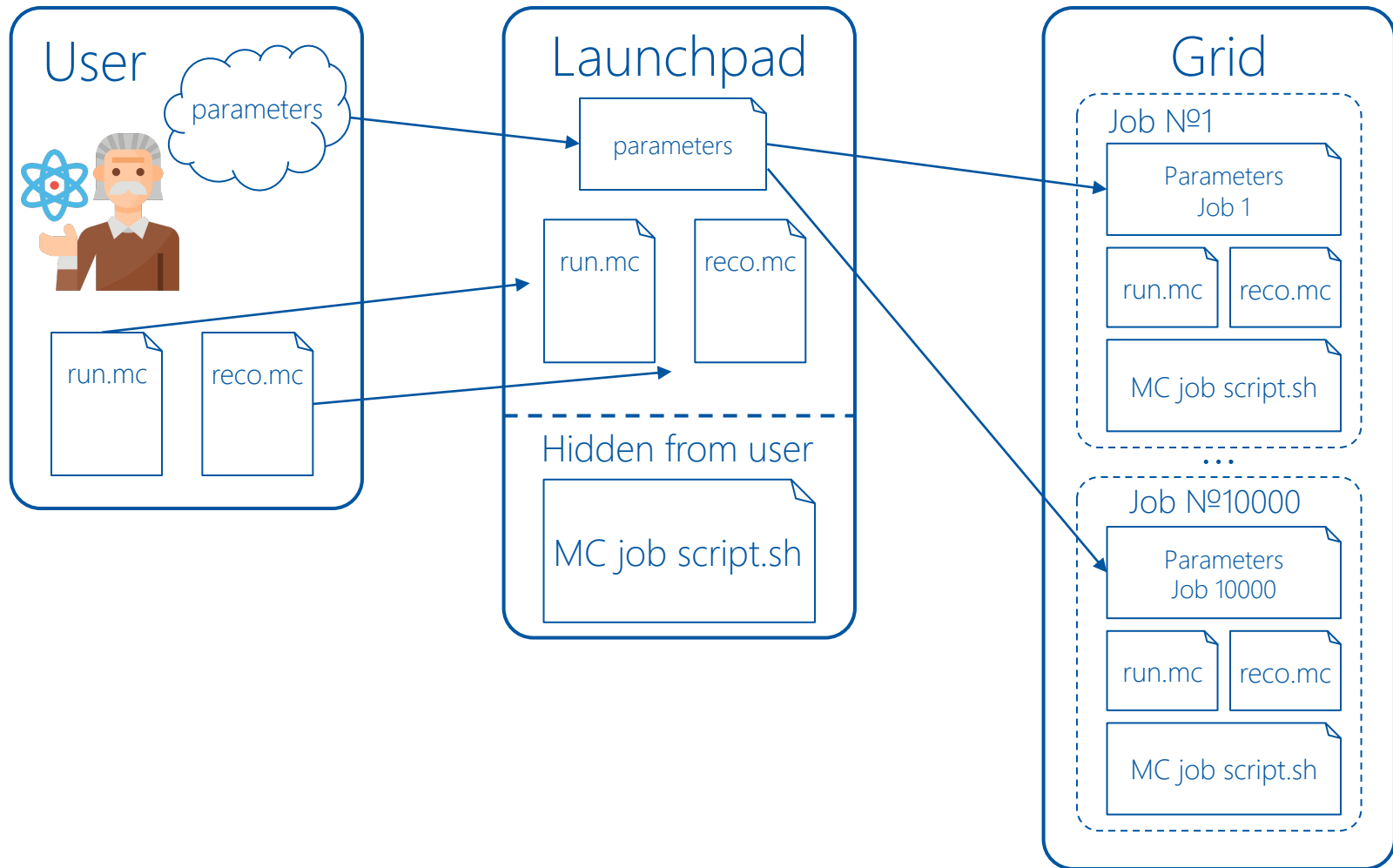
Performance monitoring

- Was initiated as Jupyter notebook with data dumped from MySQL. Proved to be informative.
- Service for performance monitoring is being developed. Functioning in JINR.
- Some steps are done to make it simple to use. BESIII DIRAC installation will be second example of its use. Thanks, Xiaomei for cooperation.
- It will be presented on BILD meeting sometime later.
- **Possible issues with the growth of data.**

Developments in JINR

Production submission app

MPD Monte-Carlo launchpad



MPD Monte-Carlo launchpad

The screenshot shows a web browser window with the URL `dirac-ui.jinr.ru/DIRAC/s:JINR-Production/g:mpd_user/?view=tabs&theme=Crisp&url_state=1|*DIRAC.MPDLa...`. The browser's address bar shows "Not secure". The page title is "MPD MC Launchpad [Untitled 1]".

The interface is divided into a left sidebar and a main content area. The sidebar, titled "Menu", contains a "Desktops&Applications" section with a tree view of tools and applications. The "Tools" section includes "Application Wizard", "Proxy Upload", "Job Launchpad", "MPD Launchpad" (highlighted with a red box and a red arrow pointing to the main content area), and "Notepad". The "Applications" section lists various system management tools like "Public State Manager", "Job Monitor", "Pilot Monitor", "Accounting", "Configuration Manager", "Registry Manager", "File Catalog", "System Administration", "Activity Monitor", "Transformation Monitor", "Request Monitor", "Pilot Summary", "Resource Summary", "Site Summary", "Proxy Manager", "Component History", "Job Summary", "Space Occupancy", "Downtimes", and "Virtual Machine". There are also "Help", "DIRAC", "My Desktops", and "Shared" options at the bottom of the sidebar.

The main content area is titled "MPD MC Launchpad [Untitled 1]". It features a "Proxy Status: Valid" indicator. Below this is a "JDL" section with a "Generator" subsection containing radio buttons for "UrQMD", "FLUID", "ION", "HSD", "SMASH", "VHLL", "PART", "BOX", "LAQGSM", and "DCQGSM". The "Beam" subsection has radio buttons for "Au", "Ag", "C", "Bi", "P", and "Pb". The "Target" subsection also has radio buttons for "Au", "Ag", "C", "Bi", "P", and "Pb".

Below the JDL section are several input fields:

- Energy: 09.2
- Centrality: mb
- GenMod: BiBi-09.2GeV-mp05-21-500ev
- RecMod: dst-BiBi-09.2GeV-mp05-21-500ev
- InputTemplate: urqmd-BiBi-09.2GeV-mb-eos0-500
- InputExtension: f14
- EventsNumber: 500

At the bottom of the main content area is an "Input Sandbox" section with two text input fields and "Browse" buttons. At the very bottom of the page are "Submit" and "Reset" buttons.

Acknowledgments

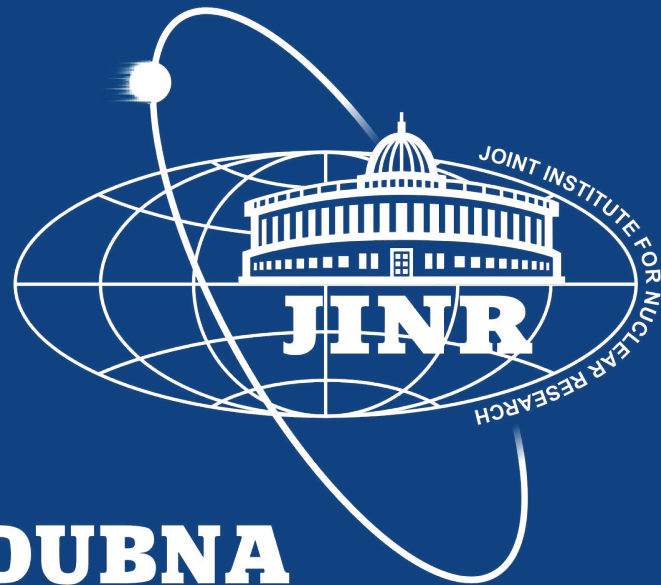
- JINR installation would not be possible without Andrei help and support during all these years.
- Thanks to all of you who helped with DIRAC, especially: Federico, Daniela, Andrii, Christophe, Xiaomei, Andre, Marko and Christopher

How would you rate the communication?

- Communication is a “killer feature” of DIRAC.
- BiLD-dev meetings are super useful for feeling the heartbeat of DIRAC.
Thanks for DIRAC Communities roundtable, it makes me confident that I am not alone with DIRAC.

Conclusions

- In JINR DIRAC allowed using all major computing resources. Biggest computing resource right now is just around 37% of peak united performance.
- DIRAC itself is a good source for "data mining".
- With experience comes better operations of DIRAC.
- For that thanks to the whole DIRAC community!



DUBNA