Monitoring

Federico Stagni

DIRAC technical coordinator

DR23, KEK, Tsukuba, 17th October 2023

Monitoring?

…once upon a time there was “monitoring”, then “operational intelligence” came and went, and now “observability”.

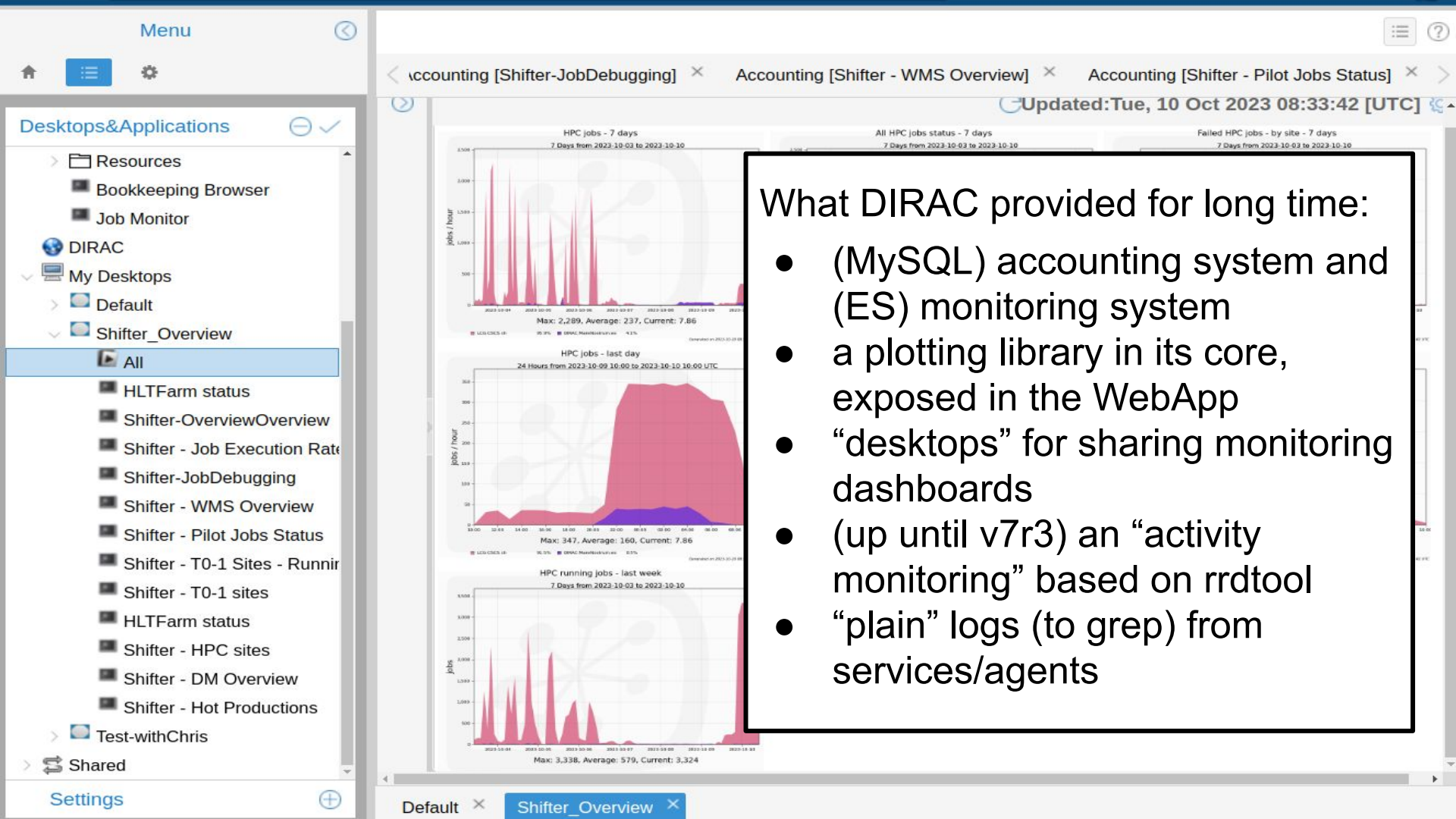
rant: that’s a deluge of words for not much new content;
to me, it’s only about answering the question “what’s going on?”

Federico, 2023

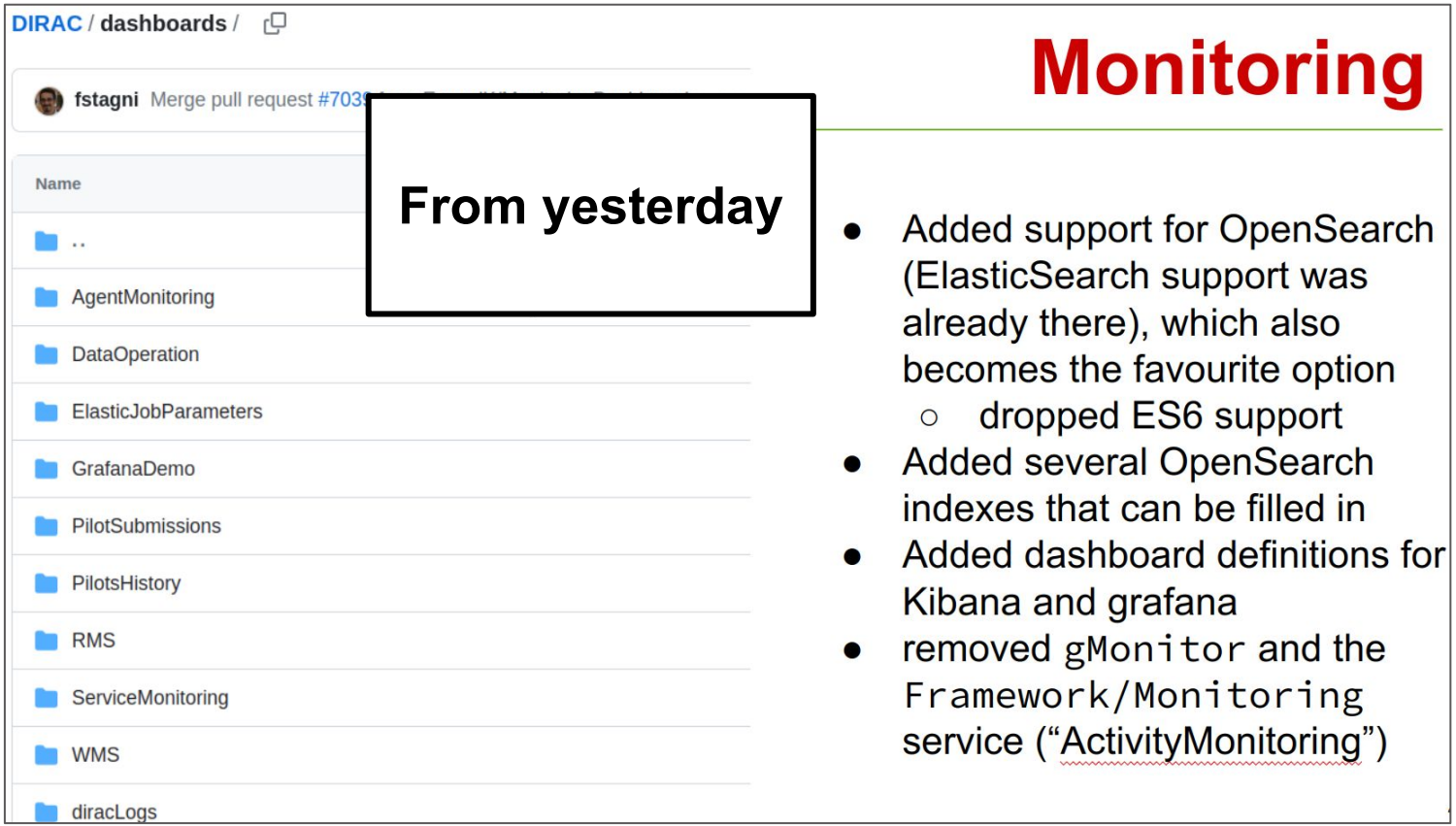
Independently, there’s a lot of good technology to use.

What you want to monitor

1. the Grid activities (let's call them "type 1")
   (jobs/pilots/transfers/… running/failing/…)
   administrators, shifters
2. the software itself (let's call them "type 2")
   (where is time/memory spent? debugging?)
   developers and sometimes admins
   security stuff goes through here


Menu
Desktops&Applications
Resources
Bookkeeping Browser
Job Monitor
DIRAC
My Desktops
Default
Shifter_Overview
All
HLTFarm status
Shifter-OverviewOverview
Shifter - Job Execution Rate
Shifter-JobDebugging
Shifter - WMS Overview
Shifter - Pilot Jobs Status
Shifter - T0-1 Sites - Runnir
Shifter - T0-1 sites
HLTFarm status
Shifter - HPC sites
Shifter - DM Overview
Shifter - Hot Productions
Test-withChris
Shared
Settings
ccounting [Shifter-JobDebugging]
Accounting [Shifter - WMS Overview]
Accounting [Shifter - Pilot Jobs Status]
Updated:Tue, 10 Oct 2023 08:33:42 [UTC]
HPC jobs - 7 days
7 Days from 2023-10-03 to 2023-10-10
Max: 2,289, Average: 237, Current: 7.86
All HPC jobs status - 7 days
7 Days from 2023-10-03 to 2023-10-10
Failed HPC jobs - by site - 7 days
7 Days from 2023-10-03 to 2023-10-10
HPC jobs - last day
24 Hours from 2023-10-09 10:00 to 2023-10-10 10:00 UTC
Max: 347, Average: 160, Current: 7.86
HPC running jobs - last week
7 Days from 2023-10-03 to 2023-10-10
Max: 3,338, Average: 579, Current: 3,324
What DIRAC provided for long time:
(MySQL) accounting system and (ES) monitoring system
a plotting library in its core, exposed in the WebApp
“desktops” for sharing monitoring dashboards
(up until v7r3) an “activity monitoring” based on rrdtool
“plain” logs (to grep) from services/agents
Default
Shifter_Overview

DIRAC v8.0 improved monitoring

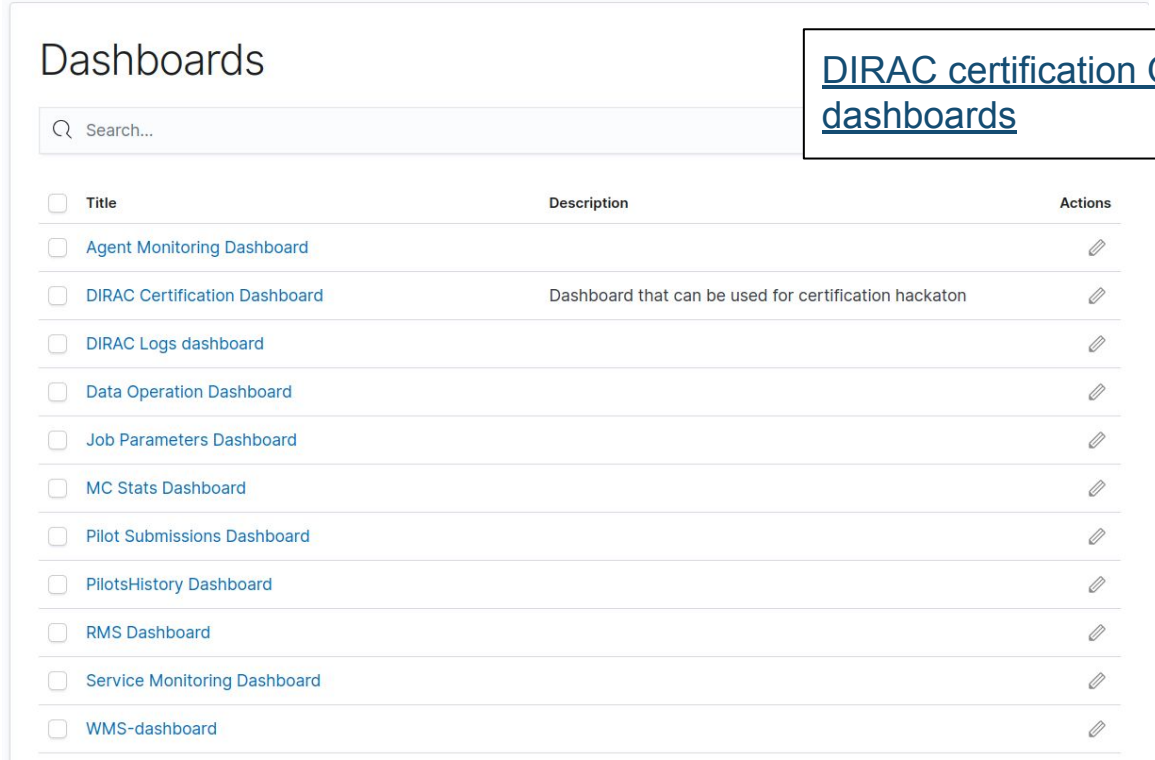


From yesterday

Monitoring

- Added support for OpenSearch (ElasticSearch support was already there), which also becomes the favourite option
  - dropped ES6 support
- Added several OpenSearch indexes that can be filled in
- Added dashboard definitions for Kibana and grafana
- removed `gMonitor` and the `Framework/Monitoring` service (“ActivityMonitoring”)

If it is on ES, kibana can visualize it



DIRAC certification Opensearch dashboards

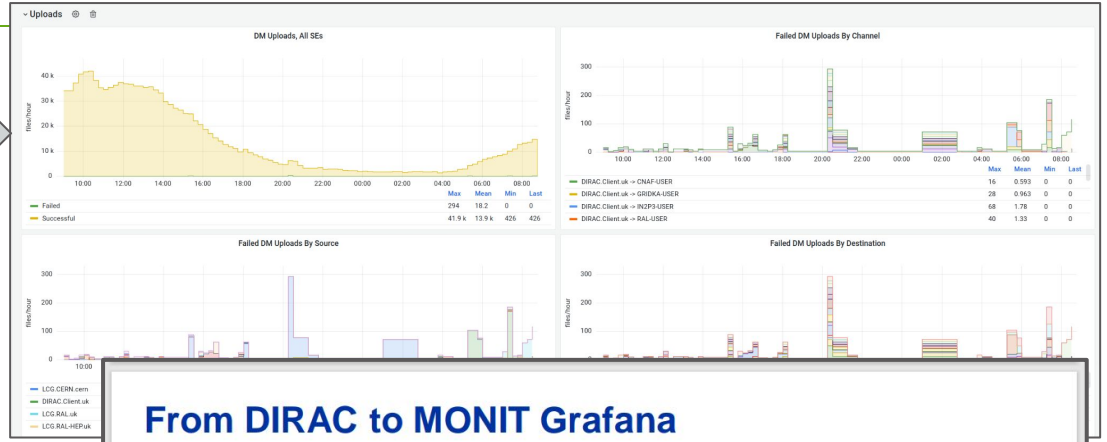
Type 1 and type 2 dashboards

LHCb's shifter dashboard in grafana

But grafana is just better

- Shifter Overview
  - DM Overview — Shifter Overview
  - HLTFarm Status — Shifter Overview
  - HPC Sites — Shifter Overview
  - Job Debugging — Shifter Overview
  - Job Execution Rate Overview — Shifter Overview
  - Overview — Shifter Overview
  - Pilot Jobs Status — Shifter Overview
  - T0-1 Sites — Shifter Overview
  - T0-1 Sites - Running Jobs — Shifter Overview
  - WMS Overview — Shifter Overview

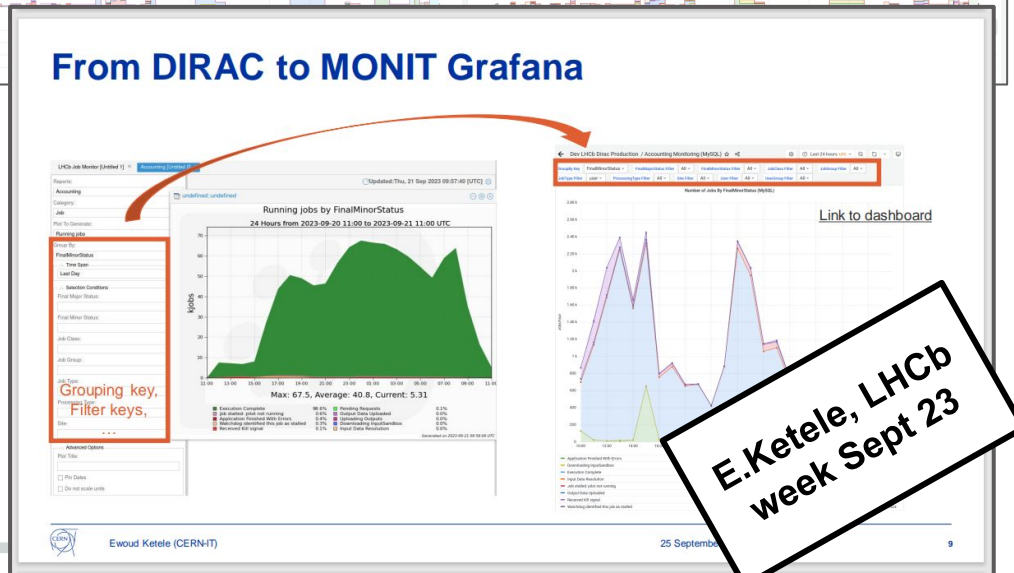
MySQL



Grafana dashboards can <u>already</u> **FULLY** replace DIRAC's own plotting library and visualizations

MySQL

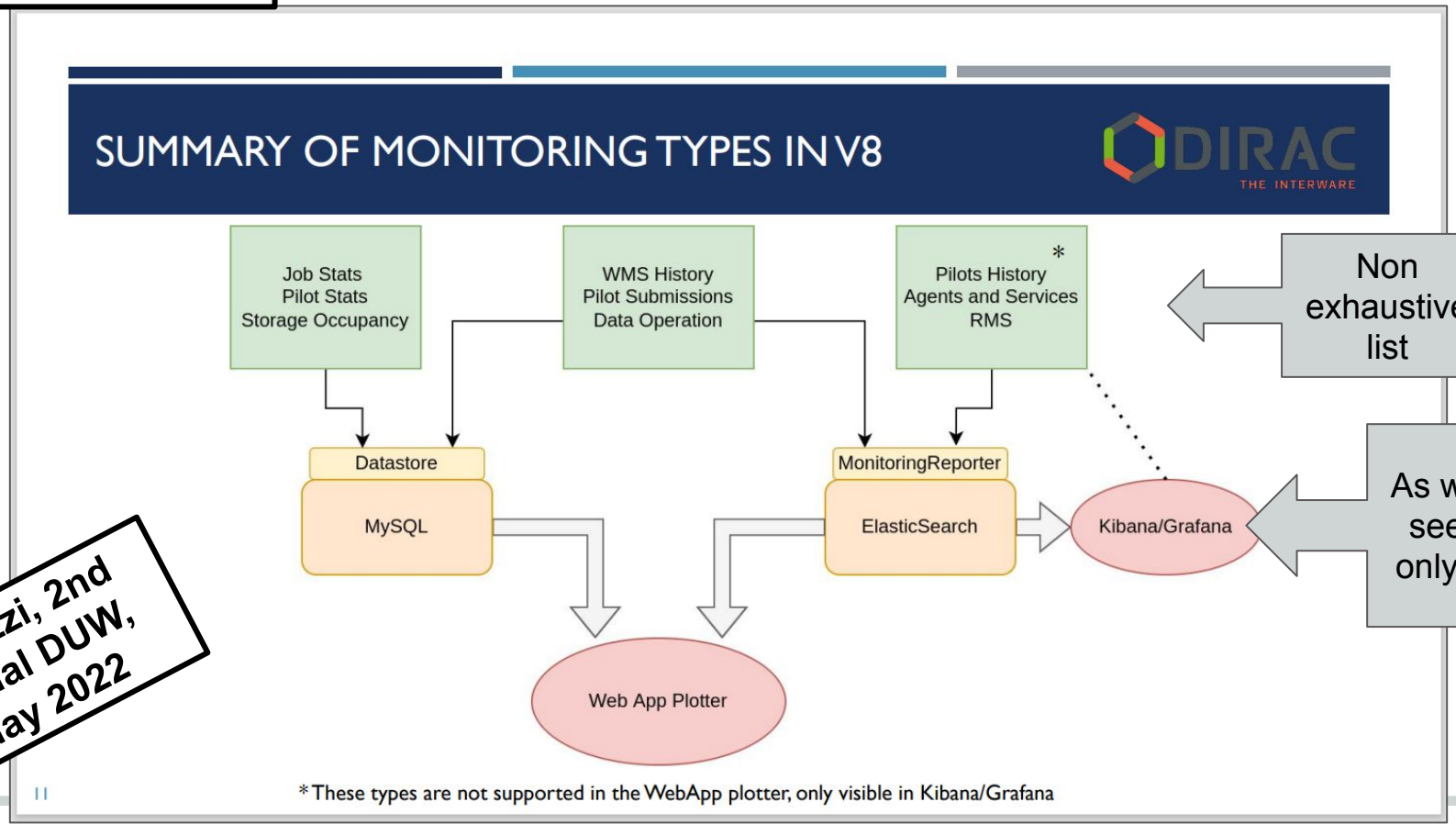
OpenSearch



DIRAC v8 provides alternate “types” in ES

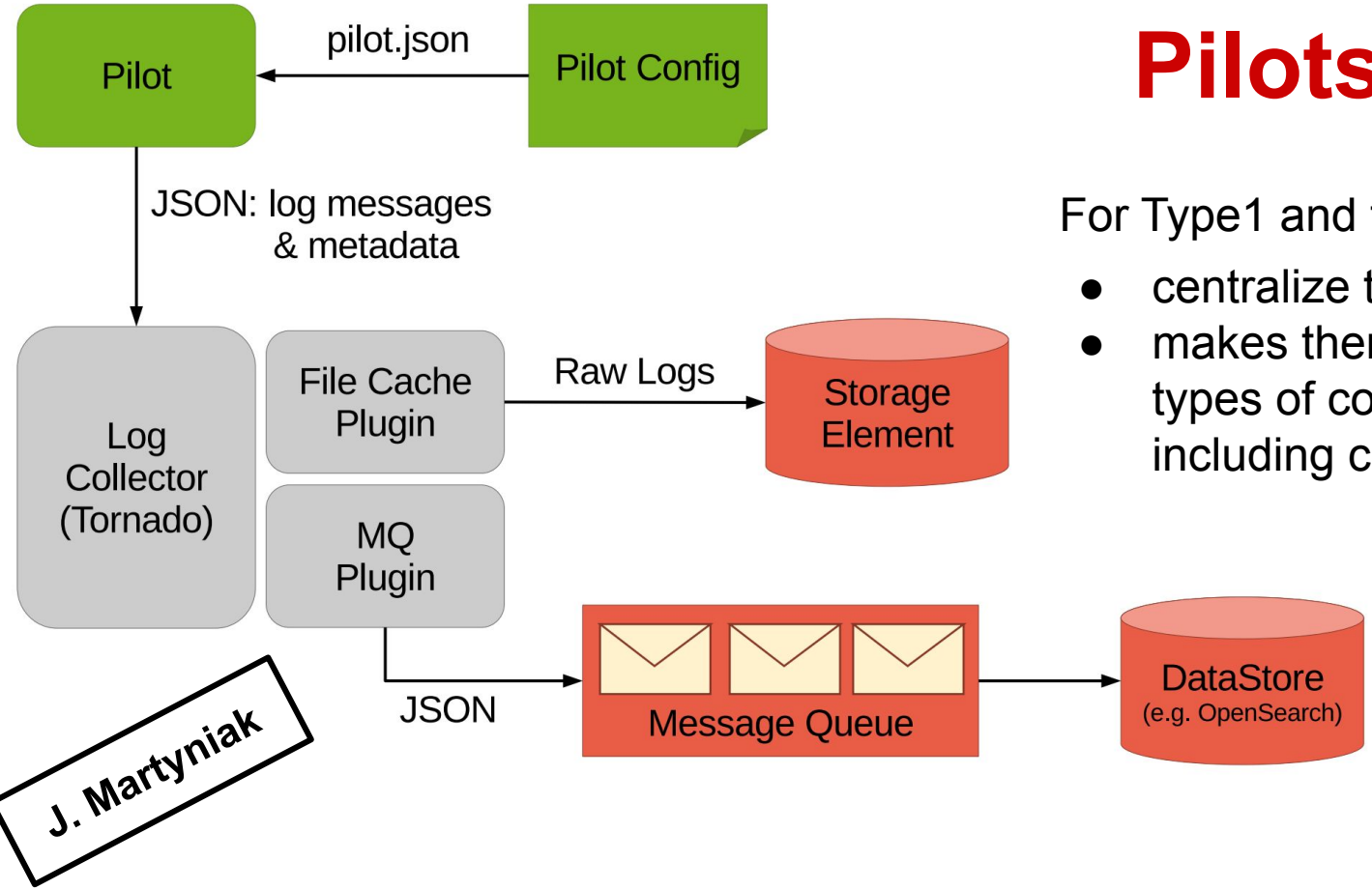
And ES is just better than MySQL

(...not for everything!)



R.Pozzi, 2nd virtual DUW, May 2022

Pilots logging



For Type1 and type2 monitoring.

- centralize the logs
- makes them available for all types of computing elements, including clouds.

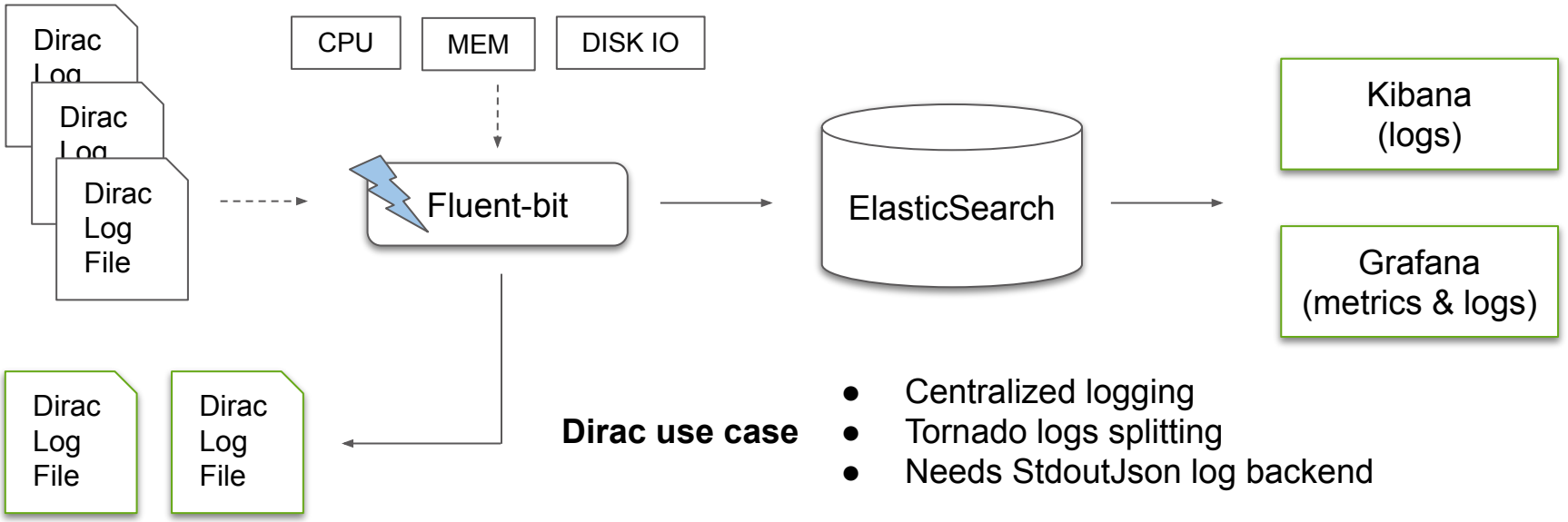
(not yet in production)

Fluentbit usage in DIRAC

B. Rigaud

Main features

- Type1 monitoring
- Lightweight software (size and memory footprint)
- Grab from multiple sources
- Export to multiple destinations (ES, files…)
- Parse/Filter/Modify (lua script)



Dirac use case

- Centralized logging
- Tornado logs splitting
- Needs StdoutJson log backend

Monitoring with and for DiracX

- Still many things to decide, but:
  - no plotting libraries!
  - reliance on external “standards”
- Type 1:
  - For visualization, Grafana should be enough
  - backends: at a minimum OpenSearch
- Type 2:
  - code instrumented with OpenTelemetry (metrics, traces, logs)

Questions?

https://github.com/DIRACGrid