Monitoring System in CTADIRAC

L. Arrabito

LUPM CNRS-IN2P3, France

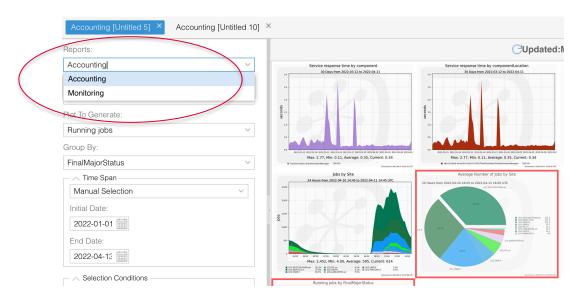DIRAC@IN2P3 F2F Meeting 14th April 2022, Lyon

Introduction

- Monitoring System installed late 2020 on CTADIRAC instance and connected to Elias service at CC-IN2P3 (Patrick, Michèle and Fabien Wernli)
- Used for
  - Component Monitoring
  - WMS History Monitoring
  - RMS Monitoring
- Documentation
  - https://dirac.readthedocs.io/en/latest/AdministratorGuide/Systems/MonitoringSystem/index.html
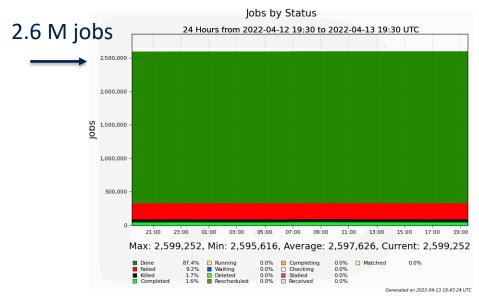
WMS History Monitoring

- Populated by the WMS StatesAccountingAgent
  - Collects information from the JobDB and send it to ElasticSearch
  - The same agent also reports to the MySQL backend of the Accounting System
- Allow to monitor jobs in real time in contrast to Accounting Monitoring and Accounting visualizations available in WebApp
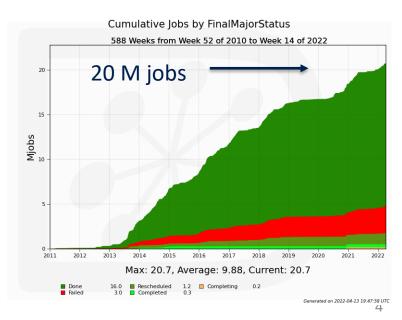
WMS History Monitoring

- Currently ~ 2.6 million of entries in ElasticSearch (WMS Hist)
- ~ 20 million jobs in AccountingDB
  - Deleted jobs are removed from JobDB (and ES) while they stay in AccountingDB

Monitoring System

Accounting System
(Cumulative Jobs)

2.6 M jobs

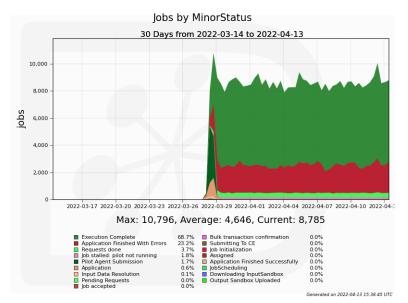20 M jobs

WMS History Monitoring

- It does not make too much sense to display Done/Failed jobs as a function of time in the MS
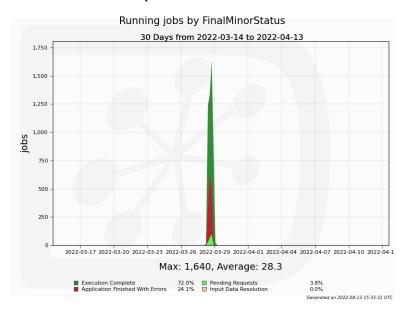 - The difference between these 2 views was quite perturbating for me …

Monitoring System
Jobs By Minor Status
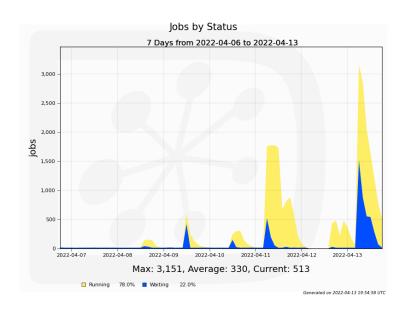JobGroup = 00002878

Accounting System
Running Jobs By Final Minor Status
JobGroup = 00002878

Jobs by MinorStatus
30 Days from 2022-03-14 to 2022-04-13

Max: 10,796, Average: 4,646, Current: 8,785

Execution Complete	68.7%	Bulk transaction confirmation	0.0%
Application Finished With Errors	23.2%	Submitting To CE	0.0%
Requests done	3.7%	Job Initialization	0.0%
Job stalled: pilot not running	1.8%	Assigned	0.0%
Pilot Agent Submission	1.7%	Application Finished Successfully	0.0%
Application	0.6%	JobScheduling	0.0%
Input Data Resolution	0.1%	Downloading InputSandbox	0.0%
Pending Requests	0.0%	Output Sandbox Uploaded	0.0%
Job accepted	0.0%		

Generated on 2022-04-13 15:38:45 UTC

Running jobs by FinalMinorStatus
30 Days from 2022-03-14 to 2022-04-13

Max: 1,640, Average: 28.3

Execution Complete	72.0%	Pending Requests	3.8%
Application Finished With Errors	24.1%	Input Data Resolution	0.0%

Generated on 2022-04-13 15:33:31 UTC
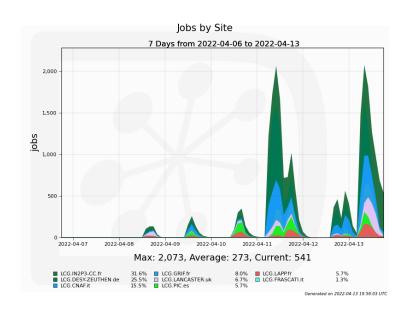
WMS History Monitoring

- Conceived to monitor Running/Waiting, ... jobs in real time

Monitoring System
Running and Waiting jobs

Monitoring System
Running jobs by Site
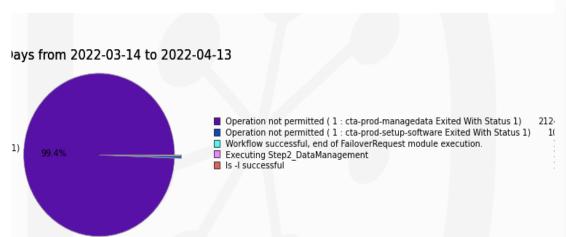
WMS History Monitoring

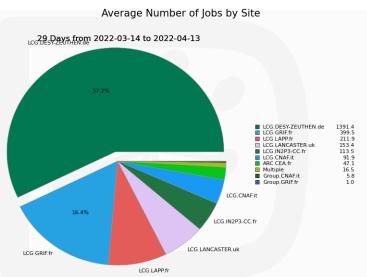- Allow to analyse jobs for some particular selection (not just Time Range selection)

Monitoring System
Failed jobs by Application Status
JobGroup = 00002878

Monitoring System
Failed jobs by Site
JobGroup = 00002878

Average Number of Jobs by Site
29 Days from 2022-03-14 to 2022-04-13

LCG.DESY-ZEUTHEN.de	1391.4
LCG.GRIF.fr	399.5
LCG.LAPP.fr	211.9
LCG.LANCASTER.uk	153.4
LCG.IN2P3-CC.fr	113.5
LCG.CNAF.it	91.9
ARC.CEA.fr	47.1
Multiple	16.5
Group.CNAF.it	5.8
Group.GRIF.fr	1.0

Days from 2022-03-14 to 2022-04-13

Operation not permitted (1 : cta-prod-managedata Exited With Status 1)	212
Operation not permitted (1 : cta-prod-setup-software Exited With Status 1)	1(
Workflow successful, end of FailoverRequest module execution.	
Executing Step2_DataManagement	
ls -l successful	

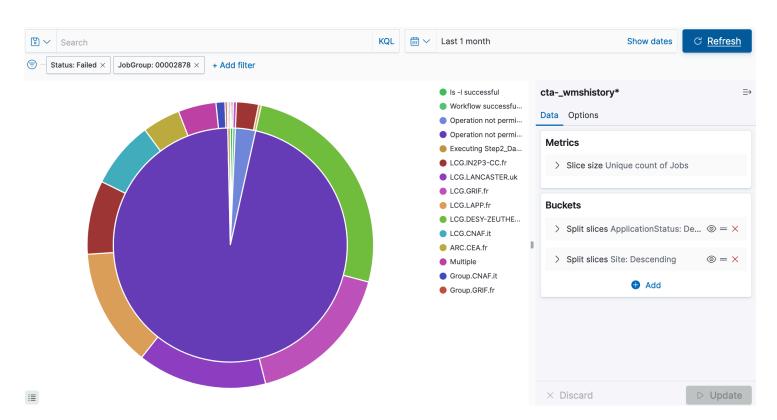# What can we do more with Kibana/Grafana dashboards?

- Both Grafana and Kibana allow to use any kind of query to build custom/dynamic views
- Grafana more oriented for time series (can use many DB backends)
- Kibana useful to search for raw results (Discovery) but also offers nice visualizations (can use only ES backend)
- Allow a finer analysis of the data collected in ES
  - Jobs debugging, Operational issues
  - Component and Server behavior
- Very well documented
- Just started to play a bit -> Demo

  Thanks to Fabien Wernli
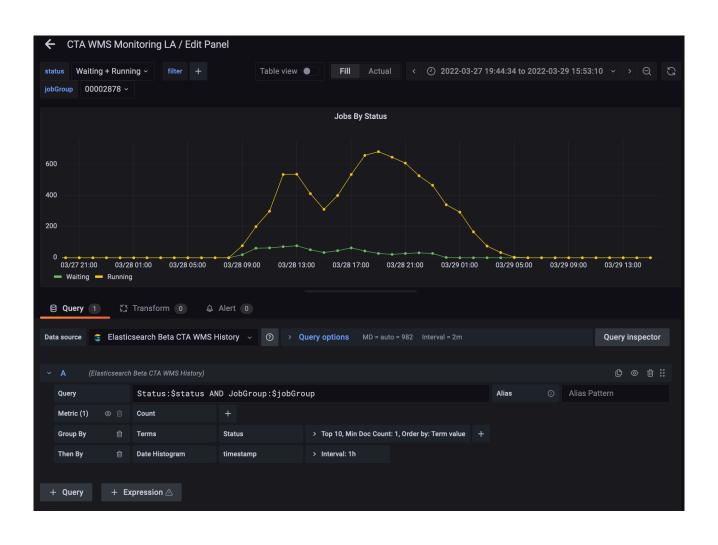
Example of Kibana visualisation

- Example of visualization with multiple aggregations

  Failed jobs by Application Status and By Site
  JobGroup = 00002878

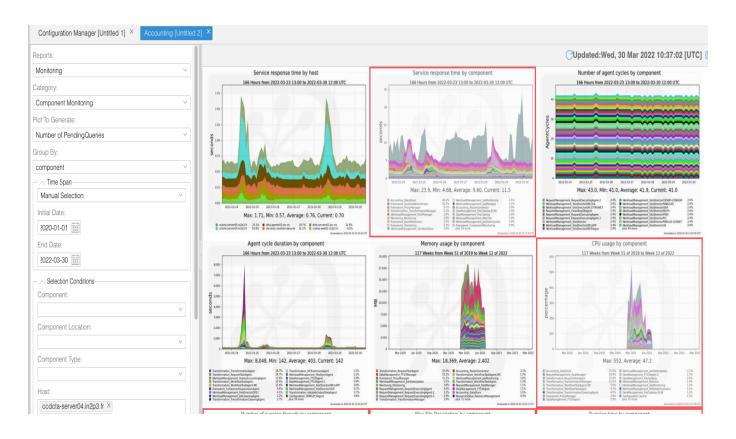# Example of Grafana visualisation

Component Monitoring

- Currently broken -> Not all Fields available
  - See: https://github.com/DIRACGrid/DIRAC/discussions/6000
  - Should be fixed in v8.0

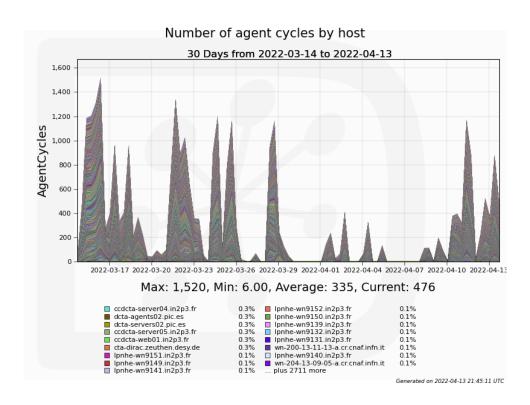# Component Monitoring

- Currently broken -> Not all Fields available
  - See: https://github.com/DIRACGrid/DIRAC/discussions/6000
  - Should be fixed in v8.0

Component Monitoring

- Also found an issue with the JobAgent which reports data from the wns where jobs are executed so that they appear as as hosts together with DIRAC hosts
  - I guess that the Monitoring should be disabled for JobAgent

Number of agent cycles by host

30 Days from 2022-03-14 to 2022-04-13

Max: 1,520, Min: 6.00, Average: 335, Current: 476

ccdcta-server04.in2p3.fr	0.3%	lpnhe-wn9152.in2p3.fr	0.1%
dcta-agents02.pic.es	0.3%	lpnhe-wn9150.in2p3.fr	0.1%
dcta-servers02.pic.es	0.3%	lpnhe-wn9139.in2p3.fr	0.1%
ccdcta-server05.in2p3.fr	0.3%	lpnhe-wn9132.in2p3.fr	0.1%
ccdcta-web01.in2p3.fr	0.3%	lpnhe-wn9131.in2p3.fr	0.1%
cta-dirac.zeuthen.desy.de	0.3%	wn-200-13-11-13-a.cr.cnaf.infn.it	0.1%
lpnhe-wn9151.in2p3.fr	0.1%	lpnhe-wn9140.in2p3.fr	0.1%
lpnhe-wn9149.in2p3.fr	0.1%	wn-204-13-09-05-a.cr.cnaf.infn.it	0.1%
lpnhe-wn9141.in2p3.fr	0.1%	... plus 2711 more	

Generated on 2022-04-13 21:45:11 UTC

13

Next plans

- Prepare dashboards for WMS, Component and RMS Monitoring to share with the community
- A Kibana dashboard for WMS History already available in v8.0
- Wants to explore how to use ES for Job Parameters
    - Collect CPU, RAM, disk space used by Jobs, etc.