# ATLAS BigPanDA monitoring Bellell DDM

S. Padolski (NPPS)

## **BigPanda Monitoring**

## Introduction

Reference talks:

- Alexei (<u>https://indico.bnl.gov/event/6290/</u>)
- Tadashi (<u>https://indico.bnl.gov/event/6333/</u>)

Instances: Atlas (<u>https://bigpanda.cern.ch</u>), Compass, EC2 (LSST, LQCD) <u>http://pandamonitor.org</u>

# Current content

- A window into the PanDA system
- > 100 different views
- From production dashboards to logs
- Covers scope in range 1...10<sup>11</sup> events

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# Current usage

17000 json requests a day

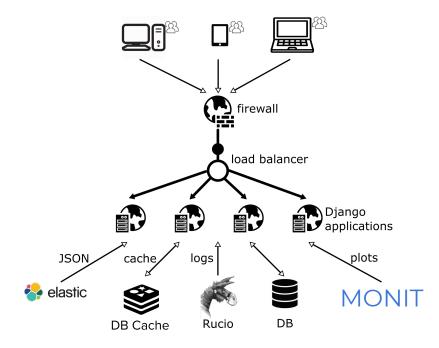




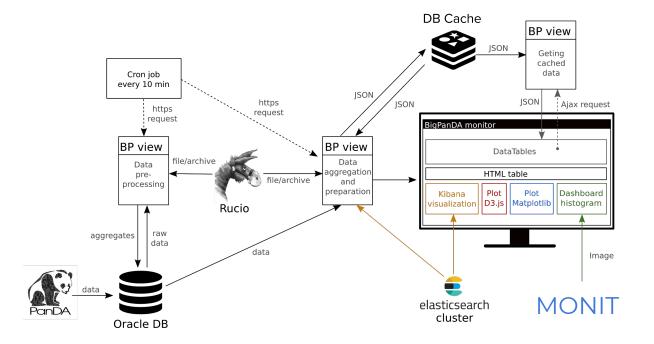
- 6.5 (+3%) user queries a day
- From 1 to 626 pages a day per user
- 1110 monthly active users
- 342 daily users

Is a primary tool ATLAS wide for shifters, experts and ADC in general

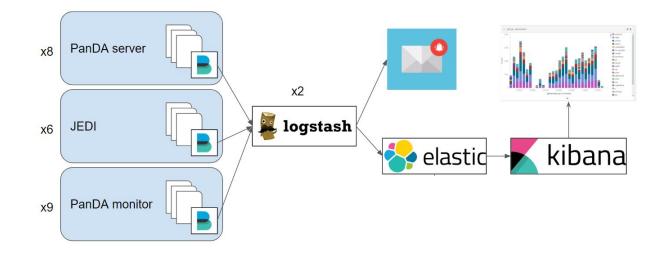
#### Architecture



#### Data-flow diagram of the BigPanDA monitor



# Self monitoring



## **Operation Intelligence**





- A lot of routine work is required for exposing and digging into problems
- We develop a mechanization such of work
  - BigPanDA attempts to provide information in the user friendly, quickly accessible way
  - OI attempts to process this information as a user would do

# **Operation Intelligence**

- A practical case is to provide reasons, at particular level, why a number or jobs failed in a task
- A prototype:
  - Builds online failure model for a task (less than a second to train)
  - Use job definition as set features
  - Extracts from the model most important factors (and its combinations) which leads to failing jobs at particular conditions
  - Provide these factors as an outcome
- A computation engine separated from monitoring itself
- Now we work on wrapping this prototype into MVP

# Forecasting

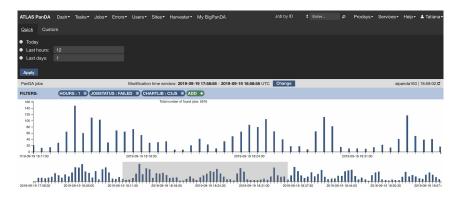
- GRID computing is a big queue
  - When is my order to get served?
  - When I do receive needed result?
  - How much can I order in principle to get result in reasonable time?
- Campaign is the ProdSys2 object which unites large computing activity (10<sup>10</sup> events) and involves different parties (physicists, managers, shifters)
- A "Hot" model was developed
- Currently it is getting to production



# Usability R&D

Aims:

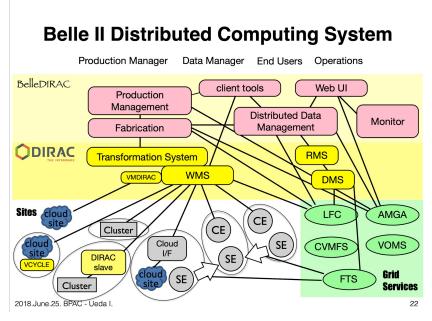
- Raise UP level of BigPanDA monitoring usability
- Build the whole system at one presentation technology stack
- Make development easy, from well defined bricks
- Technology assessment is finishing (Tatiana is leading this effort)

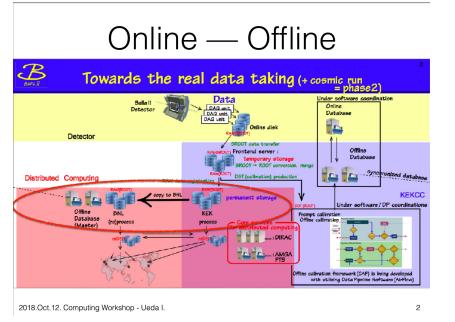


## Bellell DDM

### Introduction

Reference talks: Paul (https://indico.bnl.gov/event/6124/)



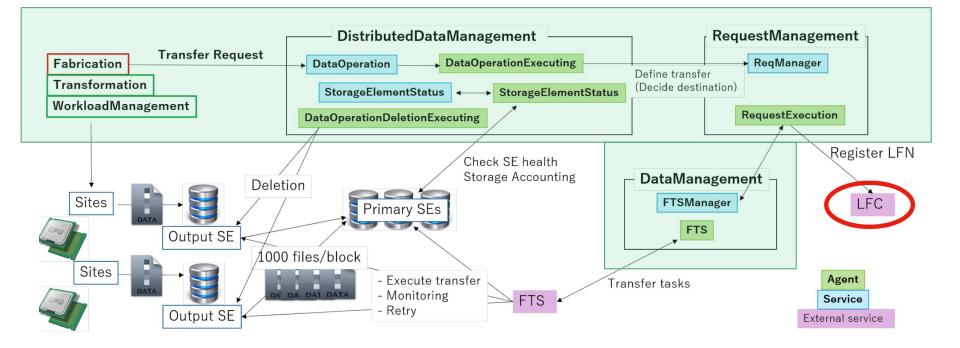


Pictures taken from Ueda I talks on B2 meetings

### Distributed computing

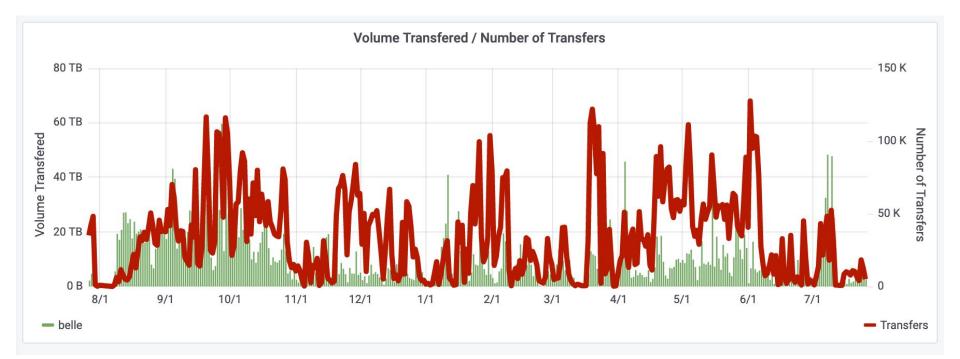
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## **Distributed Data Management**



Initial picture taken from Paul introductory talk

# **Distributed Data Management Scale**



Daily transfers

#### **BNL** time Developments

- Data mover scripts (PNNL->BNL)
- Functional tests subsystem
- Tider integration with DIRAC Resource system
- Advanced transfers load balancer. Developed to prevent possible data transfers stucks. Implements accurate submissions to the FTS served respecting:
  - SE current performance
  - Links quality
  - Recent experience of completed operations
  - Current queue state
  - Operations importance
- Deletion at scales (bulk operations, parallel processing)
- SQL queries analysis and optimization
- Simple DDM monitoring
- + Operational support

Operational experience: 2 DDM (and whole DIRAC) down due to server disk spaces exhausting and one due to RMS system failure, one failed deployment. Successful raw files distribution during data taking