CERN

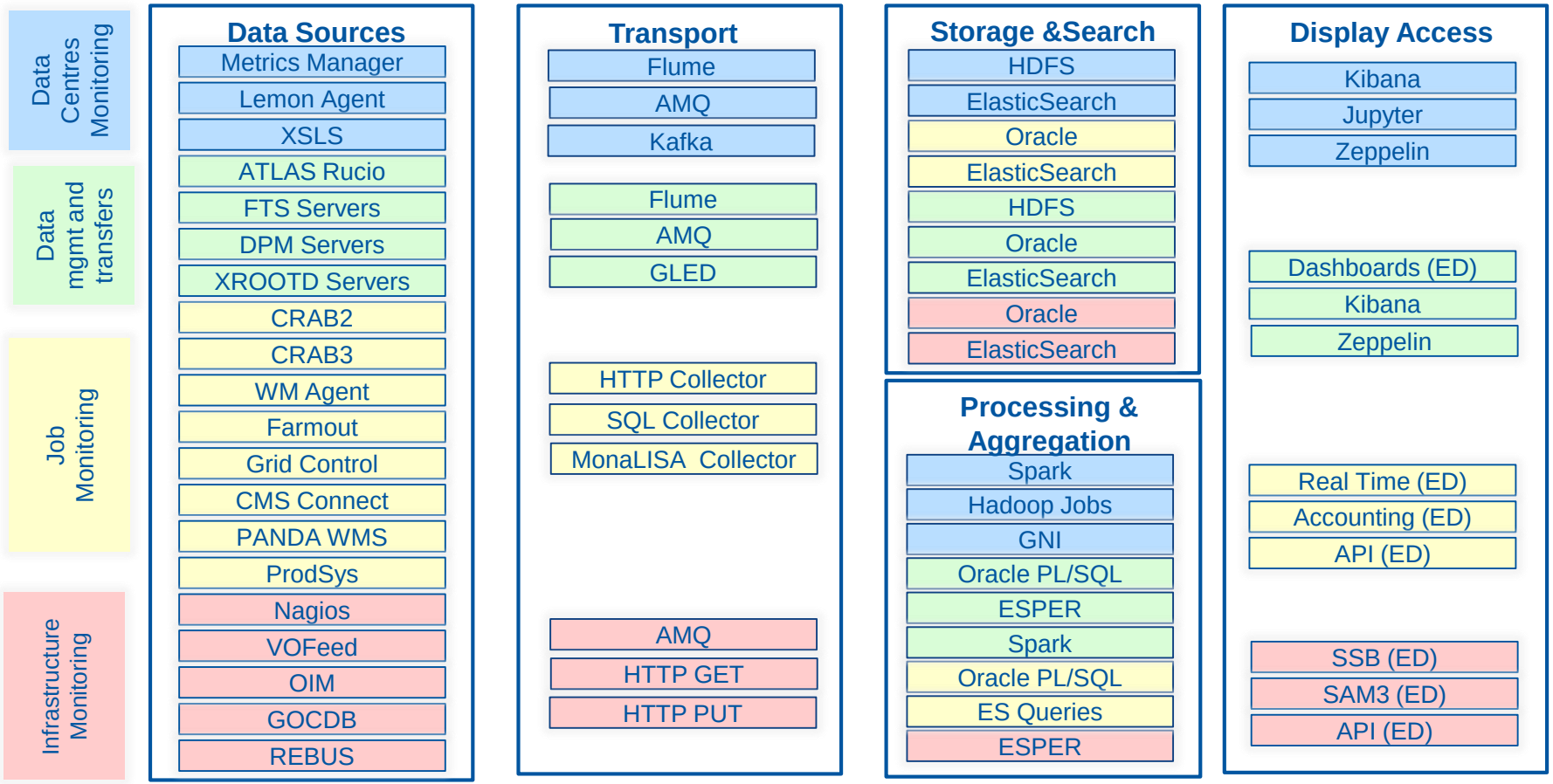
IT Monitoring Service

Update for Sites

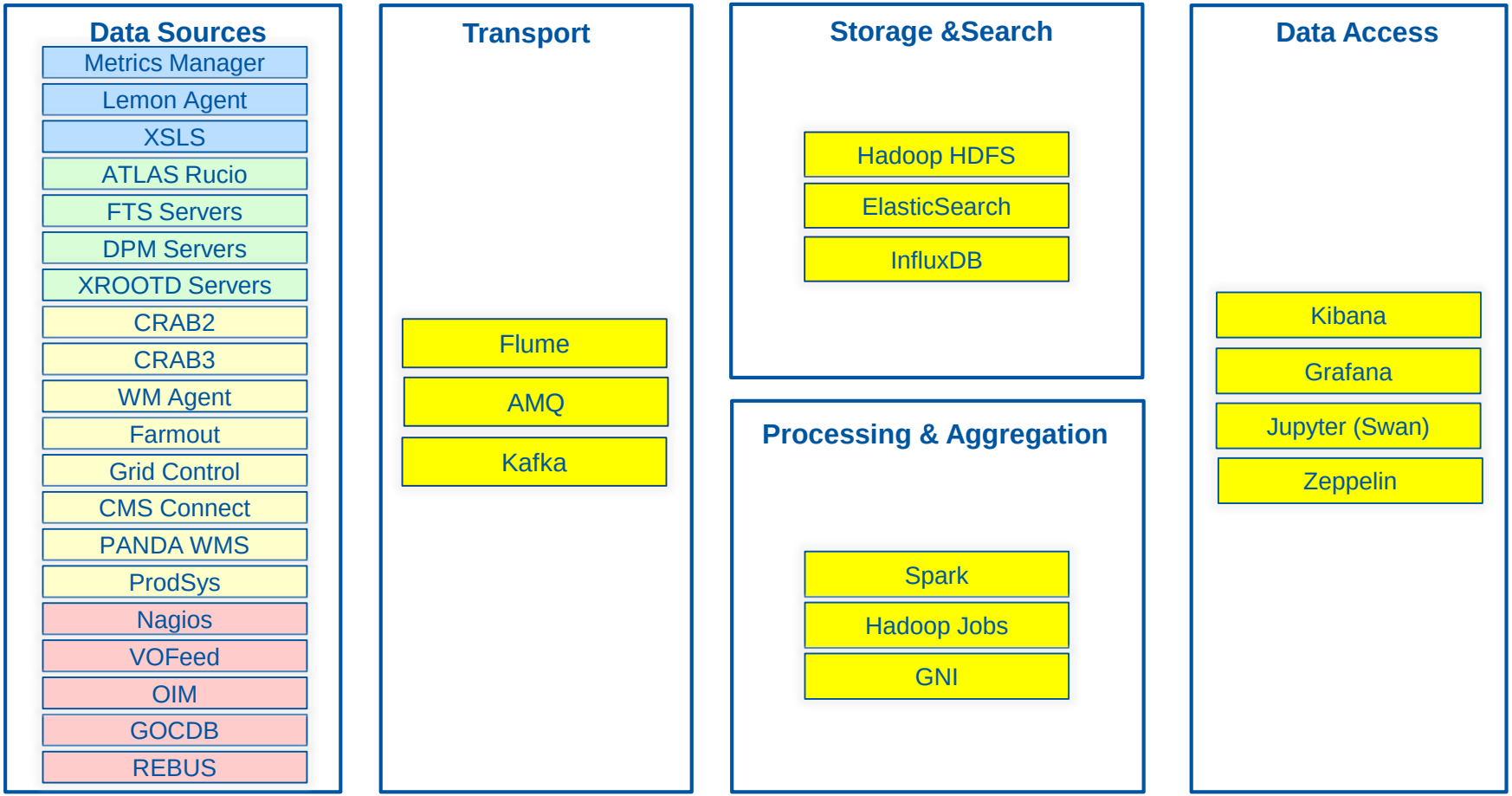
Alberto AIMAR CERN-IT
for the MONIT Team

Architecture and Data Flow

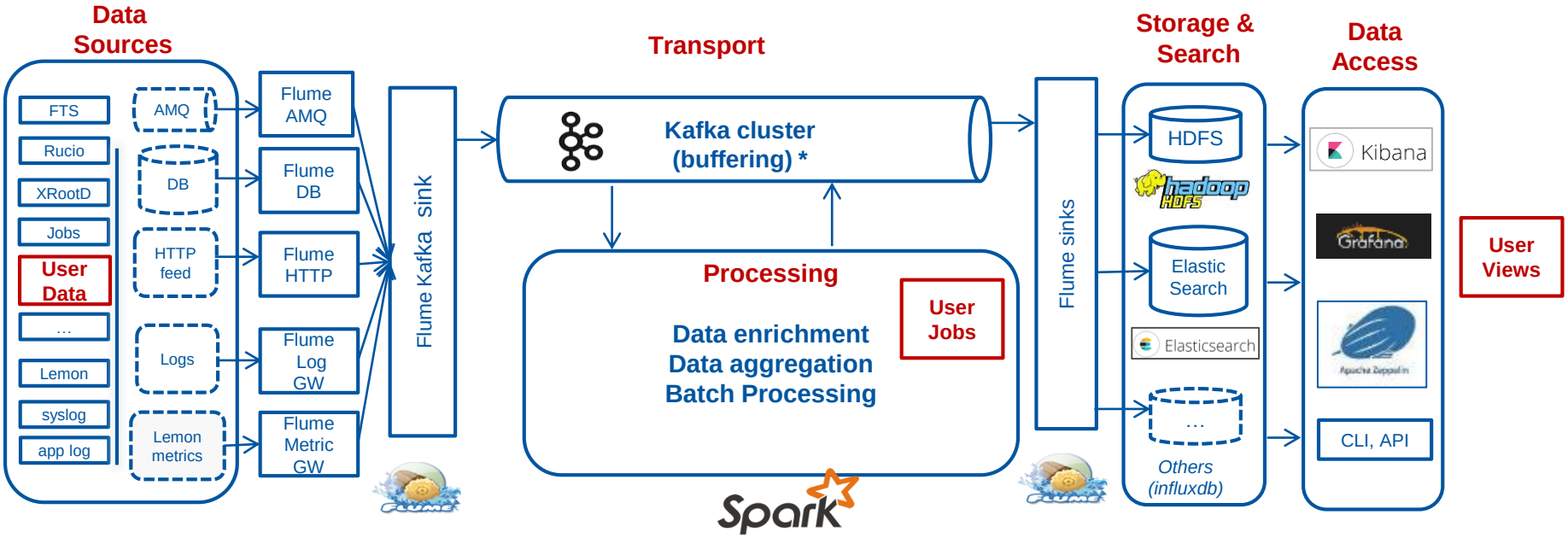
Current Monitoring



Unified Monitoring

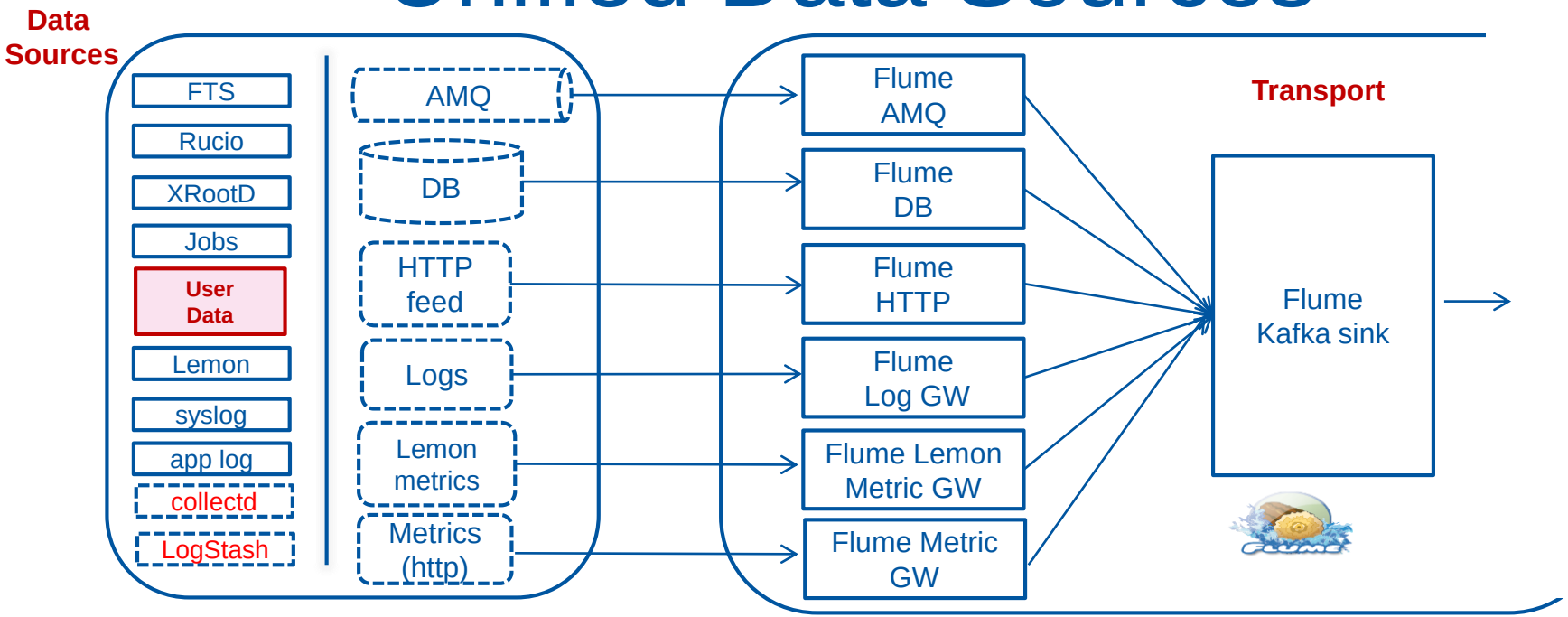


Unified Monitoring Architecture



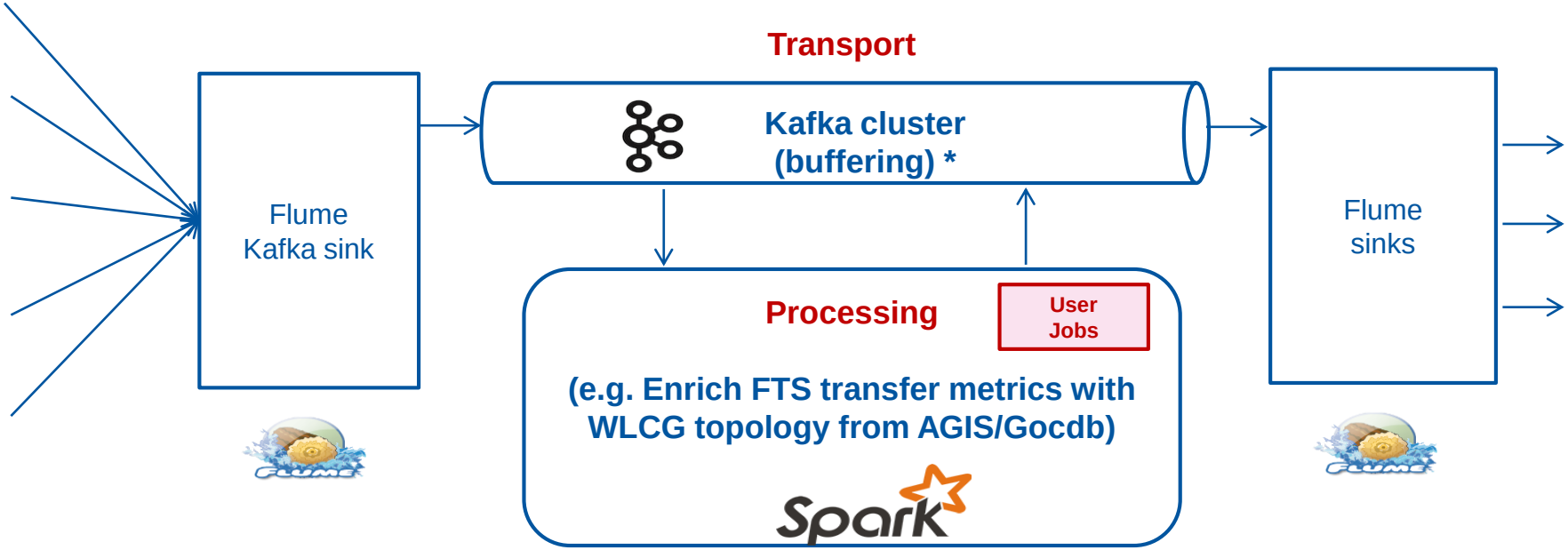
- Data now 200 GB/day, 200M events/day. At scale 500 GB/day
- Current retention period 12 h, at scale 24 h
- Proved effective in several occasions

Unified Data Sources



- Data is channeled via Flume, validated and modified if necessary
- Adding new Data Sources is documented and fairly simple

Unified Processing



- Data now 200 GB/day, 200M events/day.At scale 500 GB/day,
- Current retention period 12 h, at scale 24 h

Data Processing

Stream processing

Data enrichment

- Join information from several sources (e.g. WLCG topology)

Data aggregation

- Over time (e.g. summary statistics for a time bin)
- Over other dimensions (e.g. compute a cumulative metric for a set of machines hosting the same service)

Data correlation

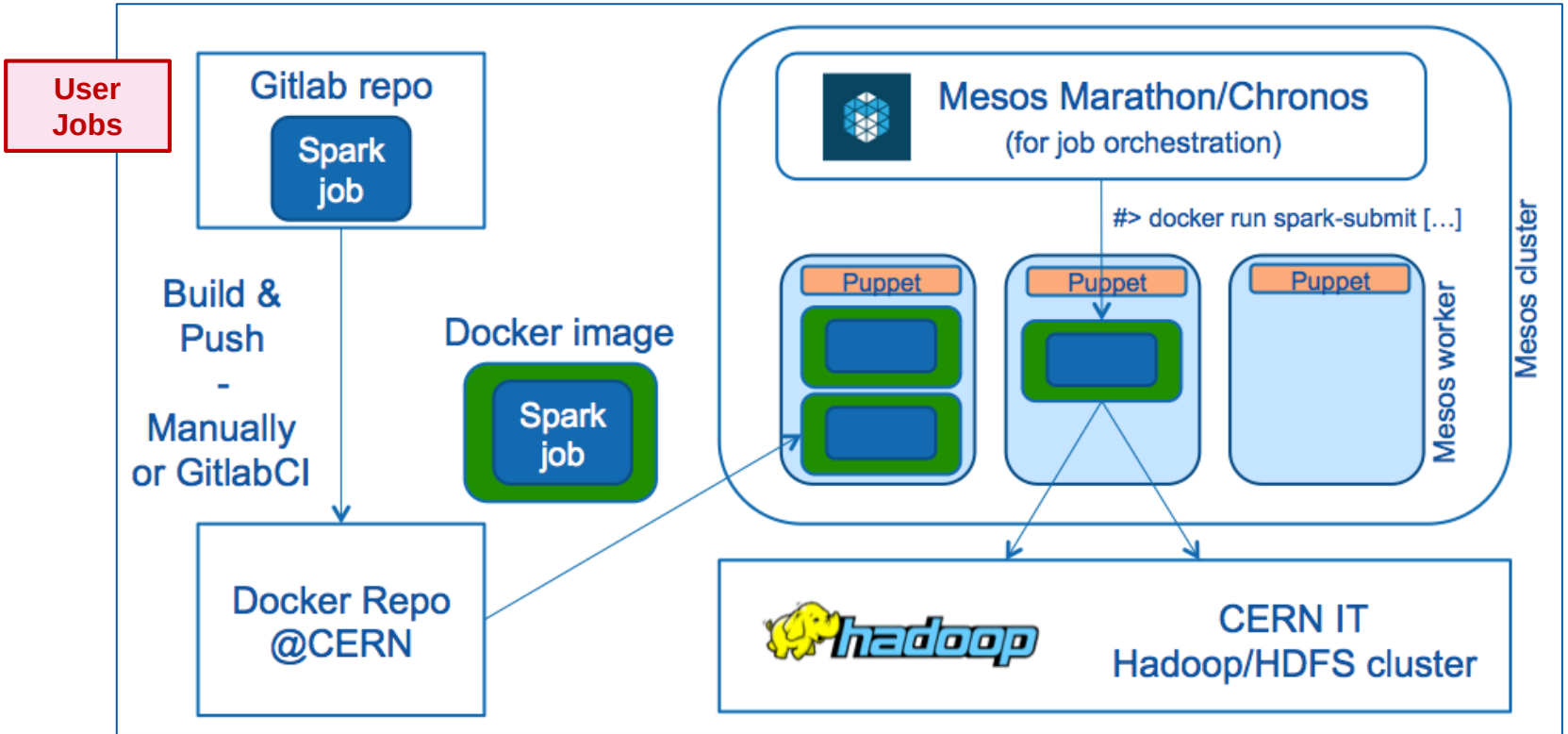
- Advanced Alarming: detect anomalies and failures correlating data from multiple sources (e.g. data centre topology-aware alarms)

Batch processing

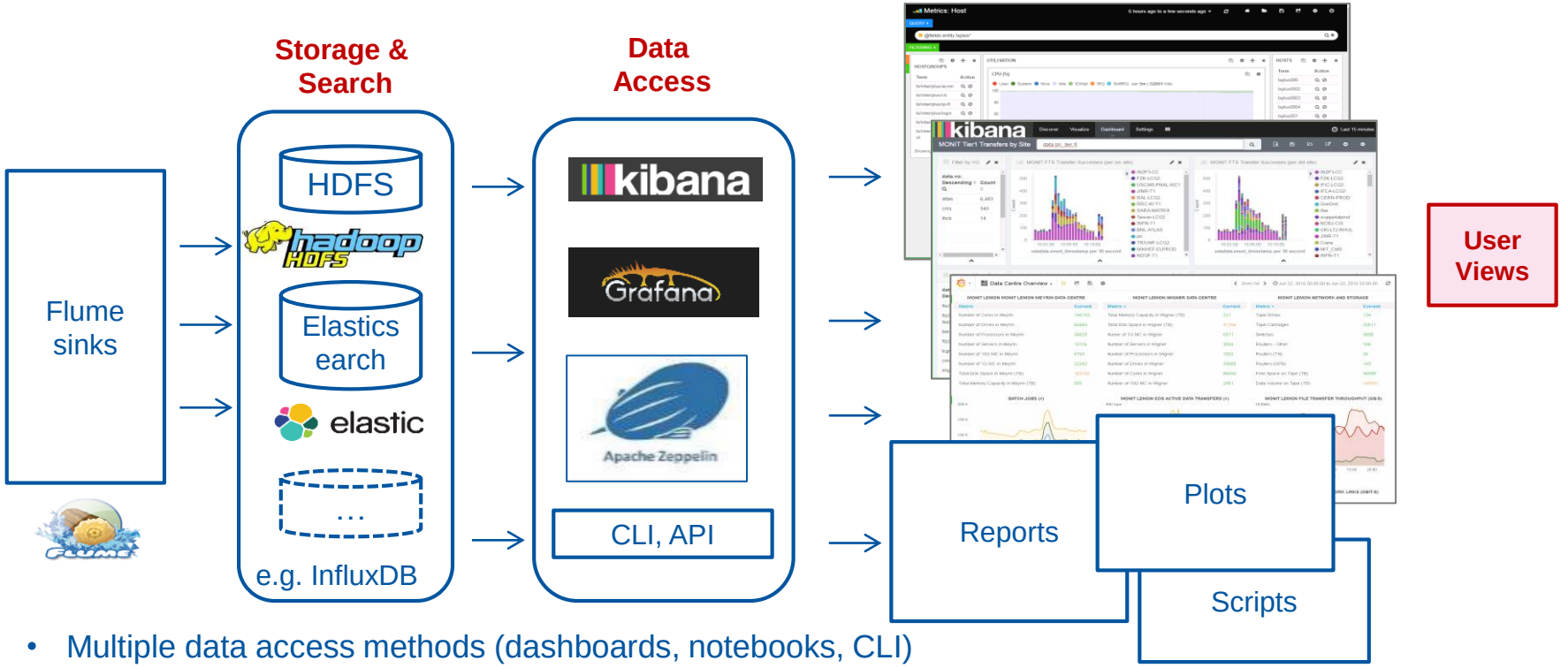
- Reprocessing, data compression, reports

Monitoring Processing Platform

Technologies: Reliable and scalable job execution (Spark), Job orchestration and scheduling (Marathon/Chronos), Lightweight and isolation deployment (Docker)



Unified Access



- Multiple data access methods (dashboards, notebooks, CLI)
- Mainstream and evolving technology

Data and Visualization

Data Storage and Search	
ElasticSearch	Short-term storage and index (months, depends on data)
InfluxDB	Short-term time series storage (months)
HDFS	Long-term archive (years)

Visualization	
Kibana	Data from ElasticSearch Dashboards and full search/filter/discovery of data
Grafana	Data from ElasticSearch, InfluxDB Dashboards optimized for time series plots
Zeppelin	Data from HDFS, ElasticSearch, InfluxDB Notebooks for analysis, reports and plots Native support for Spark
Swan (Jupyter)	Data from HDFS or ElasticSearch, InfluxDB Notebooks for analysis, reports and plots Integration with HEP toolbox (ROOT, CERNBOX, CVMFS, etc)

Status

Data Sources and Transport

- Moving all data via new transport (Flume, AMQ, Kafka)

Storage and Search

- Data in ES and HDFS, identical format

Processing

- Doing aggregation and processing via Spark

Display and reports

- Using only standard features of ES, Kibana, Spark, Hadoop
- Introduce notebooks (Zeppelin, Swan) and data discovery

Services Proposed

Monitor, collect, visualize, process, aggregate, alarm

- Metrics and Logs

Infrastructure operations and scale

Helping and supporting

- Interfacing new data sources
- Developing custom processing, aggregations, alarms
- Building dashboards and reports

Reference and Contact

Kibana Dashboards

monit.cern.ch

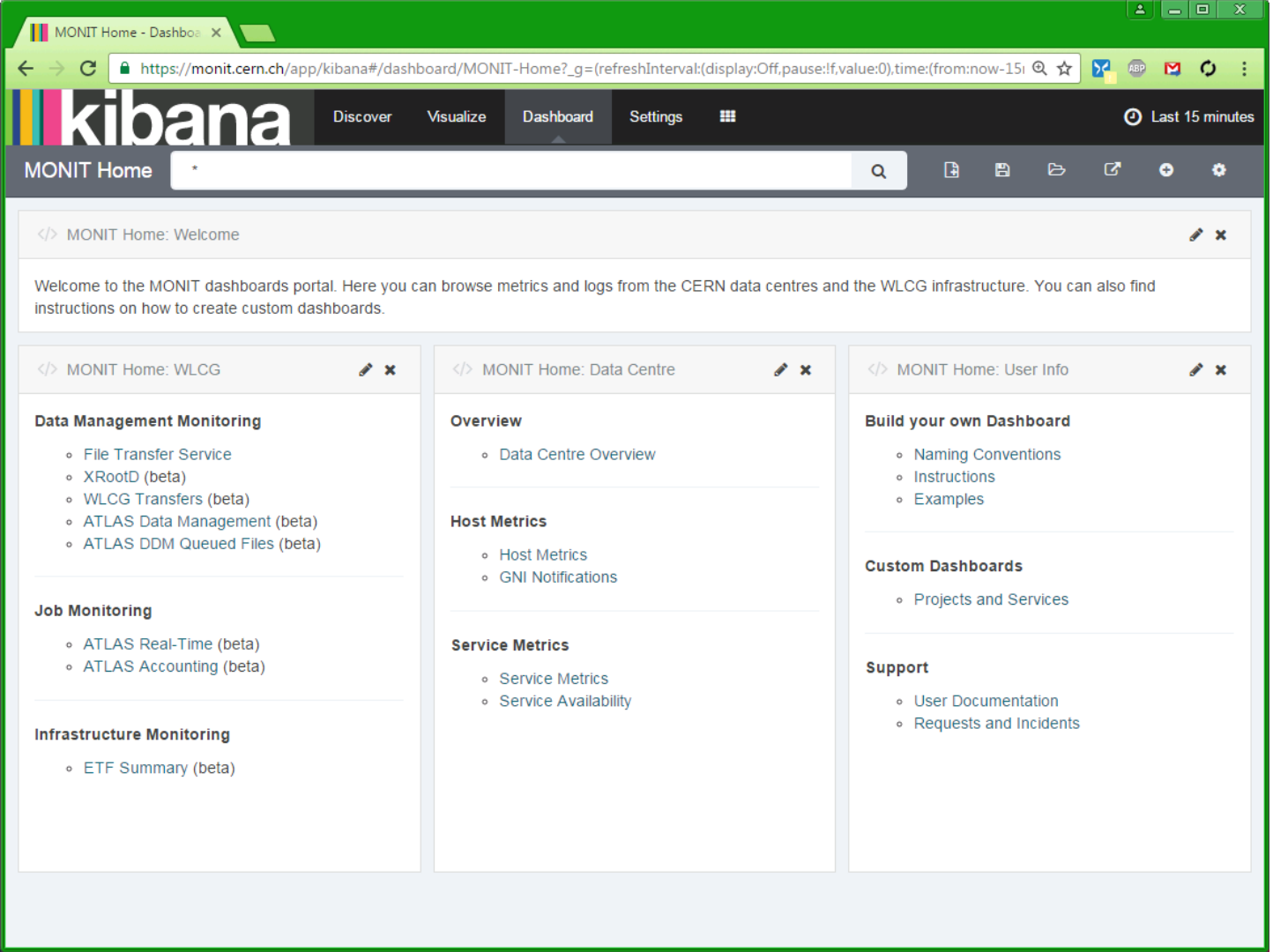
Feedback/Requests (SNOW)

cern.ch/monit-support

Early-Stage Documentation

cern.ch/monitdocs

monit.cern.ch



- Kibana homepage

Data Available

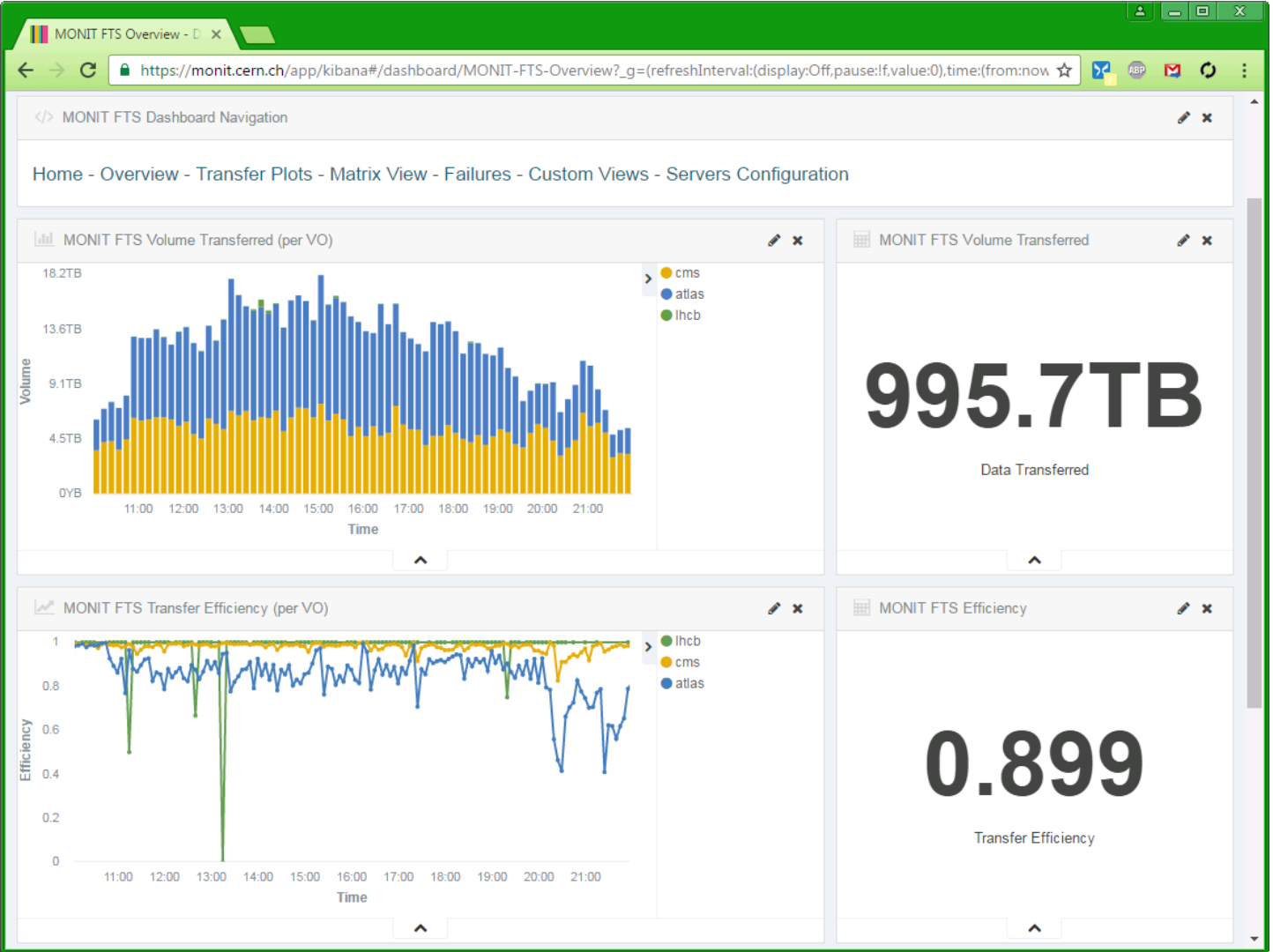
- FTS
- XRootD
- Job Monitoring Real-Time
- Job Monitoring Accounting
- SAM raw data
  - ETF
  - ALICE

Examples

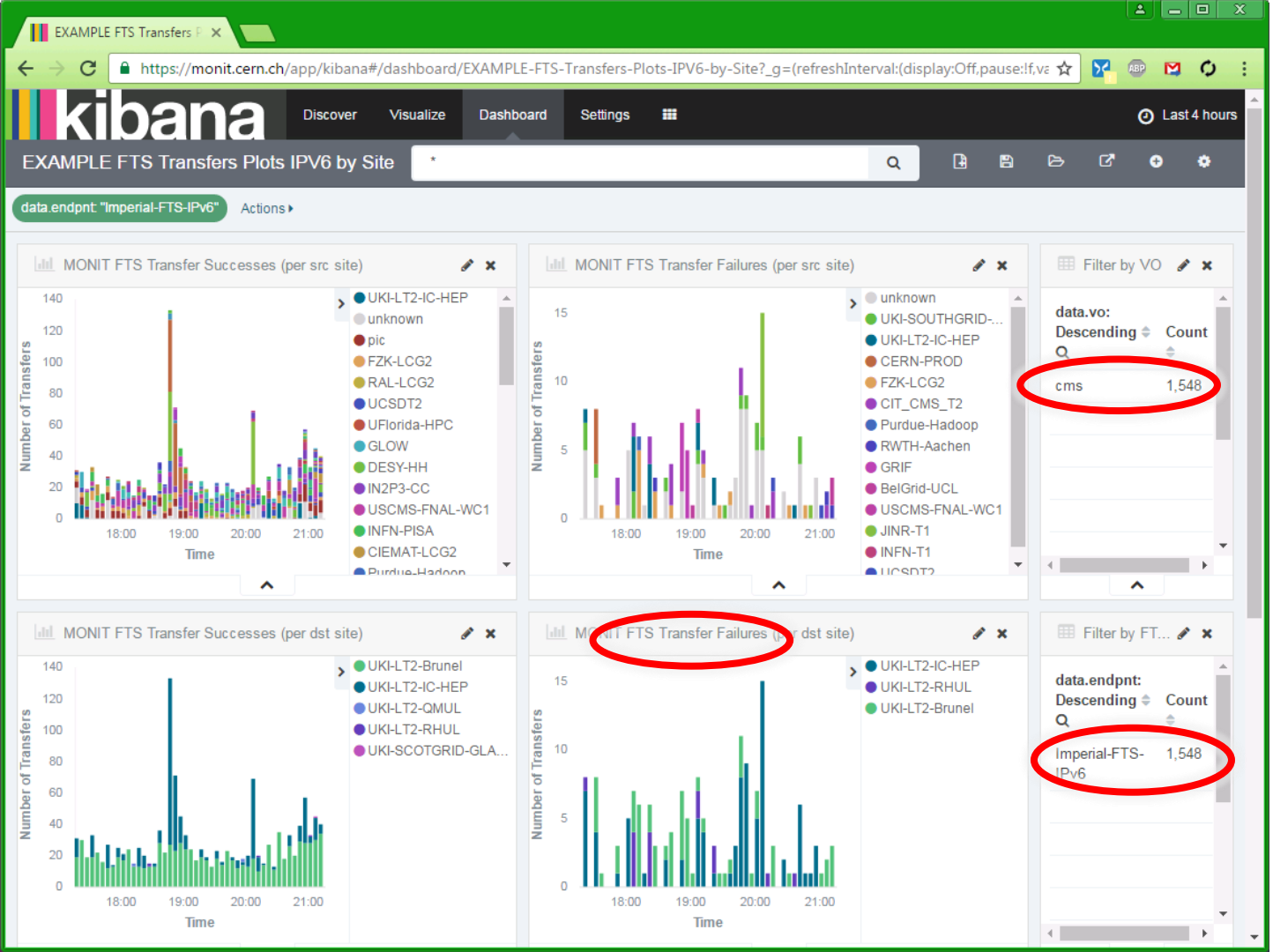
Documentation

Link to Custom Projects

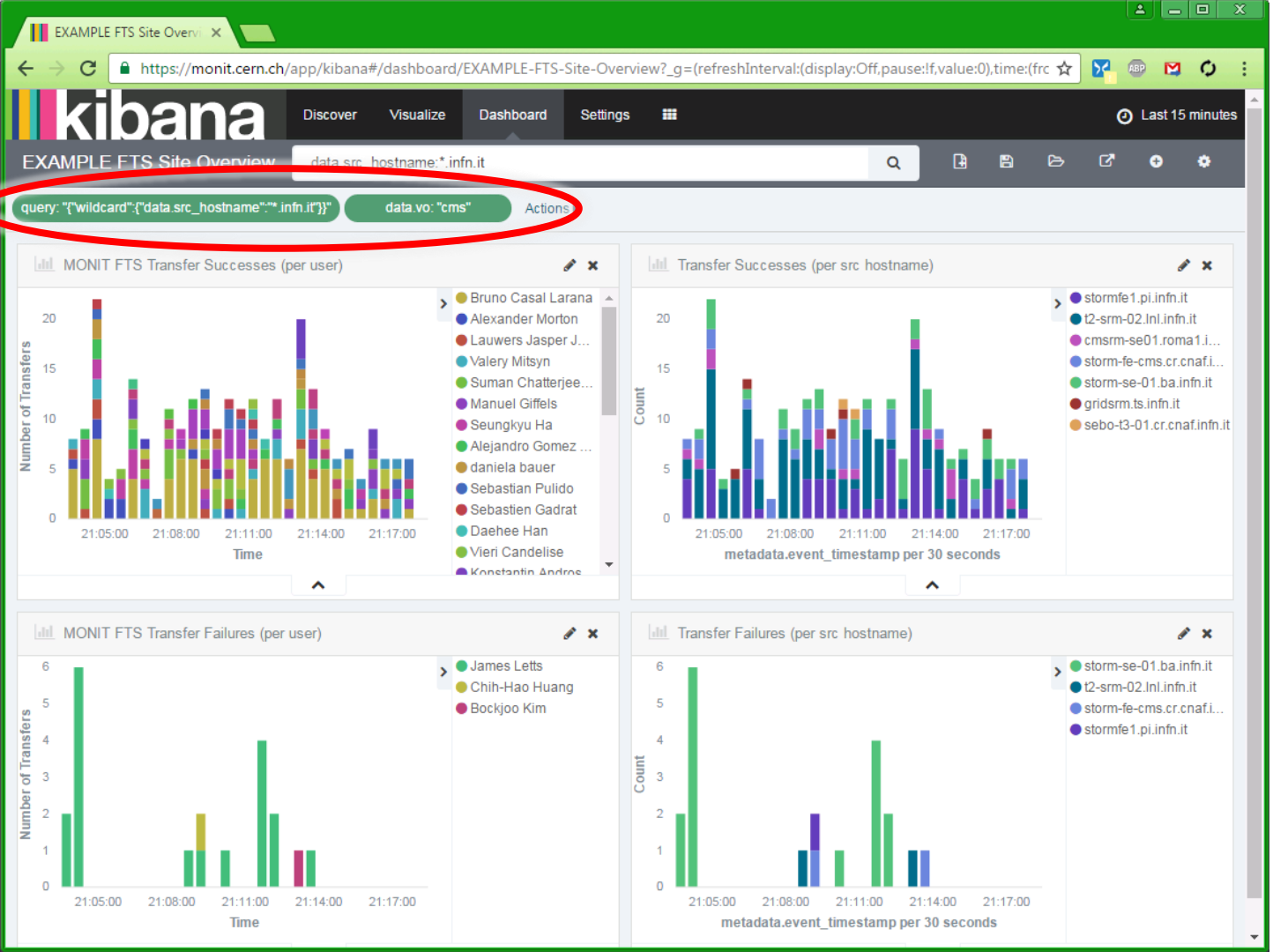
Transfers Overview

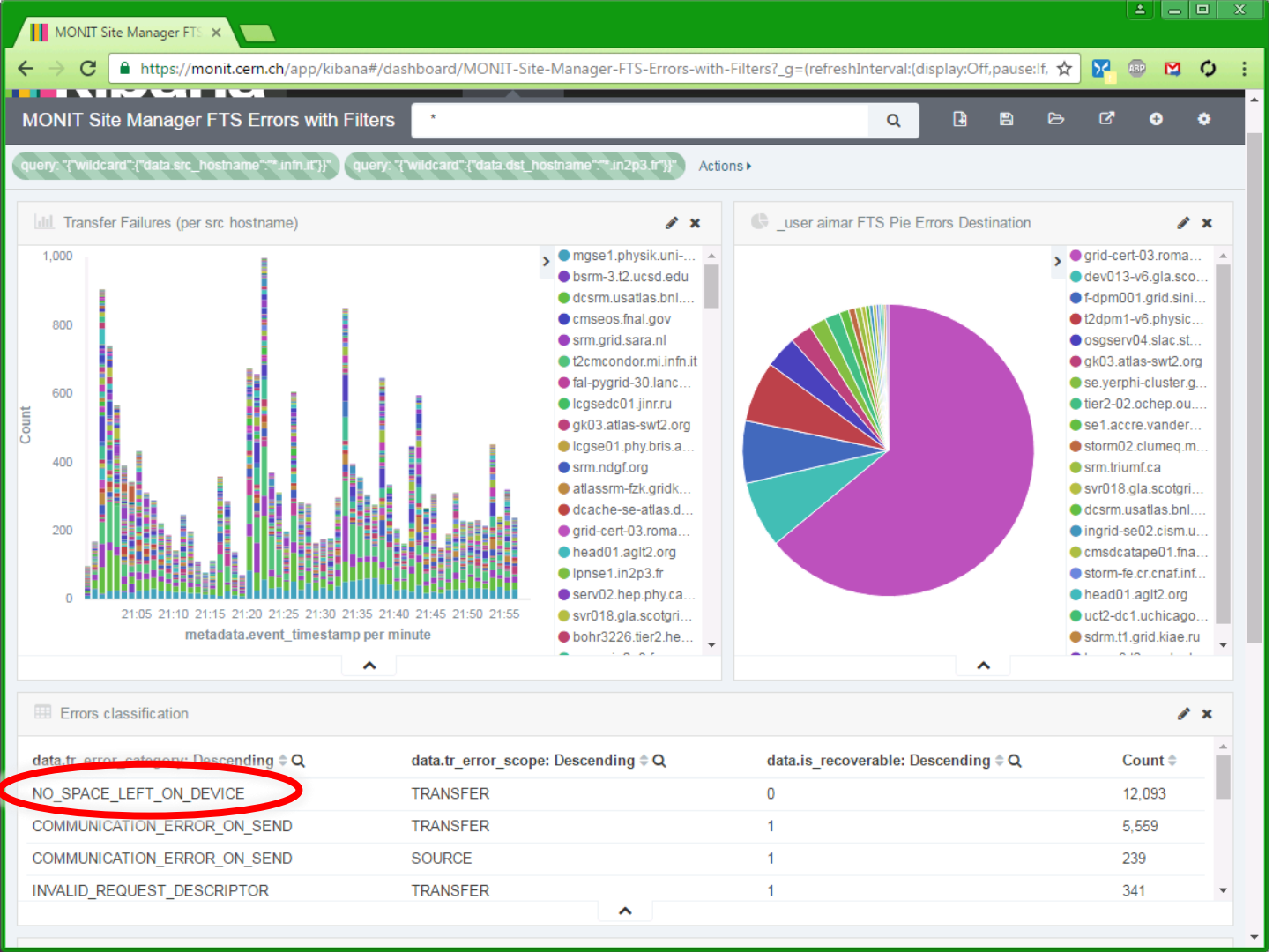


Transfer failures over IPV6

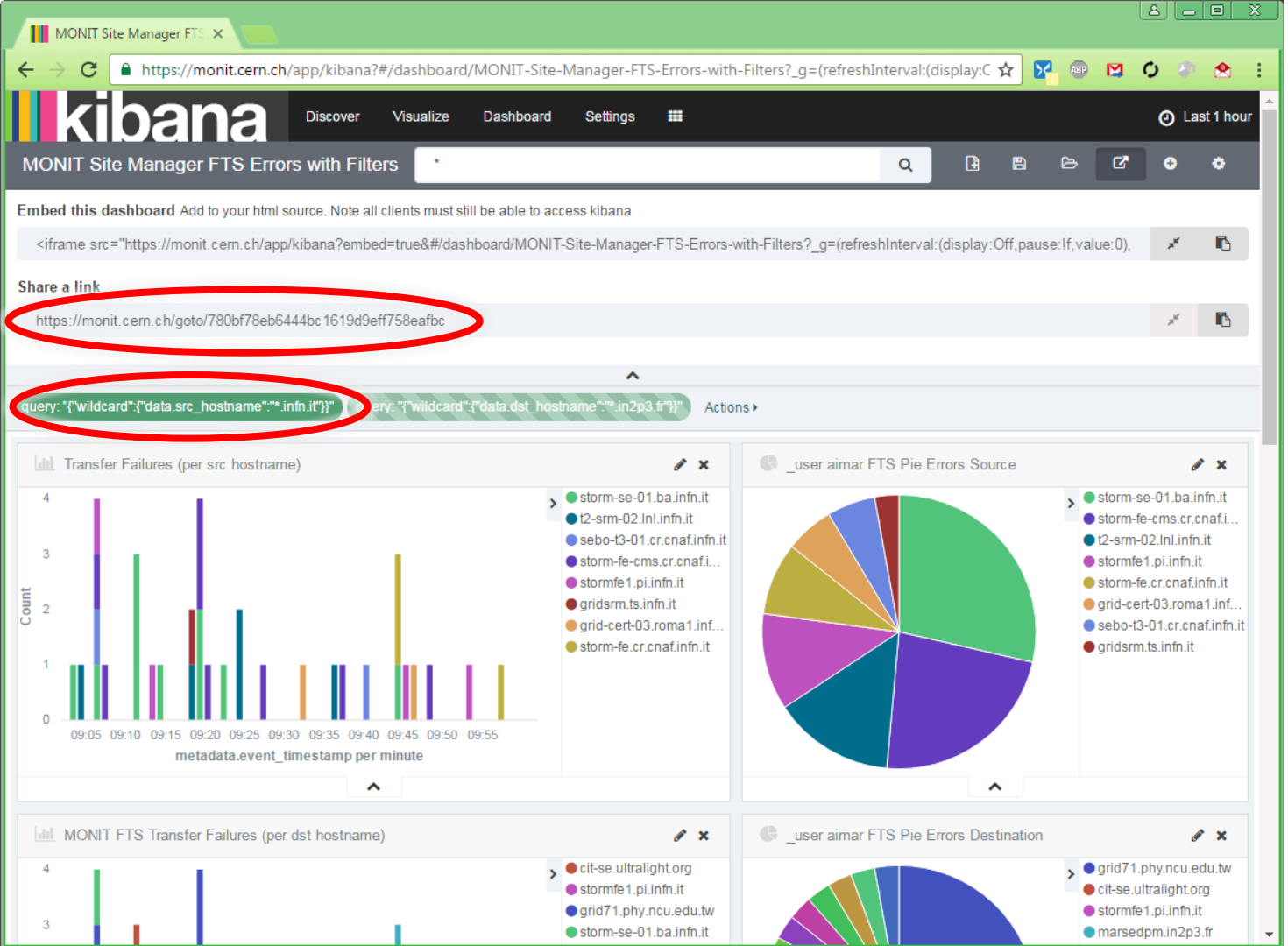


Success and failures from a src_site or a domain





Investigate and filter for a specific error

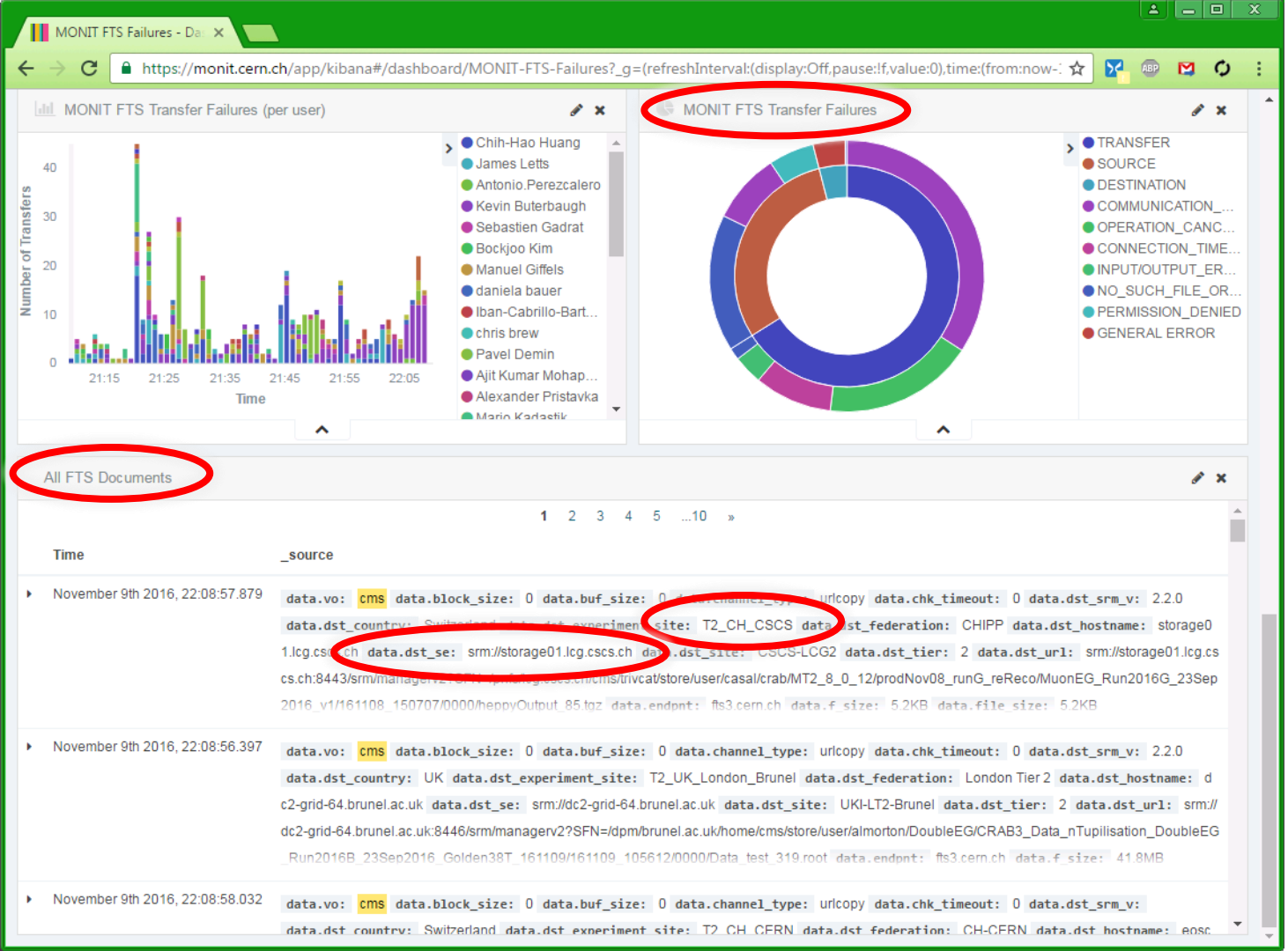


FTS Errors

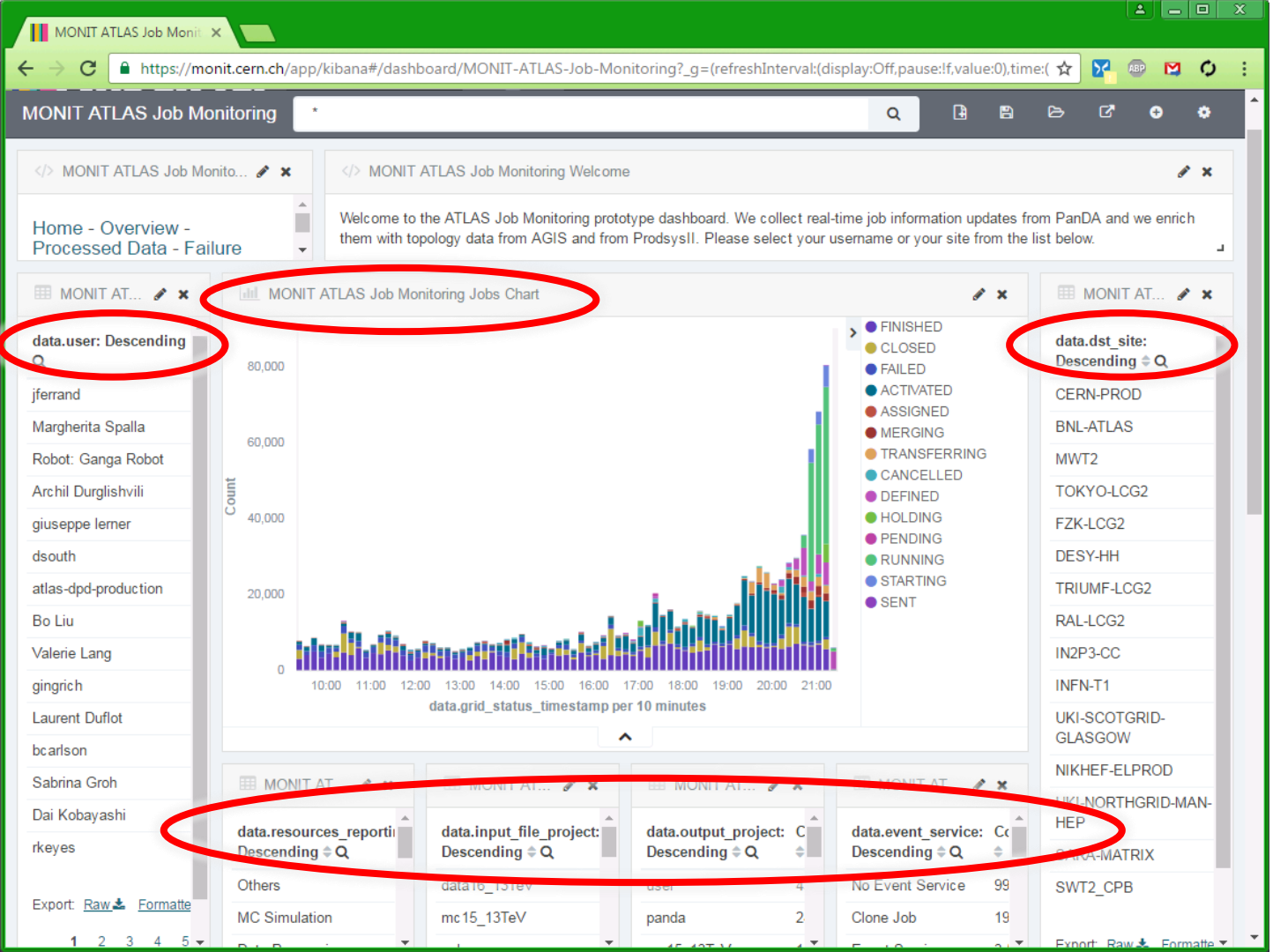
Select by a domain

Short link

GGUS ticket or email



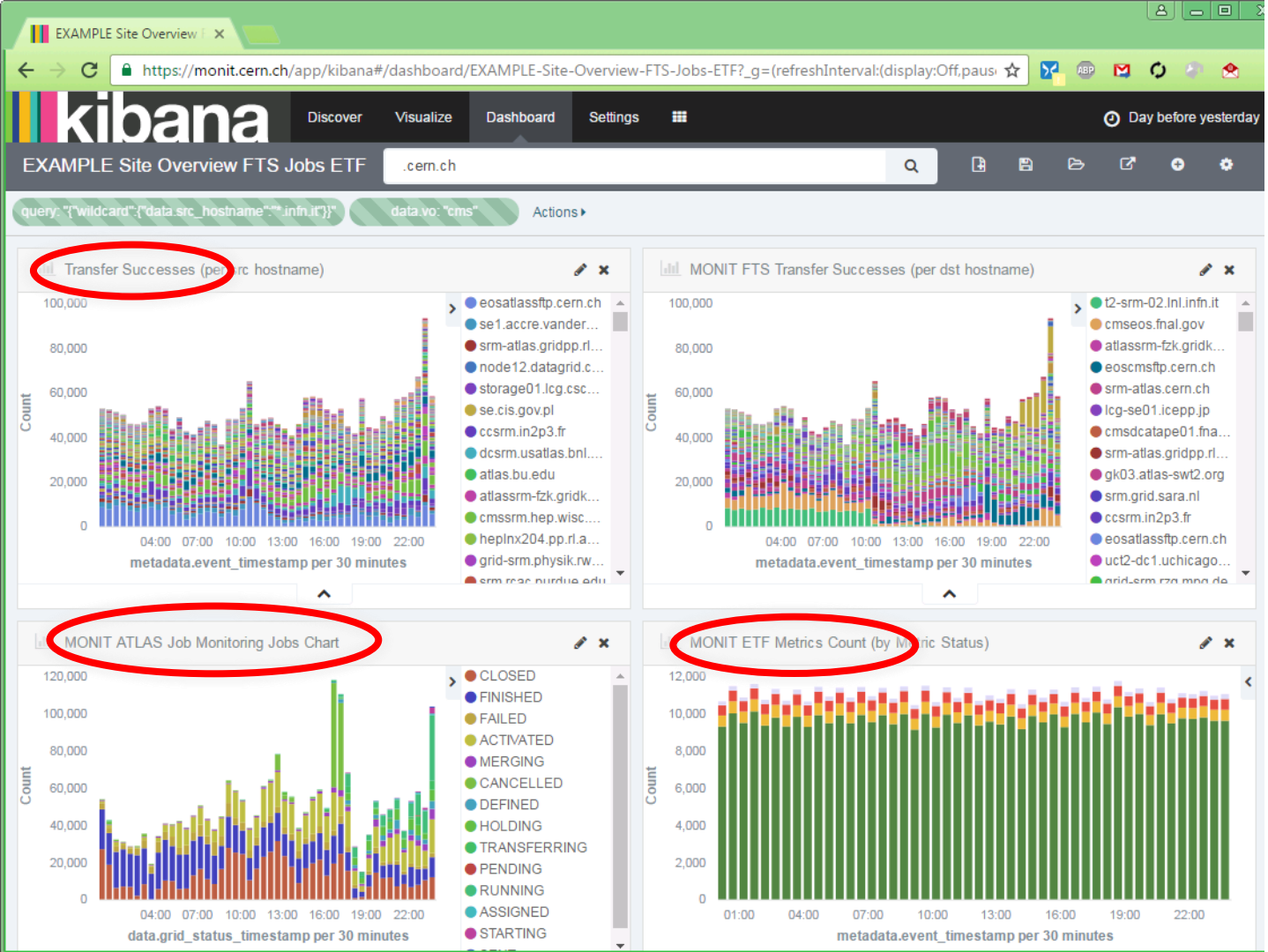
Filter and then access the raw data and logs



Job Monitoring

Real Time and Accounting

Filter by Site, User, cores, etc.

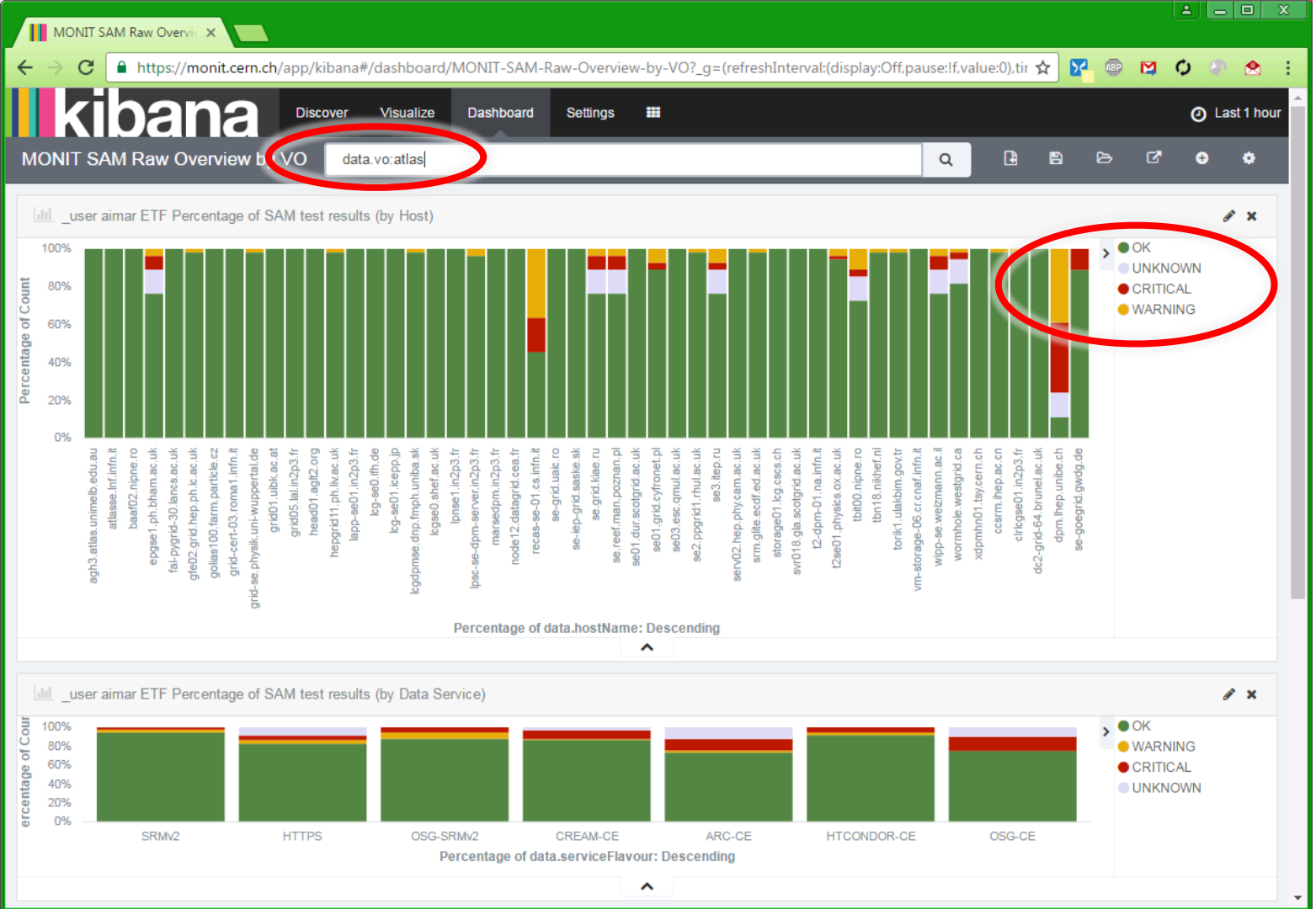


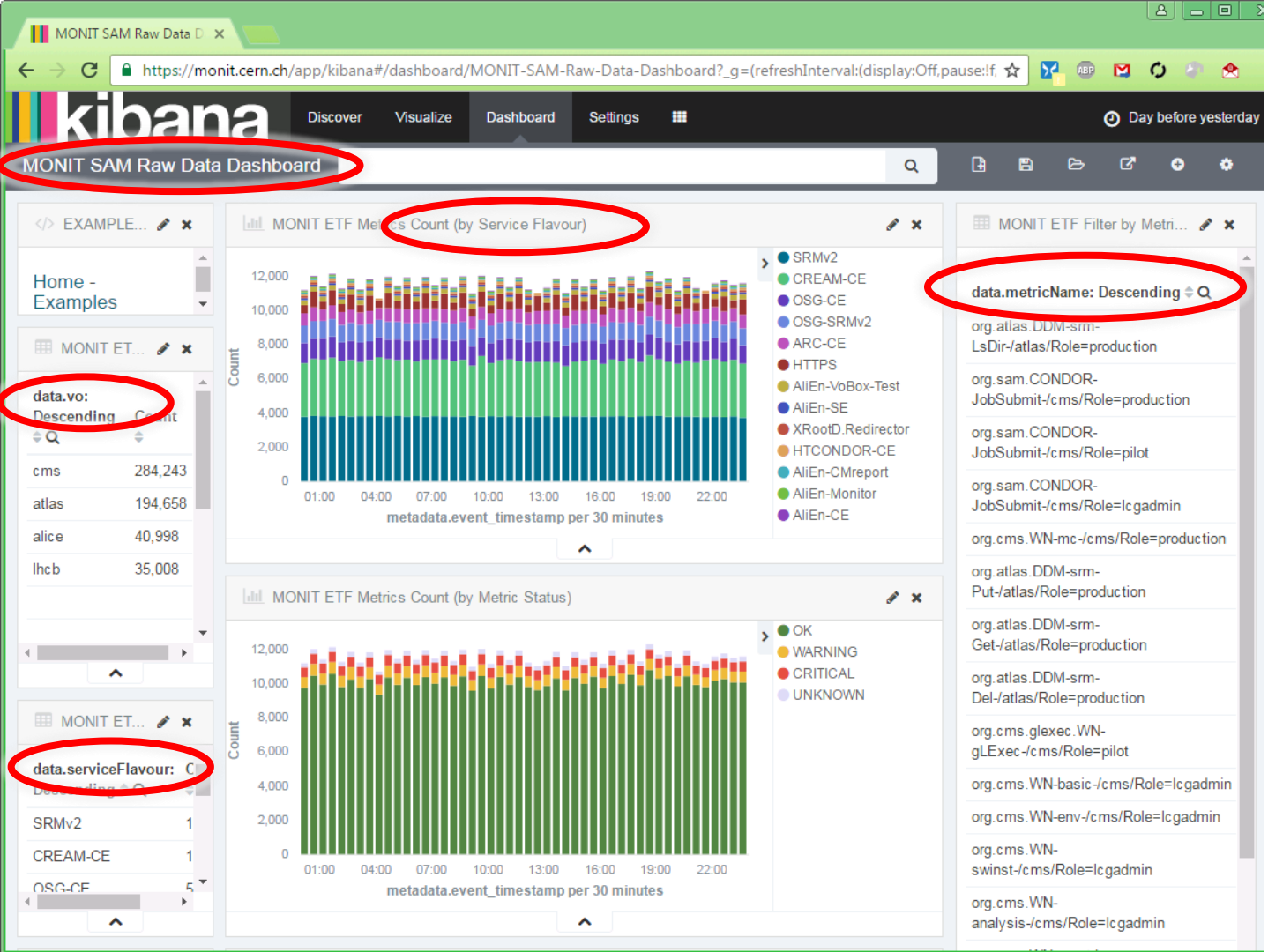
Site Overview showing

- FTS
- Jobs
- SAM Raw

cern.ch hosts

SAM Raw Data


MONIT SAM Raw Overvi
https://monit.cern.ch/app/kibana#/dashboard/MONIT-SAM-Raw-Overview-by-VO?_g=(refreshInterval:(display:Off,pause:!f,value:0),ti
kibana
Discover
Visualize
Dashboard
Settings
Last 1 hour
MONIT SAM Raw Overview b VO
data.vo:atlas
_user aimar ETF Percentage of SAM test results (by Host)
Percentage of Count
100%
80%
60%
40%
20%
0%
OK
UNKNOWN
CRITICAL
WARNING
agh3.atlas.unimelb.edu.au
atlasse.lnf.infn.it
baaf02.nipne.ro
epgse1.ph.bham.ac.uk
fal-pygrid-30.lancs.ac.uk
gfe02.grid.hep.ph.ic.ac.uk
golias100.farm.particle.cz
grid-cert-03.roma1.infn.it
grid-se.physik.uni-wuppertal.de
grid01.ui.bk.ac.at
grid05.lal.in2p3.fr
head01.aglt2.org
hepgrid11.ph.liv.ac.uk
lapp-se01.in2p3.fr
lcg-se0.ifh.de
lcg-se01.icepp.jp
lcgdpmse.dnp.fmph.uniba.sk
lcgse0.shef.ac.uk
lpnse1.in2p3.fr
lpsc-se-dpm-server.in2p3.fr
marsedpm.in2p3.fr
node12.datagrid.cea.fr
recas-se-01.cs.infn.it
se-grid.uaic.ro
se-iep-grid.saske.sk
se.grid.kiae.ru
se.reef.man.poznan.pl
se01.dur.scotgrid.ac.uk
se01.grid.cyfronet.pl
se03.esc.qmul.ac.uk
se2.ppgrid1.rhul.ac.uk
se3.itep.ru
serv02.hep.phy.cam.ac.uk
srm.glite.ecdf.ed.ac.uk
storage01.lcg.cscs.ch
svr018.gla.scotgrid.ac.uk
t2-dpm-01.na.infn.it
t2se01.physics.ox.ac.uk
tbit00.nipne.ro
tbn18.nikhef.nl
torik1.ulakbim.gov.tr
vm-storage-06.cr.cnaf.infn.it
wipp-se.weizmann.ac.il
wormhole.westgrid.ca
xdpmhn01.tsy.cern.ch
ccsrm.ihep.ac.cn
cirlcgse01.in2p3.fr
dc2-grid-64.brunel.ac.uk
dpm.lhep.unibe.ch
se-goegrid.gwdg.de
Percentage of data.hostName: Descending
_user aimar ETF Percentage of SAM test results (by Data Service)
ercentage of Cour
100%
80%
60%
40%
20%
0%
OK
WARNING
CRITICAL
UNKNOWN
SRMv2
HTTPS
OSG-SRMv2
CREAM-CE
ARC-CE
HTCONDOR-CE
OSG-CE
Percentage of data.serviceFlavour: Descending



SAM Raw Data Overview

VO

Hosts

Metrics

Flavors

Discovering Data | Monit

monitdocs.web.cern.ch/monitdocs/discovering-data.html

Monitoring Service

1. Scope and Mandate

2. Service Overview

2.1. Status and Plans

2.2. Architecture

3. Data Access

3.1. Data Schema

3.2. Monit Kibana Portal

3.3. Discovering Data

3.4. Creating Dashboards

3.5. Processing Platform

3.6. Naming Conventions

4. Data Producers

4.1. Data Centre Metrics

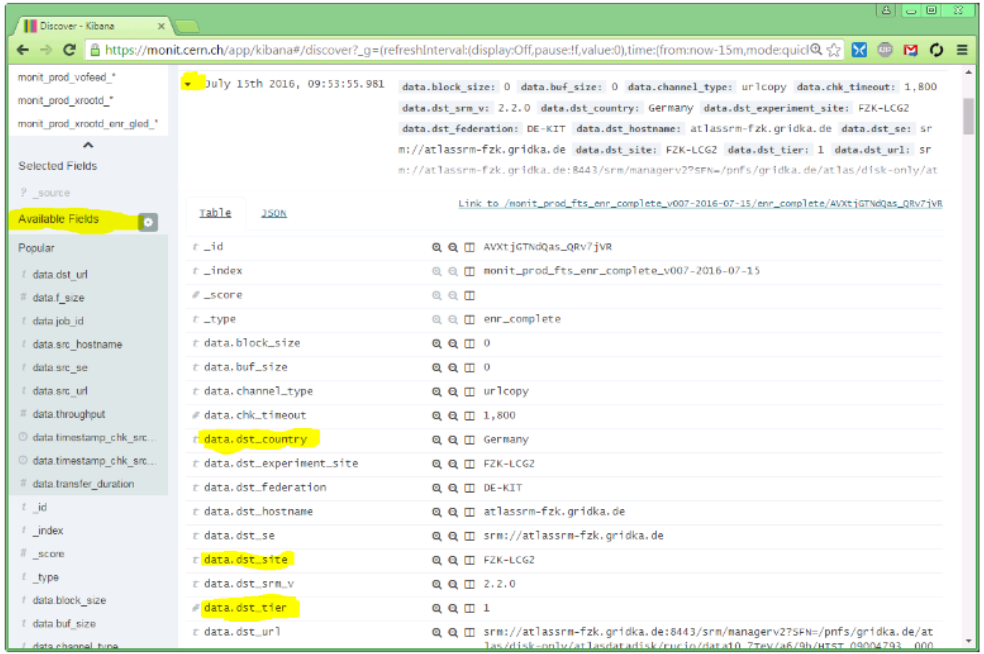
4.2. WLCG Metrics

4.3. Service Logs

Published with GitBook

ES Documents and Fields

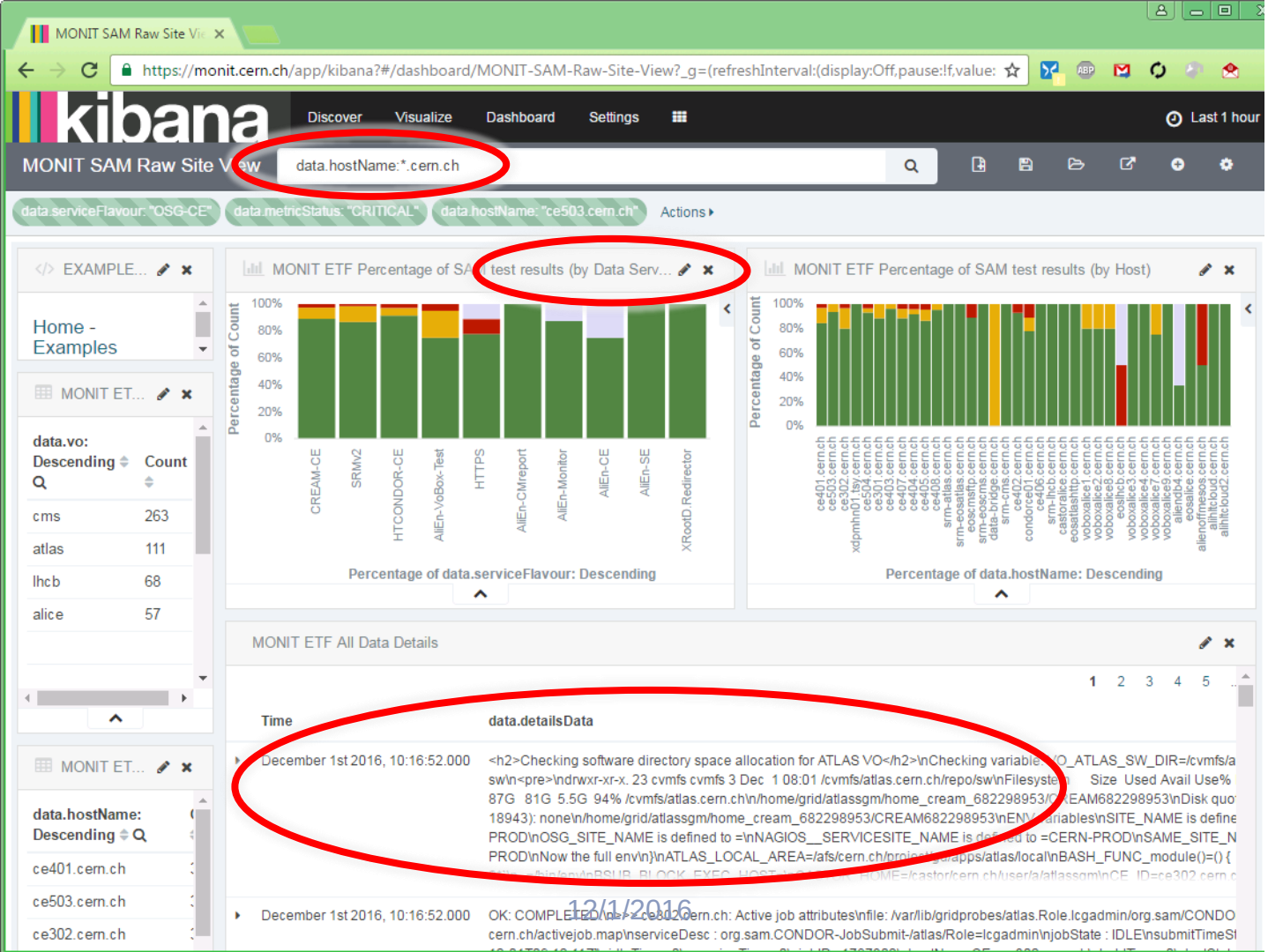
You will then be able to see all fields in each document and the more popular fields.



These fields are those used for all the searches, visualizations and the filters in the Kibana dashobards in this portal. See some how they are used in the Kibana Examples.

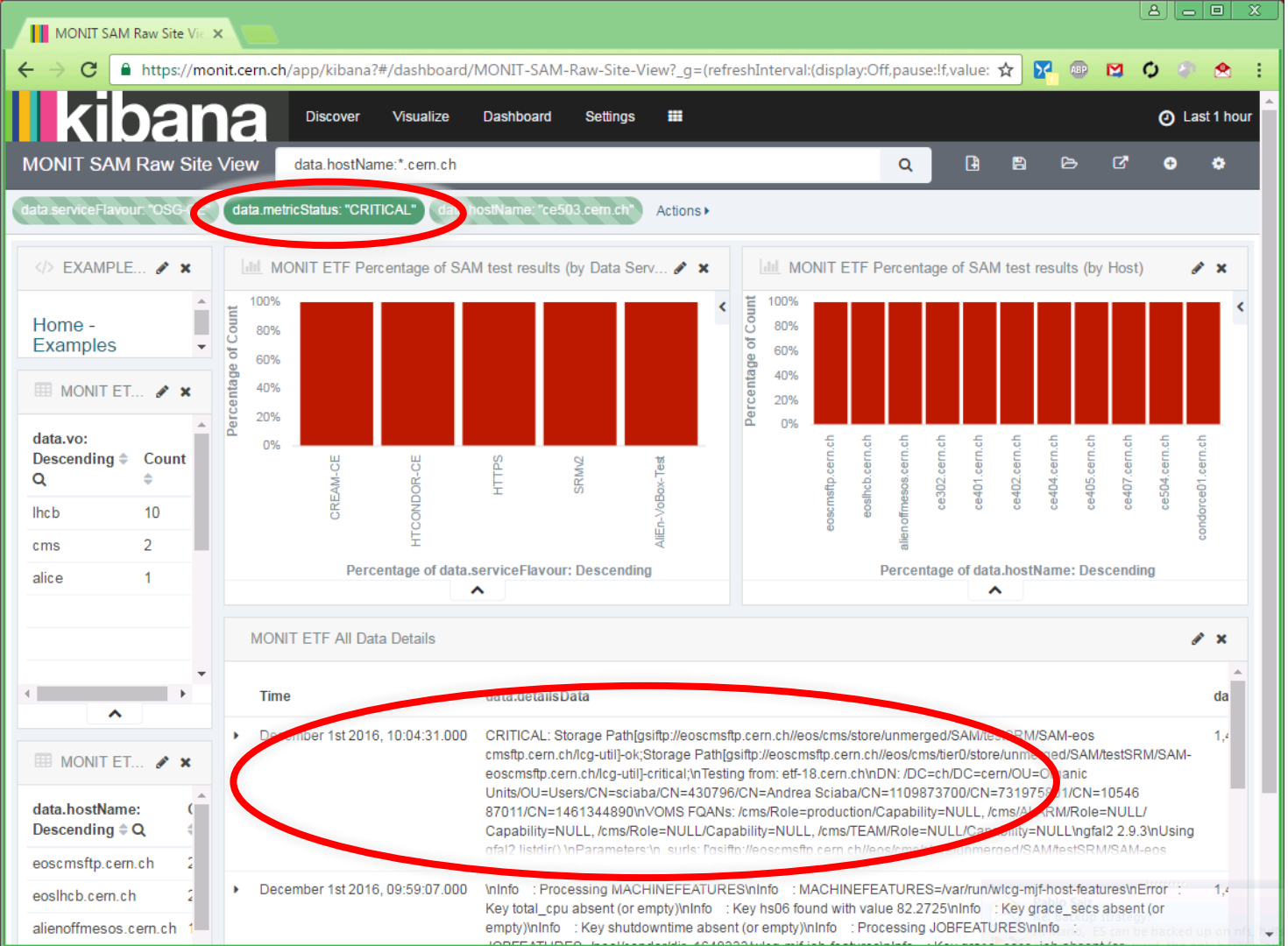
Access to raw data select by any of the fields

Important to know the structure of the data



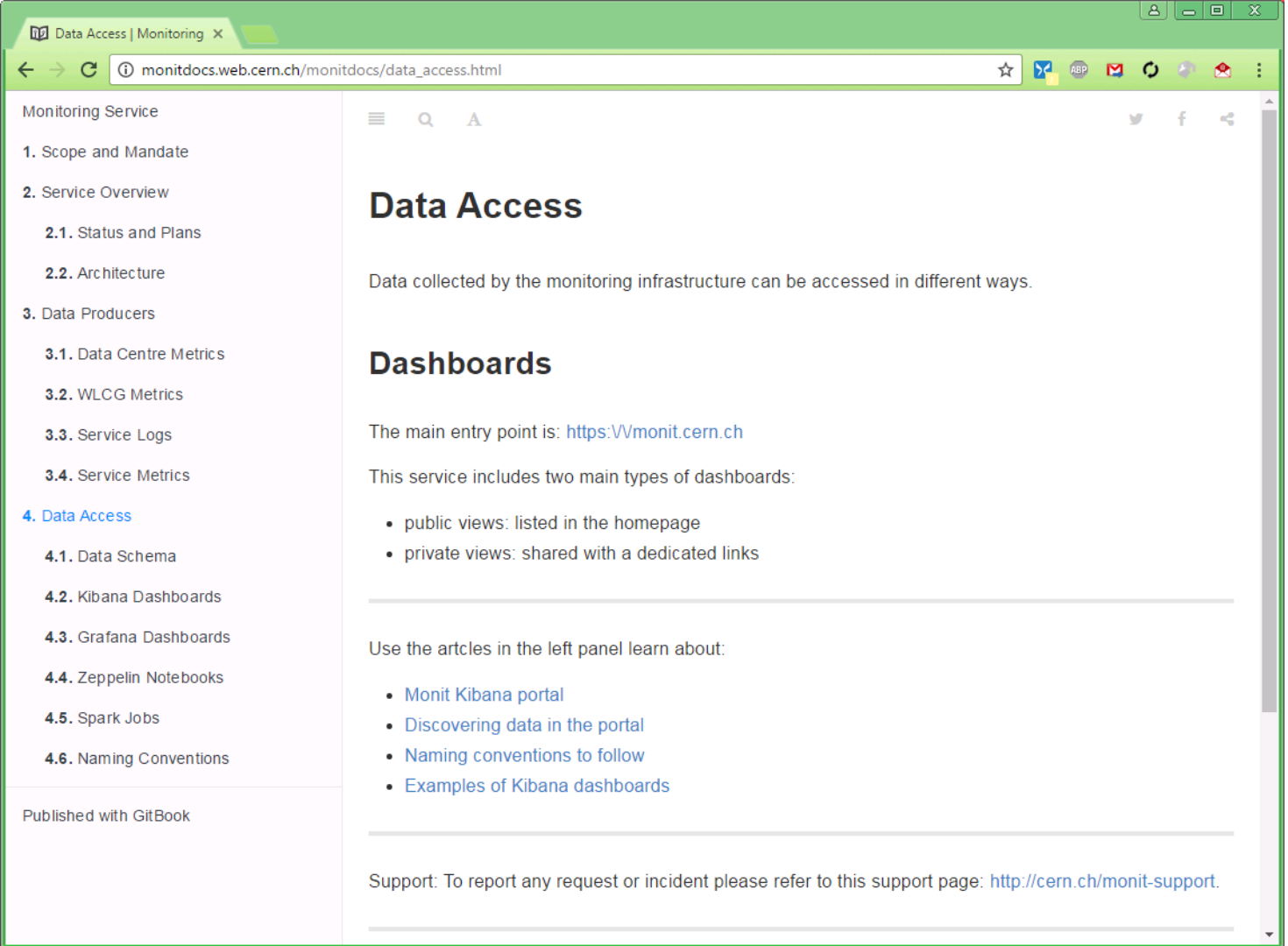
Data on service and hosts

Select cern.ch hosts



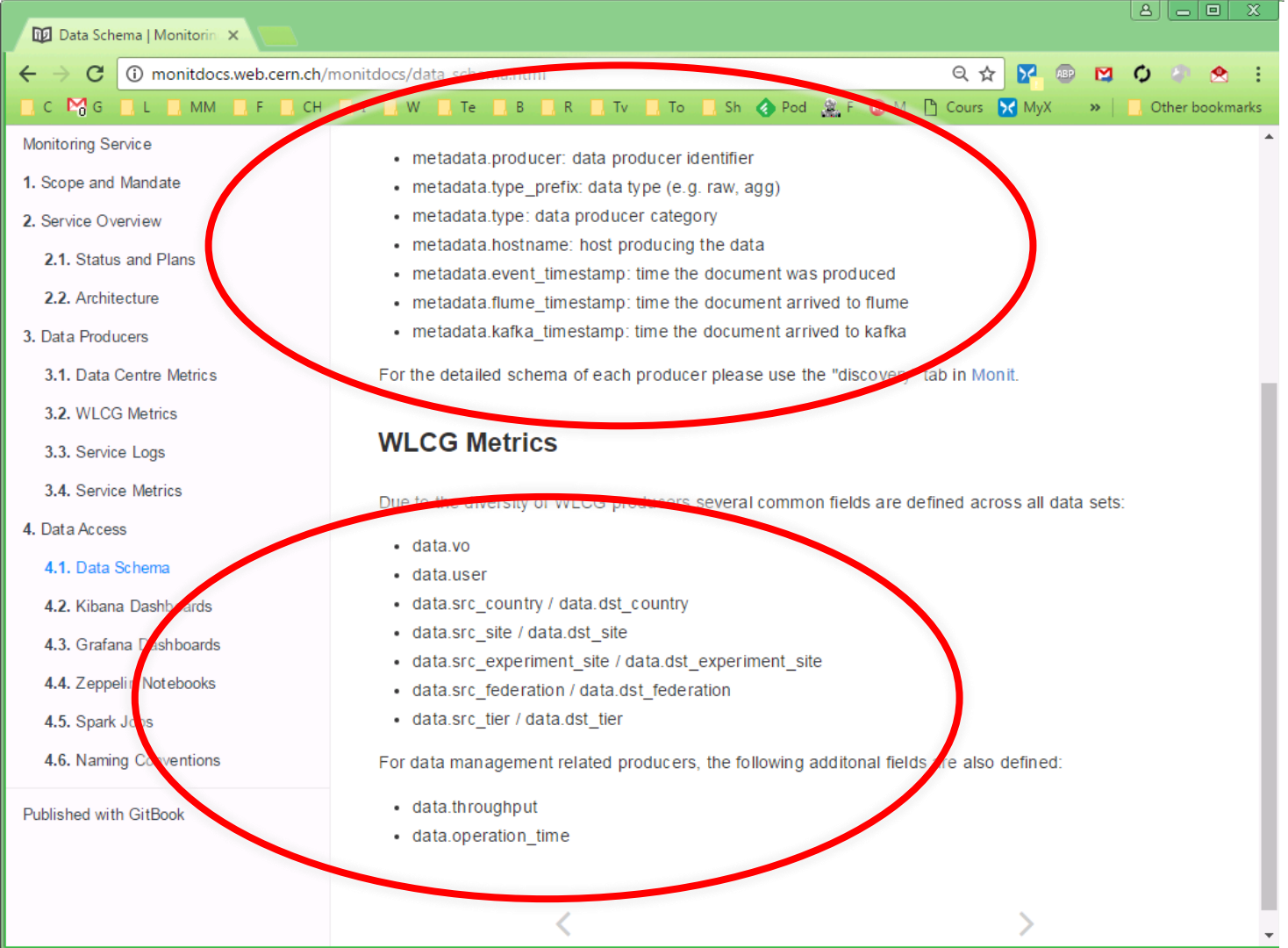
Select the errors (CRITICAL)

See all details of the errors

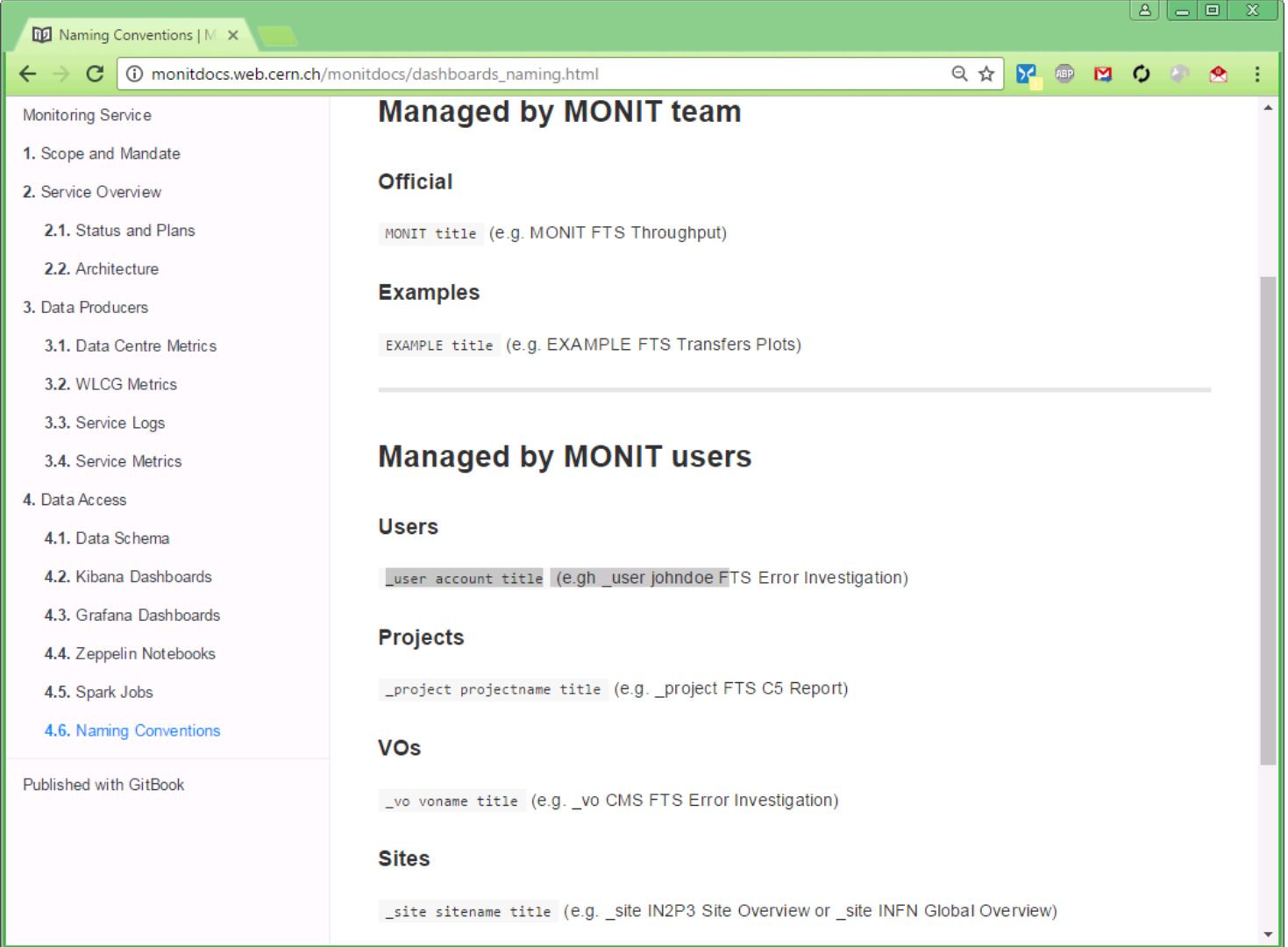


User Documentations

cern.ch/monitdocs



Common fields



Naming Conventions

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