IRIS-HEP

JULY - SEPTEMBER
2024

ENABLING ADVANCED NETWORK AND INFRASTRUCTURE ALARMS

Mentors: Shawn McKee(University of Michigan), Petya Vasileva(University of Michigan)

PRESENTED BY YANA HOLOBORODKO

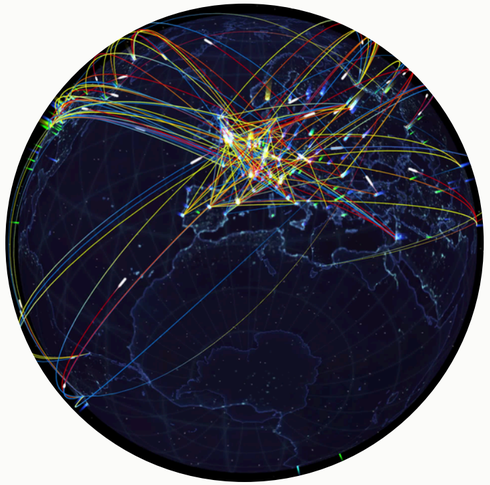
Worldwide LHC Computing Grid (WLCG)

42 countries

12 000 physicists

170 sites

1.5 million computer cores



Existing solution

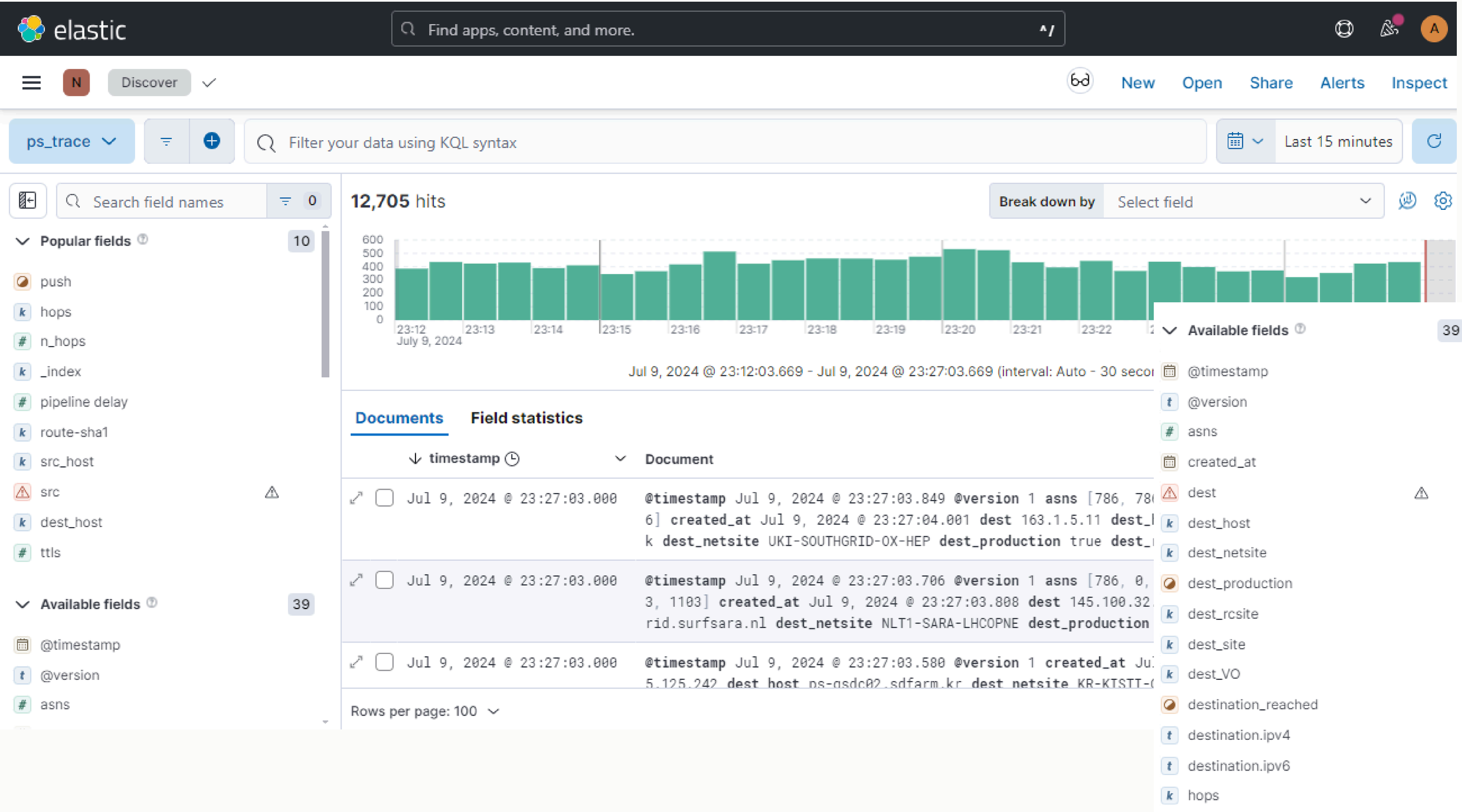
perfSONAR

performance **S**ervice-**O**riented **N**etwork monitoring **AR**chitecture

a network measurement toolkit designed to provide federated coverage of paths and help to establish end-to-end usage expectations

elastic

a distributed, RESTful search and analytics engine capable of addressing a growing number of use cases. It centrally stores the data for lightning fast search, fine-tuned relevancy, and powerful analytics that scale with ease.


elastic
Find apps, content, and more.
^/
A
N
Discover
New
Open
Share
Alerts
Inspect
ps_trace
Filter your data using KQL syntax
Last 15 minutes
Search field names
0
Popular fields
10
push
hops
n_hops
_index
pipeline delay
route-sha1
src_host
src
dest_host
ttls
Available fields
39
@timestamp
@version
asns
12,705 hits
Break down by
Select field
600
500
400
300
200
100
0
23:12
July 9, 2024
23:13
23:14
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Jul 9, 2024 @ 23:12:03.669 - Jul 9, 2024 @ 23:27:03.669 (interval: Auto - 30 seco
Documents
Field statistics
timestamp
Document
Jul 9, 2024 @ 23:27:03.000
@timestamp Jul 9, 2024 @ 23:27:03.849 @version 1 asns [786, 78
6] created_at Jul 9, 2024 @ 23:27:04.001 dest 163.1.5.11 dest_
k dest_netsite UKI-SOUTHGRID-OX-HEP dest_production true dest_
Jul 9, 2024 @ 23:27:03.000
@timestamp Jul 9, 2024 @ 23:27:03.706 @version 1 asns [786, 0,
3, 1103] created_at Jul 9, 2024 @ 23:27:03.808 dest 145.100.32
rid.surfsara.nl dest_netsite NLT1-SARA-LHCOPNE dest_production
Jul 9, 2024 @ 23:27:03.000
@timestamp Jul 9, 2024 @ 23:27:03.580 @version 1 created_at Ju
5.125.242 dest_host ps-gsdc02.sdfarm.kr dest_netsite KR-KISTI-
Rows per page: 100
Available fields
39
@timestamp
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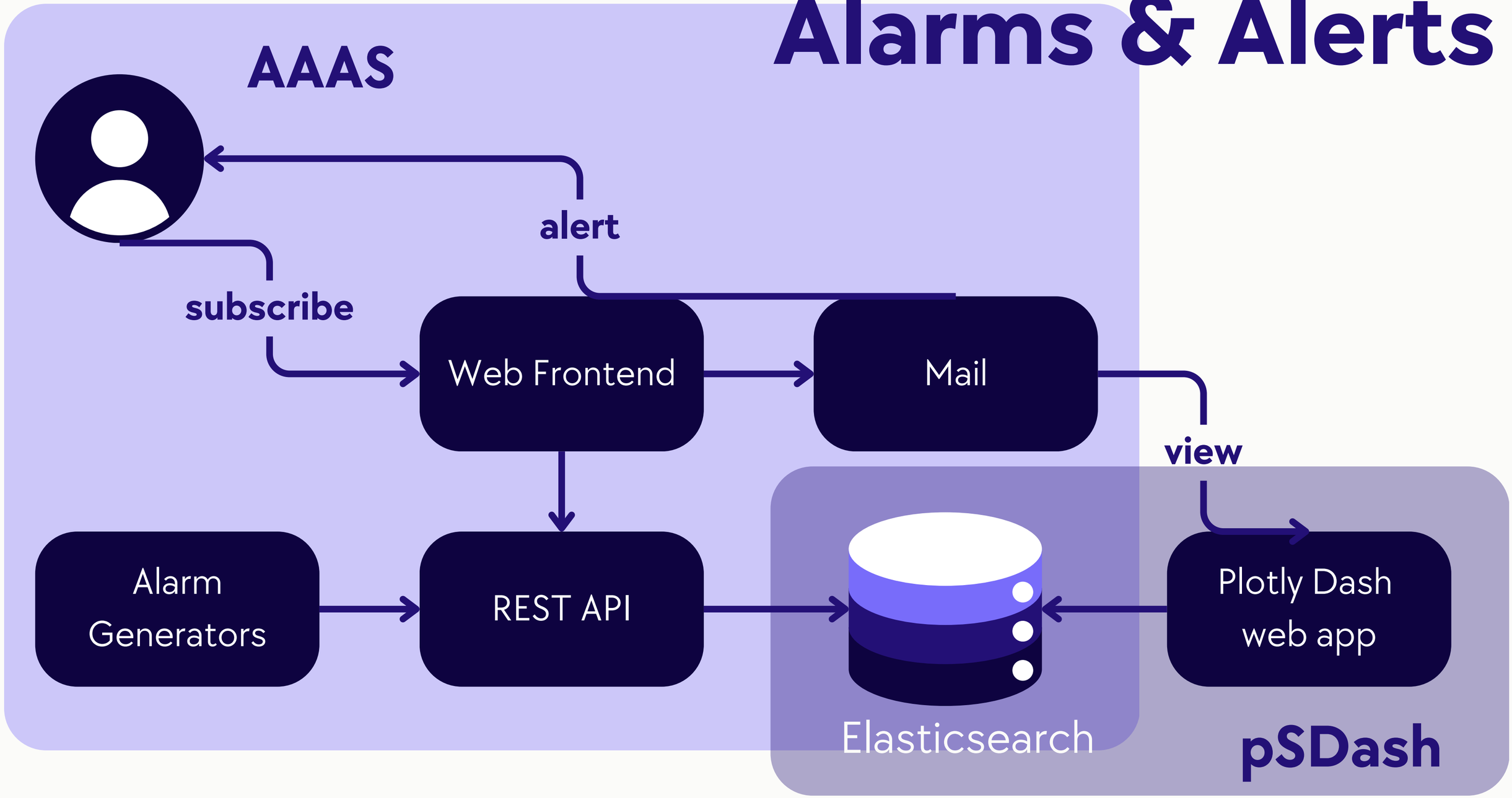
created_at
dest
dest_host
dest_netsite
dest_production
dest_rcsite
dest_site
dest_VO
destination_reached
destination.ipv4
destination.ipv6
hops

Alarms & Alerts



Bandwidth decreased

DESCRIPTION

DETAILS & VISUALIZATIONS

perfSONAR Toolkit Information | Kibana: Packet Loss in OSG/WLCG | Kibana: Packet Loss Tracking | MEPHi Tracer: Traceroute explorer | Alarms description

ps dash | SITES OVERVIEW | SEARCH ALARMS | EXPLORE PATHS

BANDWIDTH DECREASED FROM/TO MULTIPLE SITES

2023-01-12 04:08

Summary

Bandwidth decreased for the ipv6 links between site BEIJING-LCG2 to sites: GRIF-IRFU | IN2P3-LPSC | PRAGUELCG2 change in percentages: -90 | -78 | -96; and from sites: FZK-LCG2 | IN2P3-LAPP | JINR-LCG2 | NDGF-T1 | SARA-MATRIX | UAM-LCG2 | UKI-SOUTHGRID-OX-HEP, change in percentages: -92 | -75 | -100 | -64 | -75 | -91 | -100 with respect to the 21-day average.

Site BEIJING-LCG2 takes part in the following alarms in the period 24h prior and up to 24h after the current alarm end (2023-01-12 04:08)
| Bandwidth decreased: 12 | High packet loss: 1 |

BEIJING-LCG2 to GRIF-IRFU

BEIJING-LCG2 to IN2P3-LPSC

BEIJING-LCG2 to PRAGUELCG2

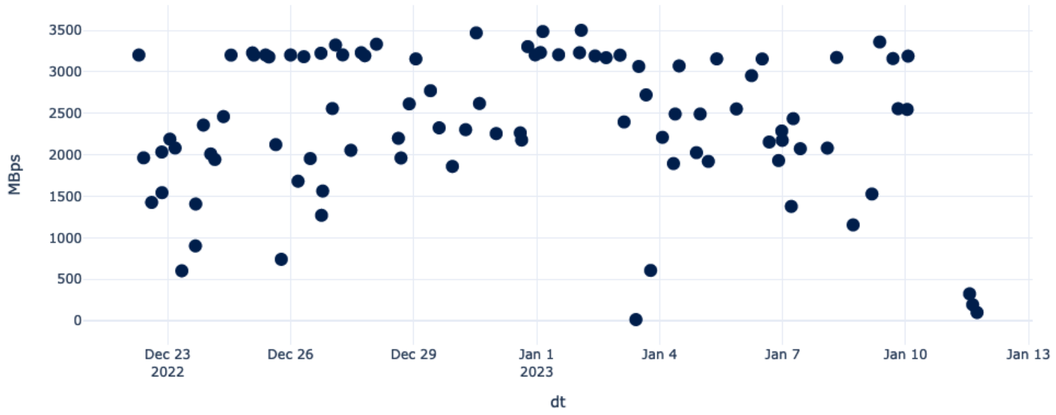
FZK-LCG2 to BEIJING-LCG2

Source
FZK-LCG2

Destination
BEIJING-LCG2

Change: -92%

Total number of throughput measures: 93
Other networking alarms
None found



SOME OF EXISTING ALARMS

Bad one-way delay

measurements is generated if a node reports time greater than 100ms

Large clock correction

alarm calculates clock corrections for all nodes that appear as both source and destination

Complete packet loss

alarm is created when a link drops all packets

Firewall issue

is an alarm generated when node is involved in links that lost 100% of its packets for all tests in a given period or when the number of links (having lost all packets) is more than 10

High packet loss

problem alerts for packet loss above 2%.

Timeline

- **Familiarization**

thorough familiarization with all the tools (ElasticSearch, Kibana) used in this project, the code and system infrastructure

1-3 weeks

4-5 weeks

- **Enabling Alarm**

writing and adding the script for the new alarms to the existing infrastructure

- **Debugging & Deployment**

eliminating bugs and deploying developed alarms

6 week

7-9 weeks

- **Alarm Creation**

creation and development of a new alarm concept, its implementation and alignment with existing alarms

- **Deployment & Performance Evaluation**

deploying, debugging, evaluating the performance of our alarms on a real-time basis, suggesting fixes and extensions / improvements

10-12 weeks

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THANK YOU!

Q&A?