



NetApp ❤️ Grafana

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Systems Engineer

AN OPEN ALTERNATIVE



An alternative to official/supported options,



targeted at power users,



for troubleshooting and planning

WHY ?



Performance monitoring

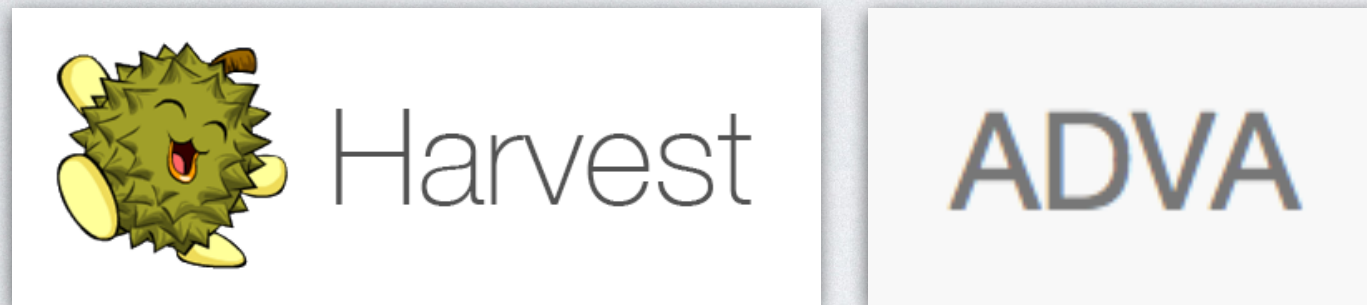


Capacity planning

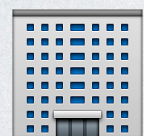


Troubleshooting

SOLUTIONS



Community supported,



Self Hosted Solution



NetApp supported,



Cloud Hosted Solution



Harvest

- Collects metrics using NetApp APIs and feed a Graphite database
- Also provides the dashboards sent to Grafana,
- Dashboards are updated when Harvest is updated,
- Customizable templates that can be tweaked to suit specific needs (change collected metrics, frequency)



NetApp Dashboard: Cluster ▾



Zoom Out



Last 6 hours



Group: nl ▾

Cluster: sdt-cdot1 ▾

TopResources: 5 ▾

≡ Related Dashboards

HIGHLIGHTS

Read Latency

Metric	Avg ▾
sdt-cdot1-02	3.1 ms
sdt-cdot1-01	3.0 ms

Write Latency

Metric	Avg ▾
sdt-cdot1-01	0.1 ms
sdt-cdot1-02	0.1 ms

Throughput

Metric	Avg ▾
sdt-cdot1-02	140 MBs
sdt-cdot1-01	78 MBs

IOPs

Metric	Avg ▾
sdt-cdot1-02	7705
sdt-cdot1-01	5411

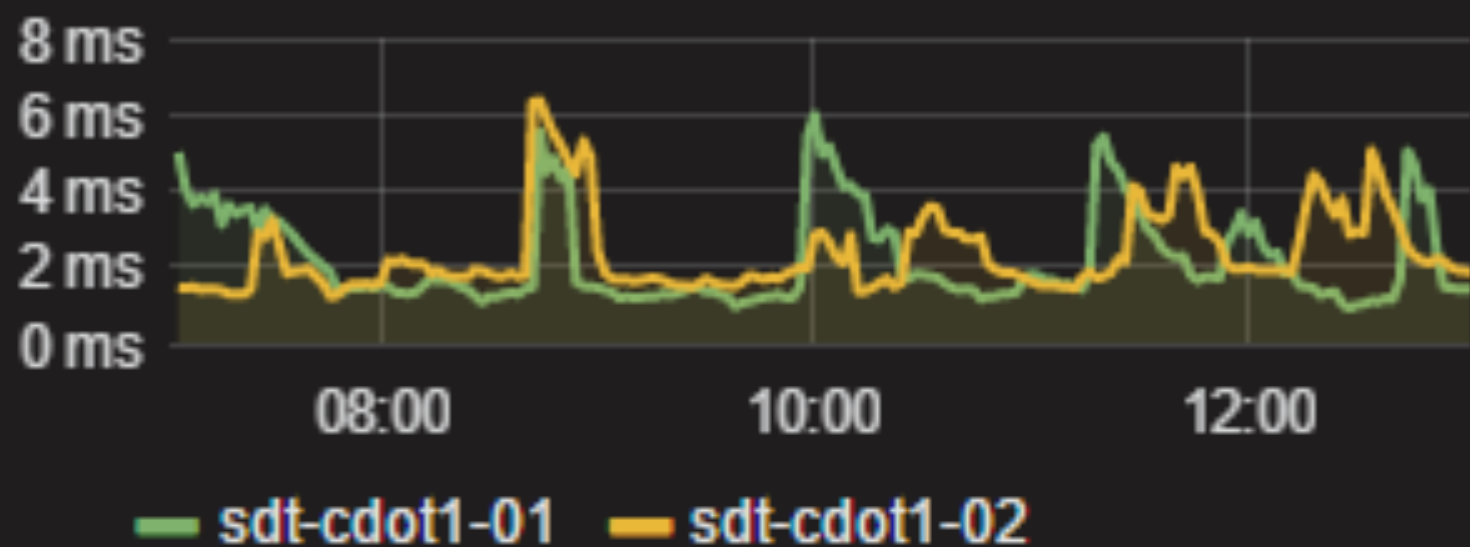
CPU Utilization

Metric	Avg ▾
sdt-cdot1-02	31%
sdt-cdot1-01	20%

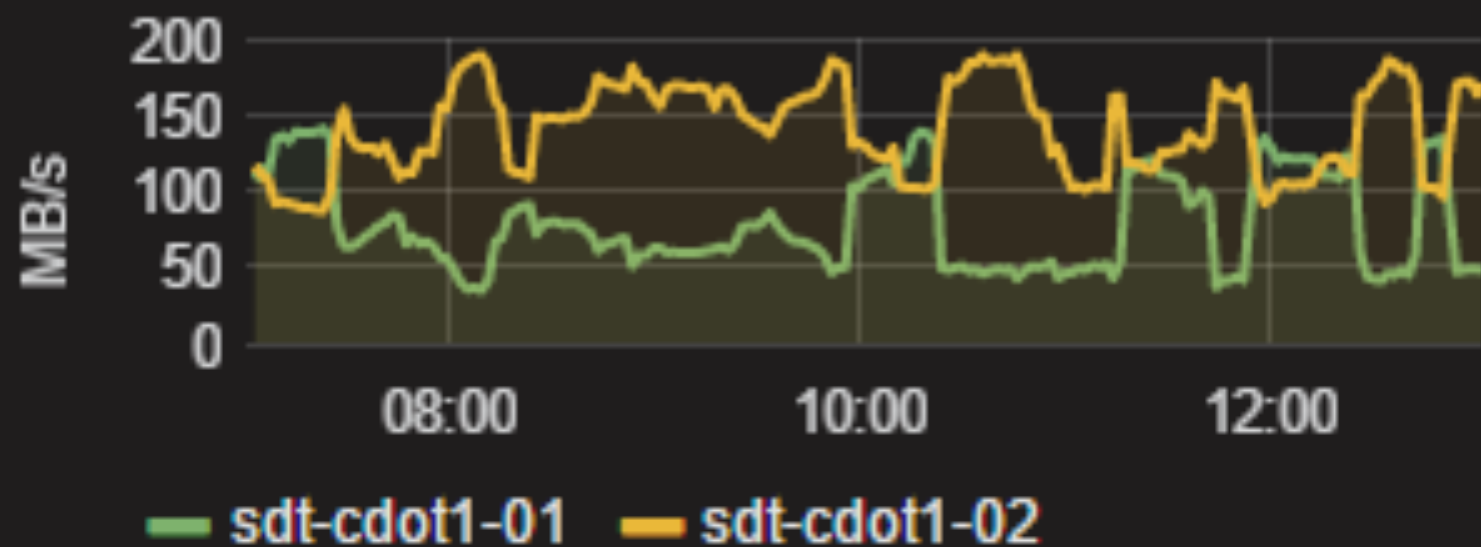
Disk Utilization

Metric	Avg ▾
sdt-cdot1-02	91%
sdt-cdot1-01	49%

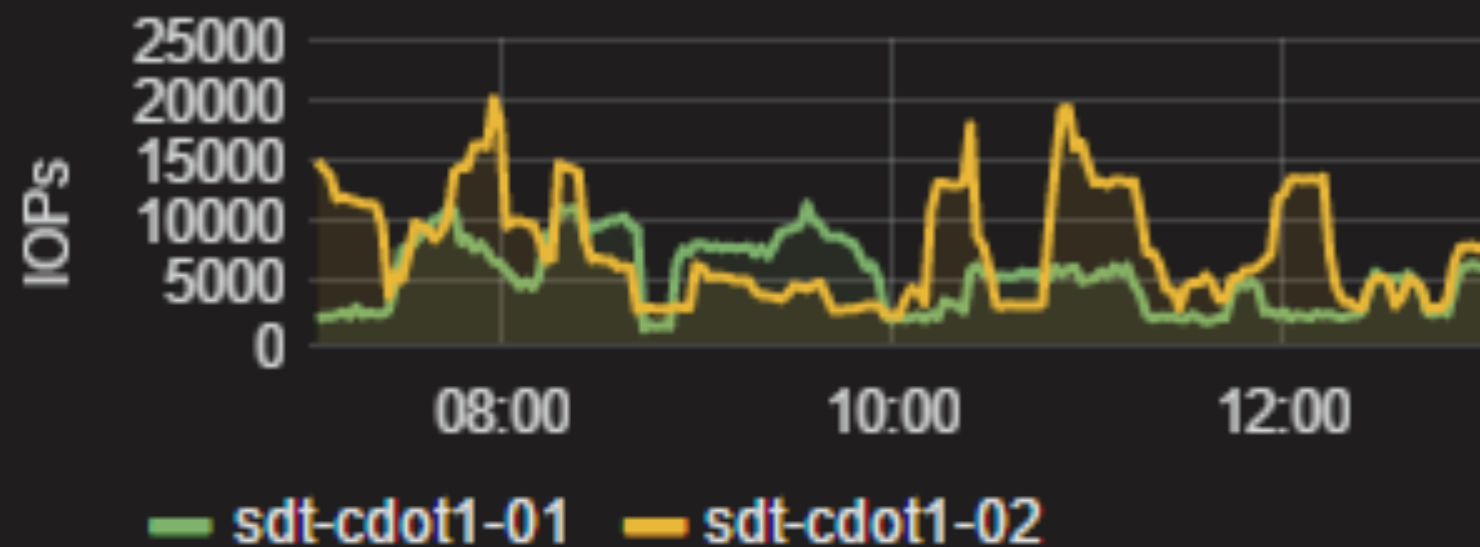
Latency



Throughput



IOPS



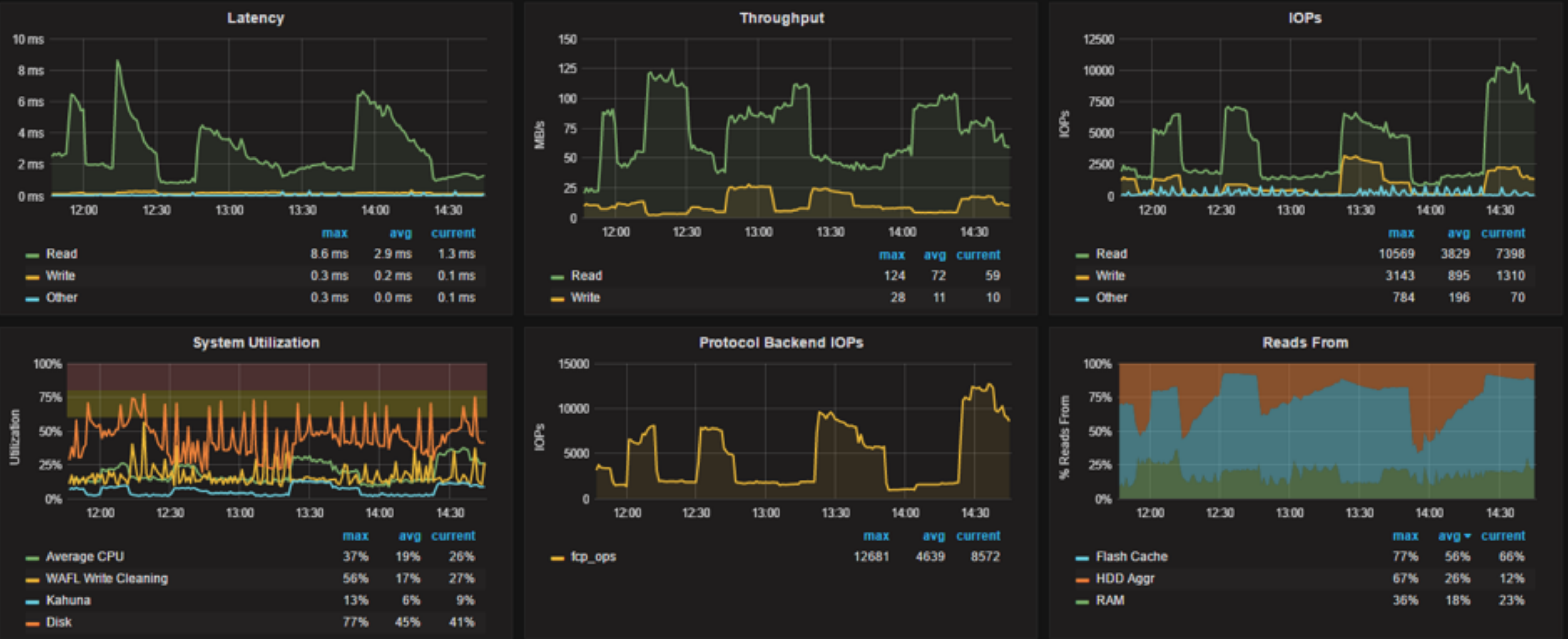
Group: nl Cluster: sdt-cdot1 Node: sdt-cdot1-01 TopResources: 5

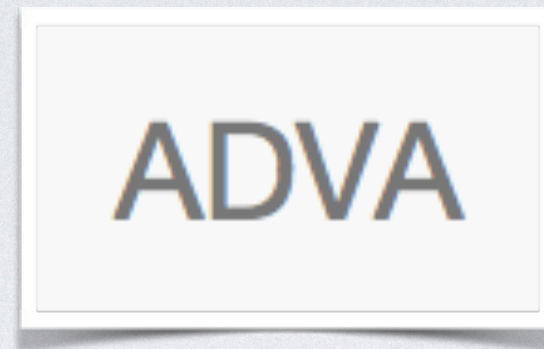
Related Dashboards

HIGHLIGHTS



BACKEND DRILLDOWN





- Advanced Dashboard Virtual Appliance
- Virtual Appliance distribution model (.ova)
- Based on Debian 8.5, contains Graphite, Grafana, and configuration UIs (Web and console menu)
- All-in-one packaged solution for easy deployment and monitoring of NetApp infrastructures

ADVA

Home

Harvest

Logout

Network Settings

Time Zone

Admin Password

LDAP / AD

Maintenance

Upgrade

You can upload an upgrade package for the ADVA or a new version of [Harvest](#) or [NMSDK](#).

Currently installed

ADVA 2.1.6 (2016-11-21).
NMSDK 5.5.
Harvest 1.3X1.

Upload package

Choose File

no file selected

Password

Password

Upload package

Support Bundle

[Download](#) support bundle.

```
[Main Menu]
You are using ADVA v2.1.6 (2016-11-21)
[1] Configure Network (Current IP: 172.16.94.204)
[2] Set Host Name
[3] Set Timezone (America/New_York)
[4] Advanced/Maintenance
[5] Configure Harvest
[6] Power Off
[7] Reboot
[x] Quit
Choice :
```

ADVA

Home

Harvest

Logout

Configured Systems

#	Name	Host	Site	
1	cluster2	10.78.1.10	Site	<div></div>
2	cluster1	10.78.1.10	Site	<div></div>

Add System

Configured OCUM Servers

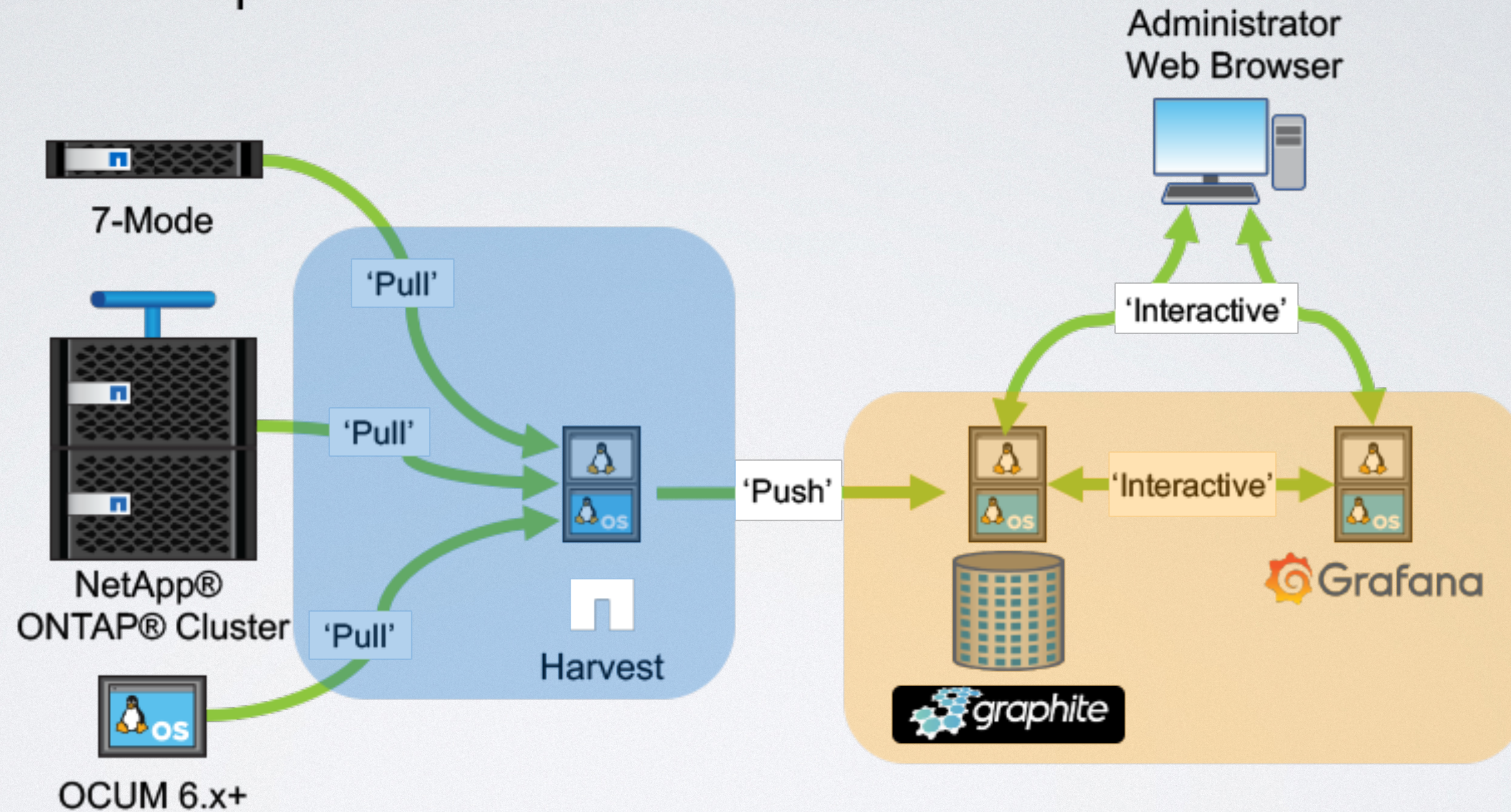
#	Host	Site	
1	ocum2	Datacenter_B	<div></div>
2	ocum1	Datacenter_A	<div></div>

Add OCUM

THE COMMUNITY



Harvest + Graphite + Grafana Architecture



Positioning of Open Source Monitoring Solution

When to recommend

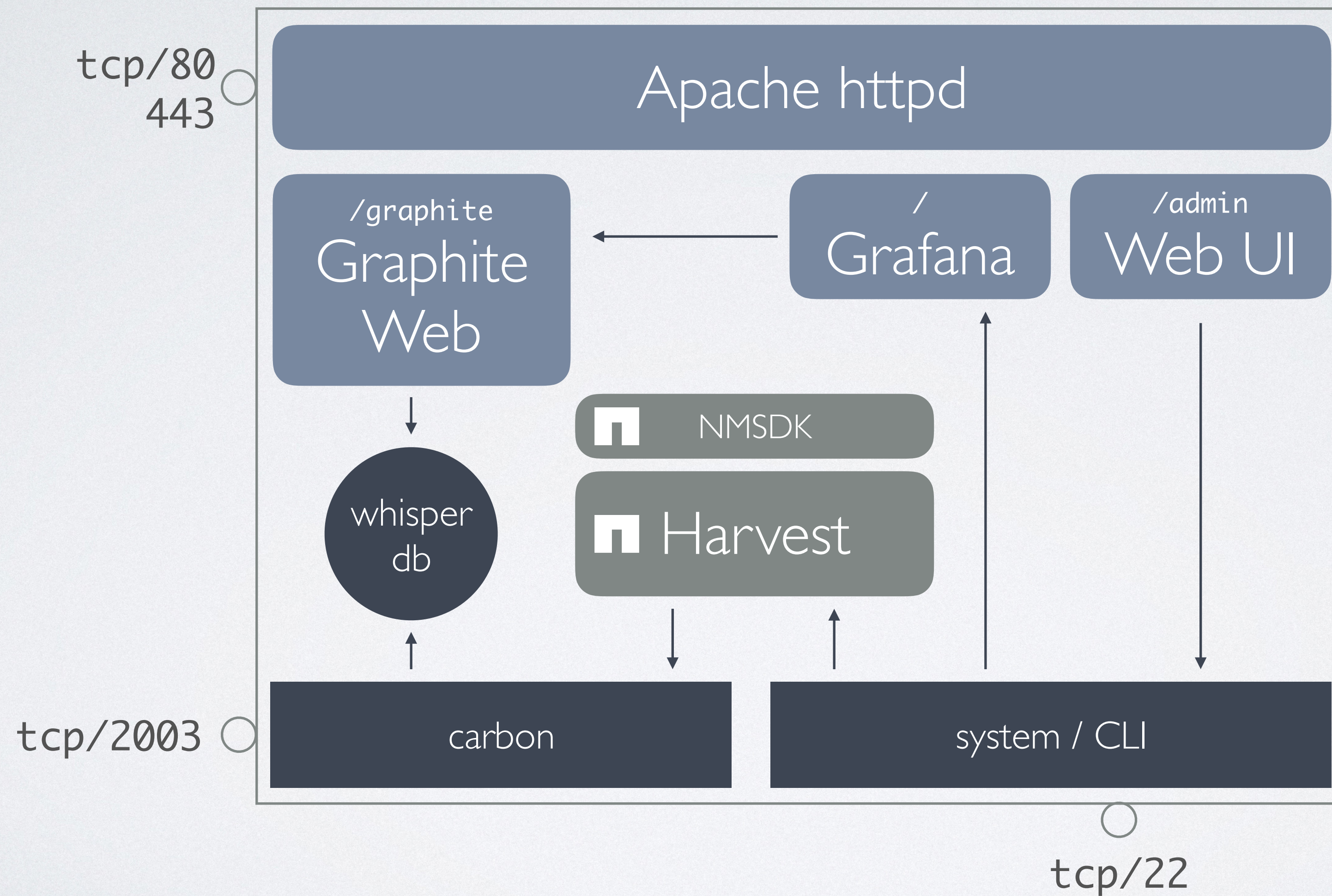
- Customer desires deep, real-time monitoring of their NetApp® storage environment
 - Typically an 'expert' user
 - Coverage of 7-mode and cDOT
- Needs the flexibility to:
 - Collect any counter at any frequency
 - Create own dashboards
 - Integrate with other performance reporting solutions
- Already has Graphite and Grafana for other purposes
- Customer is 'ok' with open source software and a community based support model

Why Do People Like It?

Open source monitoring

- Prove it's not storage
- It's storage—and I know why
- It's storage—and I don't know why but I have the instrumentation to dig deeper
- Integration with larger dashboard and service views
- Capacity planning and balancing
- **The Grafana GUI; beautiful and responsive**

ADVA ARCHITECTURE



DEMO

NEXT?

Grafana 4

Alerting

Annotations



- ONTAP Analytics and Telemetry Services Console
- Incubating NetApp supported solution
- Cloud hosting model
- Lightweight agent on-prem pushes data to AWS
- Uses annotation to mark storage events

OATS

Hi guest!

Home

Storage Admin

Datacenter Overview

Cluster Overview

Administration

Documentation

Log In

Datacenter Overview Report

Home / Reports / Datacenter Overview Report

View in Grafana

⚙️

Datacenter Overview

🔗

🔍 Zoom Out

🕒 Nov 12, 2016 05:41:48 to Nov 12, 2016 09:42:19

🔄

cluster: All

⚡ EMS Errors

PERFORMANCE

Total Cluster IOPs

Cluster Latency

RESOURCES

Average CPU Busy

Total Network Throughput (IP + FCP)

Cluster Disk Traffic

EMS Logs

@timestamp	ems_severity	cluster_name	node_name	ems_owner	ems_event	ems_syslog	ems_sev
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[Home](#) / [Reports](#) / [Datacenter Overview Report](#)

View in Grafana

Cluster Overview

Nov 8, 2016 16:46:04 to Nov 9, 2016 17:36:41

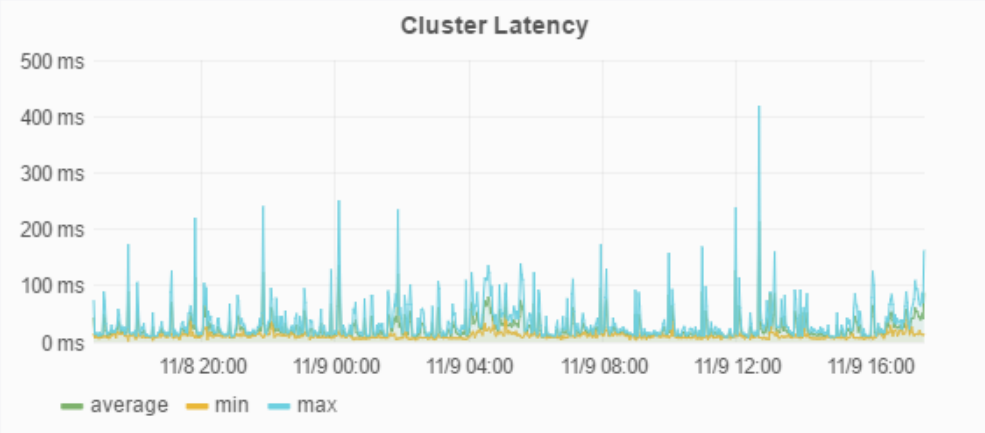
cluster: rtpolb

node: All

EMS Warnings

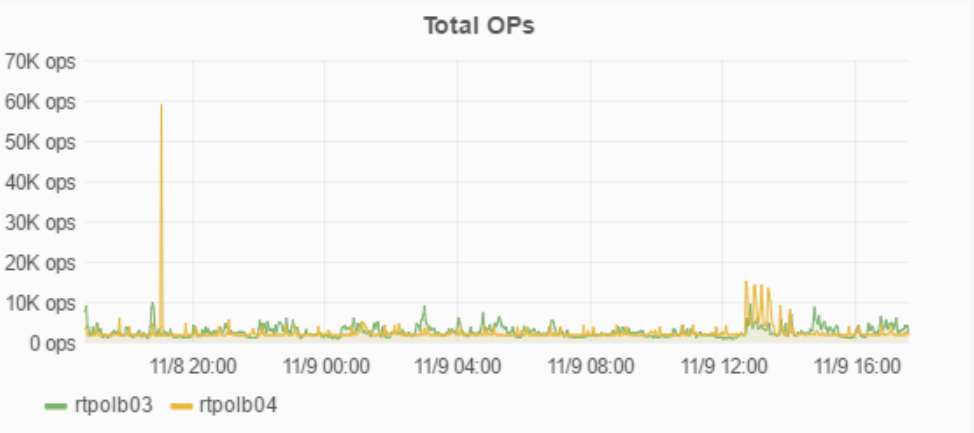
EMS Errors

Cluster Latency

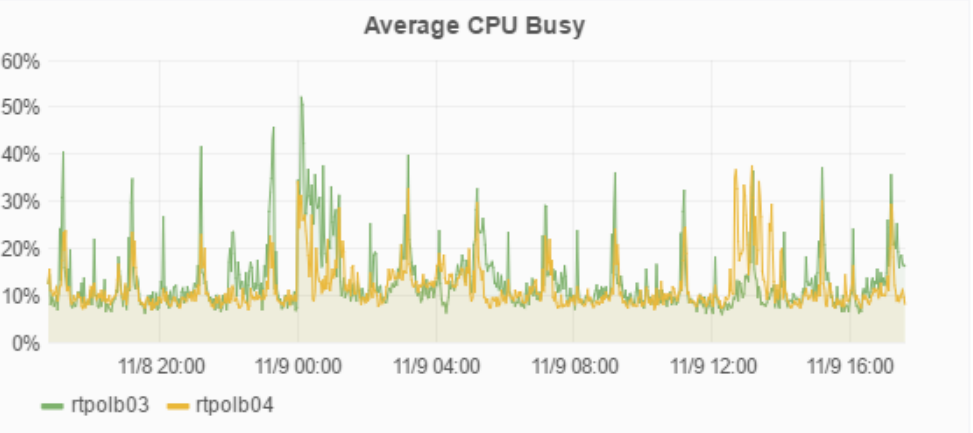


SUMMARY

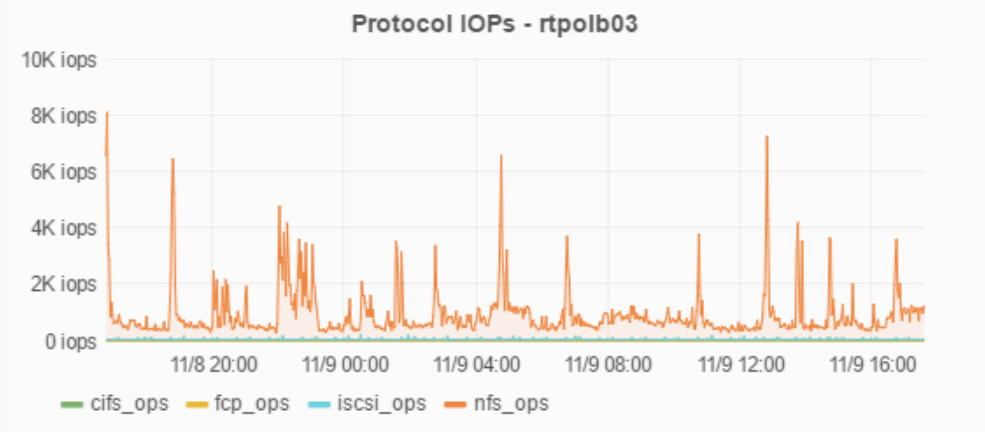
Total OPs



Average CPU Busy

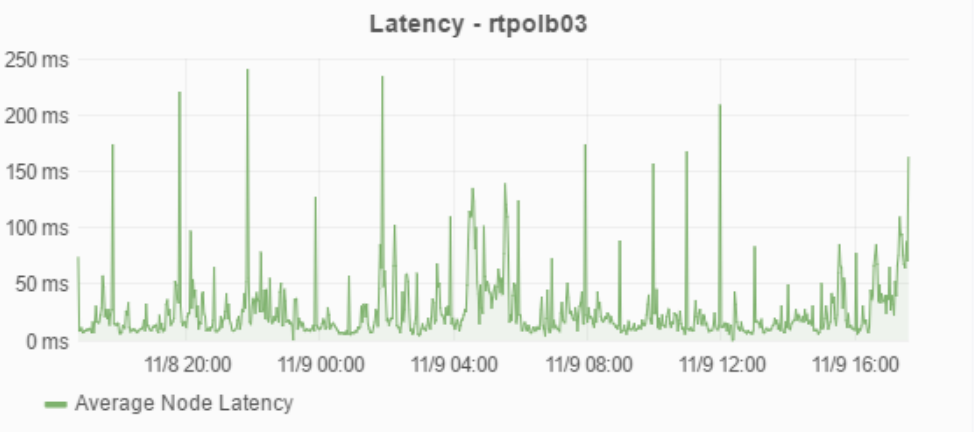


Protocol IOPs - rtpolb03

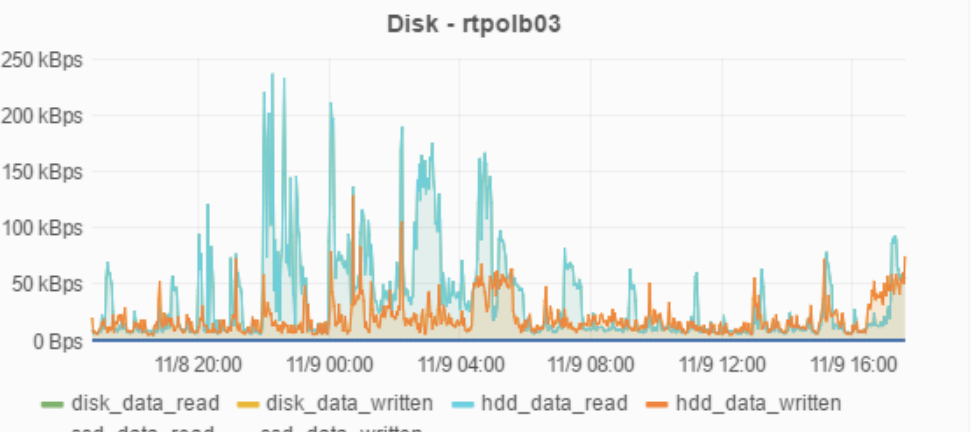


RTPOLB03

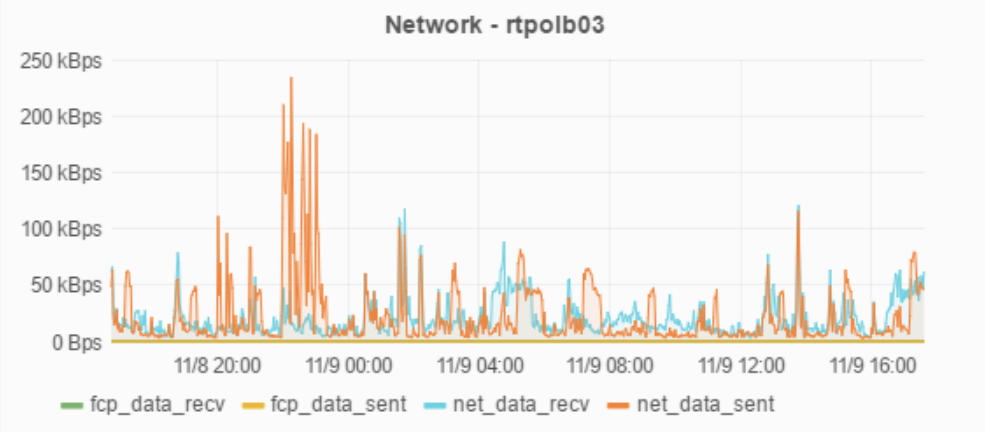
Latency - rtpolb03



Disk - rtpolb03



Network - rtpolb03



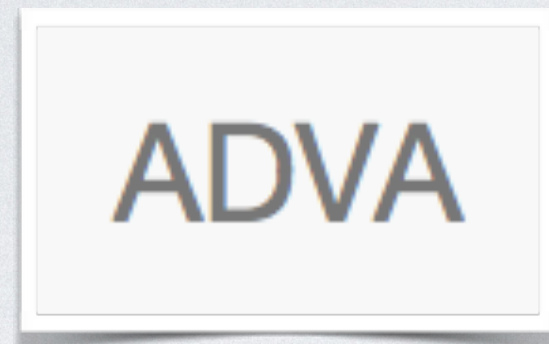
Events - rtpolb03

@timestamp	ems_severity	ems_event	ems_owner	ems_syslog	ems_sev
11/09/2016 15:54:00	Debug	disk_mediaScrubComplete_1	disk_server_0	Disk 0a.01.19 [NETAPP X308_HMRKP03TSSMNA00P9GUZUEX X308_HMRKP03TSSMNA00P9GUZUEX NA00P9GUZUEX] S/N [P9GUZUEX] has completed media scrub pass 1 in 29d:09h:42m : (0x0x480:0x0xb880:0x0x15c9dc680 0d:00h:00m)	7
11/09/2016 15:54:00	Notice	raid_spares_media_scrub_start_1	raidio_thread	raid_spares_media_scrub_start	5
11/09/2016 15:54:00	Notice	raid_spares_media_scrub_start_1	raidio_thread	raid_spares_media_scrub_start	5

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