SESSION GOALS

1. The Monitoring Challenge
2. Solution Overview
3. Demo
4. What’s Next?
THE MONITORING CHALLENGE

“We” need monitoring today - RHCS 2.x and RHCS 3.x

So many ceph counters, not enough time...confusion

How to better enable Operations;
● Which metrics make the most sense to monitor
● Which metrics benefit from graphs/charts
● What are the common operation workflows
MONITORING STRATEGY

- Build on ‘best of breed’
- Use meaningful visualizations
- Combine Ceph and OS level metrics
- Support near real time analytics
- Identify key metrics
- Deliver a simple deployment with Ansible
- Flexibility to extend!

...and above all, don’t reinvent the wheel!
SOLUTION OVERVIEW

- grafana
- graphite
- carbon
- collectd
  - cephmetrics
    - mon
    - osd
    - rgw
    - iSCSI

- admin
- dashboards

- Best of breed Off-the-Shelf Visualization
- Common to RH Storage Console and cephmetrics
- cephmetrics plugin/modules
### COLLECTORS

<table>
<thead>
<tr>
<th>Collector Type</th>
<th>Data Source</th>
<th>Operational Visibility</th>
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| mon            | admin_socket perf dump  
                | ceph health  
                | ceph df  
                | ceph osd pool stats | Monitor stats and cluster health and client side performance metrics  
                                | Health events with triggers |
| osd            | admin_socket perf dump  
                | /proc/diskstats | Per OSD latencies for backing device and journals  
                                | OS level latencies and performance per device with cluster level aggregation |
| rgw            | admin_socket perf dump | RGW object operations and latency overview, by host  
                                | Aggregated across all hosts |
| iSCSI          | LIO via python rtslib_fb | Overview metrics (IOPS/Throughput) and configuration  
                                | (client count, LUNs/capacity exported)  
                                | Per client IOPS/throughput, with drill-down to each LUN |
THE AT-A-GLANCE DASHBOARD
The main workflows stem from the at-a-glance dashboard which provides high-level visibility and drill down.

The alert-status dashboard provides basic alert triggers, that all use a notification endpoint called 'cephmetrics'. This endpoint is created automatically during installation.

The iscsi-overview dashboard is available from the dashboard list, and not directly linked to form the at-a-glance dashboard.
FEATURE SUMMARY

General Features
- RHCS 2.x and RHCS 3.x
- SELINUX support
- Filestore and Bluestore OSD support
- Encrypted and non-encrypted OSD support
- MON/OSD/RGW and iSCSI roles supported
- Initial support for MDS (state ONLY)
- Drill down / dashboard links
- 10 second granularity
- Configurable alerts
- HDD/SSD/NVMe/IntelCAS support

Cluster Details
- Cluster flags status (noout, nodown etc)
- OSD/RGW Host up/down
- Per Pool capacity usage
- Raw capacity utilisation
- Scrub/Recovery active indicators
- Growth tracking and forecast (raw)
- OSDs down, near full information (host and disk)

Cluster Summary
- OSD Configuration breakdowns
  - OSD filestore vs bluestore
  - OSD encrypted vs non-encrypted
- Ceph version breakdown by node type
- Disk Size Summary
- Host Size by Capacity and disk count
- PG Status breakdown
- RBD and Pool counts

OSD Performance
- IOPS/throughput by pool
- OSD performance indicators
- Disk stats (per OSD)
- Cluster wide disk throughput
- Read/Write ratio (client IOPS)
- Disk utilisation heatmap
- Network load by Ceph Role

RGW
- Aggregated Load View
- Per Host Latencies and throughput

iSCSI
- Aggregated views
  - Configuration
  - Performance
- Per Gateway Resource Utilisation
- Per client Load and configuration
  - Per rbd image performance

Host Metrics support
- CPU and RAM Usage
- Network load

Alerts
- Alerts and triggers “OOB”
- Notification target automatically defined
- Ceph Health Summary
REQUIREMENTS

- A Ceph cluster running RHEL 7
- An Ansible inventory file in the same format as ceph-ansible
- A dedicated RHEL 7 host (physical or vm) to run the dashboard
- Primary requirement for the monitoring host...fast storage!
- All hosts must share a DNS domain
WHAT’S NEXT?

Planned Changes

- Ceph metrics from ceph-mgr daemon
- iSCSI metrics from gateway daemons
- Data stored in prometheus
- Operational focus
- Adoption of new Grafana features
- Prometheus node exporter
- New dashboard feature embeds Grafana

Benefits

- Ceph & iSCSI metrics without ‘agents’
- Reduction in monitor host requirements
- Support for containerized Ceph
- Grafana v5 simplifies deployment
- No host configuration for the node exporter
- Node exporter delivers visibility of OS metrics
- Time series graphs inside the Ceph element manager (dashboard v2)
QUESTIONS
THANK YOU

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DEPLOYMENT OVERVIEW

- Ansible
- Uses a ‘new’ host group in ansible’s inventory
- Installs and configures collectd, grafana and graphite
- admin user enabled by default
- Dashboards loaded
- Default alerts configured
- Auto-login to the “Ceph At A Glance” dashboard
ADDITIONAL MATERIAL
COMPARING COLLECTD PLUGINS

**ceph plugin**

```xml
<Plugin ceph>
  LongRunAvgLatency false
  ConvertSpecialMetricTypes true
  <Daemon "osd.0">
    SocketPath "/var/run/ceph/ceph-osd.0.asok"
  </Daemon>
  <Daemon "osd.1">
    SocketPath "/var/run/ceph/ceph-osd.1.asok"
  </Daemon>
  <Daemon "mon.a">
    SocketPath "/var/run/ceph/ceph-mon.ceph1.asok"
  </Daemon>
  <Daemon "mds.a">
    SocketPath "/var/run/ceph/ceph-mds.ceph1.asok"
  </Daemon>
</Plugin>
```

**cephmetrics plugin**

```xml
<Plugin python>
  ModulePath "/usr/lib64/collectd/python-plugins"
  LogTraces true
  Import "cephmetrics"
  <Module cephmetrics>
    ClusterName "ceph"
    EventURL "http://graphite.test.lab/events/"
  </Module>
</Plugin>
```
SUPPORTED ALERT TARGETS

Grafana supports a number of notification channels (alert targets):

- Email
- Slack
- PagerDuty
- HipChat
- Telegram
- Sensu
- Generic webhooks

For more detail, look at [http://docs.grafana.org/alerting/notifications/](http://docs.grafana.org/alerting/notifications/)
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