IBM Cloud Containers Workshop

Monitoring and Logging

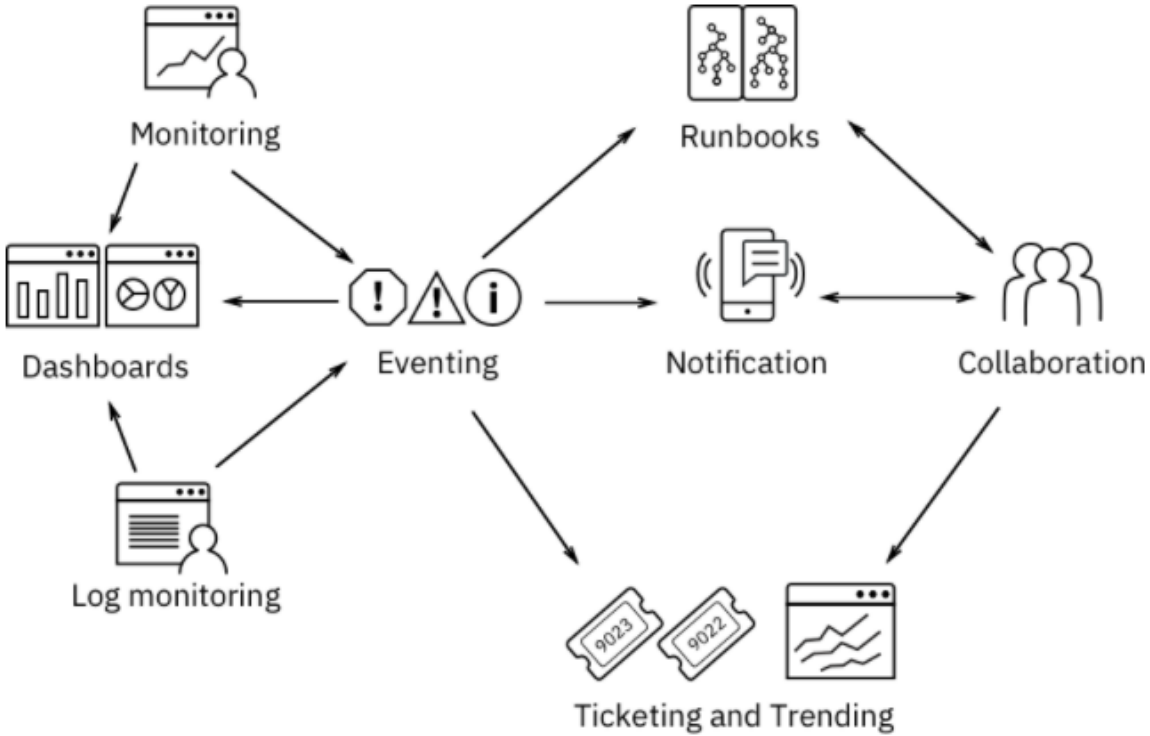
Agenda

- Cloud Service Management & Operations
- Native monitoring and Dashboard
- Prometheus
- Application Performance Management
- Netcool Operation Insights

What is Cloud Service Management & Operations

- **Cloud Service Management and Operations** refer to all the activities that an organization does to plan, design, deliver, operate, and control the IT and cloud services that it offers to customers.
- Service management includes the operational aspects of your applications and services. After an application is pushed to production, it must be managed.
- Applications are monitored to ensure **availability** and **performance** according to service level agreements (SLAs) or service level objectives (SLOs).

CSMO Incident Management Tool Chain



https://www.ibm.com/cloud/garage/architectures/incidentManagementDomain/overview

Levels of CSMO

Level 0 – Out of the box

- Built-in Dashboard for metrics
- Built-in Log console

Level 1 – Default monitoring workloads

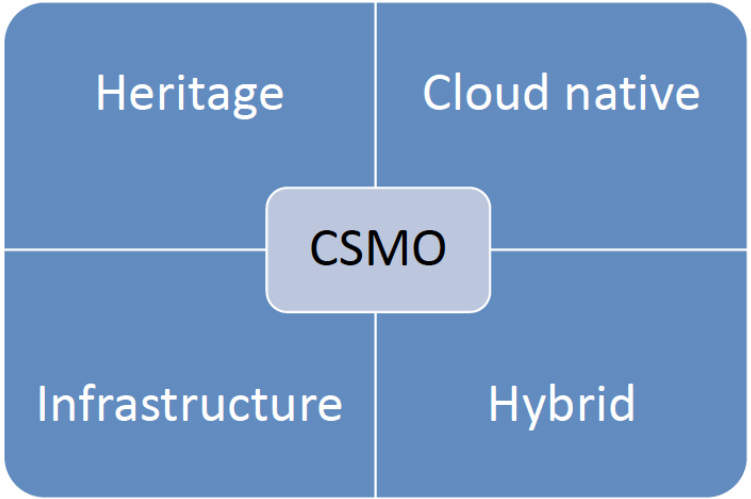
- Deploy Prometheus for metrics
- Deploy ELK for Logging

Level 2 – External Monitoring and Logging

- External APM monitors metrics and thresholds
- ELK stacks forwards to external ELK stack

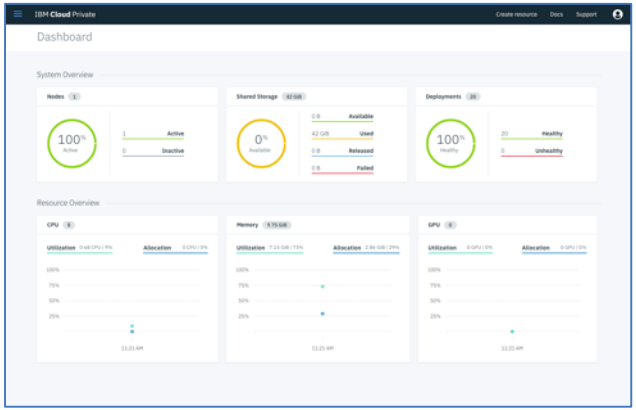
Level 3 – Integration with CSMO toolchain

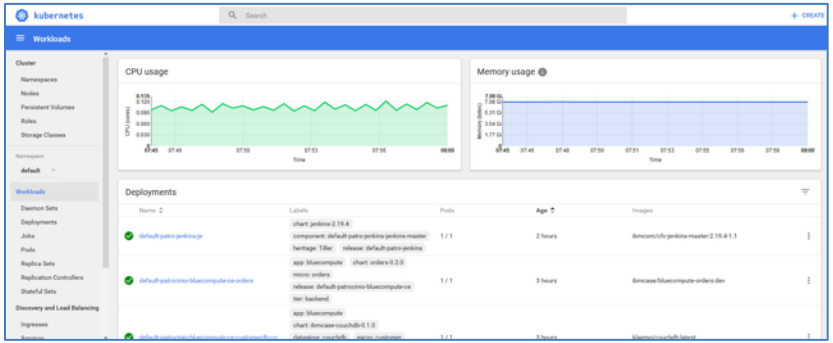
- Forward events to NOI
- Forward Log events to NOI



Level 0 - Monitoring an IBM Cloud Private Deployment

- High level Key Performance Indicators
  - 1. The ICP dashboard shows a high level overview of resource usage and status.
  - 2. The Kubernetes Dashboard shows CPU and memory consumption of the full cluster and deployments
  - 3. Within an application you can view performance of the pod.
- All well and good but you can only look and “not touch”.
- There are APIs available.
- We need to be able monitor and alert on Out of Bounds conditions for the applications and their infrastructure.





Level 1 – Default monitoring workloads

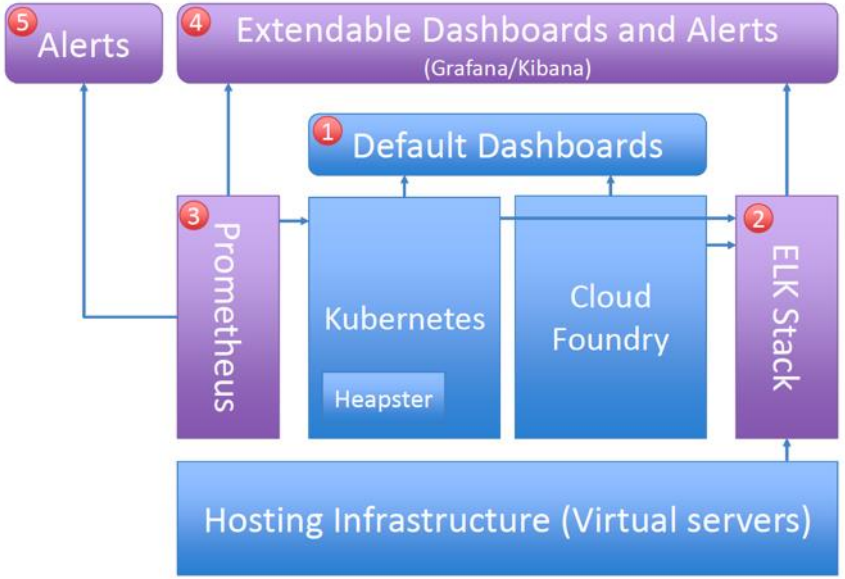
1. The ICP dashboard shows the status, metrics and log entries for all the workloads & Infrastructure.

2. An ELK stack collects logs from all the workloads & Infrastructure. Multiple ELK stacks are possible (but each log can only reside in one stack)

3. A Prometheus stack collects logs from the Kubernetes workload

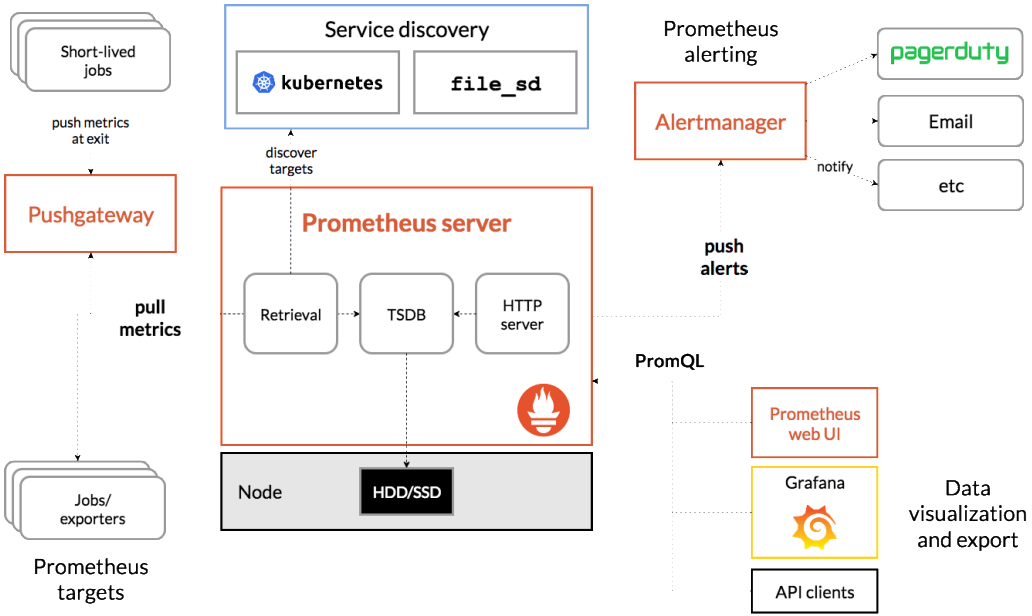
4. Customizable Grafana and Kibana dashboards are available for use

5. Prometheus can send alerts to external system (email, webhooks..)



Prometheus

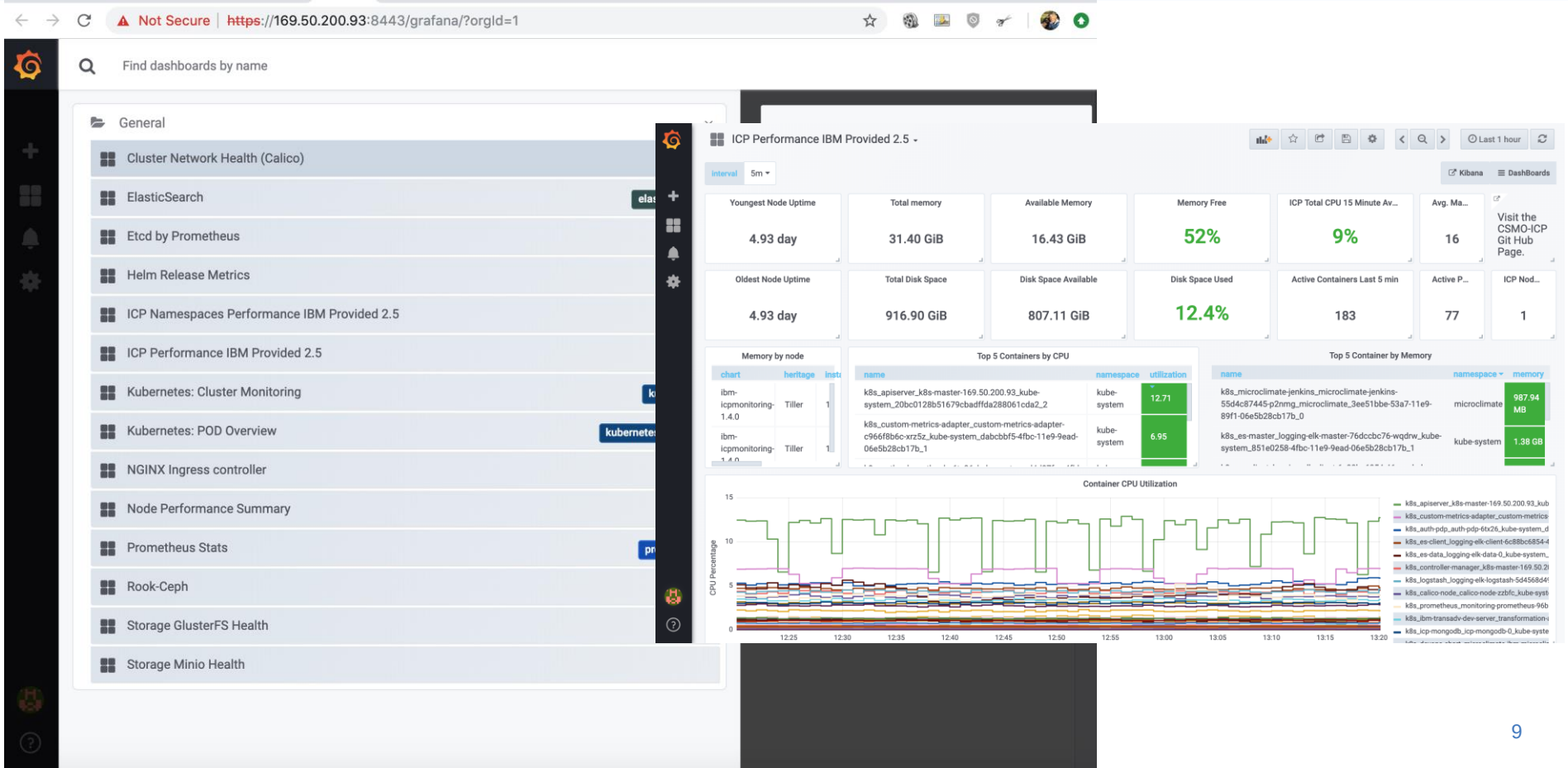
- **Prometheus** is a Cloud Native Computing Foundation (CNCF) project, is a systems and service monitoring system. It collects metrics from configured targets at given intervals, evaluates rule expressions, displays the results, and can trigger alerts if some condition is observed to be true.
- https://prometheus.io/
- Prometheus has several components for Time Series Data Collection, an Alert Manager and the Prometheus Server which scrapes and stores the data.
- Prometheus will be deployed via a Helm Chart into ICP



Grafana

- Grafana is an open source metric analytics & visualization suite. It is most commonly used for visualizing time series data for infrastructure and application analytics but many use it in other domains including industrial sensors, home automation, weather, and process control.
- https://grafana.com/grafana
- While Prometheus has limited dashboarding capabilities of its own, regular display of metrics will be done using Grafana dashboards.
- Prometheus and the Grafana Dashboards are installed togethers as applications into ICP using Helm charts.

Grafana – Dashboards for ICP

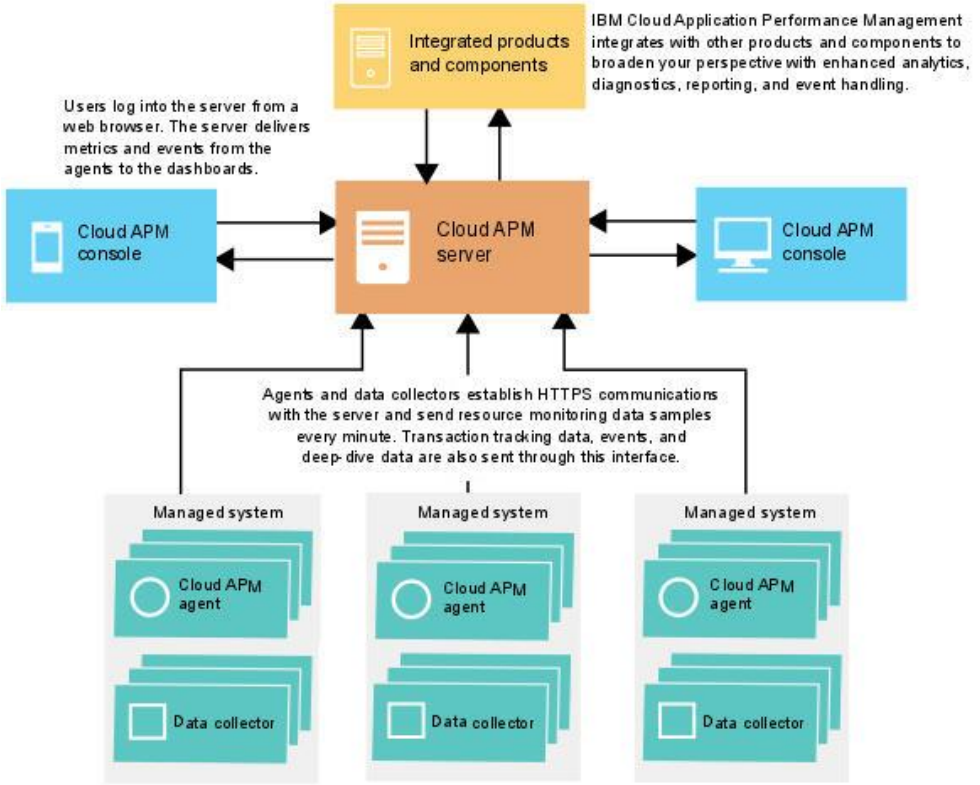


Level 2 – Application Performance Management

- IBM APM is a comprehensive solution that helps you manage the performance and availability of applications that are deployed on premises (private), in a public cloud, or as a hybrid combination.

- This solution provides you with visibility, control, and automation of your applications, ensuring optimal performance and efficient use of resources.

- You can reduce and prevent outages and slowdowns around the clock in a hybrid application world as Cloud APM assists you in moving from identifying performance issues to isolating where the problem is occurring and diagnosing issues before your business is impacted.



Level 3 – Integration with CSMO toolchain

- **Netcool Operation Insight**
- NOI probes and observers collect events from multiple data sources within ICP including Kubernetes, Prometheus & DevOps monitoring
- APM monitors ICP (both workloads and Infrastructure) and forwards events to NOI
- NOI Event Management layer performs de-duplication, correlation, grouping, etc…