&

It’s A Match!

Brief Introduction

Wenting Gong

Software Engineer, Observability, Tinder

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Email: wenting.gong@gotinder.com

Agenda

Agenda

- Our Monitoring Journey with Grafana
  - Applications running as VMs and Containers
  - Infrastructure resources
  - Datasource and Dashboard Automation

- Demo

2 Years Ago

Let’s meet some of our Tinder Engineering team members:

Alice

Observability Team

Charlie

Cloud Infrastructure Team

Bob

Backend Team

Charlie

Cloud Infrastructure Team

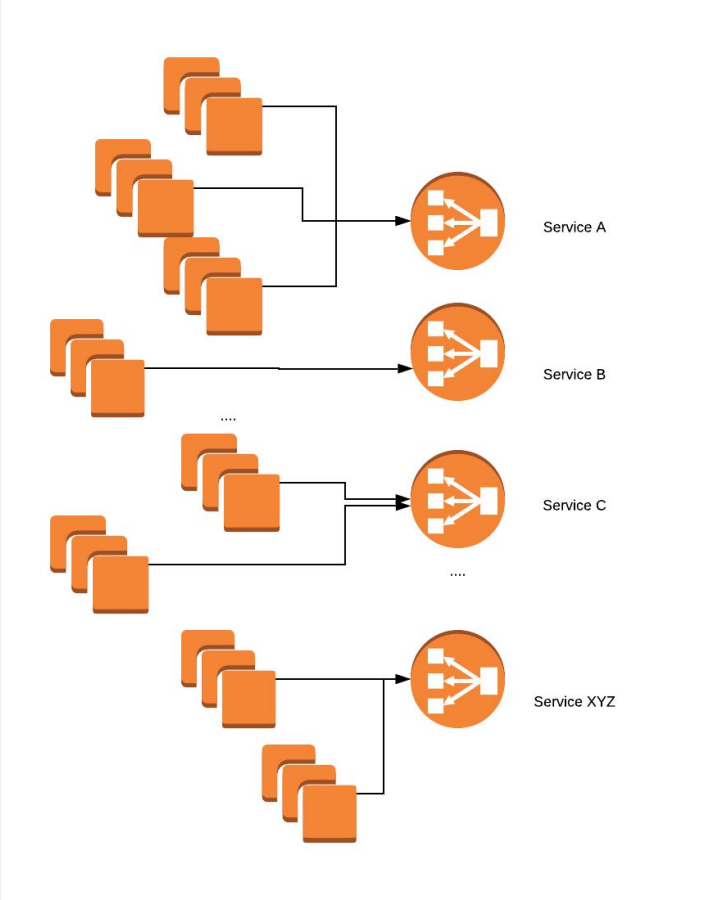
Let’s build our observability infrastructure to monitor the health of all the services!

Hmmm, we also need a central place for engineers to check and view the real-time metrics!

Alice
Observability Team

Initial Scenario

Around **fifty** microservices running with AWS **EC2** instances and **ELBs**



AWS Cloudwatch and Grafana should help with that!

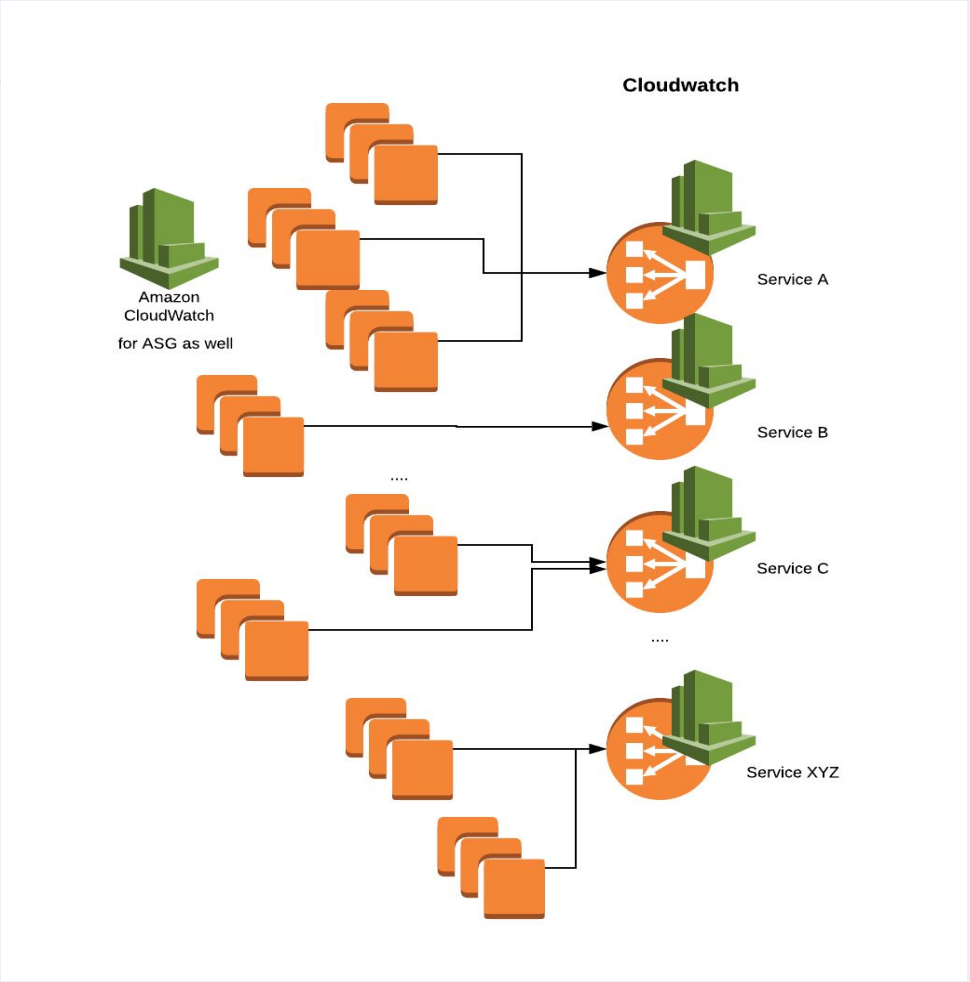
Alice
Observability Team

Amazon
CloudWatch

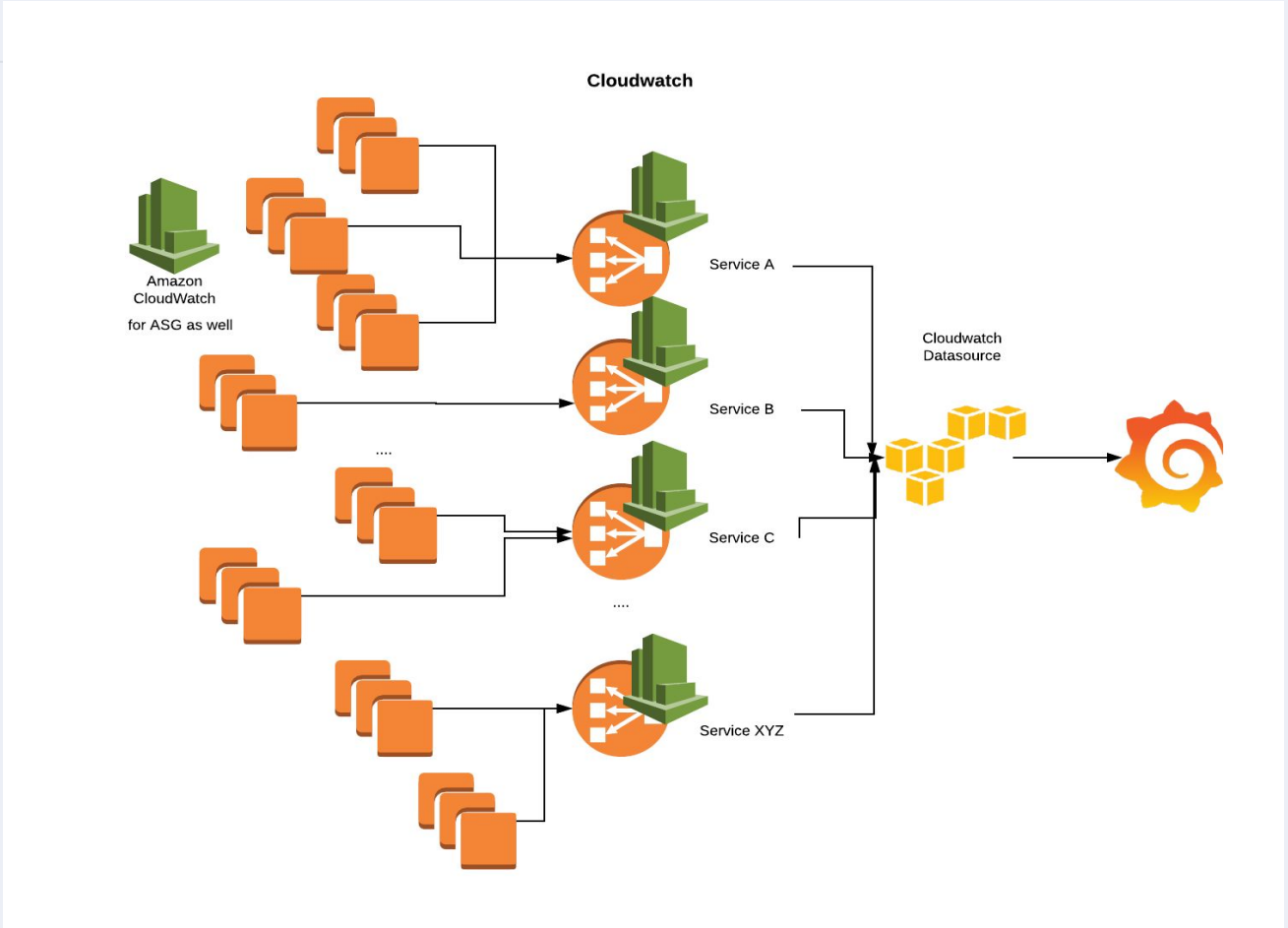
+

Grafana

Solution


Cloudwatch
Amazon
CloudWatch
for ASG as well
Service A
Service B
....
Service C
....
Service XYZ

Solution


Cloudwatch
Amazon
CloudWatch
for ASG as well
Service A
Service B
....
Service C
....
Service XYZ
Cloudwatch
Datasource

Ok! Now we can view and check the services real-time health metrics from Grafana!

Alice
Observability Team

Bob
Backend
Team

Charlie
Cloud Infra
Team

👏👏👏 Great!

Bob
Backend Team

We backend engineers also want to know the details about our services!
E.g. the P50, P95, P99 latency, the requests status for different routes, etc

That sounds fair enough! We need to investigate some open source monitoring solutions!

Alice
Observability Team

Prometheus

OpenTSDB

Alice
Observability Team

graphite

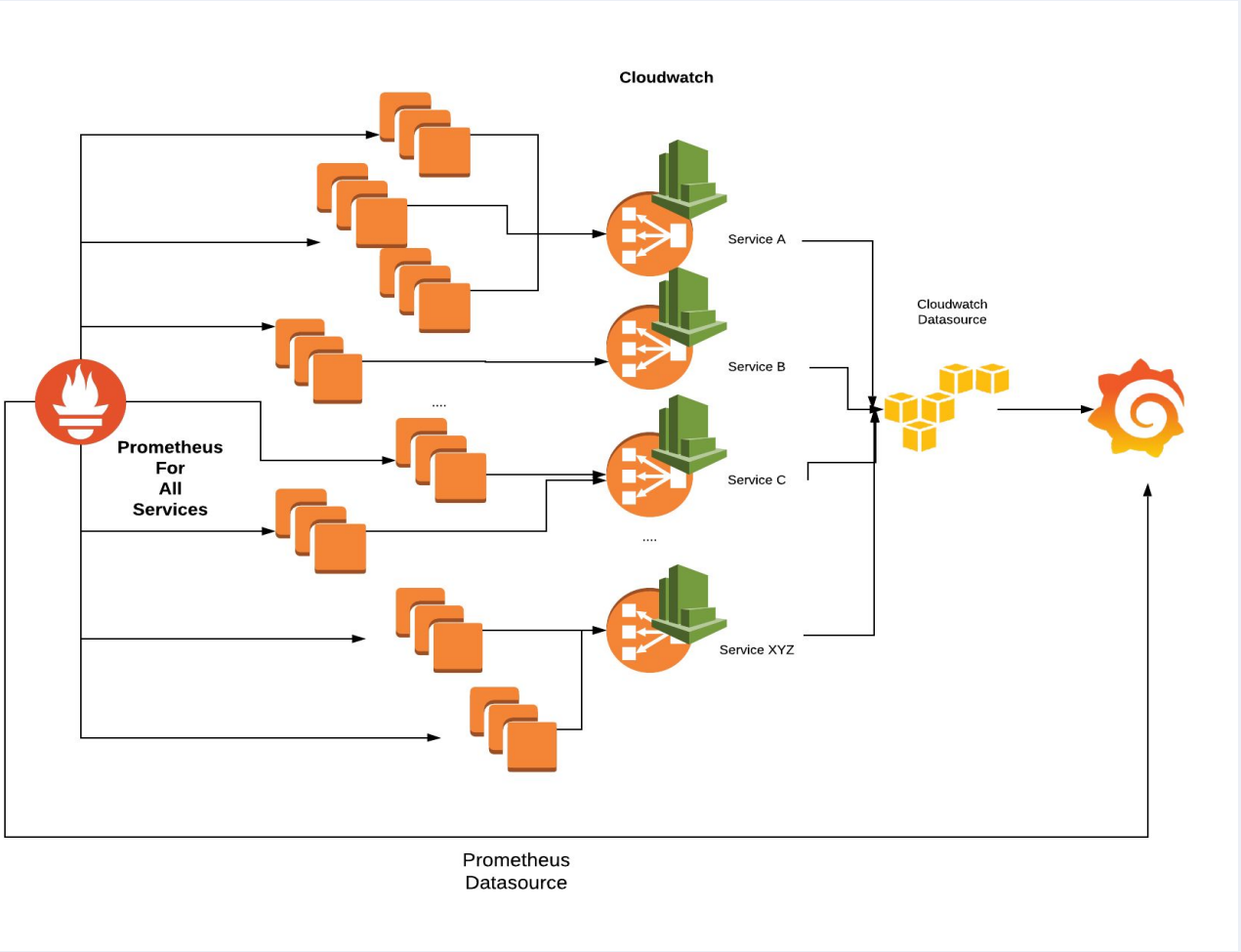
influxdb

Nagios®

Prometheus is the best option for us!

Alice
Observability Team

Solution


Cloudwatch
Service A
Service B
Service C
Service XYZ
....
....
Cloudwatch
Datasource
Prometheus
For
All
Services
Prometheus
Datasource

A few months later...

Bob
Backend Team

Our business grows so fast that one prometheus server could not handle them all.

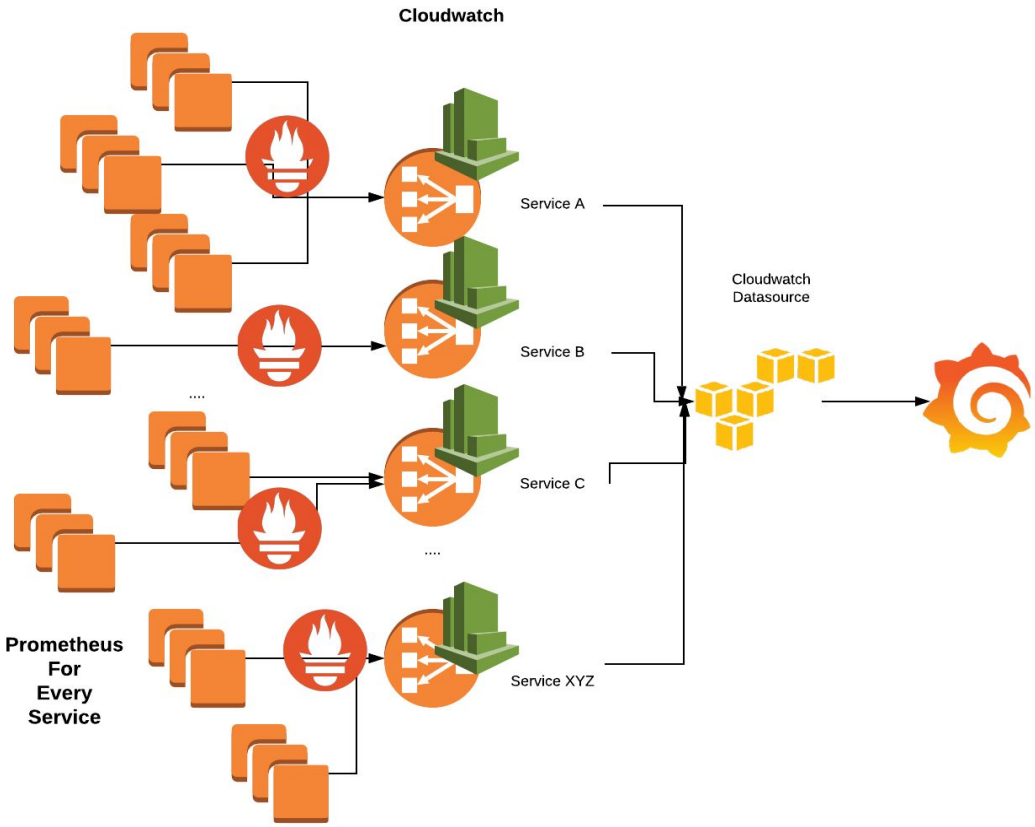
Yeah, we should have a better solution to make our monitoring infra more scalable.

Alice
Observability Team

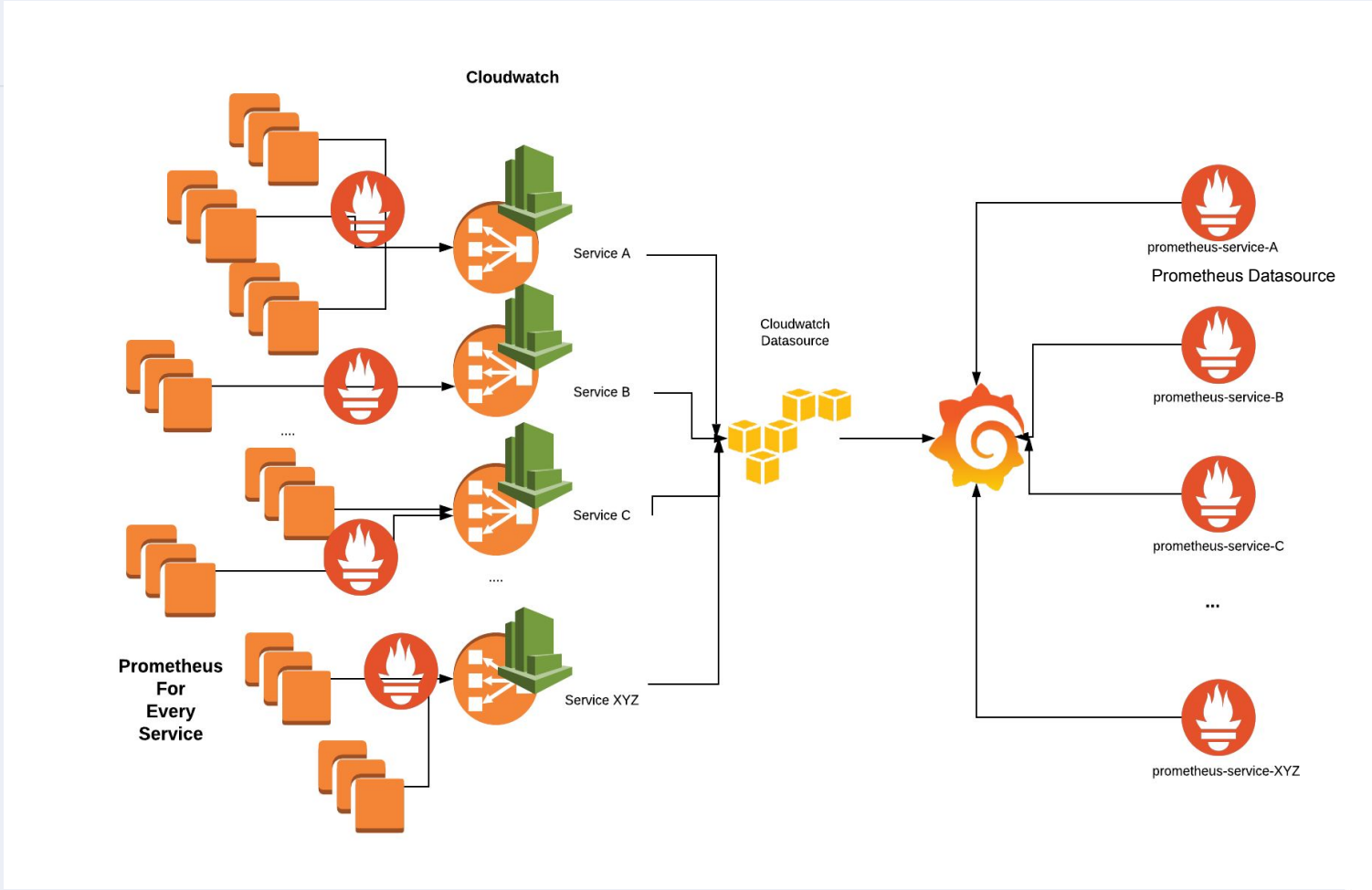
Let’s get each service an assigned prometheus server!

Alice
Observability Team

Solution


Cloudwatch
Service A
Service B
....
Service C
....
Service XYZ
Prometheus
For
Every
Service
Cloudwatch
Datasource

Solution


Cloudwatch
Service A
Service B
....
Service C
....
Service XYZ
Prometheus
For
Every
Service
Cloudwatch
Datasource
prometheus-service-A
Prometheus Datasource
prometheus-service-B
prometheus-service-C
...
prometheus-service-XYZ

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Bob
Backend
Team

Charlie
Cloud Infra
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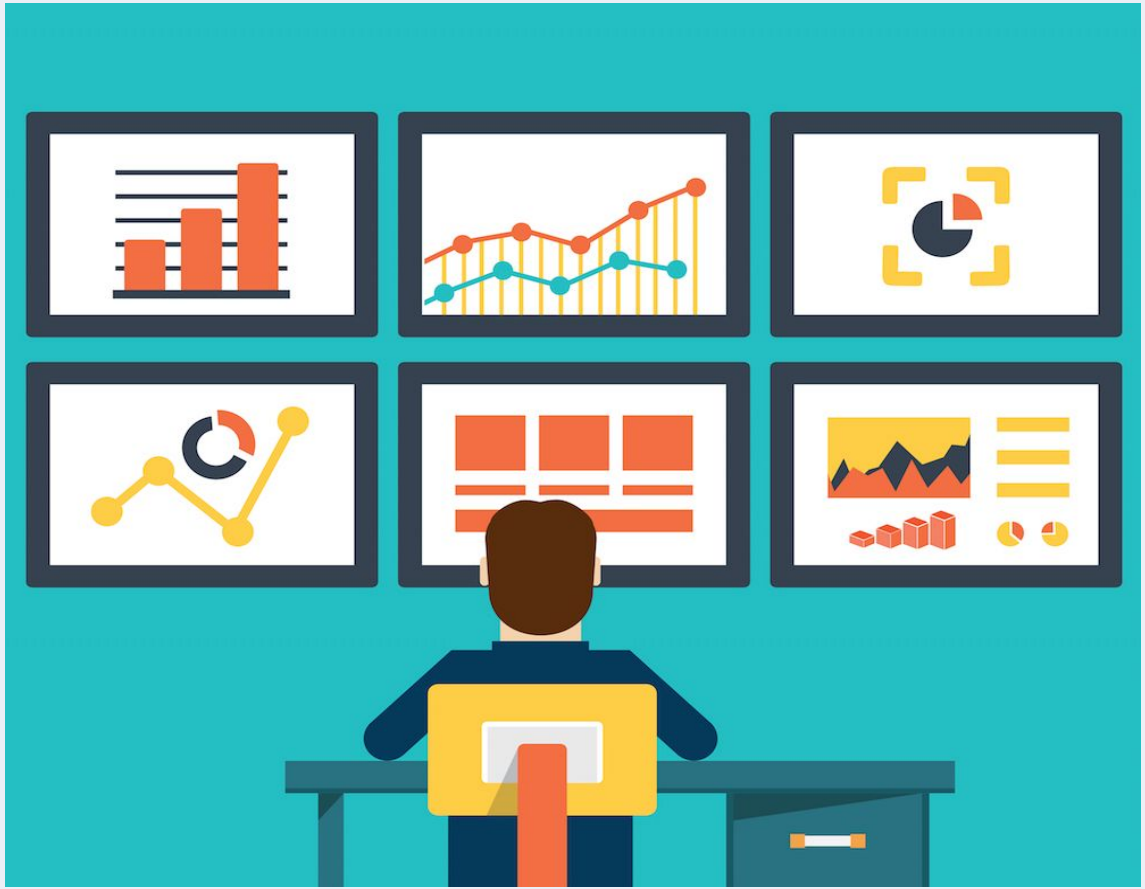

Picture from https://blogs.oracle.com/marketingcloud/how-to-decide-what-marketing-metrics-to-track-and-report

Bob
Backend Team

The metrics are great! Can we keep them longer so that we can see the trends and compare them when necessary?

That’s a good point!

Alice
Observability Team

Compare two approaches

Approach	**Pros**	**Cons**
Increase the retention period **for all** prometheus servers	Super EASY	• Not all metrics are needed for longer retention • Increased costs • $$$ and resources wasted for unnecessary metrics
Have a **separate prometheus archive server** for long-term metrics	Uses the resources and $$$ more efficiently	• Extra setup • Module owners need to understand and update existing configuration

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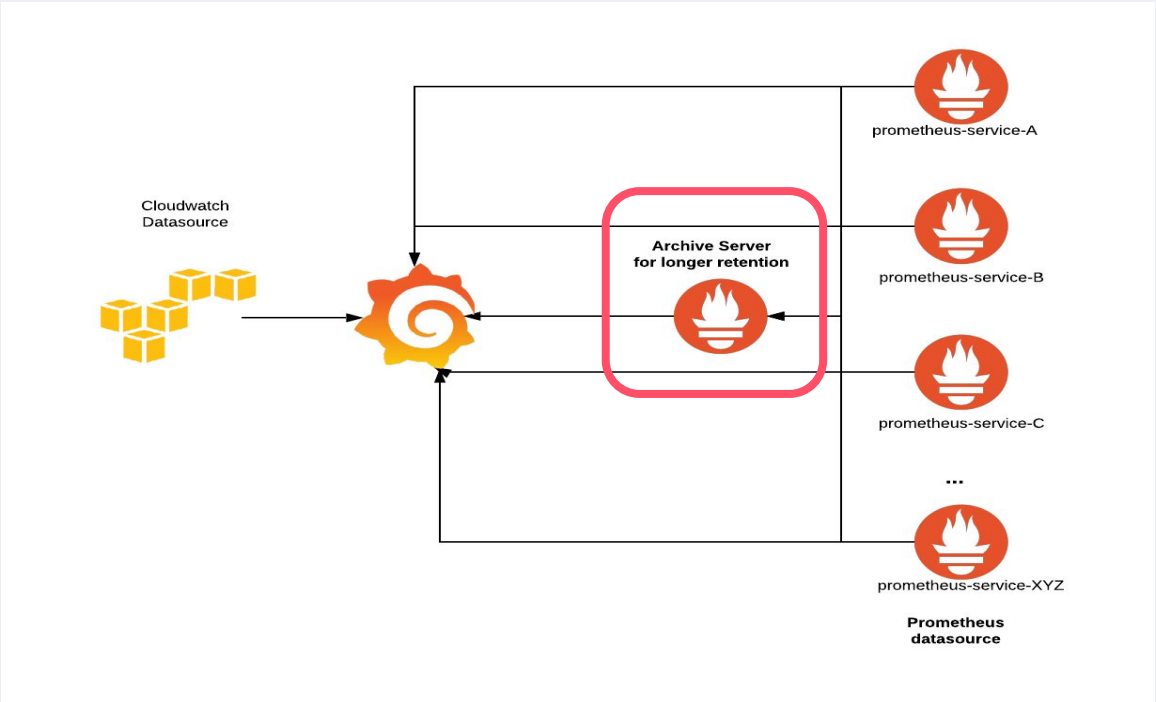
Solution

Let's only archive those key metrics for longer time!

Alice
Observability Team



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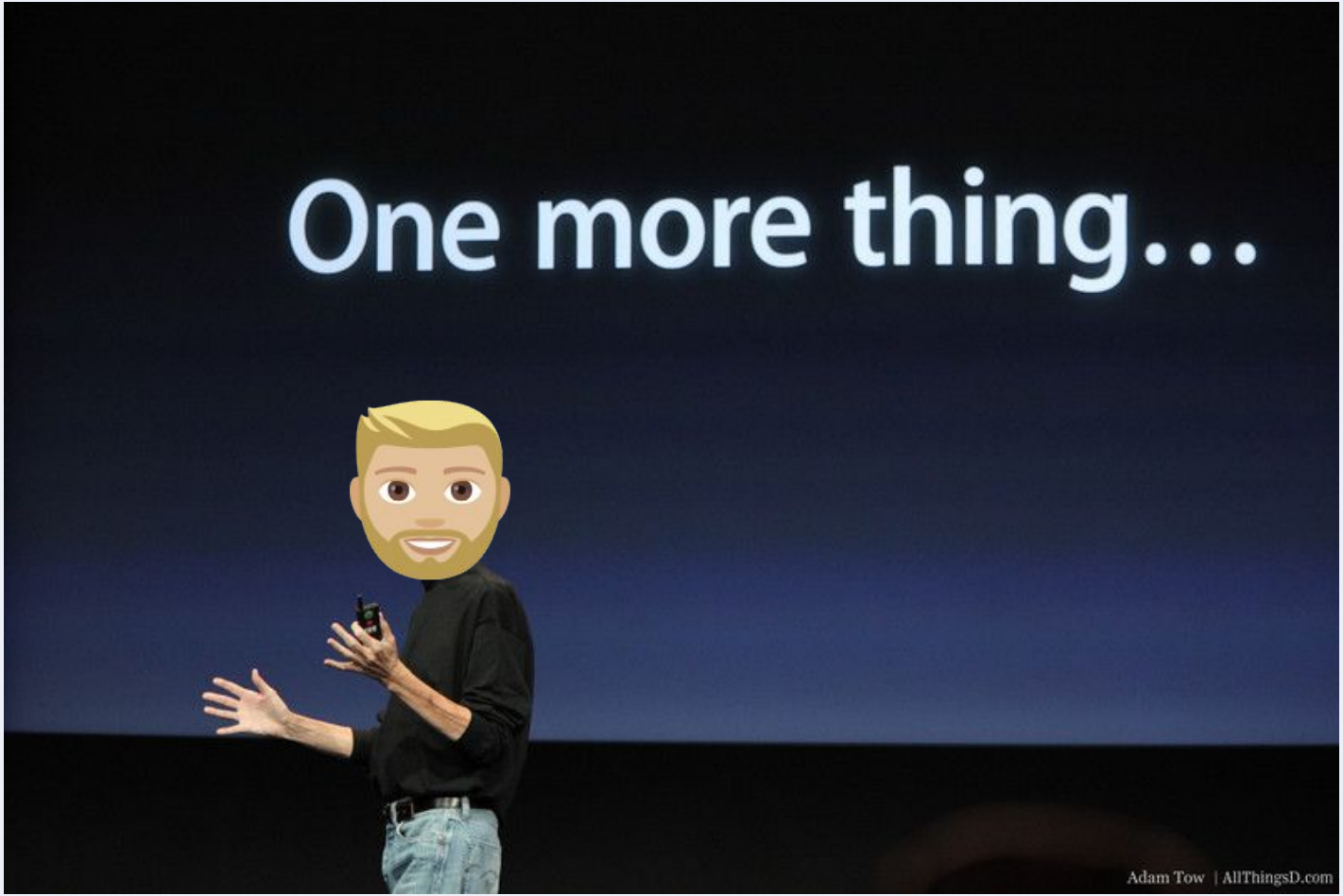
🎉🎉🎉 Well Done! 🎉🎉🎉

Picture from Adam Tow, AllThingsD.com



Picture from Adam Tow, AllThingsD.com

Charlie
Cloud Infrastructure Team

Our services expand so aggressively, it is time to move to **Kubernetes** for deploying and managing containerized applications at scale.

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Cloud Infrastructure Team

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Kubernetes was designed to give developers more **velocity, efficiency** and **agility.**

Charlie
Cloud Infrastructure Team

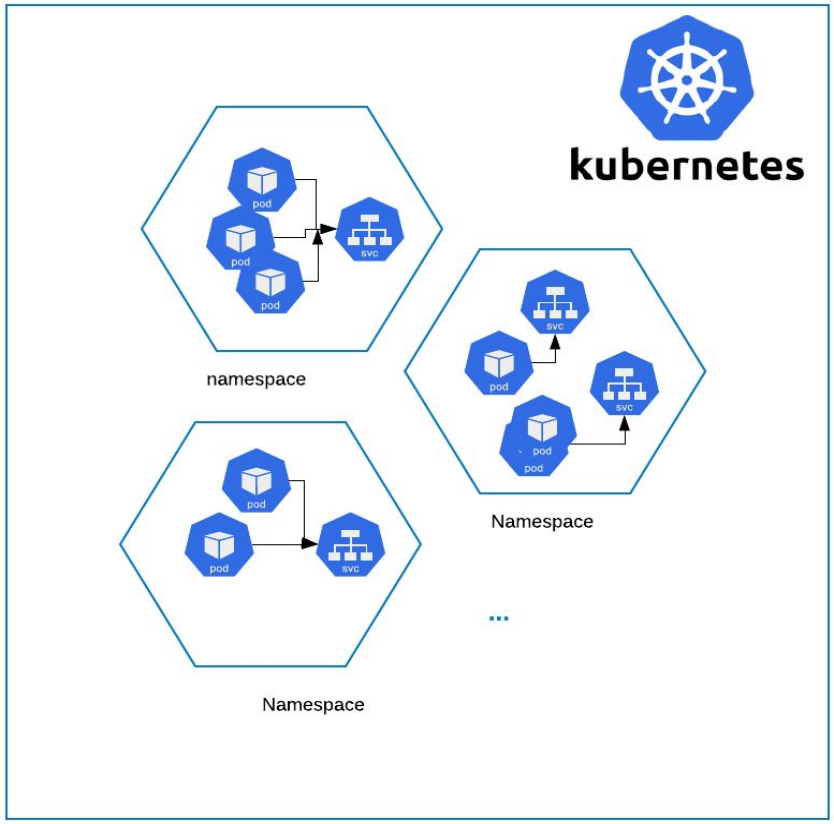
Our services expand so aggressively, it is time to move to **Kubernetes** for deploying and managing containerized applications at scale.

Kubernetes was designed to give developers more **velocity, efficiency** and **agility.**

Then we should definitely support the monitoring for K8S environment!

Alice
Observability Team

Charlie
Cloud Infrastructure
Team



Developers should not redo the metrics instrumenting, we need to stick with **Prometheus** in **Kubernetes** as well!

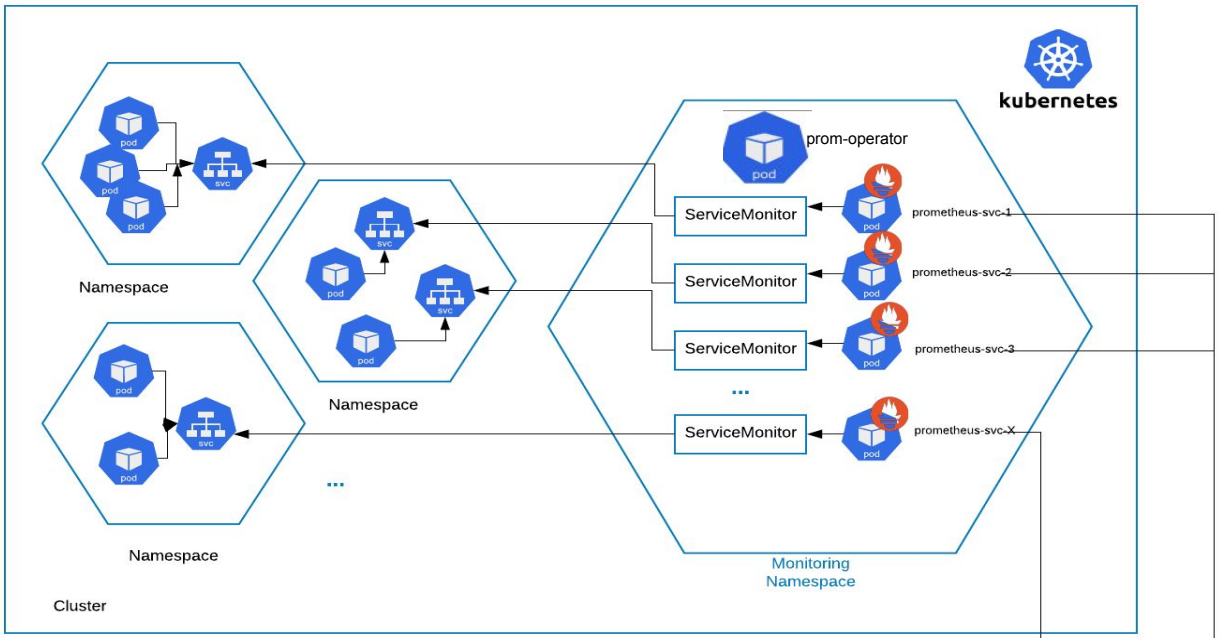
Alice
Observability Team

+

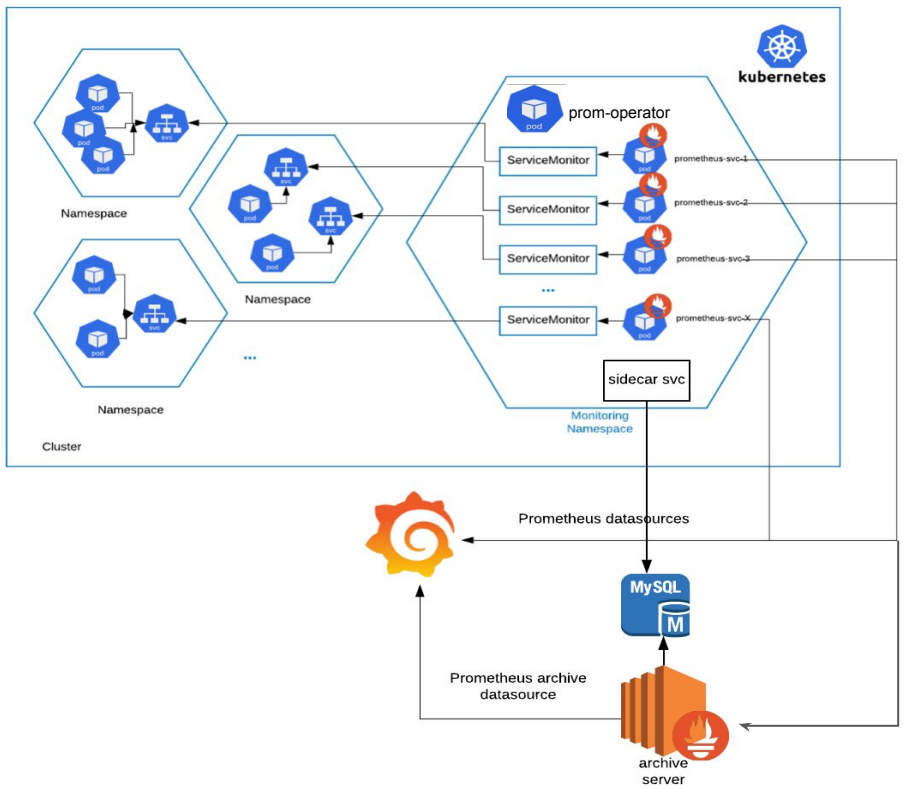
= ?

Prometheus Operator

Solution - metrics for all services



Solution: archived metrics for longer retention



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Awesome!!! 🙌 🙌 🙌

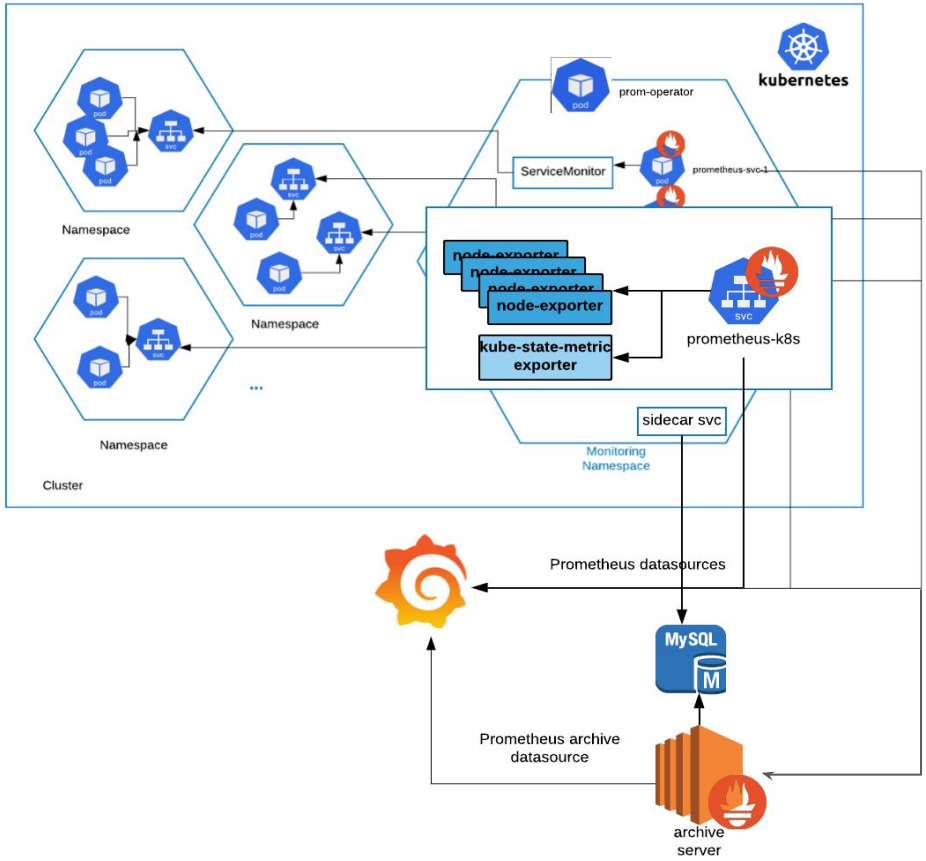
Charlie
Cloud Infrastructure Team

Speaking of 🔥, sometimes issue happens inside k8s cluster. We need the capability to monitor the k8s health itself.

Sure thing! Kubernetes has a large, rapidly growing ecosystem. Its services, support, and tools are widely available [1]

Alice
Observability Team

Solution


kubernetes
prom-operator
ServiceMonitor
prometheus-svc-1
Namespace
Namespace
Namespace
node-exporter
node-exporter
node-exporter
node-exporter
kube-state-metric exporter
prometheus-k8s
sidecar svc
Monitoring Namespace
Cluster
Prometheus datasources
MySQL
Prometheus archive datasource
archive server

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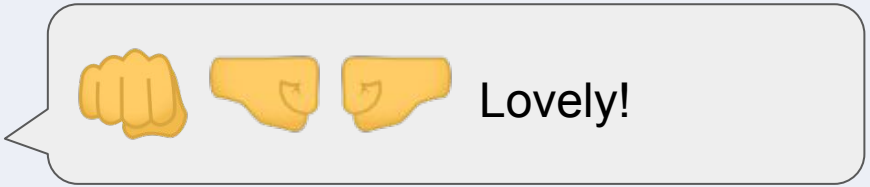

Bob
Backend Team

Are infrastructure resources being taken care of? Do we have metrics for them?

Let me look into that!

Alice
Observability Team

Infrastructure Monitoring

Component	Method
Elasticsearch Clusters	Prometheus elasticsearch exporter
Kafka Clusters	Prometheus kaf rter, Prometheus k mer group exporter
AWS RDS Instances	Prom s clou exporter
AWS Dynamodb	Pr loudwatch exporter

Charlie
Cloud Infrastructure Team

Now everything gets settled!
With the help of k8s, we can scale the testing environments with monitoring! Could we **reduce manual dashboard creation** work?

We should definitely do that! Also Grafana has many useful APIs, I can develop that automation utils!

Alice
Observability Team

Wrote my Grafana dashboard automation utils with the help of **Grafanalib** in Python with a Http client wrapper. Would help a lot when **duplicating** similar dashboards for all **clusters** and all **environments**

Alice
Observability Team

Summary

- Have Grafana as a **central monitoring** place
  - Detailed real-time metrics for each service
  - Longer term historical key metrics available

- Monitor the health of all the **microservices** running in containers and VMs
- Monitor the health of **Kubernetes clusters**
- Monitor the health of all of our **infrastructure resources**, e.g. Elasticsearch, Dynamodb, Redis, etc
- Datasource auto-discovery and Dashboard auto-creation

Demo Time

Reference

[1] https://kubernetes.io/docs/concepts/overview/what-is-kubernetes/

[2] Emoji icons supplied by EmojiOne

[3] Kubernetes related icons https://github.com/octo-technology/kubernetes-icons

QUESTIONS?

THANKS