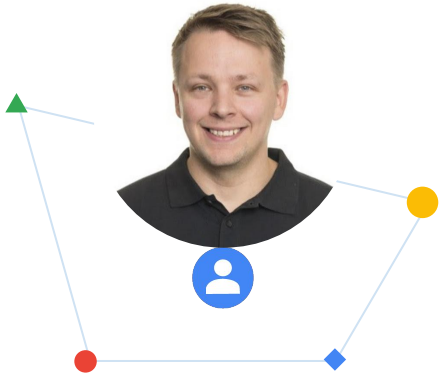
Google Cloud

Road to Managed Prometheus on GKE



Simon Ostling

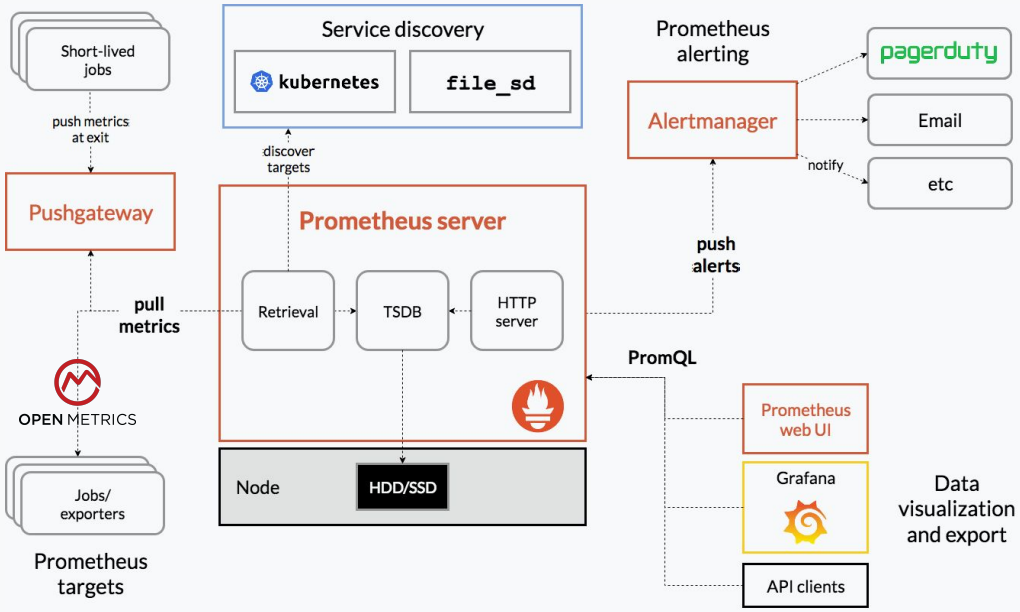
Customer Engineer
Google Cloud

Prometheus

is a popular monitoring tool backed by **CNCF**, widely considered to be the **de-facto standard solution** for Kubernetes workloads.

Typical setup

- **PromQL** is the query language for Prometheus deployments and is **increasing in popularity**
- **Grafana** is a popular open source dashboard that is closely affiliated with Prometheus
- Standardized metrics scraping (i.e. /metrics) in **OpenMetrics** format



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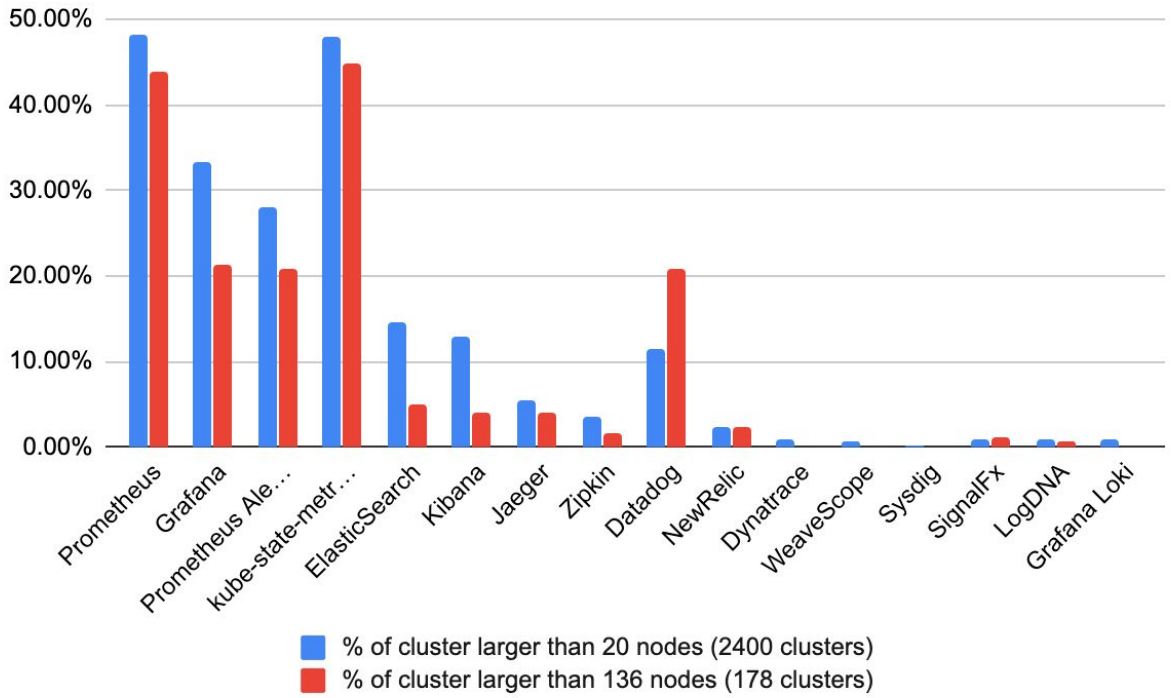
GKE users want Prometheus

- **48% of clusters running Prometheus today.** 33% run Grafana. 28% run prometheus alert manager.
- **Cloud Monitoring adoption at 27%.** 90% of clusters have monitoring enabled (it's by default)



Analysis of 3rd party observability agents running within a cluster

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Challenges with Prometheus

02

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Prometheus is great.

Managing Prometheus for small deployments is easy.

Managing Prometheus at scale can be hard.

Hard to scale horizontally

Hard to make global

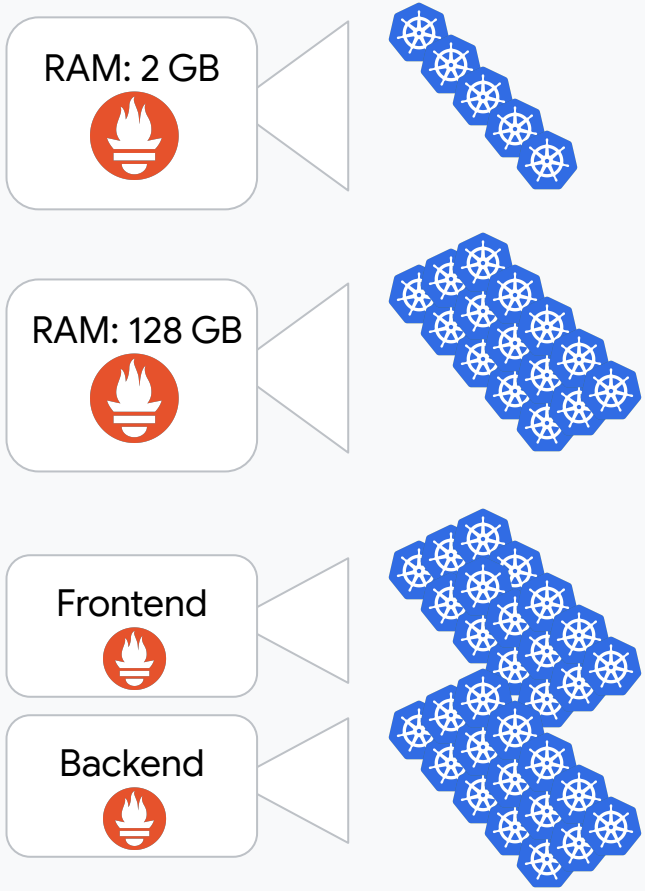
Maintenance toil

Prometheus can be hard to scale horizontally

01

02

03



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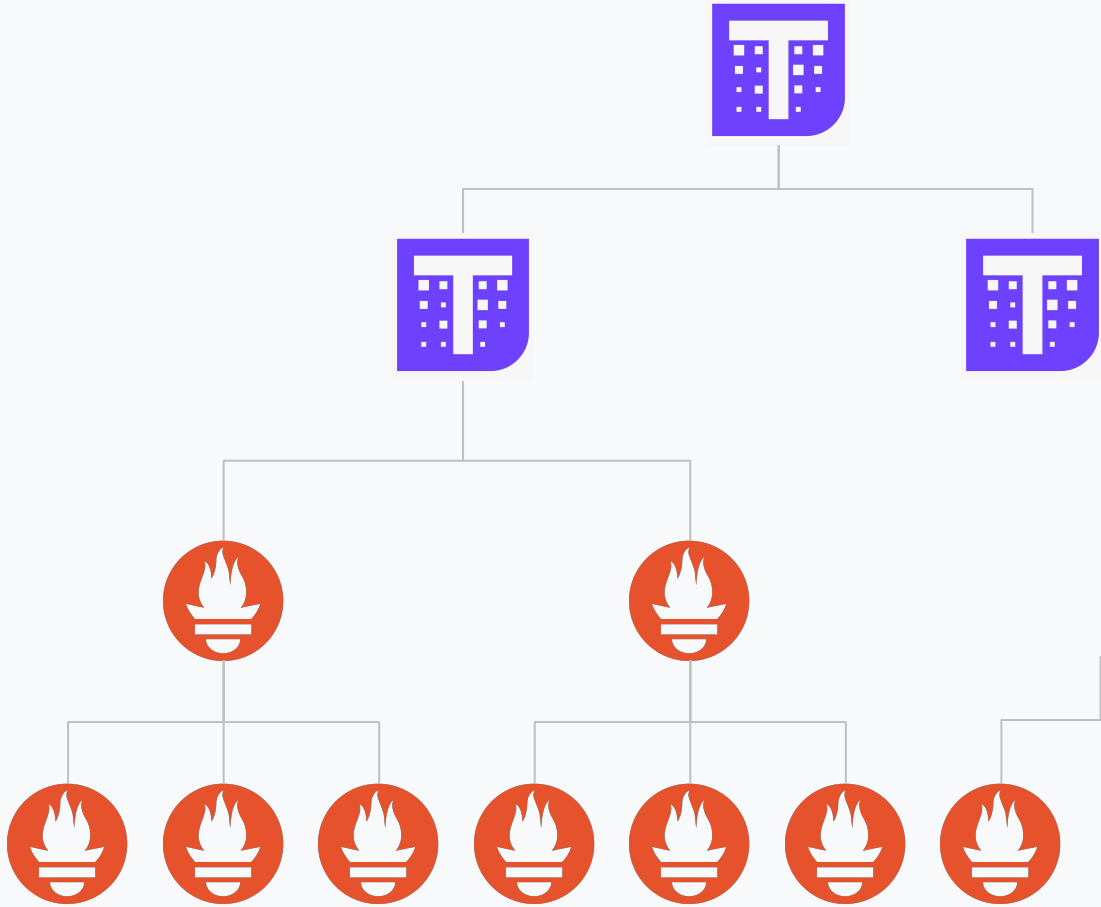
Prometheus can be hard to make global



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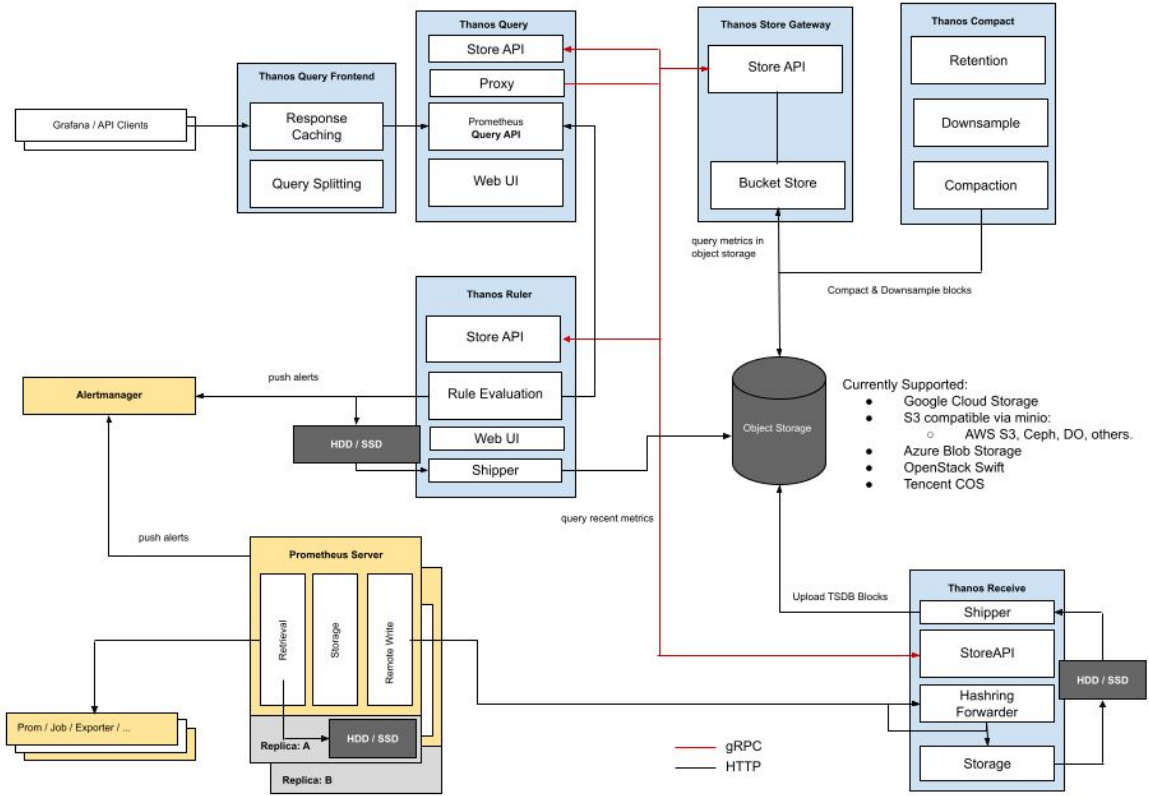
Prometheus can be hard to operate



https://github.com/thanos-io/thanos

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Google Cloud Managed Service for Prometheus

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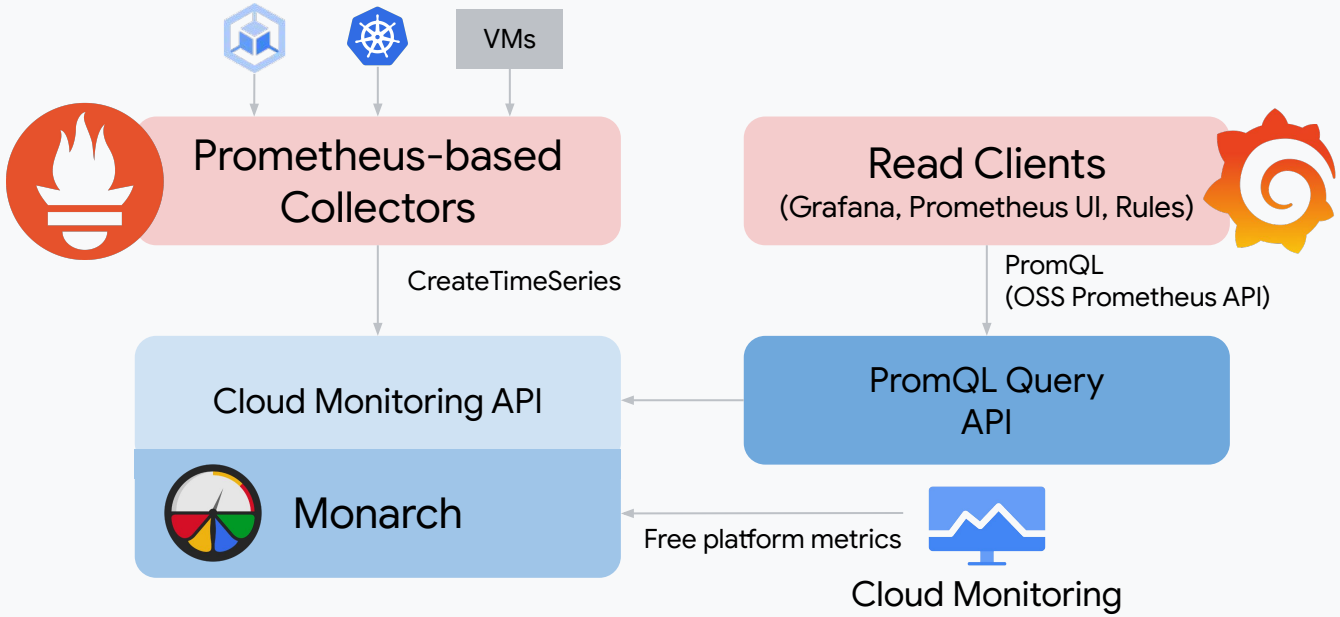
Managed Prometheus at a Glance



- **A Prometheus-compatible** monitoring service offering ingesting, querying, and alerting
- Tightly **integrated with GKE**
- **Scalable metric storage and retrieval** as a service using open source interfaces

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Datastore: Monarch, Google's planet-scale in-memory time series database

- Same tool used to monitor internal Google
- Has over **2 trillion time series in RAM** and **65,000,000,000,000,000 points on disk**, writes over **4.2 TB/s**, monitors **58 billion resources**
- Configured for **2-year retention**
- Regional storage with **ad-hoc global aggregations** at query time

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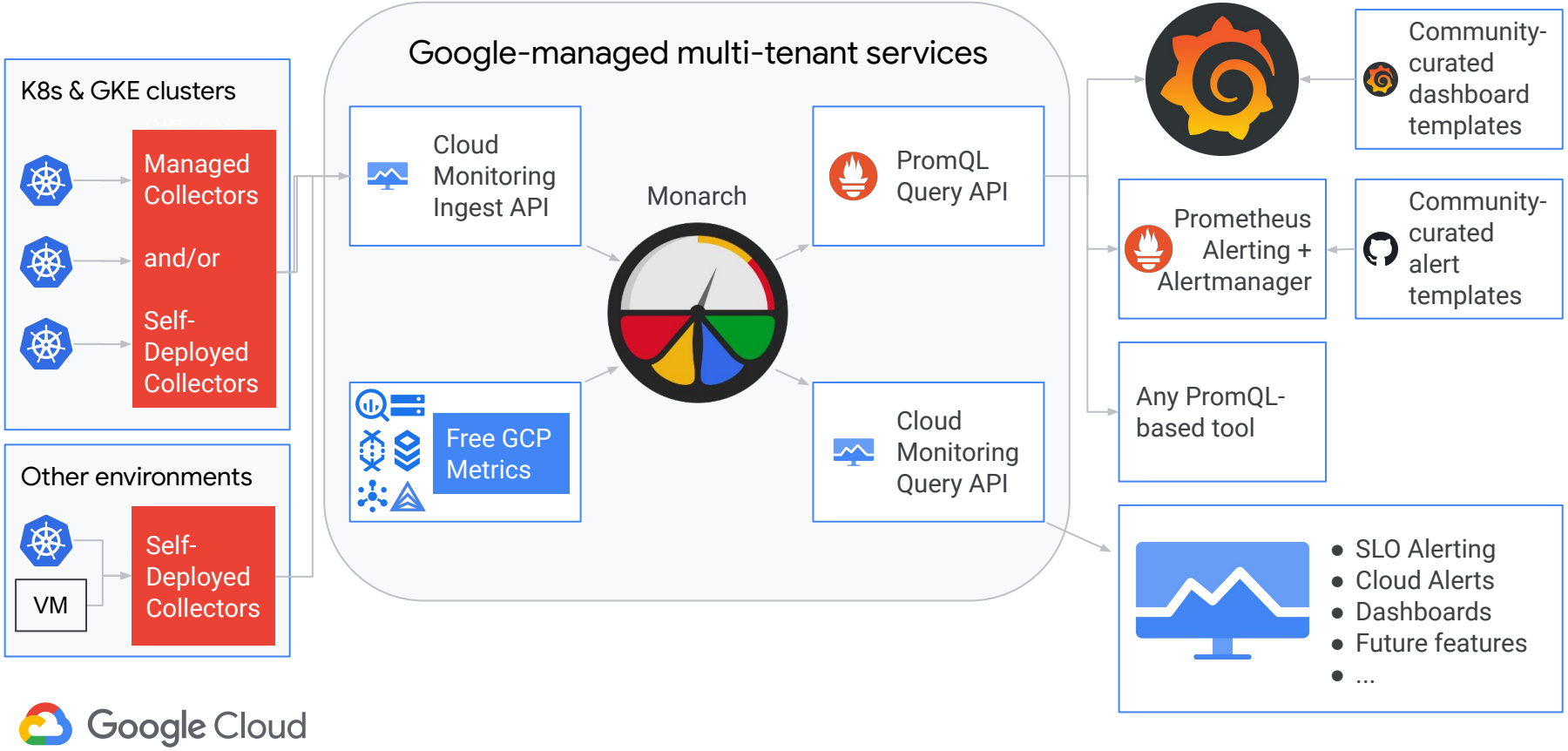
The Managed Service for Prometheus Ecosystem



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Why run GMP vs run Prometheus Yourself?

- **Removes customer toil**
- Offers greater **reliability** than can easily be achieved by running Prometheus yourself
- Offers greater **scalability** than running Prometheus yourself
- **Elastic** capacity
- Implements **best practices** for Prometheus-based monitoring

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Easy Drop in Replacement

- **One click switch** to go from existing Prometheus deployments to managed
- Existing Grafana dashboards **continue to work** without disruption

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All roads lead to Managed Prometheus

04

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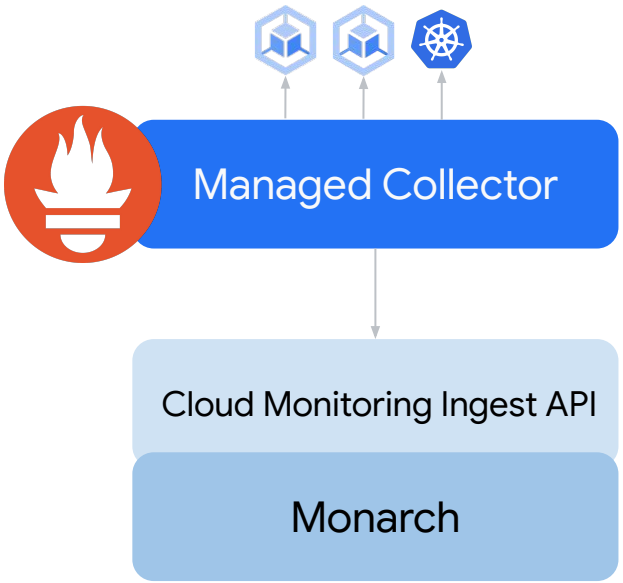
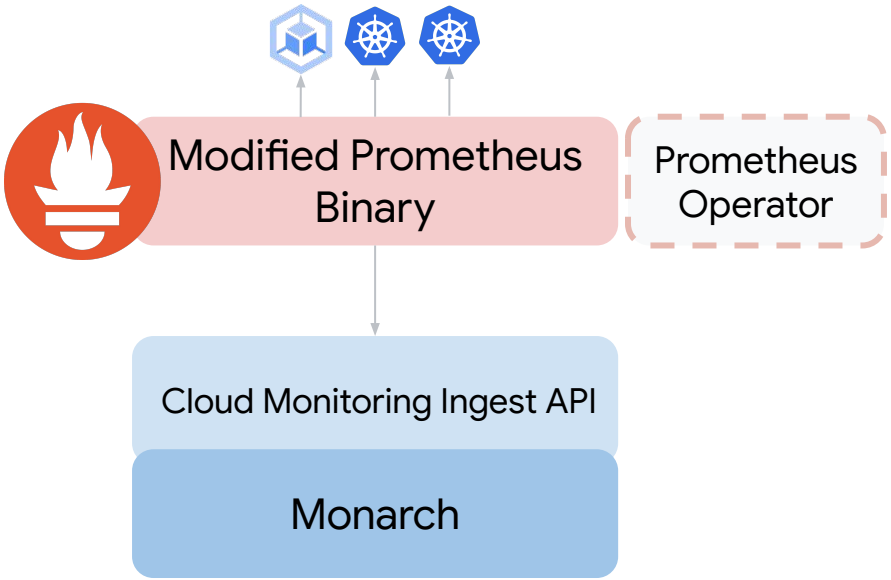
Managed Collection VS Self-deployed Collection





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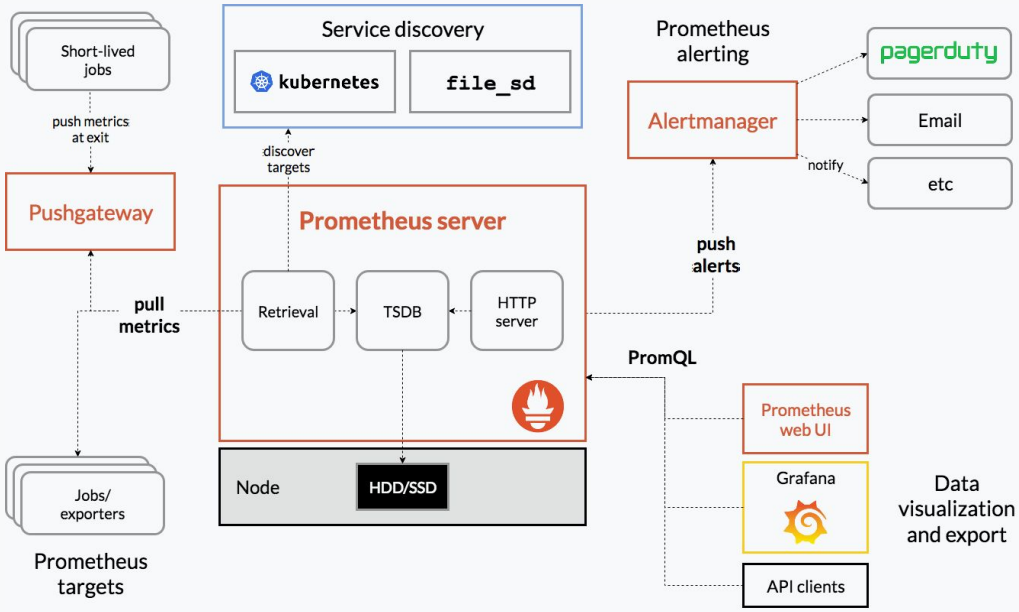
Self-deployed Collection

- **Modified binary** compatible with existing Prometheus deployments
- Metrics are **forwarded** to **Cloud Monitoring Ingestion API** instead
- Works with **prometheus-operator**, **kube-prometheus**, ...
- Built-in support for **highly available collection** by using leader election



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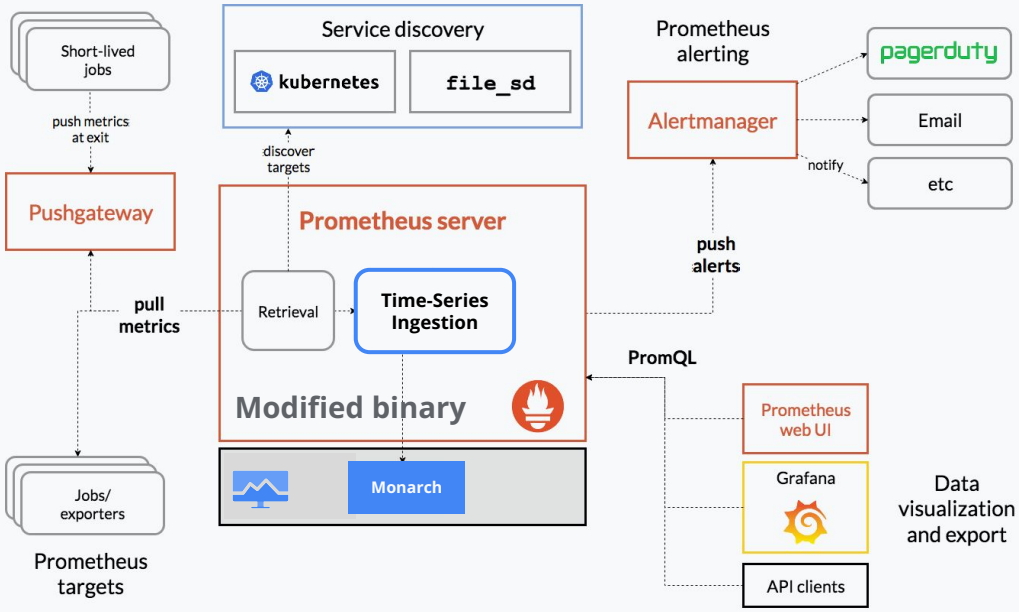

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Using prometheus-operator

- Only image change required with **workload identity** setup
- Modified binaries exist for different versions
- Outside of GKE you can **mount the credentials** and set required environment variables

```
apiVersion: monitoring.coreos.com/v1
kind: Prometheus
metadata:
  name: gmp-test
  namespace: gmp-system
spec:
  image: gke.gcr.io/prometheus-engine/prometheus:v2.35.0-gmp.2-gke.0
  ...
  replicas: 1
  serviceAccountName: default
  version: v2.35.0
  ...
  secrets:
  - gmp-sa-key
  containers:
  - name: prometheus
    env:
    - name: GOOGLE_APPLICATION_CREDENTIALS
      value: /gmp/key.json
    volumeMounts:
    - name: secret-gmp-sa-key
      mountPath: /gmp
      readOnly: true
  ...
```

Short demo

Q&A