Kubernetes Monitoring with Prometheus

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Why?

- Dynamic environments
- High level visibility
- Drill-down troubleshooting

How?

- Pull based monitoring
- Multi dimensional model
- Able to process large amounts of data

Querying

- PromQL

Find 3 endpoints with most errors in the last hour:

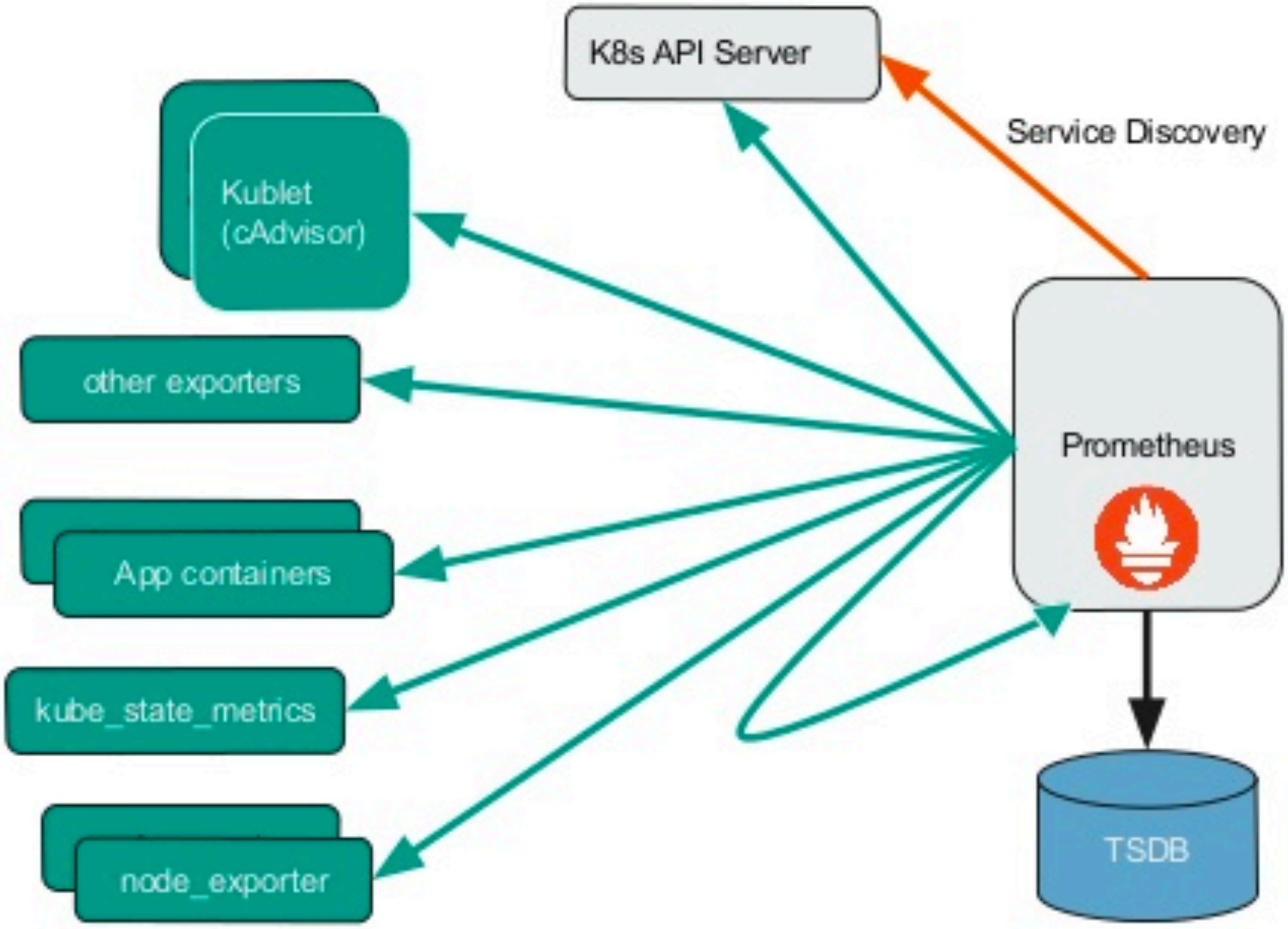
```
topk(
  3, sum(
    rate(api_http_requests_total{code='500'}[1h])
  ) by (endpoint)
)
```

Querying

Find disks that will fill up in 3 hours:

```
rules:
- alert: DiskWillFillIn4Hours
    expr: predict_linear(node_filesystem_free{job="node"}
[1h], 4 * 3600) < 0
```

Cluster monitoring



Performance monitoring

```
// Init
const Prometheus = require('prom-client')
const httpRequestDurationMicroseconds = new Prometheus.Histogram({
  name: 'http_request_duration_ms',
  help: 'Duration of HTTP requests in ms',
  labelNames: ['route'],
  // buckets for response time from 0.1ms to 500ms
  buckets: [0.10, 5, 15, 50, 100, 200, 300, 400, 500]
})
```

```
// After each response
httpRequestDurationMicroseconds
  .labels(req.route.path)
  .observe(responseTimeInMs)
```

```
// Metrics endpoint
app.get('/metrics', (req, res) => {
  res.set('Content-Type', Prometheus.register.contentType)
  res.end(Prometheus.register.metrics())
})
```

Alerting

- Alert manager

Deployment

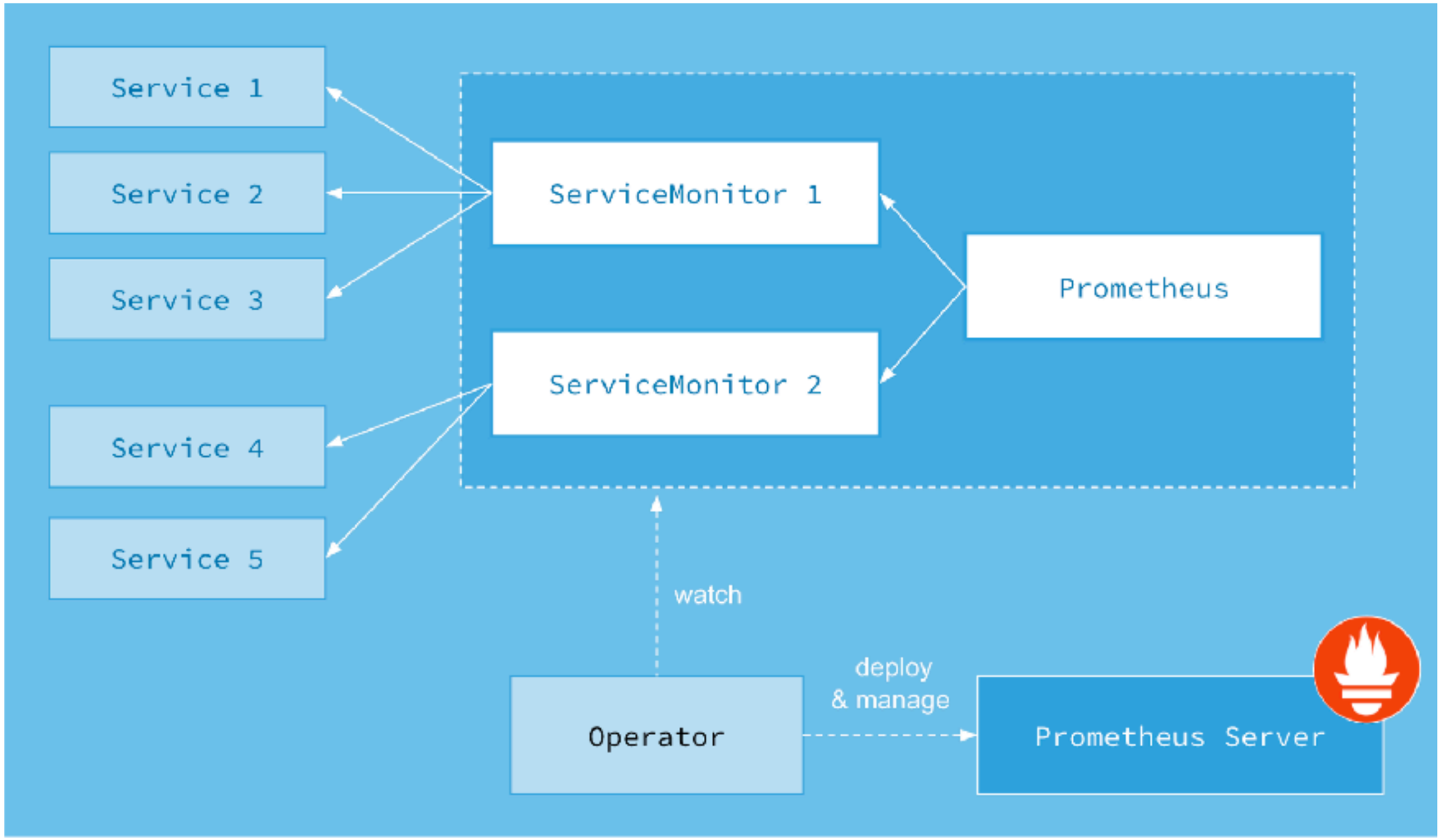
- Prometheus Operator
  - Prometheus
  - ServiceMonitor
  - AlertManger

```
apiVersion: monitoring.coreos.com/v1
kind: Prometheus
metadata:
  name: prometheus
spec:
  serviceAccountName: prometheus
  serviceMonitorSelector:
    matchLabels:
      team: frontend
  resources:
    requests:
      memory: 400Mi
```

Operator

```
apiVersion: monitoring.coreos.com/v1
kind: ServiceMonitor
metadata:
  name: example-app
  labels:
    team: frontend
spec:
  selector:
    matchLabels:
      app: example-app
  endpoints:
  - port: web
    path: /metrics
    interval: 30s
```

Operator


Service 1
Service 2
Service 3
Service 4
Service 5
ServiceMonitor 1
ServiceMonitor 2
Prometheus
watch
Operator
deploy
& manage
Prometheus Server

Demo

Thank you <3