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China 2018

Seamless Integration - Take Kubernetes into your Existing Monitoring Stack



Agenda

- About Me
- Background
- Problem
- Solution
- Solution scenarios

About Me

- Iris Ding (丁少君- dingsj@cn.ibm.com)
- IBMer
- Rich Experience on Middleware production development experience
- Rich Experience on Open Source development
- Apache CXF committer
- Current focus on Service Mesh, Istio

Background

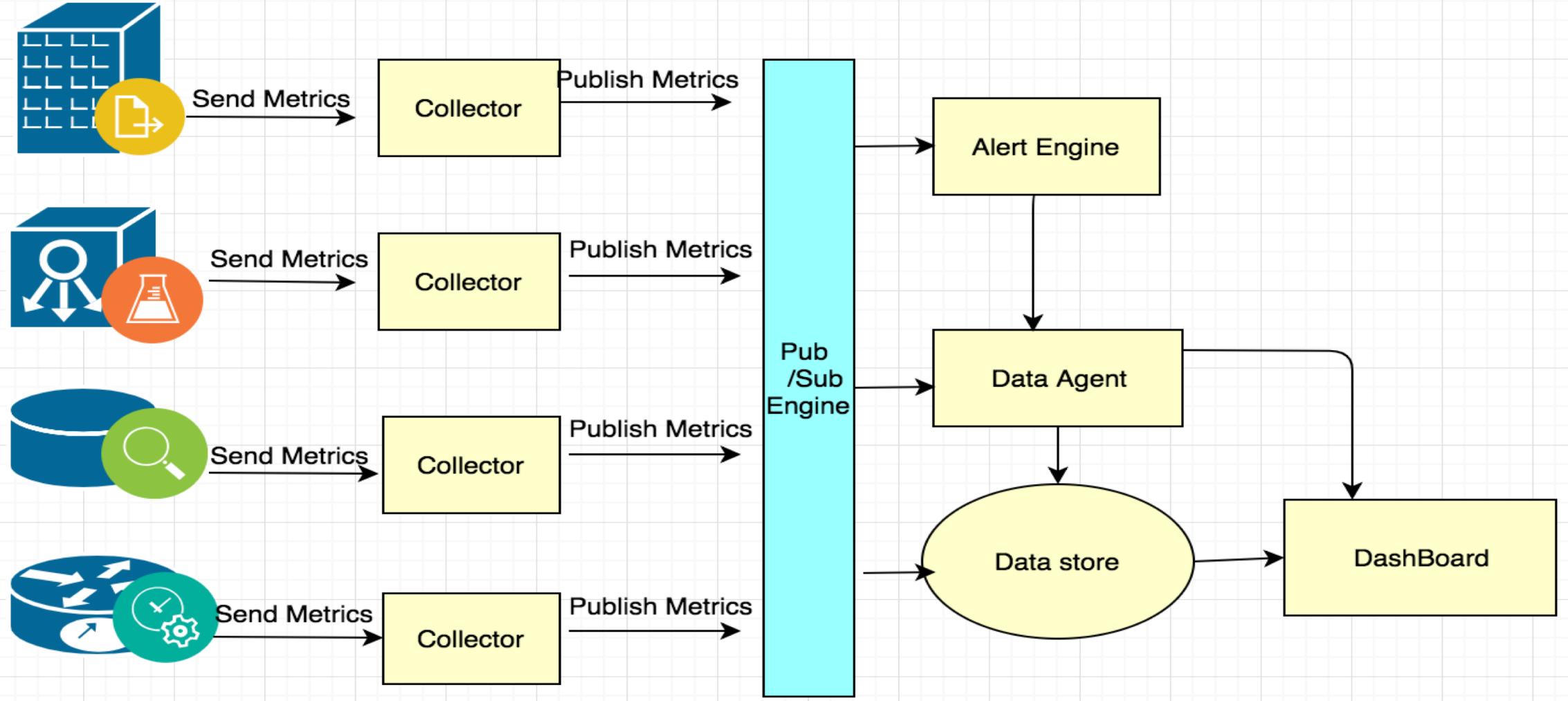


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Background

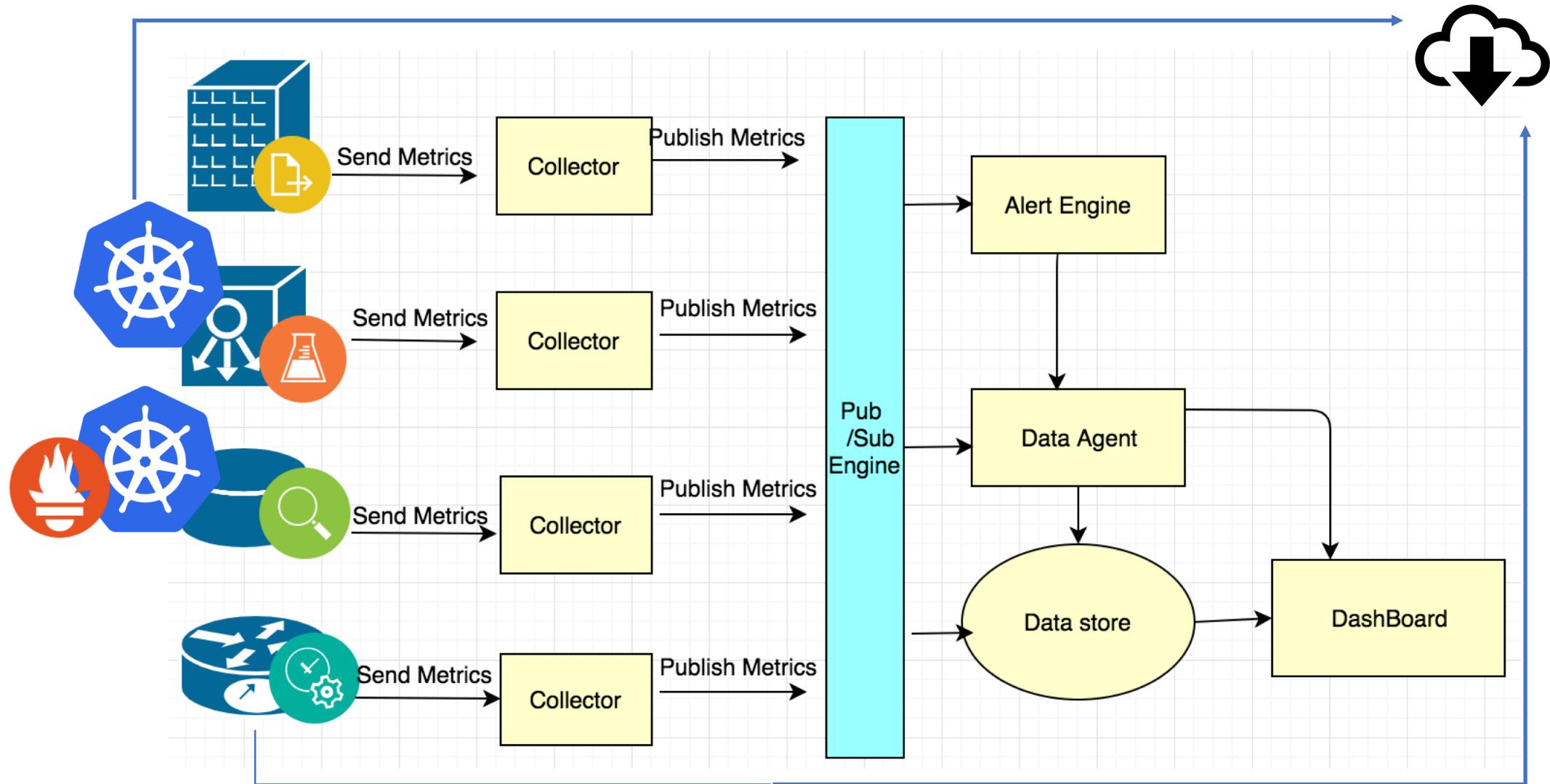


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Problems

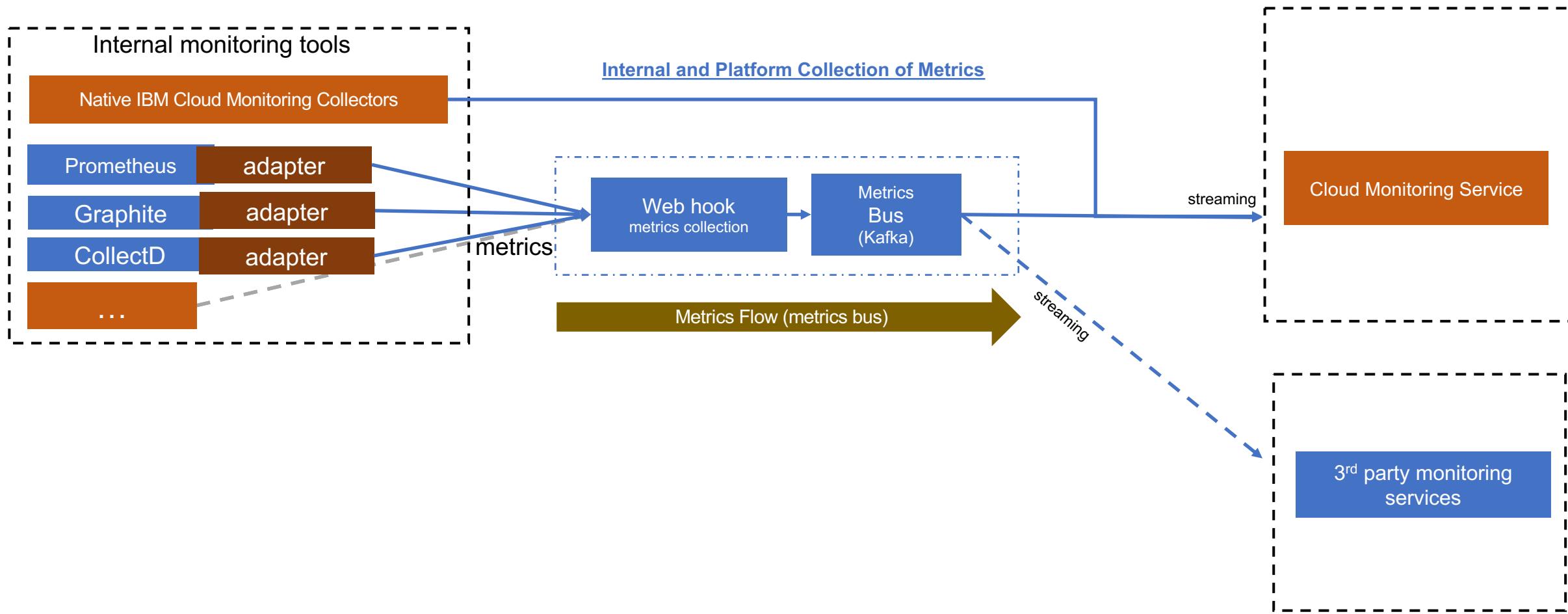
- **Short-lived vs Long-running**
- **Dynamic**
- **Monolithic applications --> Microservices**
- **Large amount of Metrics**
- **Central view of whole system status**

Metrics Integration Architecture



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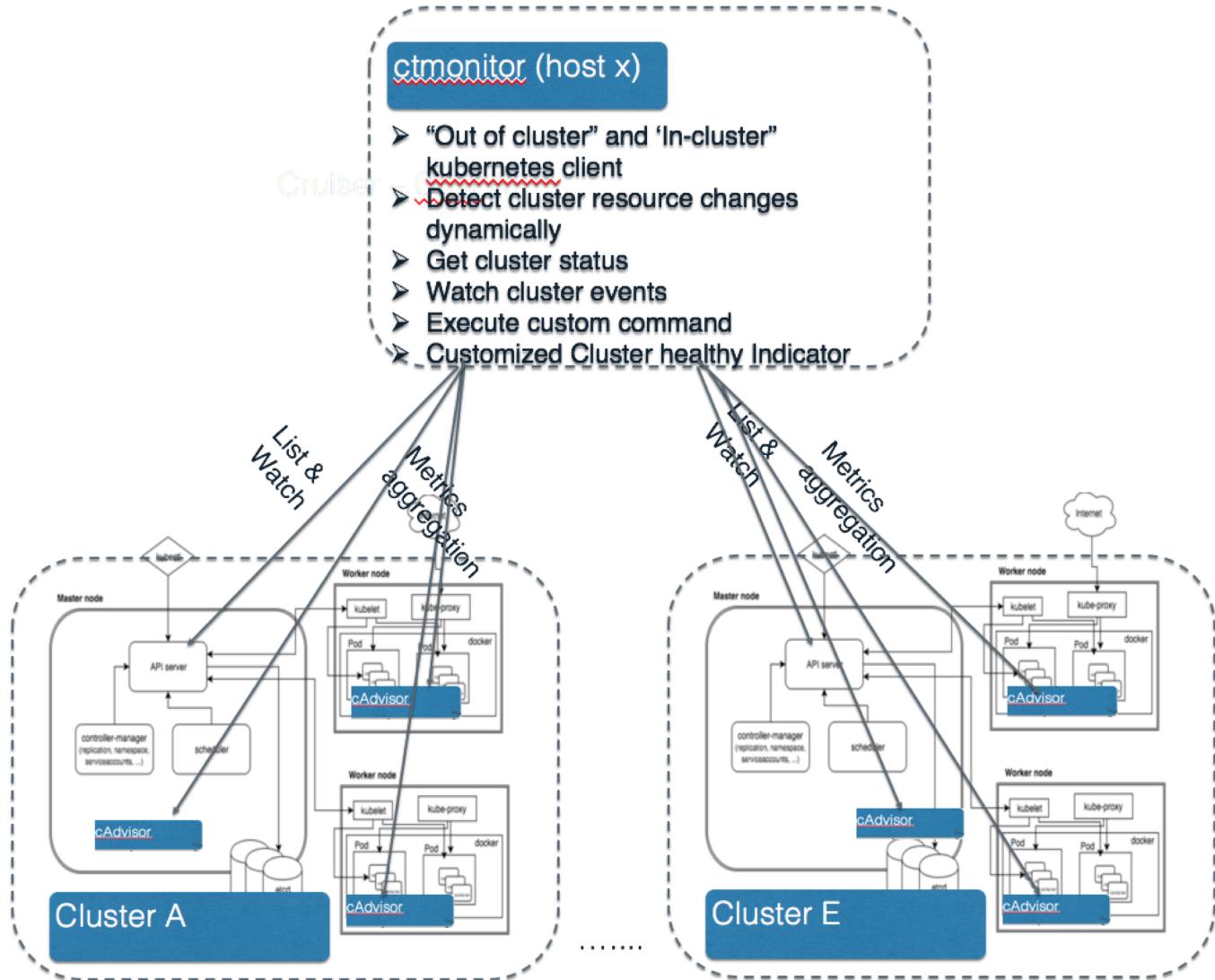
Solution1 – Self-maintained



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Solution1 – Self Maintained

- Resource usages for whole cluster
- Resource usage for pod
- Resource usage for every containers in the cluster
- Resource usage for nodes
- Node status , Pod status, Node Number, Pod Number
- Cluster events
- Specific metrics via executing command

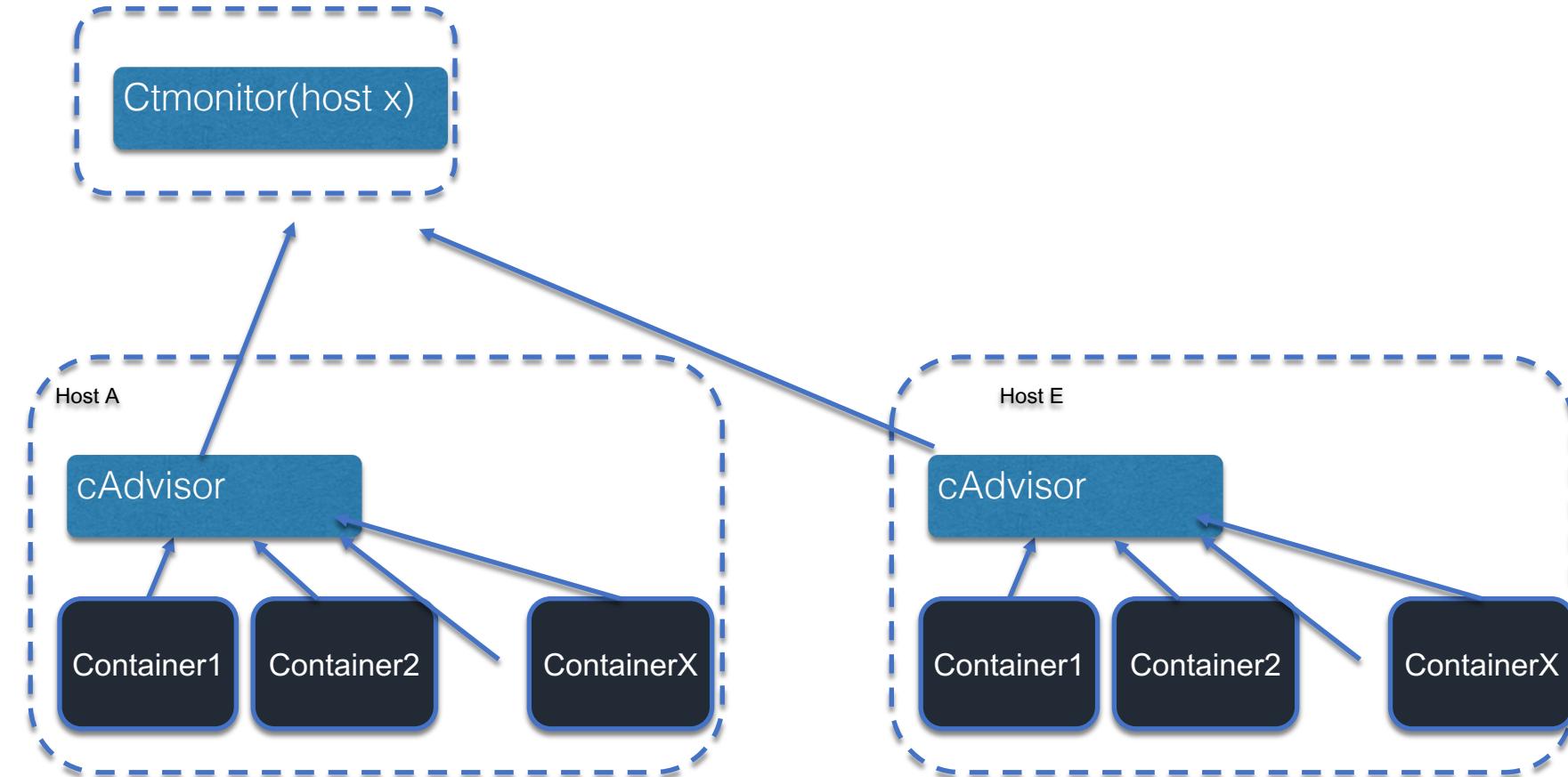
Solution1 – Self Maintained



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- Available metrics:
 - Specific container's resource usage includes CPU, memory, disk and load average of CPU.
 - Active container counts
 - resource usage for whole containers on a host

cAdvisor consideration



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Issue	Solution
No cAdvisor	Install cAdvisor as daemon set
cAdvisor port is disabled	Enable cAdvisor port (KUBELET_CADVISOR_ARGS=--cadvisor-port=0)

Solution 1 - Dashboard



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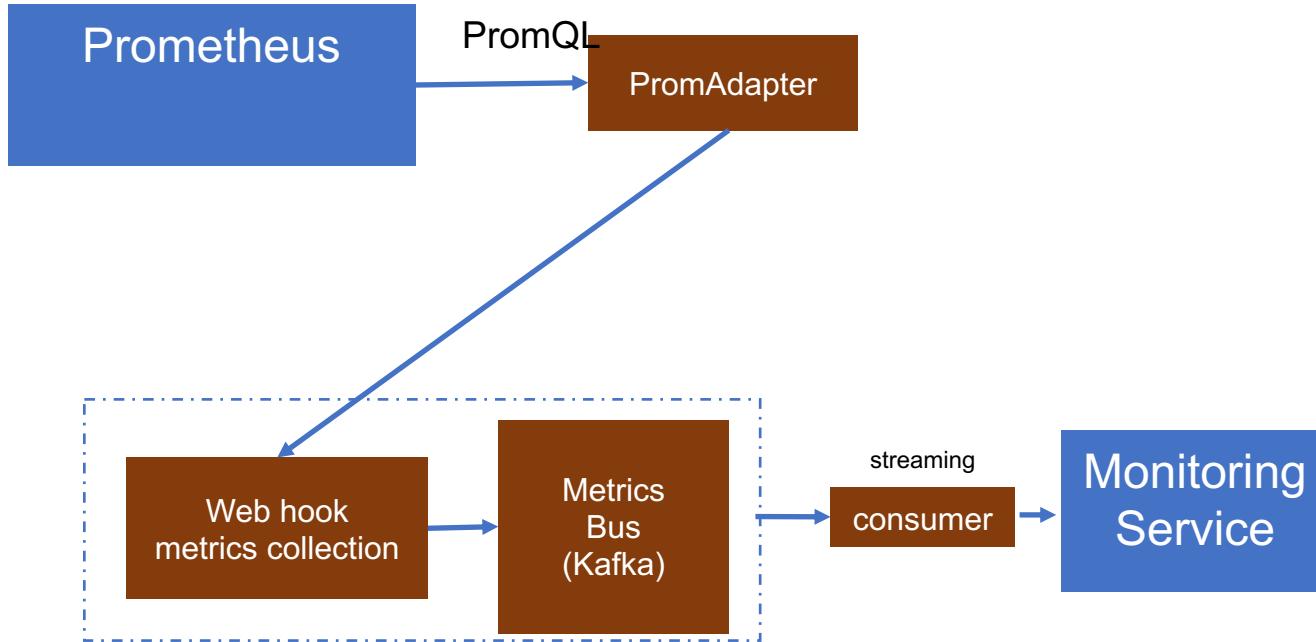
Solution 2 - Prometheus



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```
{
  "prometheus": {
    "url": "http://9.123.123.123:9090",
    "max_read": 5,
    "max_conn": 5,
    "CustomLabel": {
      "org": "monitor_org",
      "env": "monitor_env",
      "cluster": "monitor_cluster"
    }
  },
  "promMetrics": [
    {
      "metric": "container_cpu_usage_seconds_total",
      "prefix": "container_cpu_usage_seconds_total",
    },
    {
      "metric": "container_memory_working_set_bytes",
      "prefix": "container_memory_working_set_bytes"
    },
    {
      "metric": "container_network_transmit_bytes_total",
      "prefix": "container_network_transmit_bytes_total"
    },
    {
      "metric": "container_fs_usage_bytes",
      "prefix": "container_fs_usage_bytes",
    }
  ],
  "interval": 60
}
```

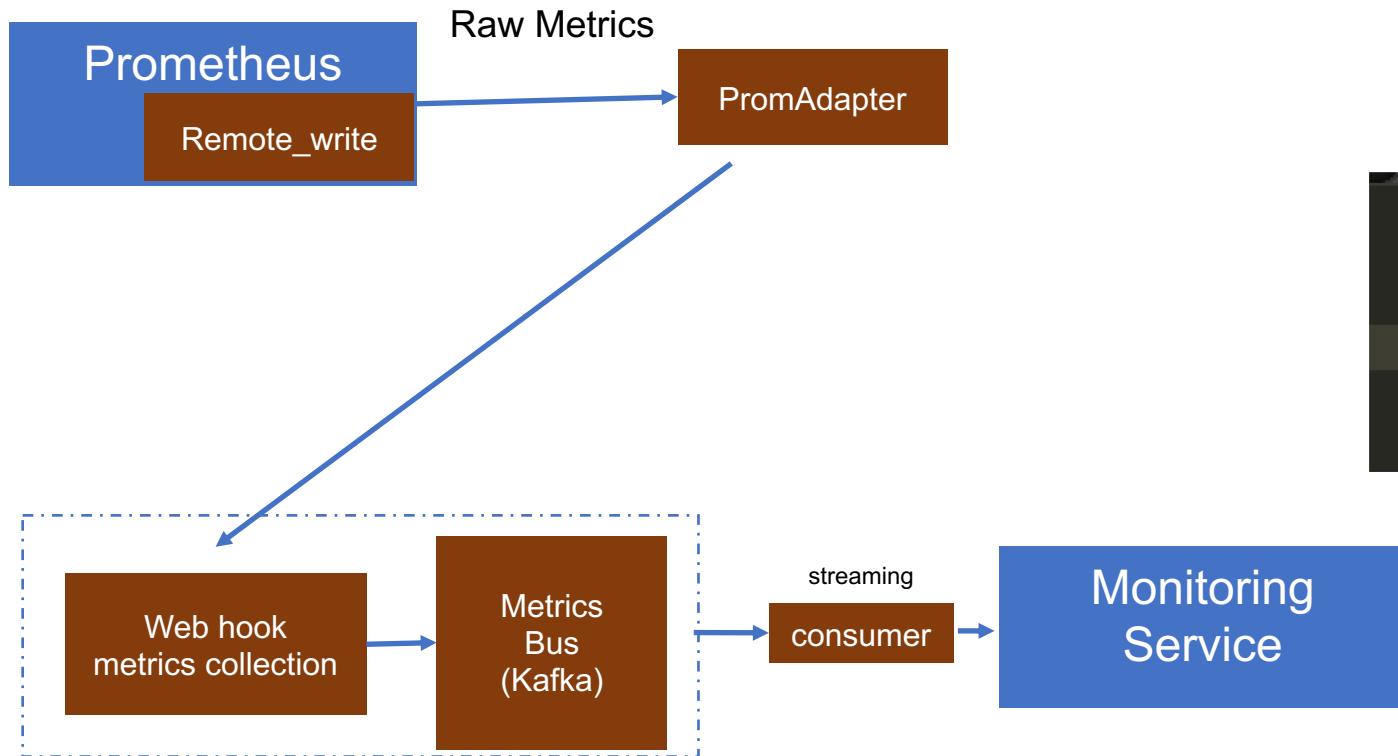
Solution 3 - Prometheus



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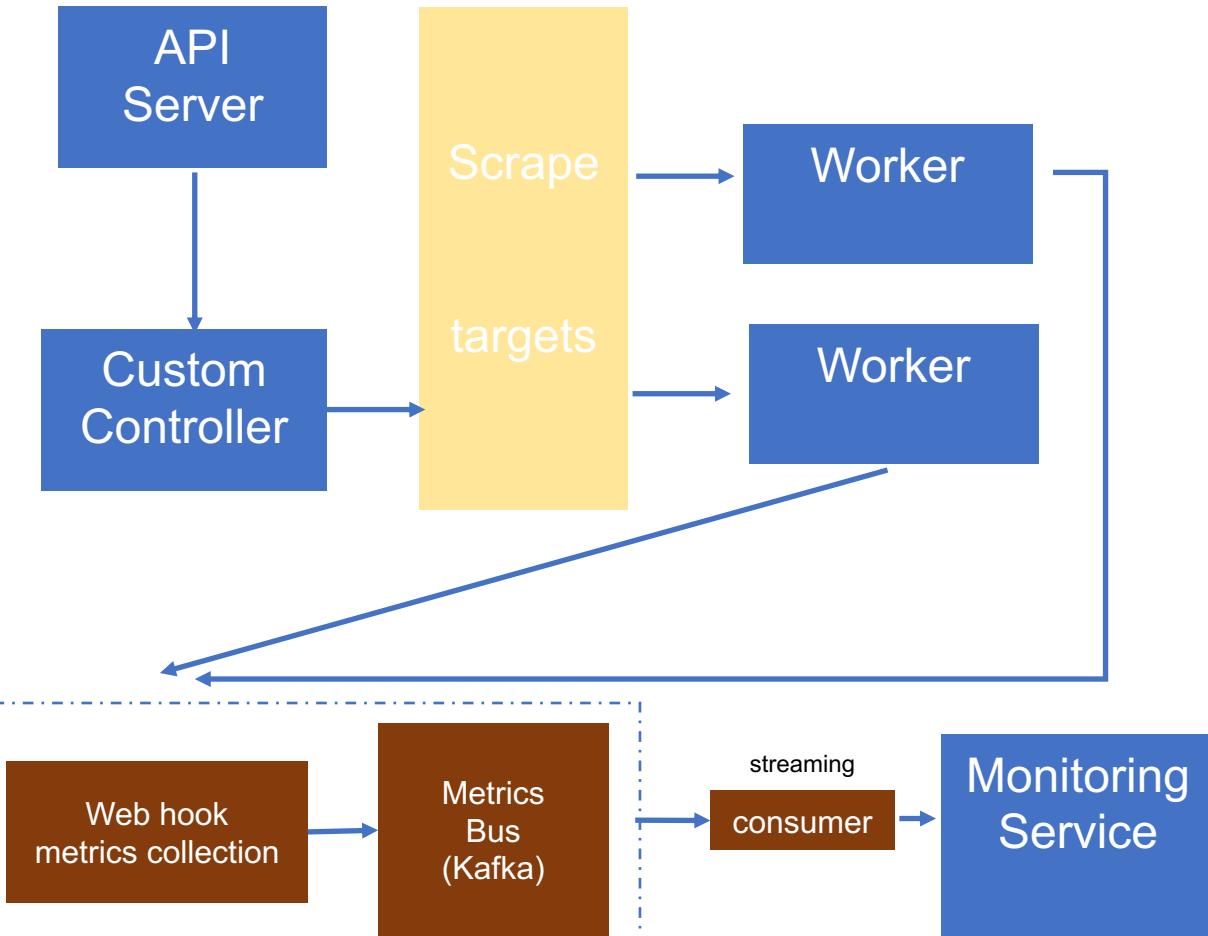
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```
global:  
  scrape_interval: 5s  
remote_write:  
  - url: "http://9.123.123.123:1234/receive"
```

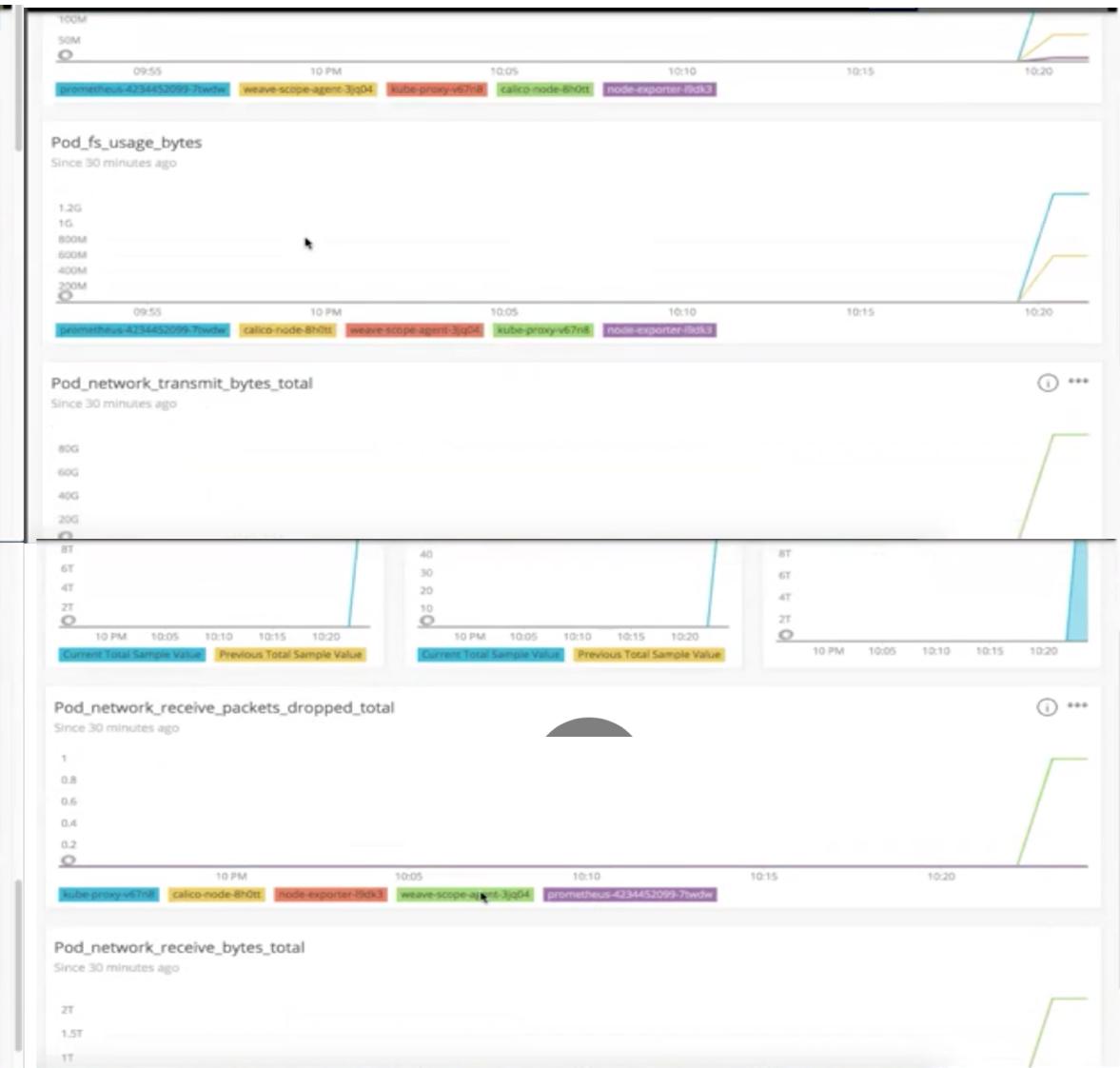
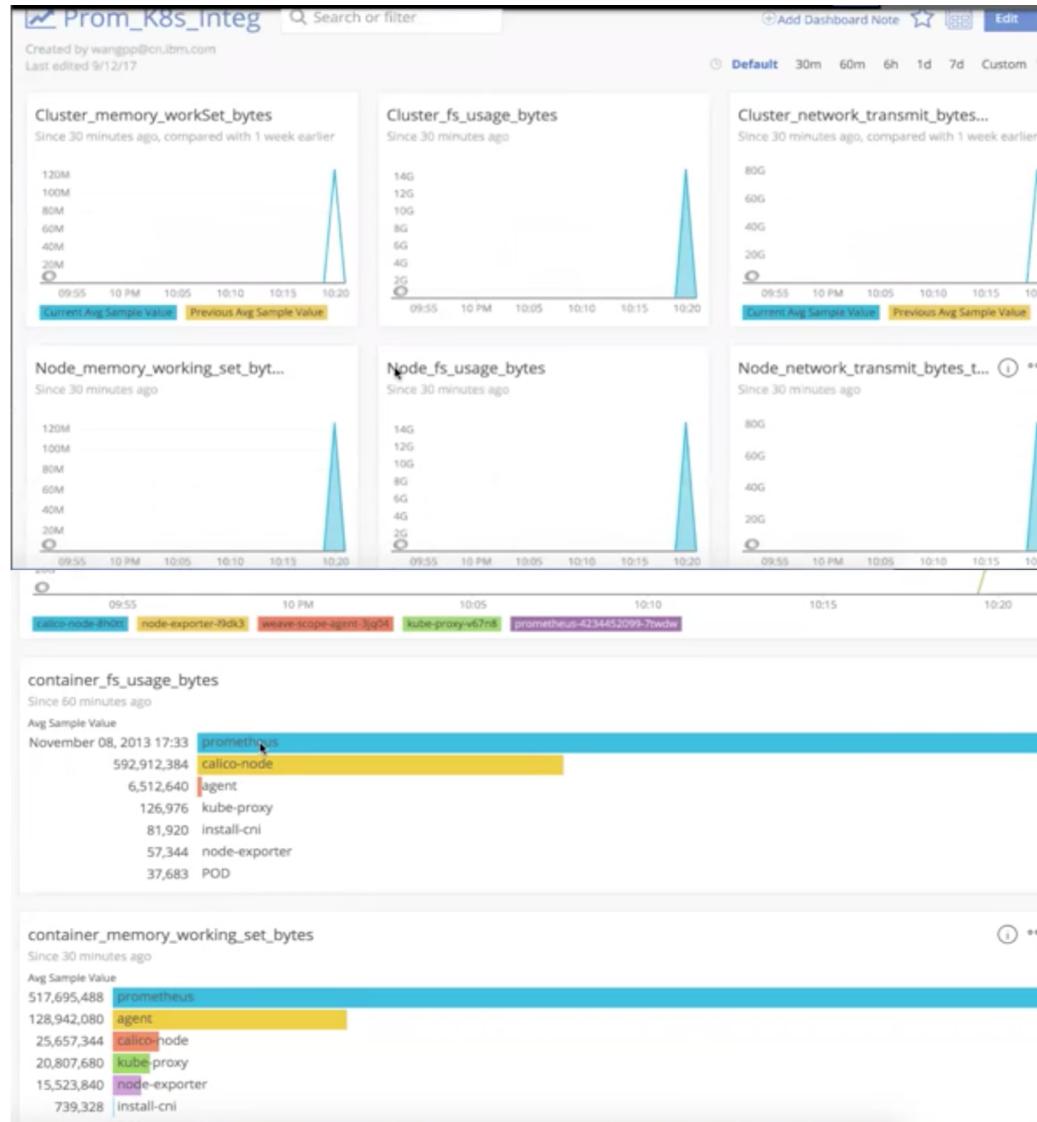
Solution 4 – Exporter Only



```

if _, ok := svc.GetAnnotations()["prometheus.io/scrape"]; ok {
    annotations := svc.GetAnnotations()
    promScrape := annotations["prometheus.io/scrape"]
    if promScrape == "true" {
        var (
            subpath = "/metrics"
            port   = "9090"
        )
        if _subpath, ok := svc.GetAnnotations()["prometheus.io/path"]; ok {
            subpath = _subpath
        }
        if _port, ok := svc.GetAnnotations()["prometheus.io/port"]; ok {
            port = _port
        }
        return &scrape.Target{
            Source: key,
            URL:   fmt.Sprintf("http://%v.%v:%v%v", name, namespace, port, subpath),
        }, true
    }
}
  
```

Prometheus Dashboard



Summary

Solution	Pros	Cons	User cases
Self-maintained	<ul style="list-style-type: none">No extra Maintenance effort	<ul style="list-style-type: none">Self development	No Prometheus
Prometheus with Remote-write	<ul style="list-style-type: none">No performance penalty	<ul style="list-style-type: none">Need change configNeed higher version of PrometheusMaintenance effort	Prometheus
Prometheus with Query	<ul style="list-style-type: none">Has Performance penalty	<ul style="list-style-type: none">No need to change configNo need upgrade PrometheusMaintenance effort	Prometheus
Exporters Only	<ul style="list-style-type: none">No performance penaltyNo Maintenance effort	<ul style="list-style-type: none">Rely on exporters	No Prometheus But with exporters

Alert Integration

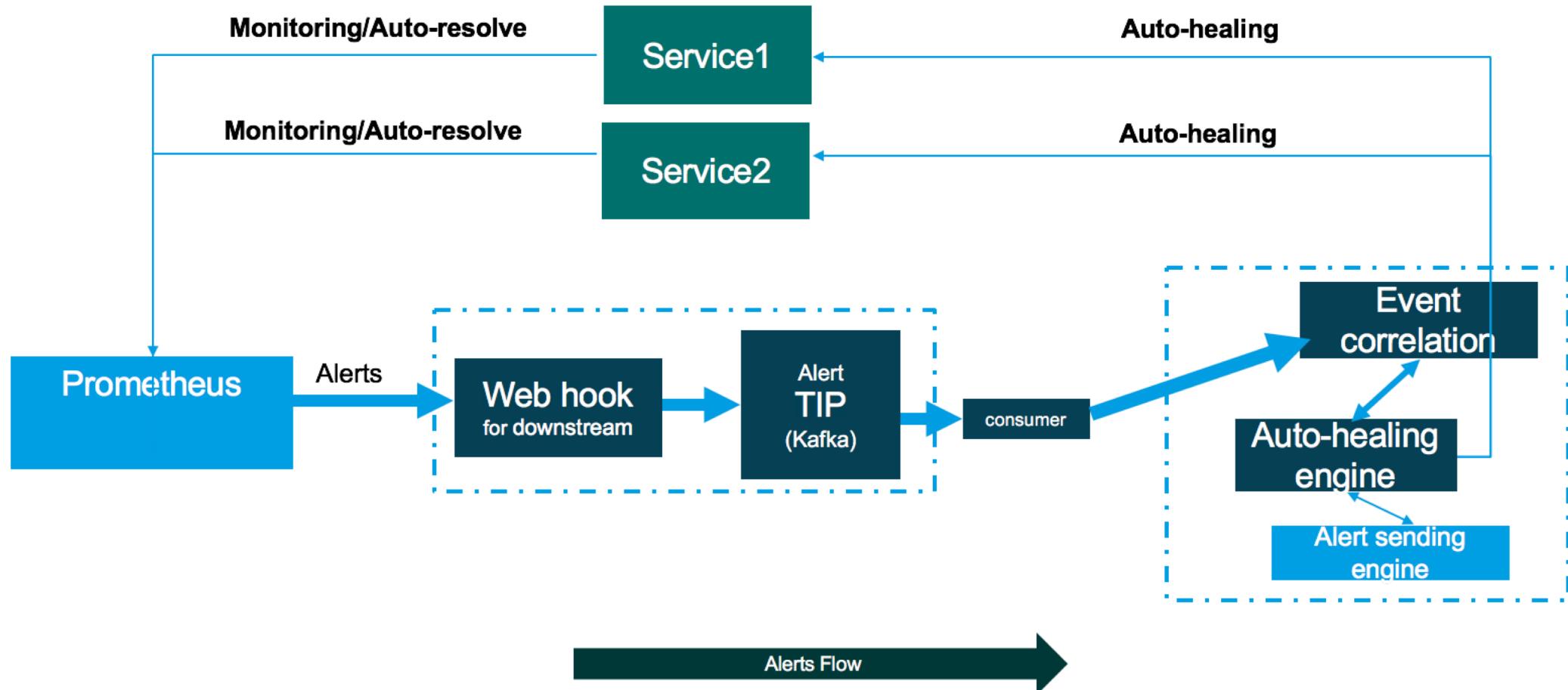


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Demo



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THANKS!

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