Elastic's journey with Kubernetes

K8s released

Filebeat
Metricbeat

Helm Charts
Join CNCF
Infrastructure UI

Elastic Cloud on
Kubernetes

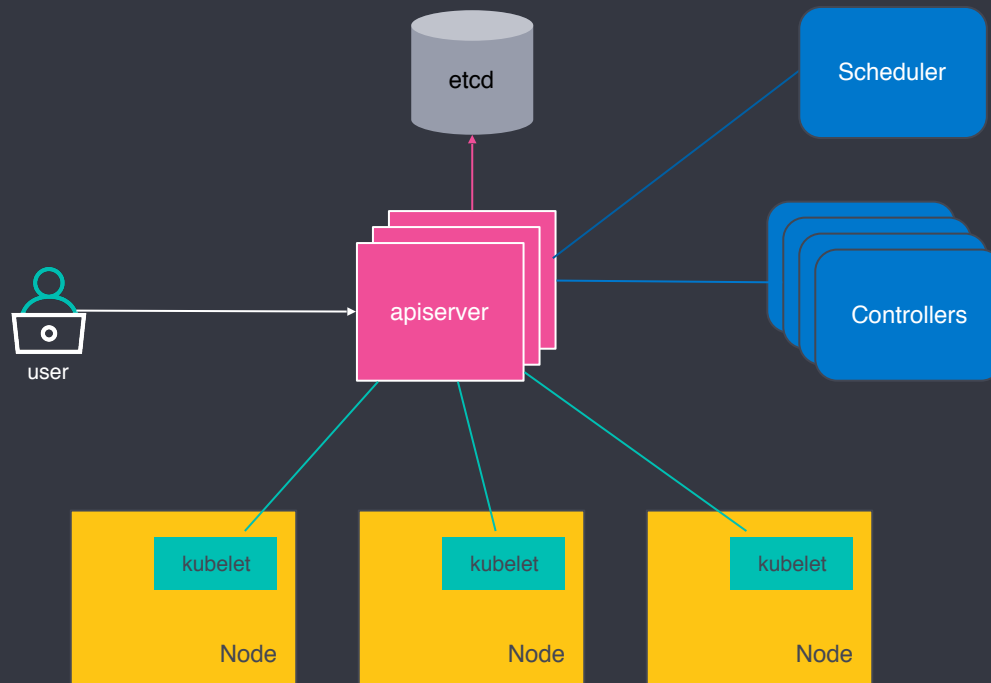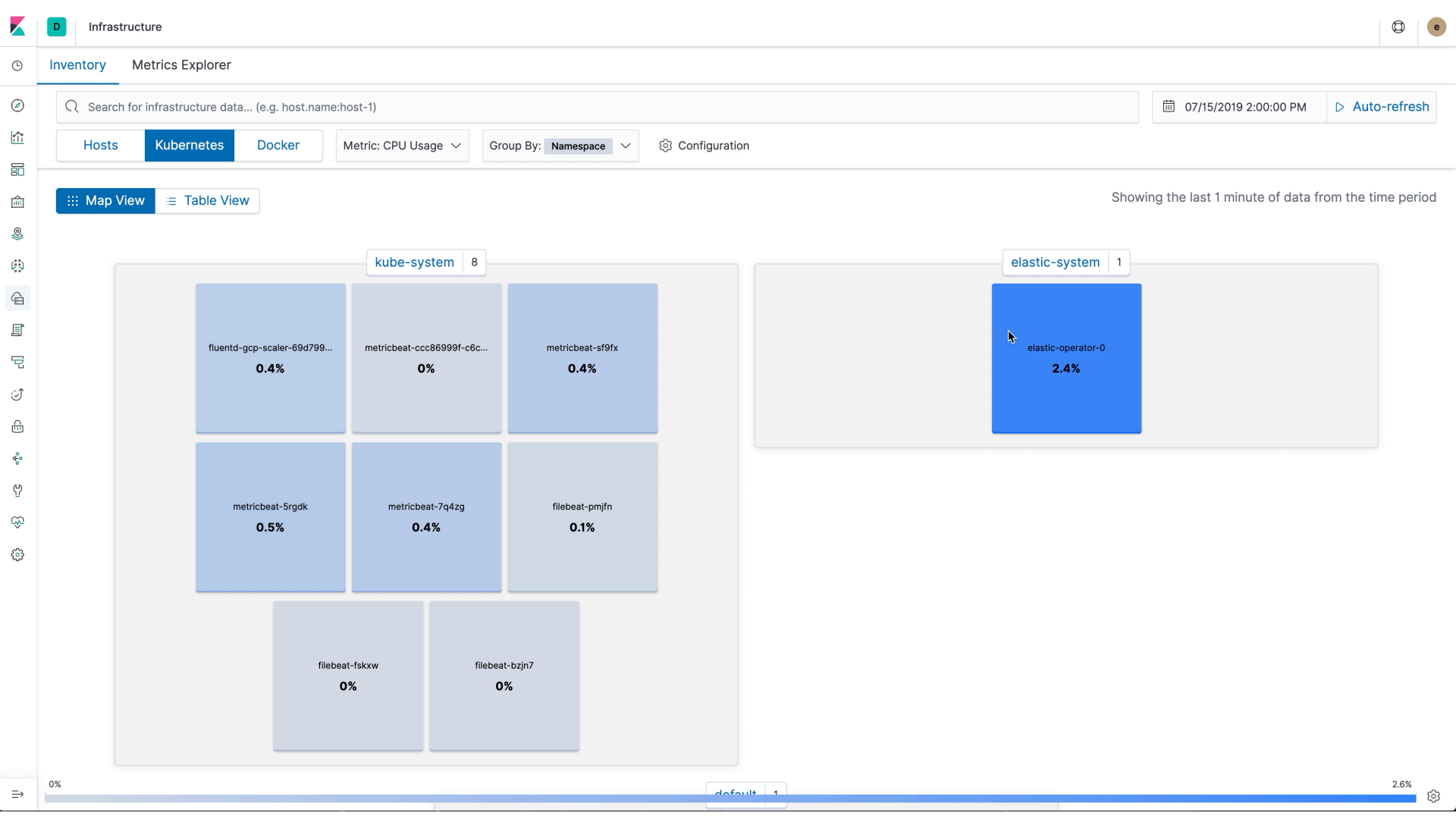2015   2017   2018   2019

Kubernetes and you…

Kubernetes architecture

Inventory   Metrics Explorer

Search for infrastructure data... (e.g. host.name:host-1)

07/15/2019 2:00:00 PM   ▷ Auto-refresh

Hosts   Kubernetes   Docker

Metric: CPU Usage ⌄   Group By: Namespace ⌄   ⚙ Configuration

⊞ Map View   ☰ Table View

Showing the last 1 minute of data from the time period

kube-system   8

fluentd-gcp-scaler-69d799...
0.4%

metricbeat-ccc86999f-c6c...
0%

metricbeat-sf9fx
0.4%

metricbeat-5rgdk
0.5%

metricbeat-7q4zg
0.4%

filebeat-pmjfn
0.1%

filebeat-fskxw
0%

filebeat-bzjn7
0%

elastic-system   1

elastic-operator-0
2.4%

0%

default   1

2.6%

Challenges of running on Kubernetes

- Managing Kubernetes resources: pods, nodes, services

- Storage: persistent, local, or ephemeral

- Maintaining uptime and high availability

- Ensuring consistent security: secrets, certs, and TLS

- Namespace isolation and flexibility

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Enter Kubernetes Operators

A better way to run on K8s

Custom Resource Definitions (CRDs)

Extending the Kubernetes API with Elasticsearch, Kibana, and APM Server definitions.

Controllers

Bring CRDs to life, and handle any changes

Allow you to embed best practices

Where can we get best practices of running elasticsearch?

Custom Resource Definitions (CRDs)

Controllers

Elastic Cloud and Elastic Cloud Enterprise!

3
Public Cloud Providers

Azure
GCP
AWS

17
Regions supported

New regions being added throughout the year

7+
Years of experience

Operating before Kubernetes even existed

Elastic Cloud on Kubernetes

https://github.com/elastic/cloud-on-k8s
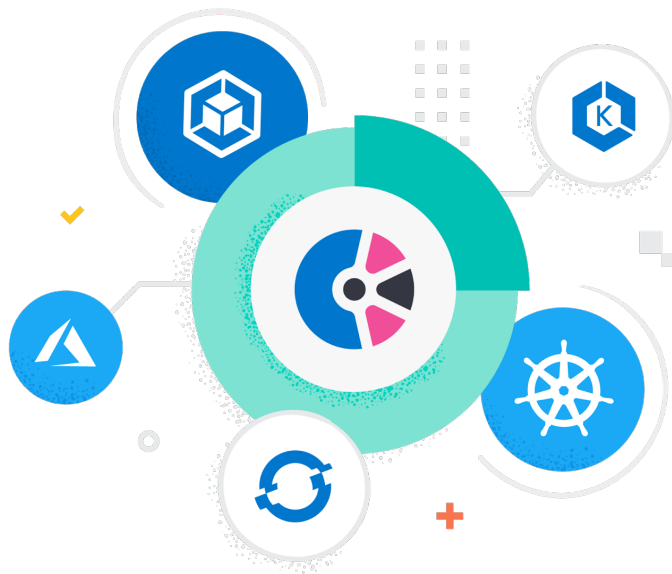
Deploy and Manage

Elasticsearch, Kibana, and APM Server

Supports multiple K8s distros

Azure Kubernetes Service (AKS), Elastic Kubernetes Service (EKS), Google Kubernetes Engine (GKE), Vanilla Kubernetes, and Red Hat Openshift

Native Kubernetes experience

Fully integrated with Kubernetes API, use kubectl to operate and control

Elastic Cloud on Kubernetes

Feature packed

Multi-cluster management
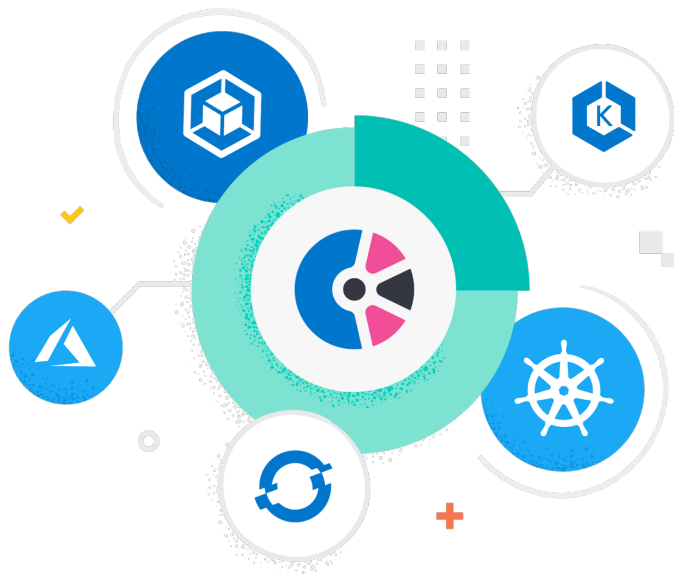Deploy one or dozens of clusters

Automatic security
All clusters have security and TLS configured

Snapshot scheduling and Keystore
Full access to Elasticsearch API for snapshotting and keystore settings

Advanced Topology
Supports hot-warm-cold deployments, dedicated masters/ingest, and machine learning

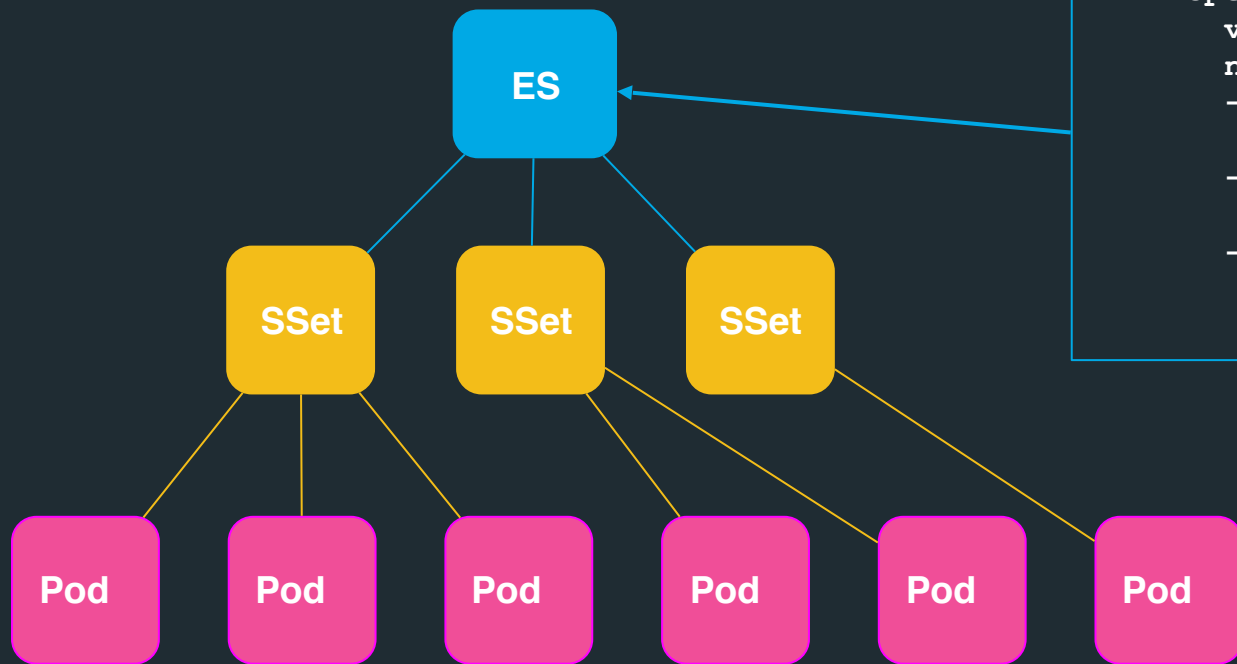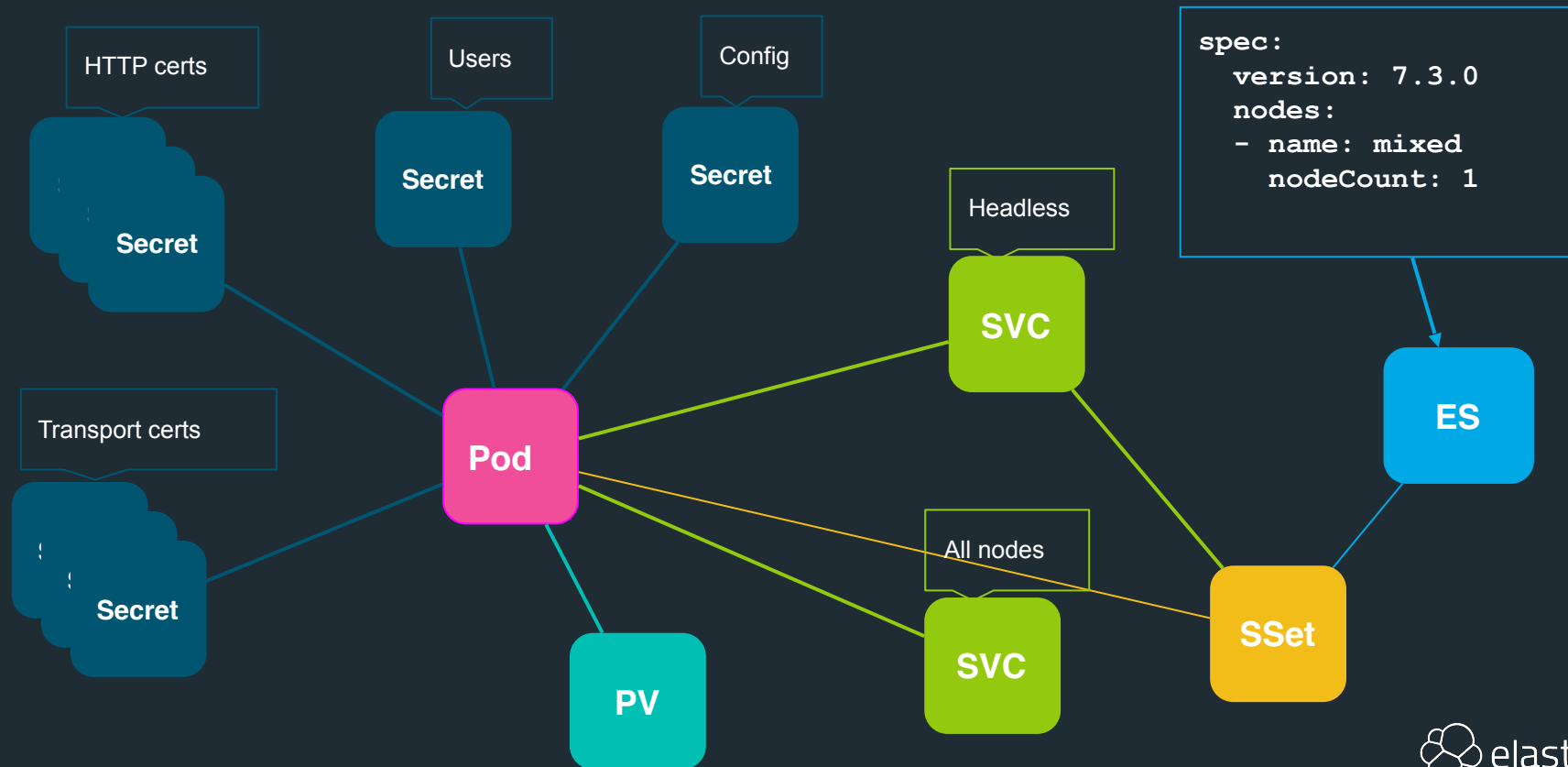# ECK: I want this cluster


```
spec:
  version: 7.3.0
  nodes:
  - name: masters
    nodeCount: 3
  - name: data
    nodeCount: 2
  - name: ingest
    nodeCount: 1
```

ES

elastic

ECK: here is your cluster


```
spec:
  version: 7.3.0
  nodes:
  - name: masters
    nodeCount: 3
  - name: data
    nodeCount: 2
  - name: ingest
    nodeCount: 1
```

ES

SSet   SSet   SSet

Pod   Pod   Pod   Pod   Pod   Pod

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ECK: Actually ...

HTTP certs

Secret

Users

Secret

Config

Secret

Transport certs

Secret

Pod

PV

Headless

SVC

All nodes

SVC

SSet

```
spec:
  version: 7.3.0
  nodes:
  - name: mixed
    nodeCount: 1
```

ES

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Demo

Roadmap

Roadmap
1.0 coming soon!

Beta

- StatefulSets support for ultra fast upgrades and configuration changes

Future

- Additional Kubernetes distribution support

- Auto-scaling

- AppSearch, Enterprise Search, and Site Search components

- Dedicated UI and API experience

Where to learn more

https://elastic.co/products/eck

GitHub repo and discuss forum

- https://github.com/elastic/cloud-on-k8s/

- https://discuss.elastic.co/c/eck

Getting Started

- https://www.elastic.co/guide/en/cloud-on-k8s/current/k8s-quickstart.html

- https://www.elastic.co/products/elastic-cloud-kubernetes

Internals

- https://www.youtube.com/watch?v=wMqzAOp15wo