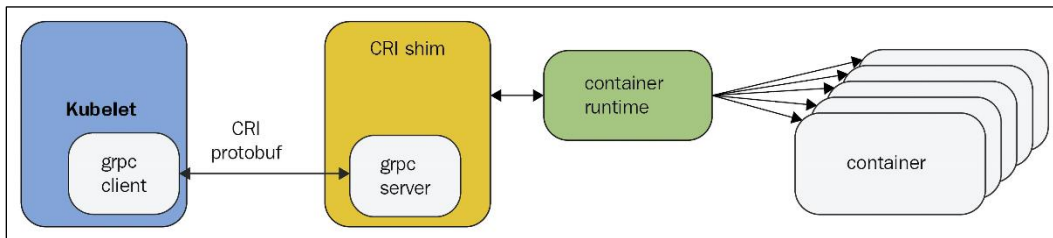
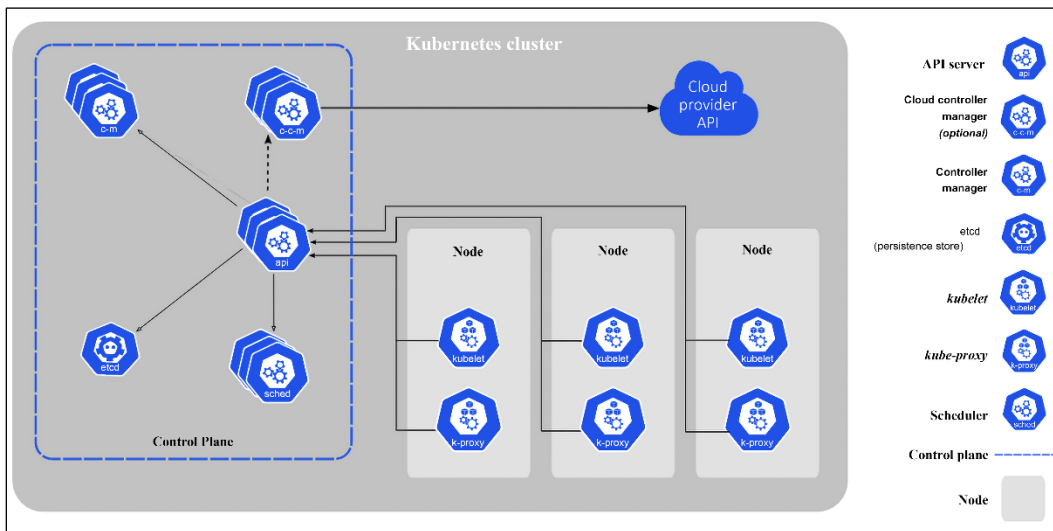
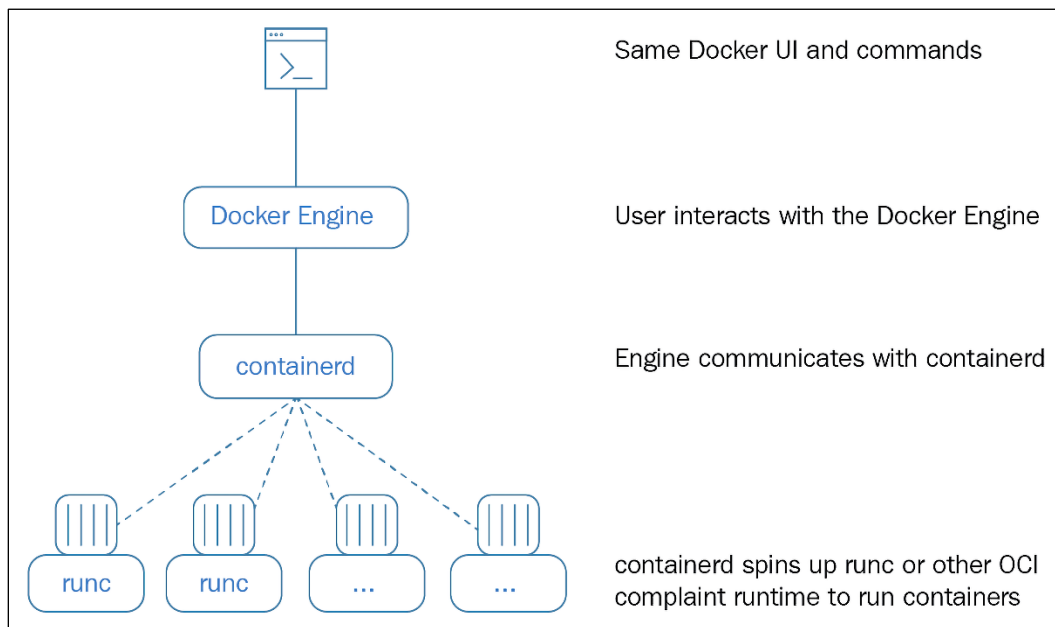


Chapter 1: Understanding Kubernetes Architecture

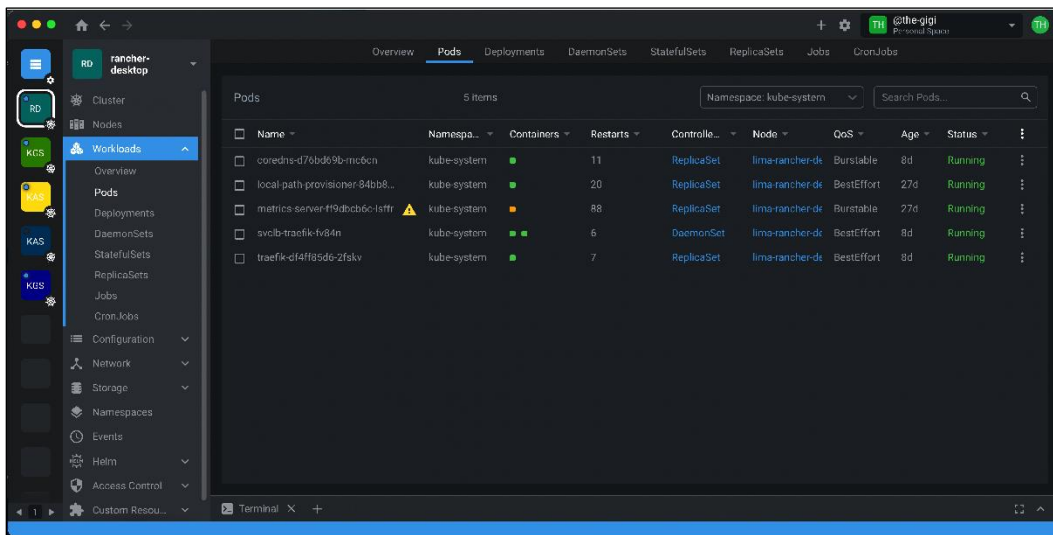
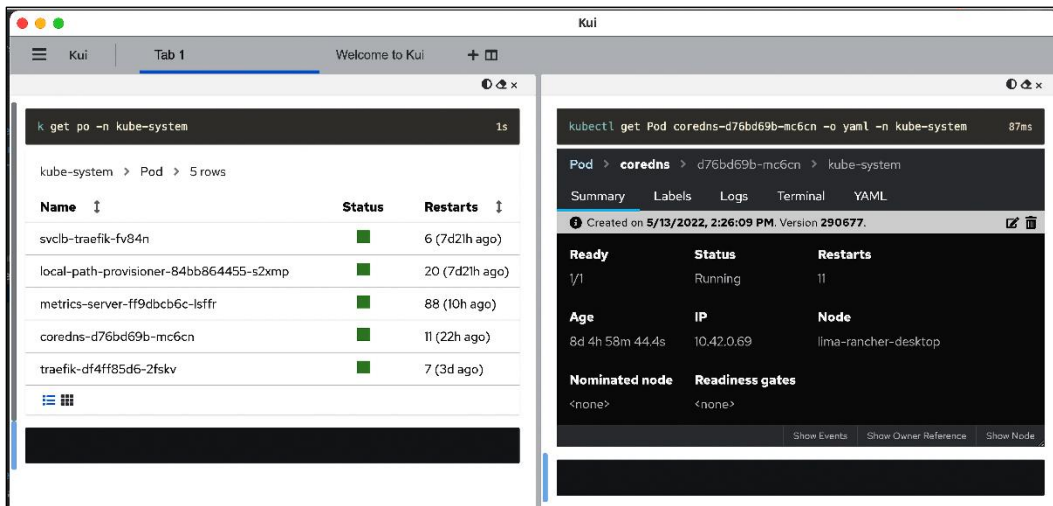




Chapter 2: Creating Kubernetes Clusters

```
k9s
Context: rancher-desktop
Cluster: rancher-desktop
User: rancher-desktop
K9s Rev: v0.25.18
K8s Rev: v1.23.6+k3s1
CPU: 0%
MEM: 0%

Pod(kube-system) [5]
NAME                                PF  READY  RESTARTS  STATUS  CPU  MEM  %CPU/R  %CPU/L  %MEM/R  %MEM/L  IP              NODE
coredns-d76bd69b-mc6cn              ●  1/1     11         Running  0    0    0        n/a      0        n/a      10.42.0.69      lima-
local-path-provisioner-84bb864455-s2xmp ●  1/1     20         Running  0    0    n/a      n/a      n/a      n/a      10.42.0.68      lima-
metrics-server-ff9dbcb6c-lsffr      ●  0/1     88         Running  0    0    0        n/a      0        n/a      10.42.0.70      lima-
svc1b-traefik-fv84n                 ●  2/2     6          Running  0    0    n/a      n/a      n/a      n/a      10.42.0.67      lima-
traefik-df4ff85d6-2fskv             ●  1/1     7          Running  0    0    n/a      n/a      n/a      n/a      10.42.0.71      lima-
```





kubernetes

default

Search

Workloads

Workloads

Cross Jobs

Daemon Sets

Deployments

Jobs

Pods

Replica Sets

Replication Controllers

Stateful Sets

Service

Ingresses

Services

Config and Storage

Config Maps

Persistent Volume Claims

Secrets

Storage Classes

Cluster

Cluster Role Bindings

Cluster Roles

Namespaces

Workload Status

Running: 1

Deployments

Running: 1

Pods

Running: 1

Replica Sets


Deployments

Name	Namespace	Images	Labels	Pods	Created
echo	default	k8s.gcr.io/e2e-test-images/echoserver:2.5	app: echo	1 / 1	22 minutes ago

Pods

Name	Namespace	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created
echo-7f648b98-dhh48	default	k8s.gcr.io/e2e-test-images/echoserver:2.5	app: echo pod template hash: 7f648b98	minikube	Running	0	-	-	22 minutes ago

Rancher Desktop

 RANCHER DESKTOP

General

Application Settings

Kubernetes Settings

Port Forwarding

Images

Troubleshooting

Kubernetes Settings

Kubernetes version
v1.23.6 (stable, latest)

Port
6443

☒ Enable Kubernetes☒ Enable Traefik

Container Runtime

☐ containerd
Namespaces for container images; use with nerdctl.

☒ dockerd (moby)
Docker API; use with Docker CLI and k3d.

Memory (GB)
6

2

8

16

24

32

CPUs
2

2

4

6

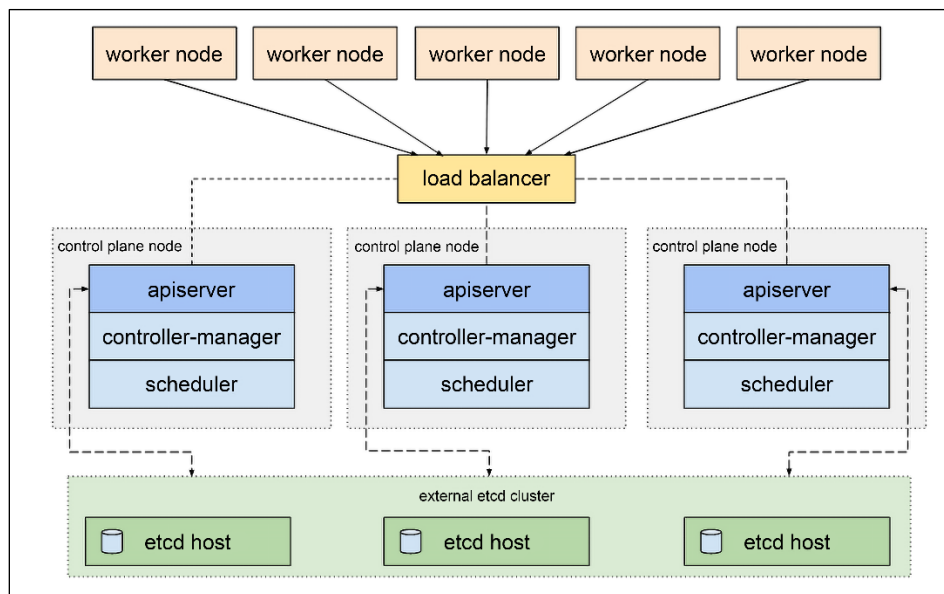
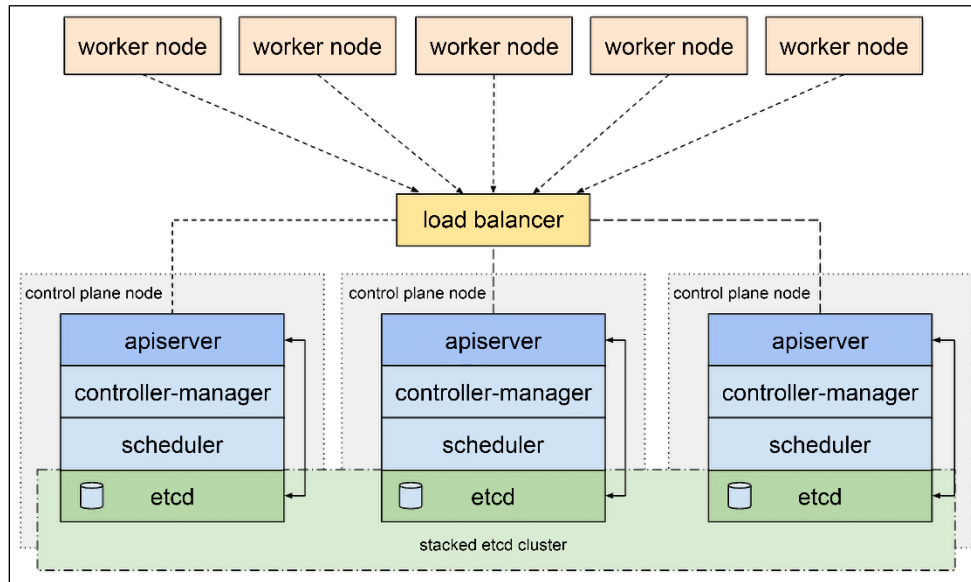
8

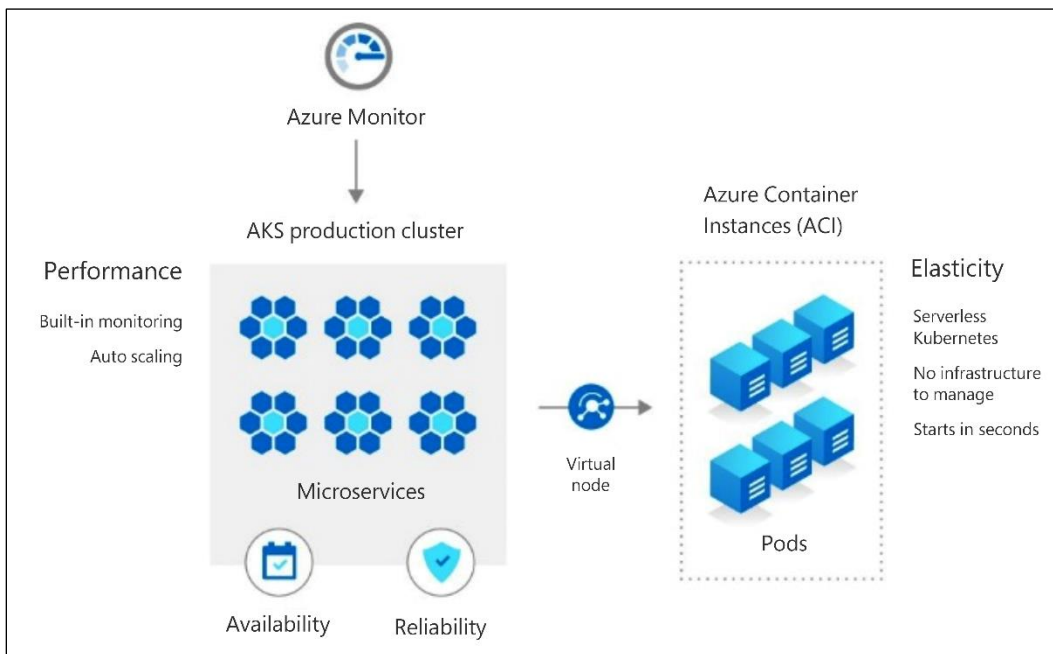
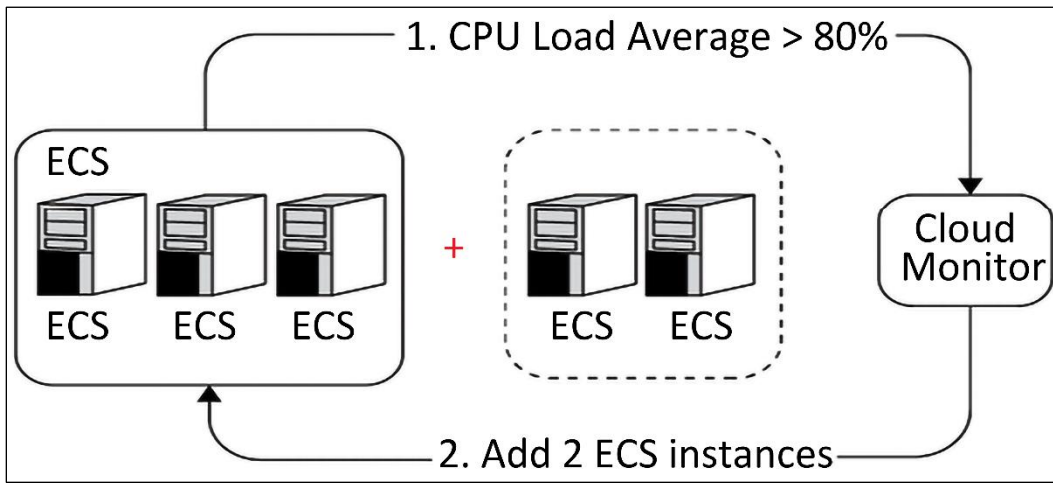
10

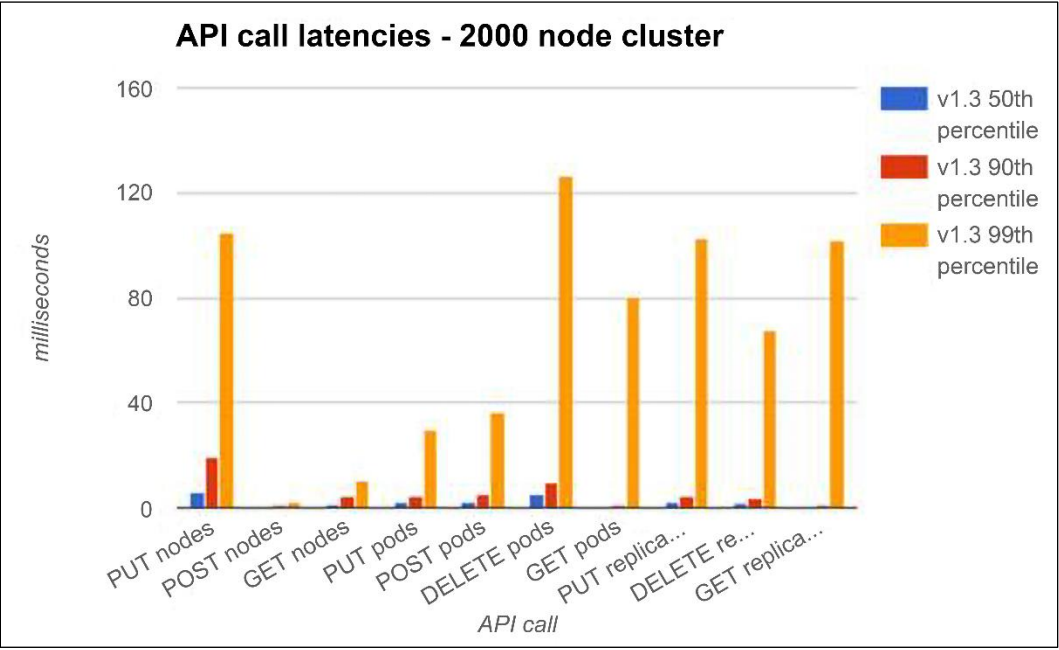
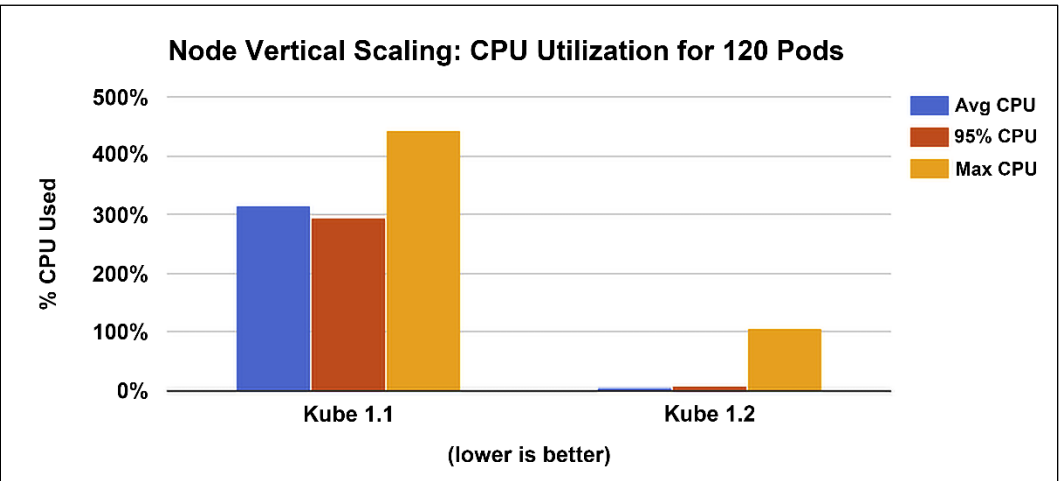
Reset Kubernetes

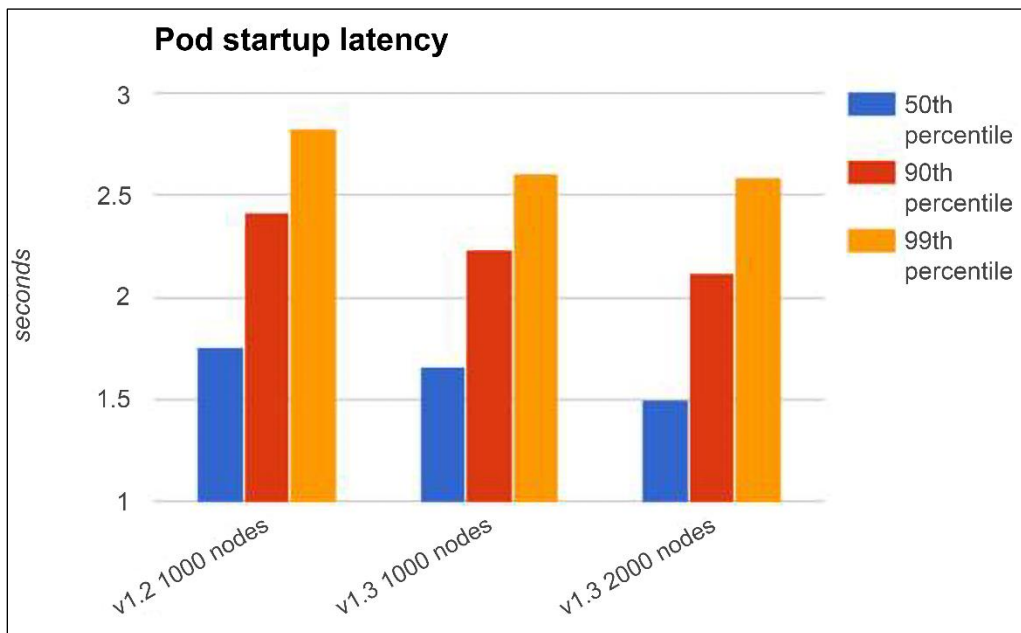
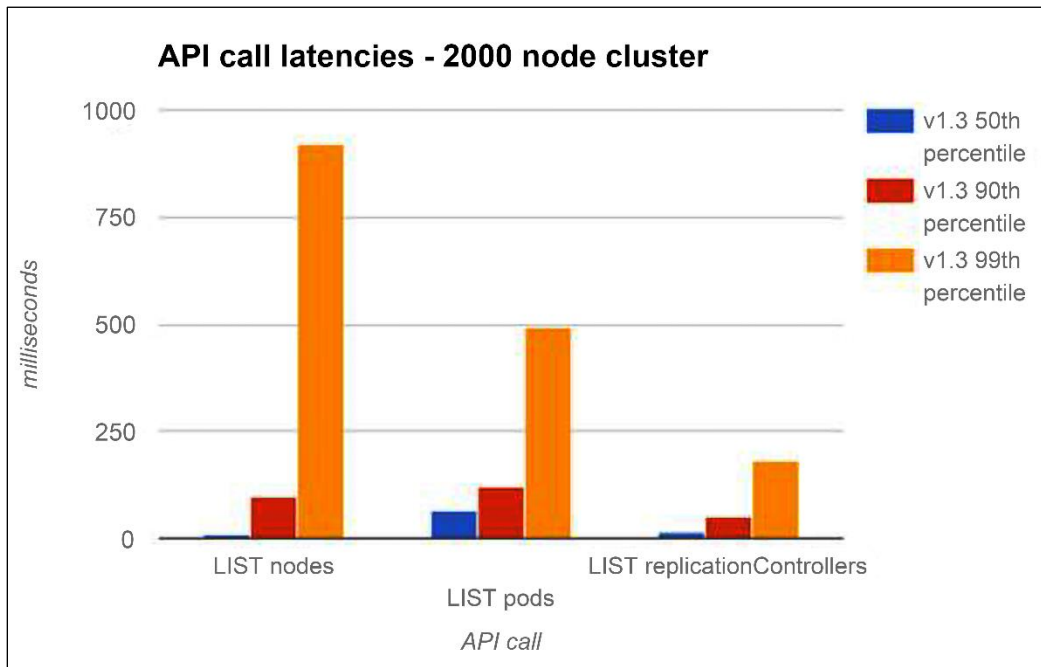
Resetting Kubernetes to default will delete all workloads and configuration

Chapter 3: High Availability and Reliability

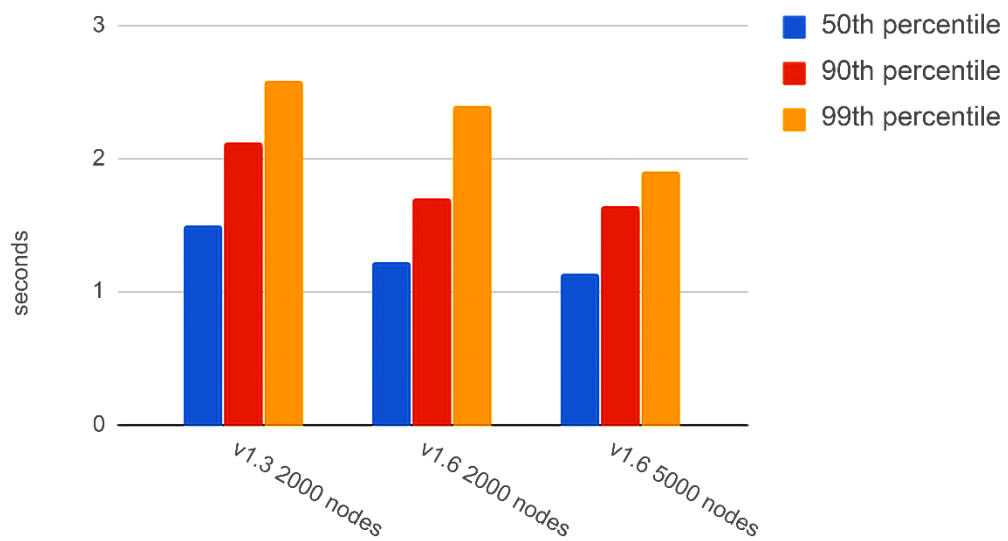




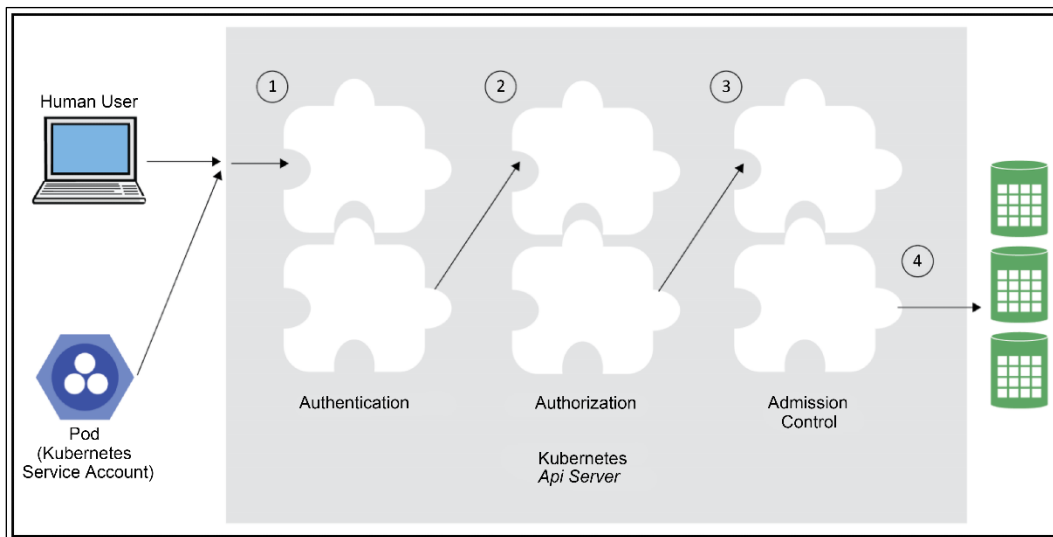
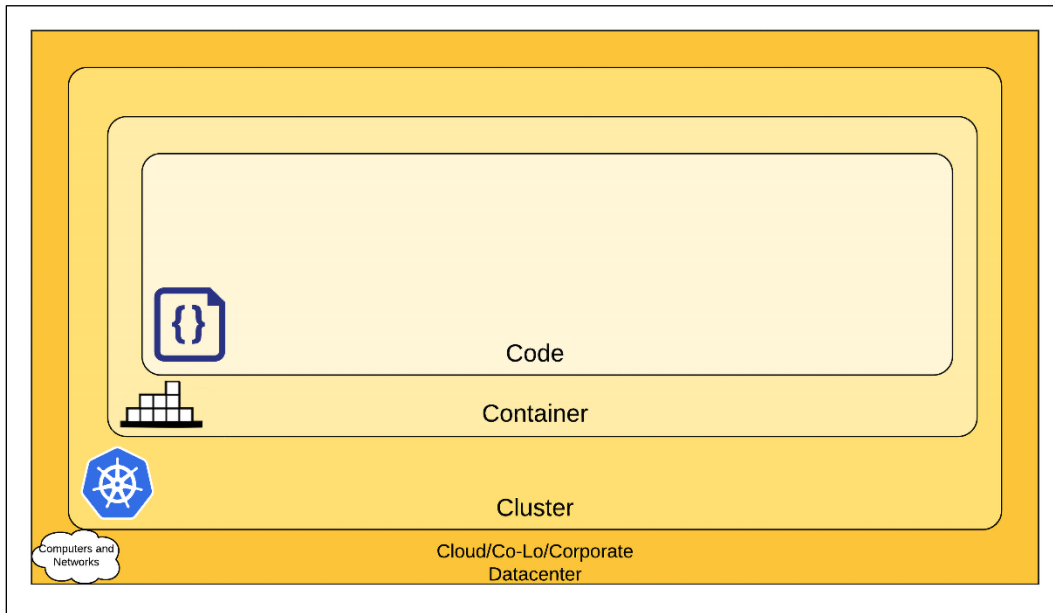


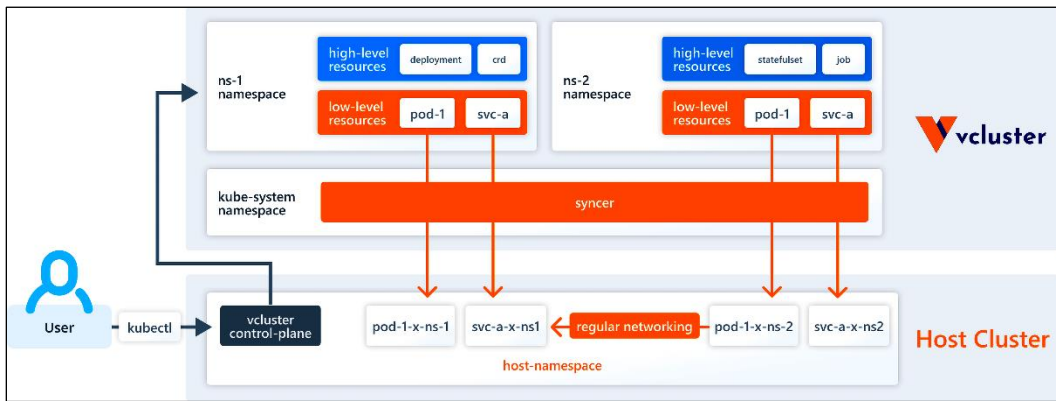


Pod startup latency

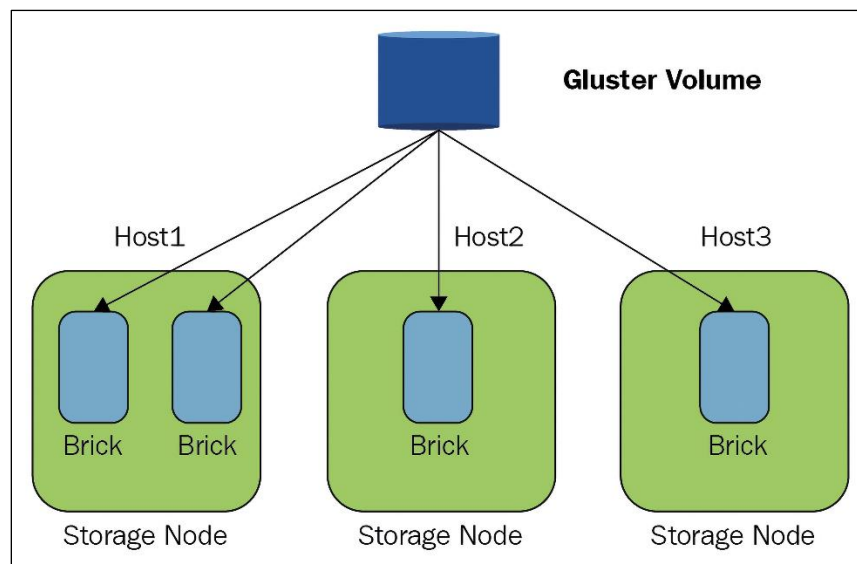
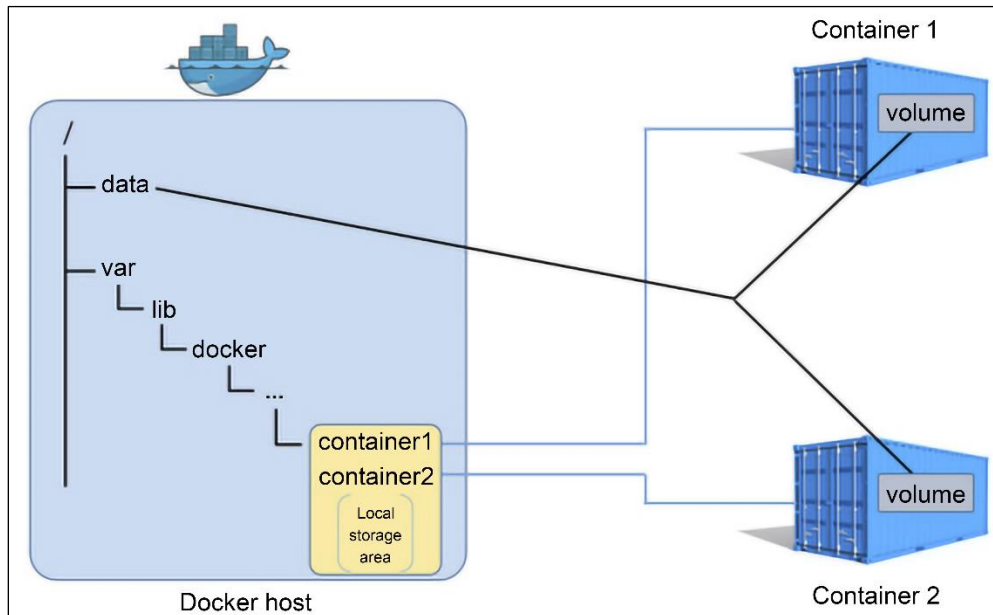


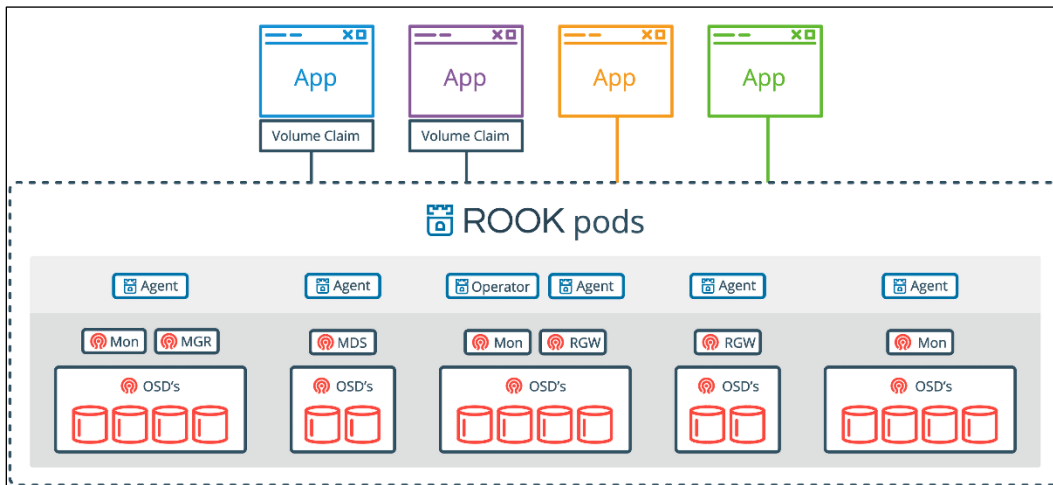
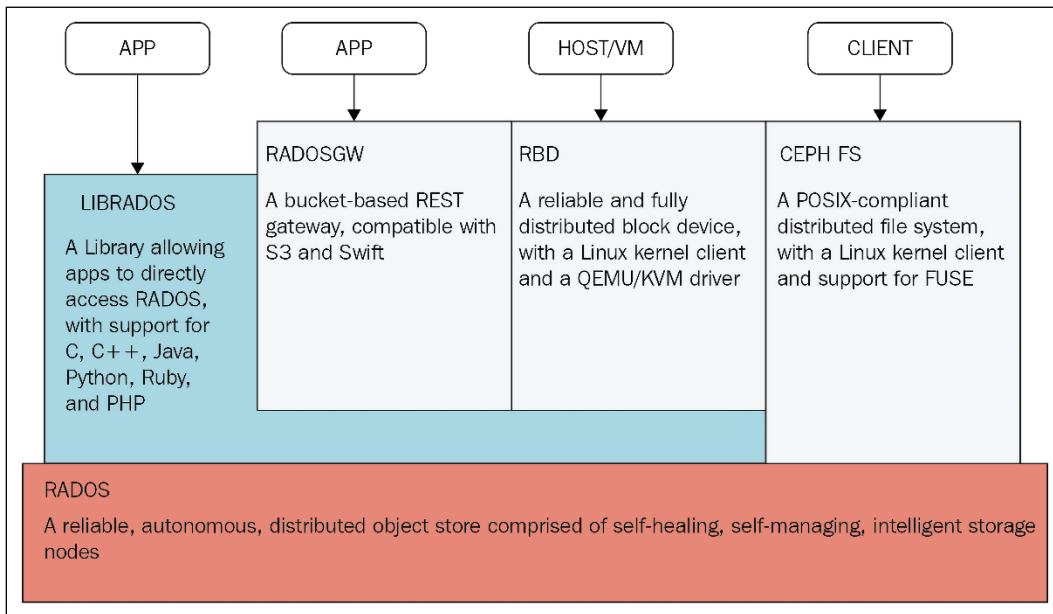
Chapter 4: Securing Kubernetes

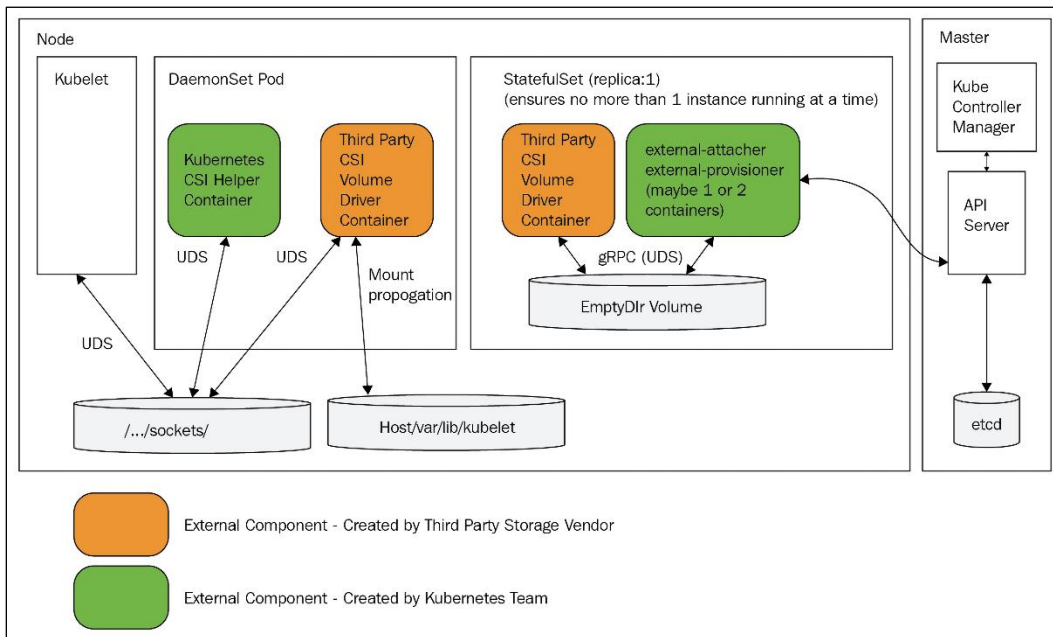




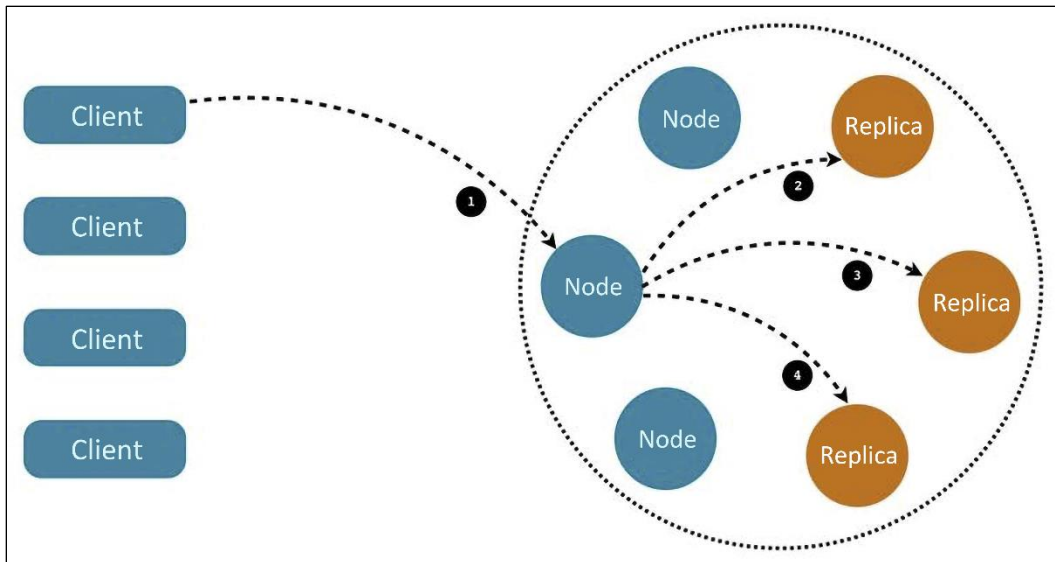
Chapter 6: Managing Storage



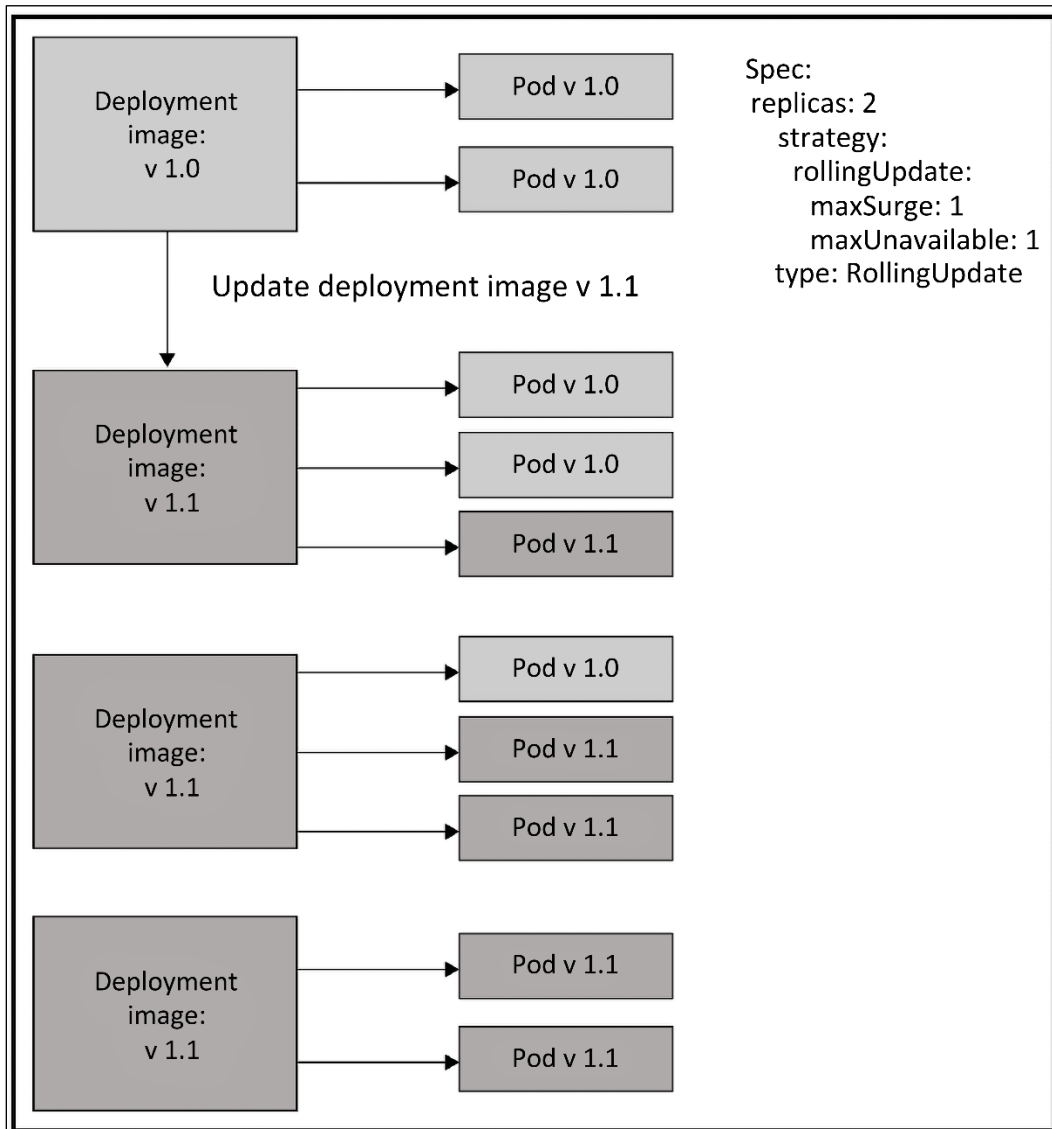


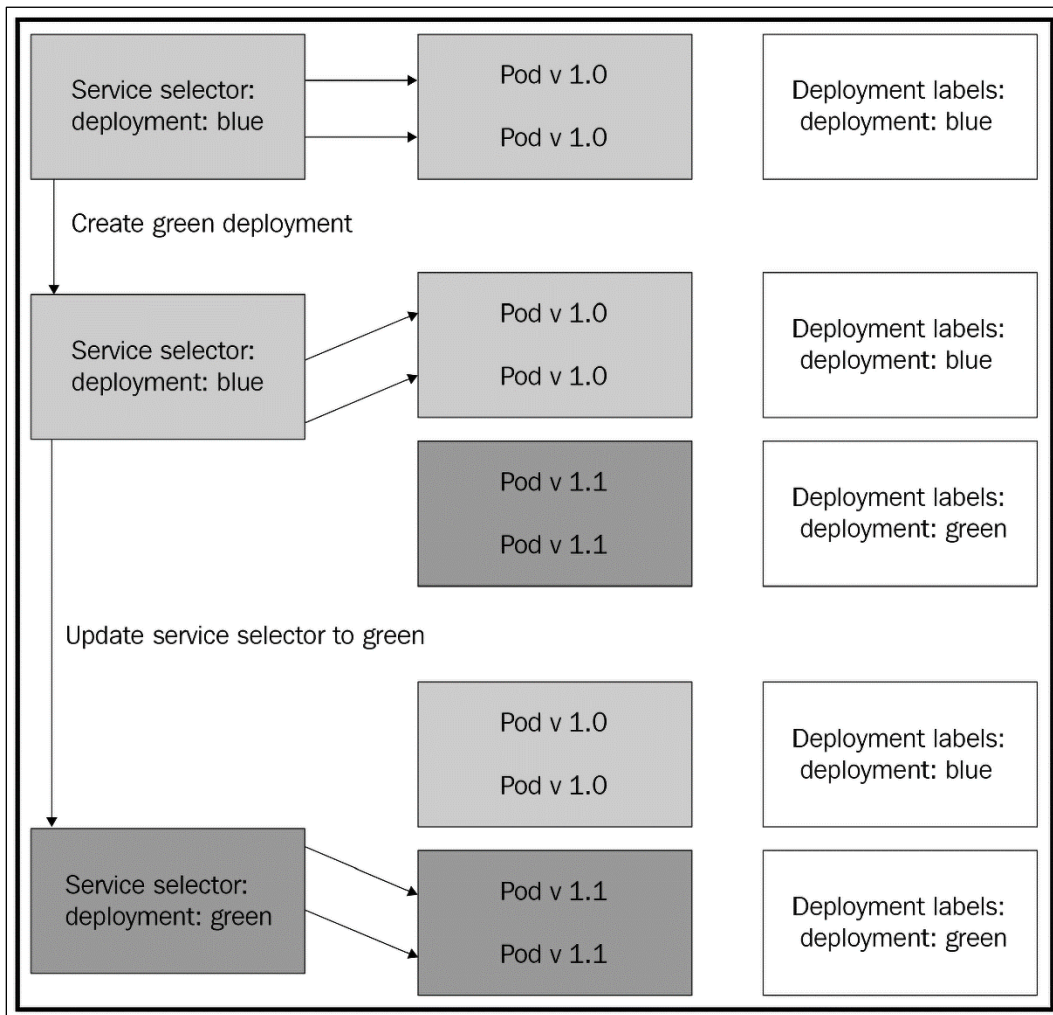


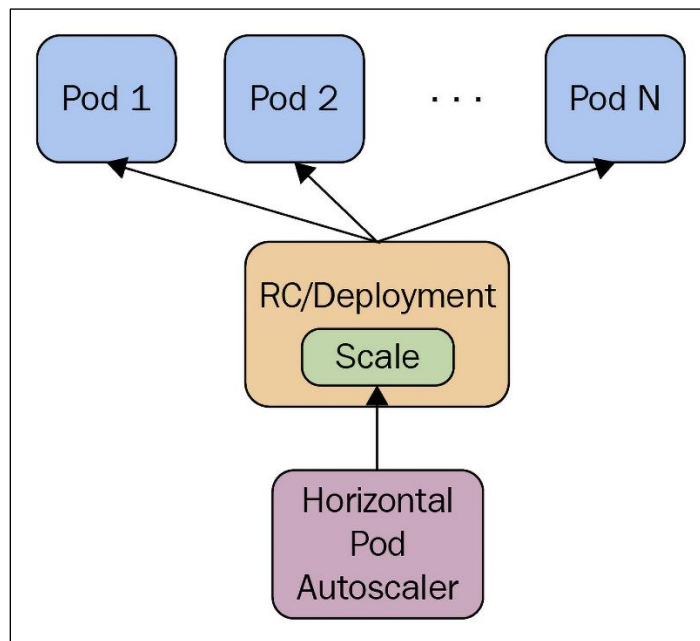
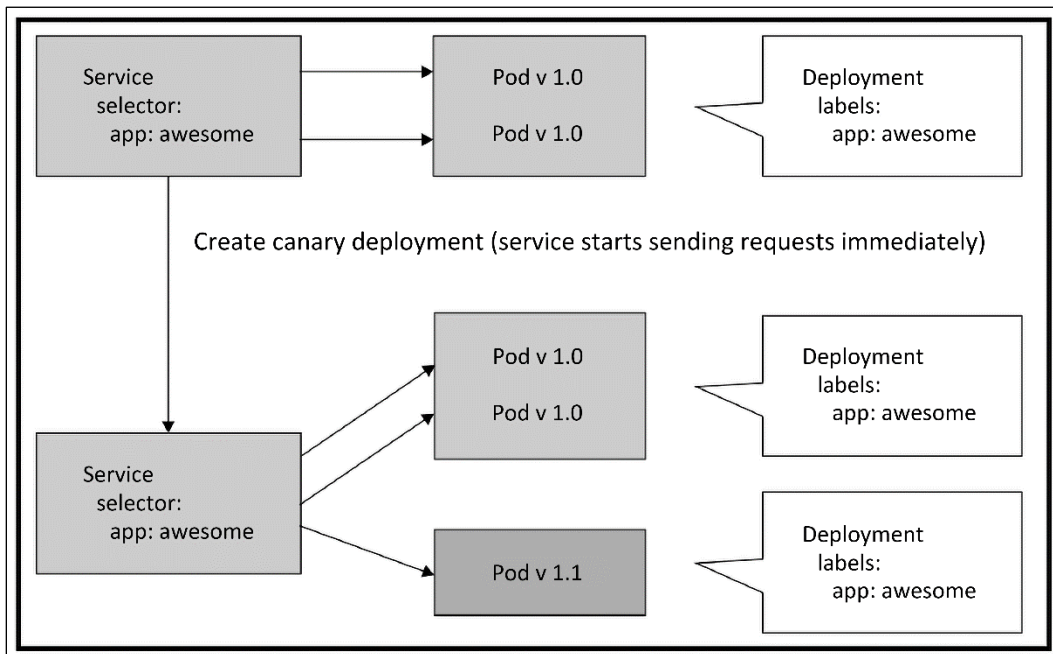
Chapter 7: Running Stateful Applications with Kubernetes

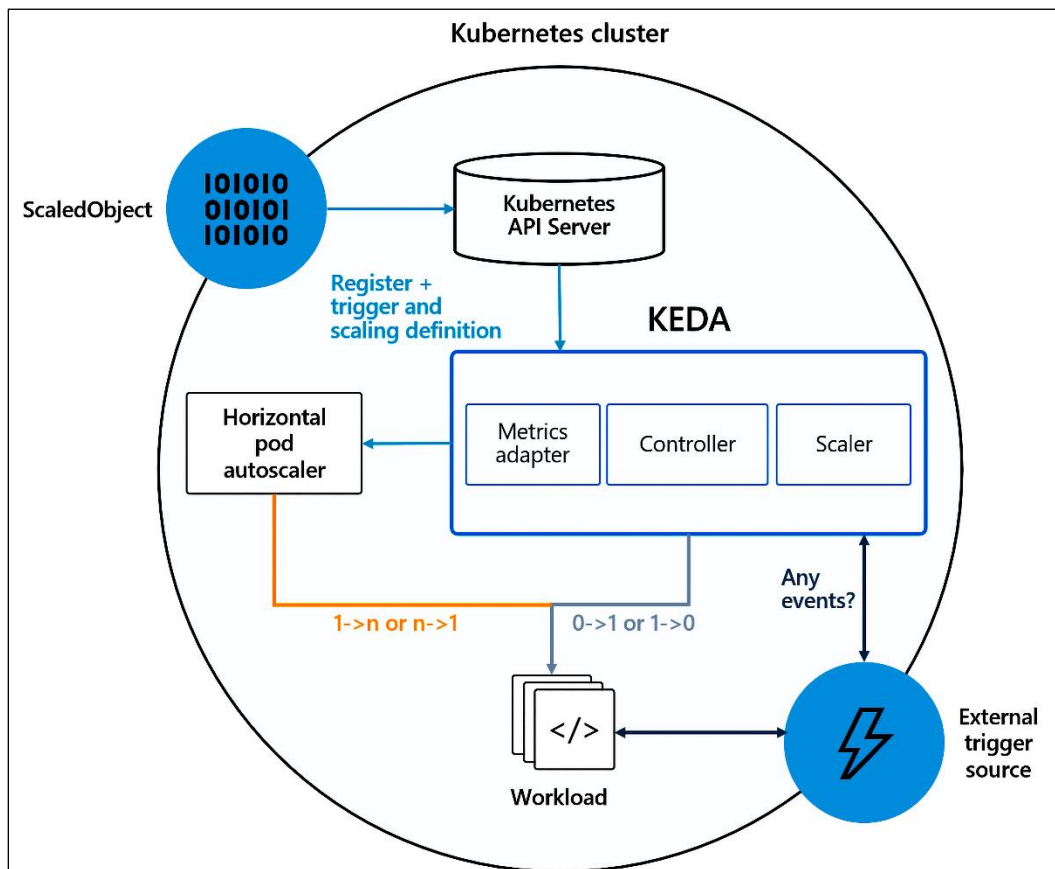


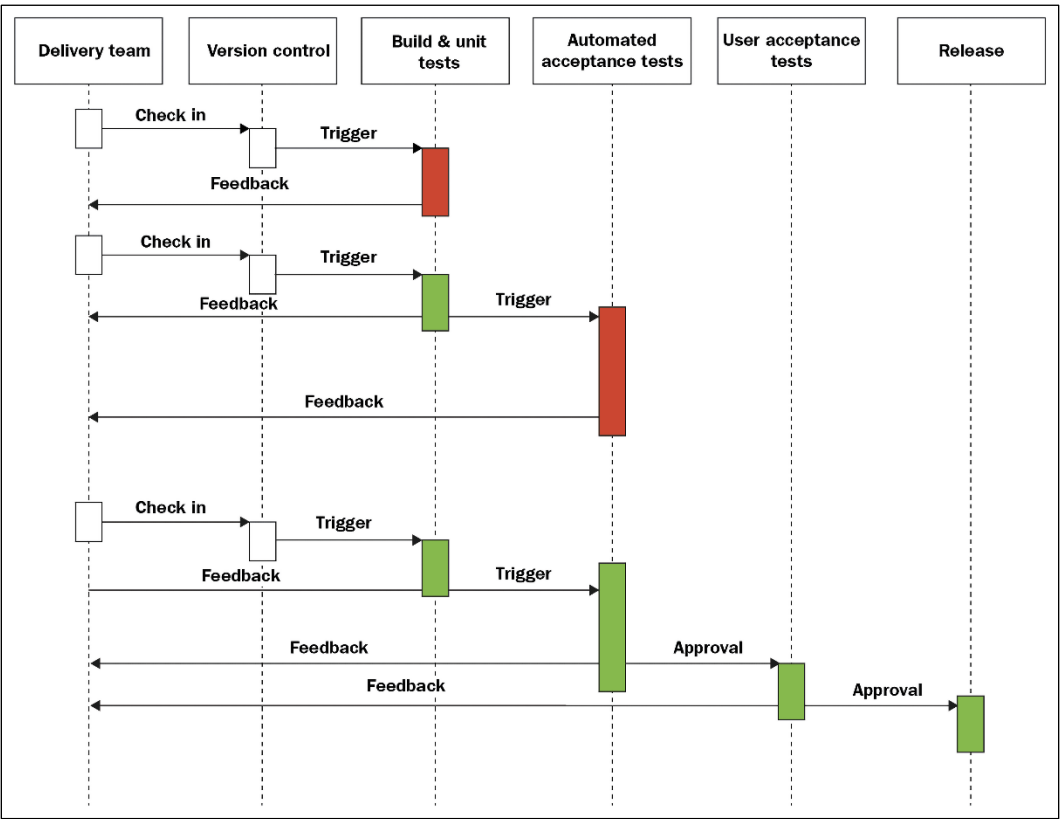
Chapter 8: Deploying and Updating Applications

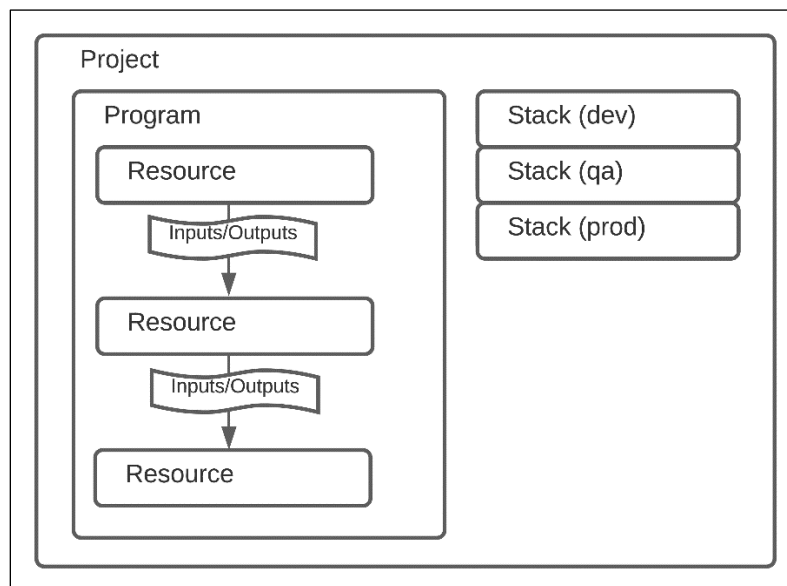
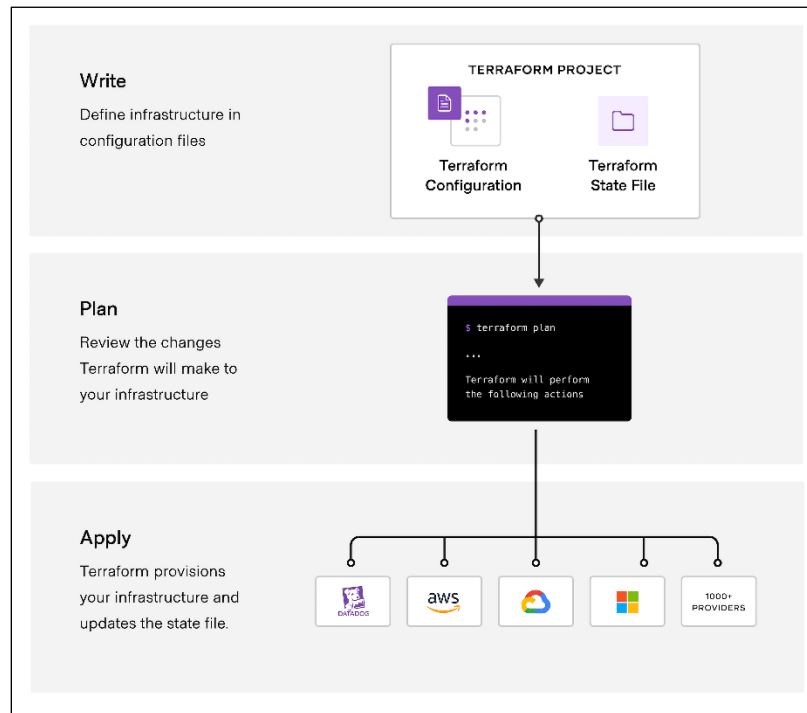




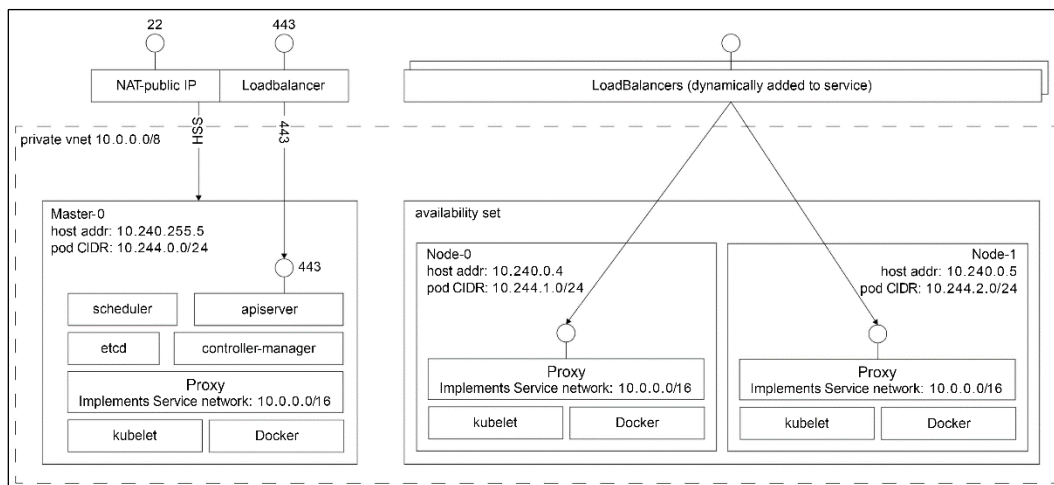
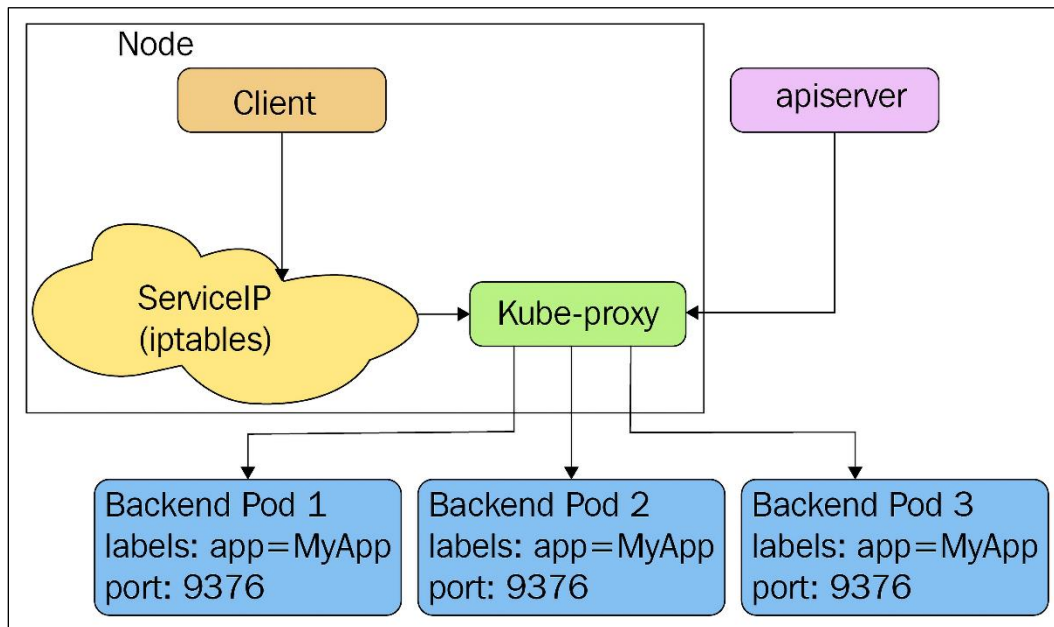


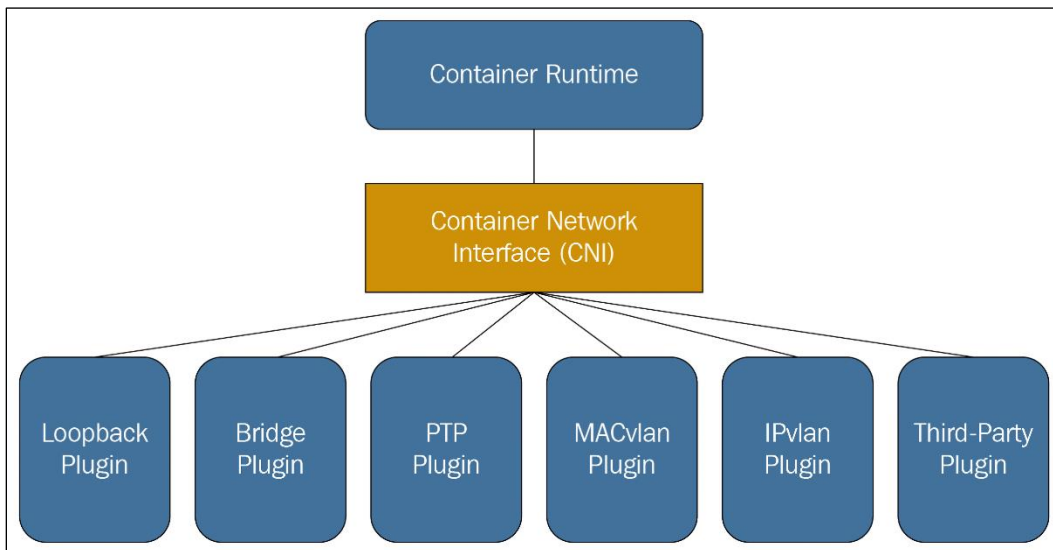
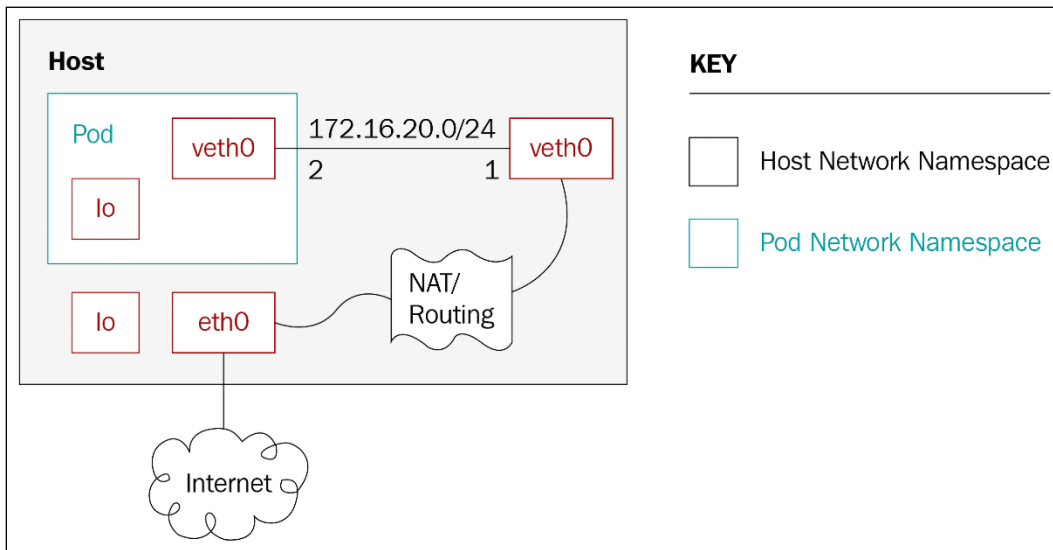


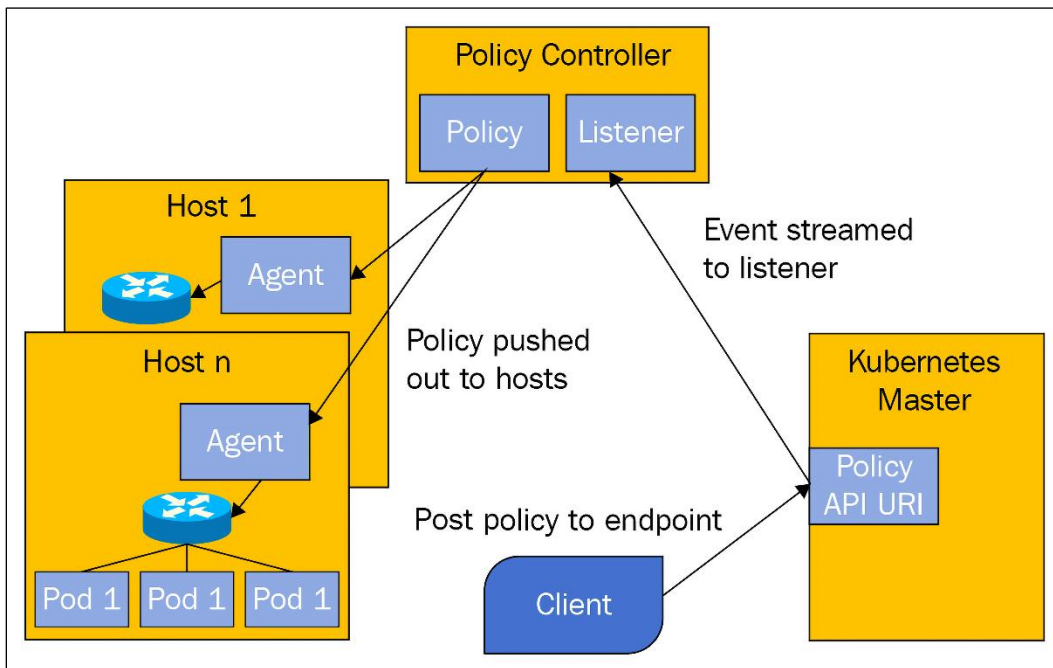
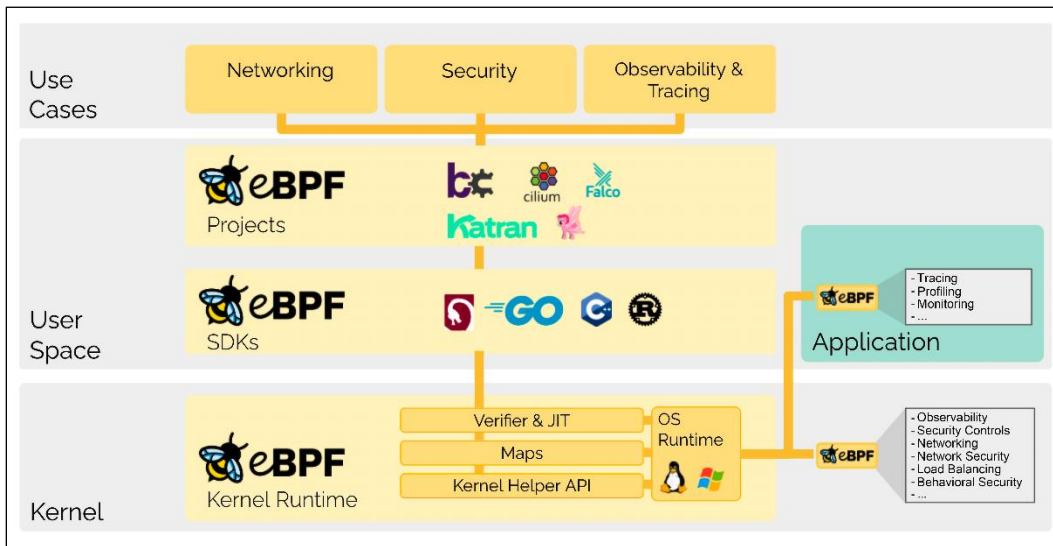


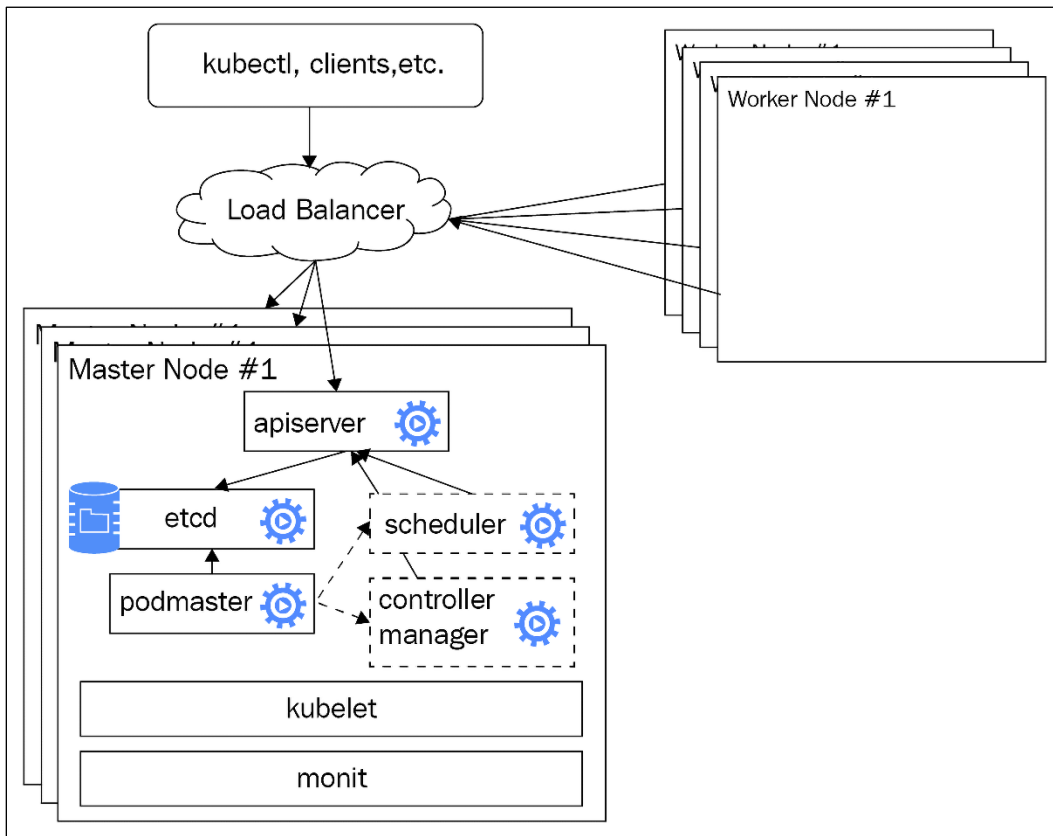


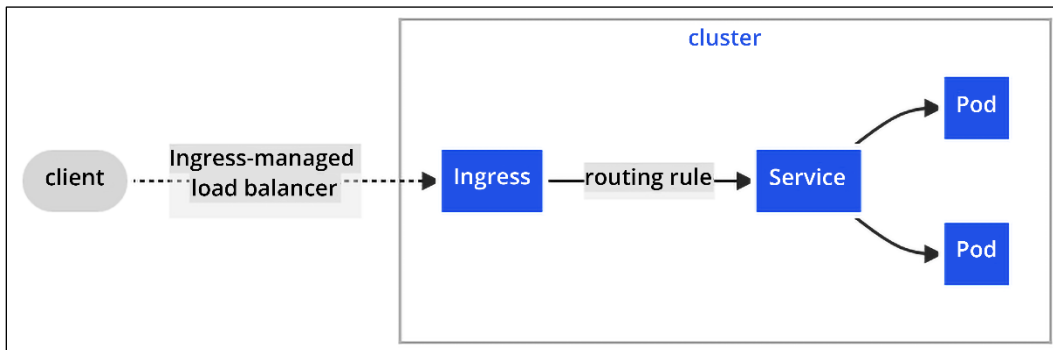
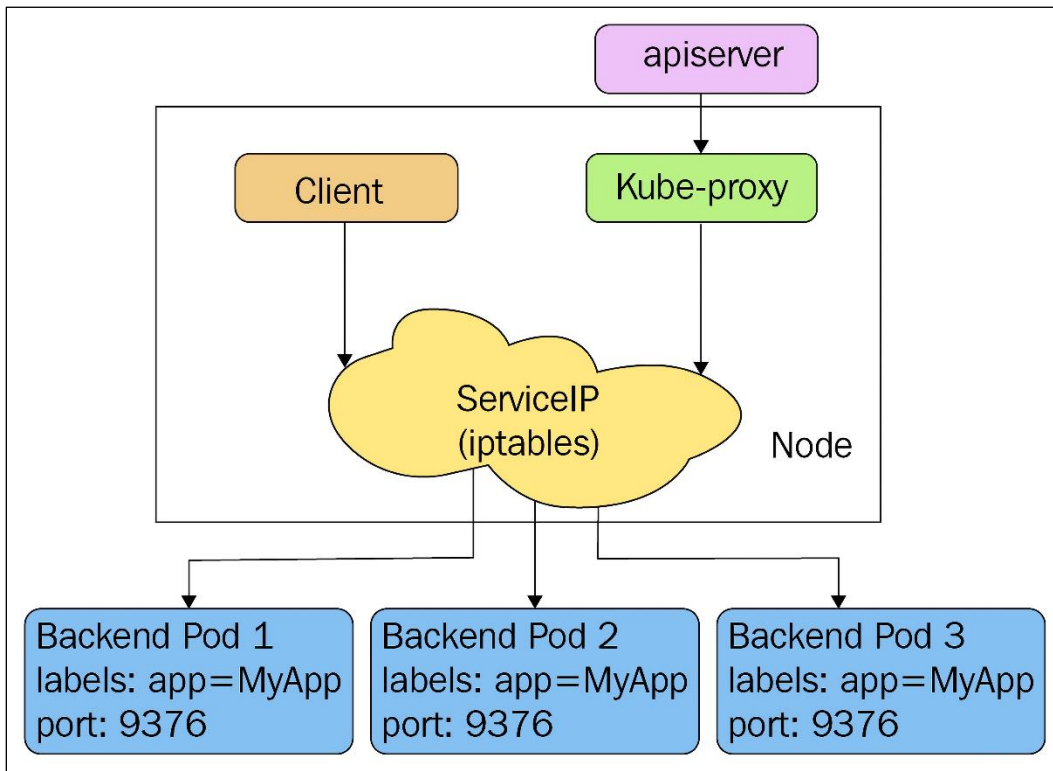
Chapter 10: Exploring Kubernetes Networking

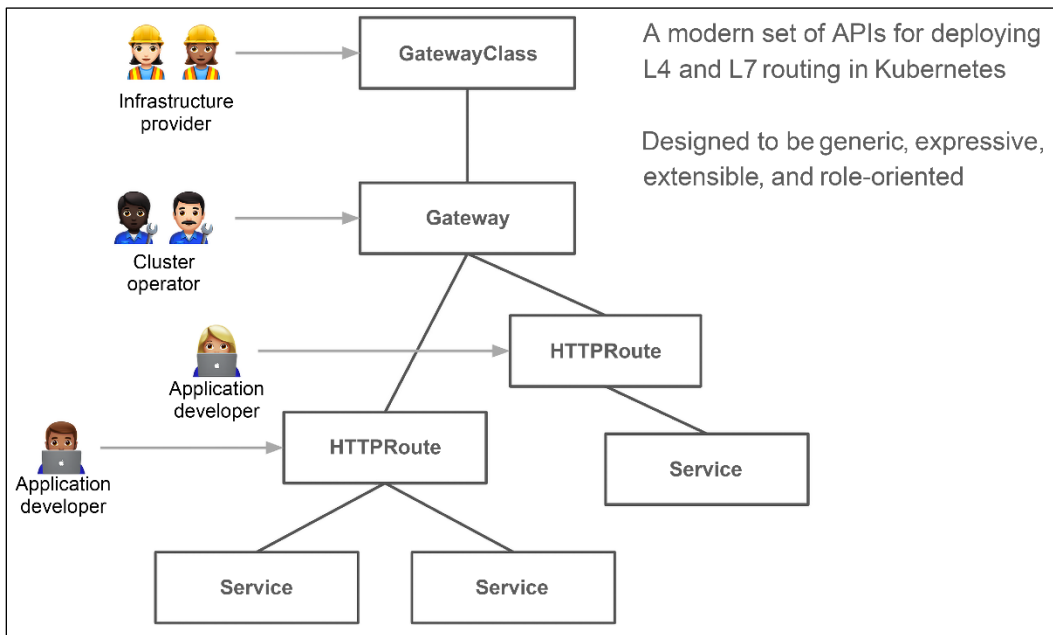
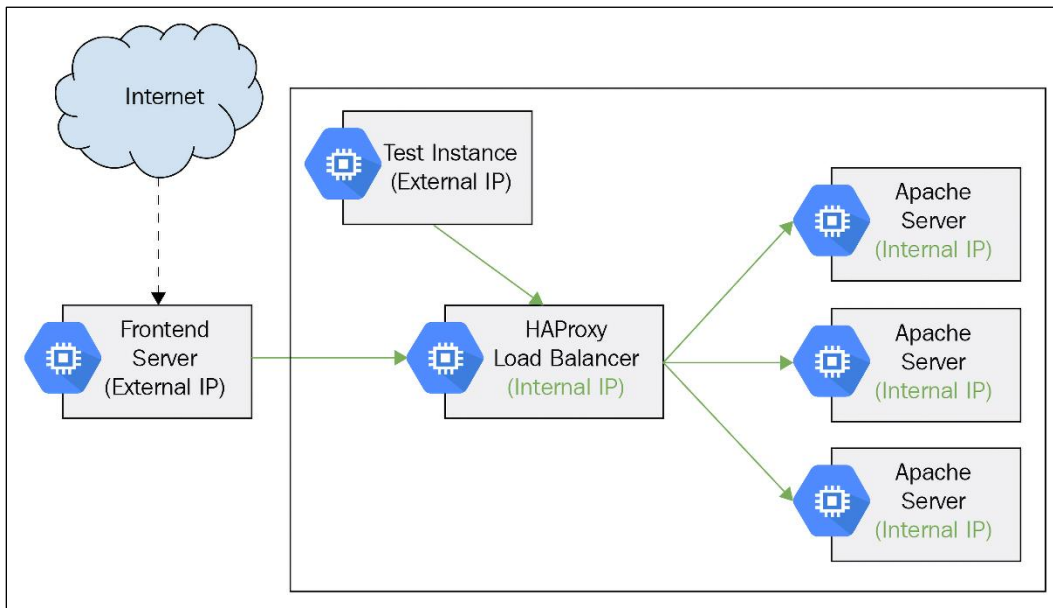




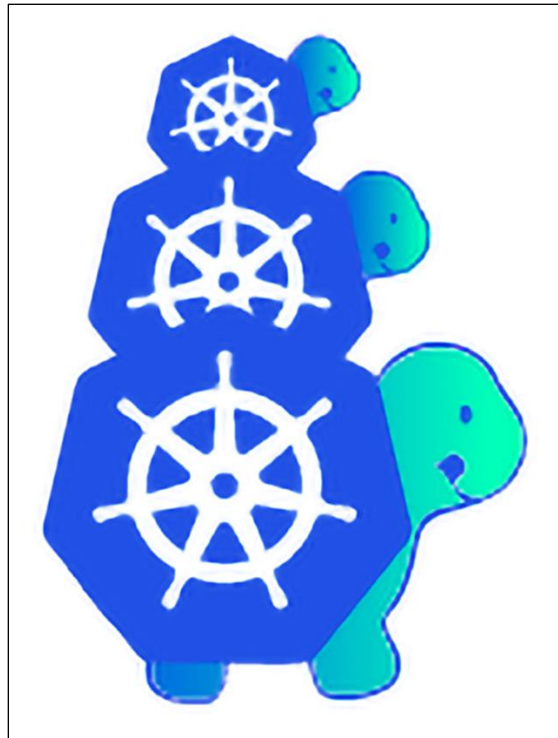


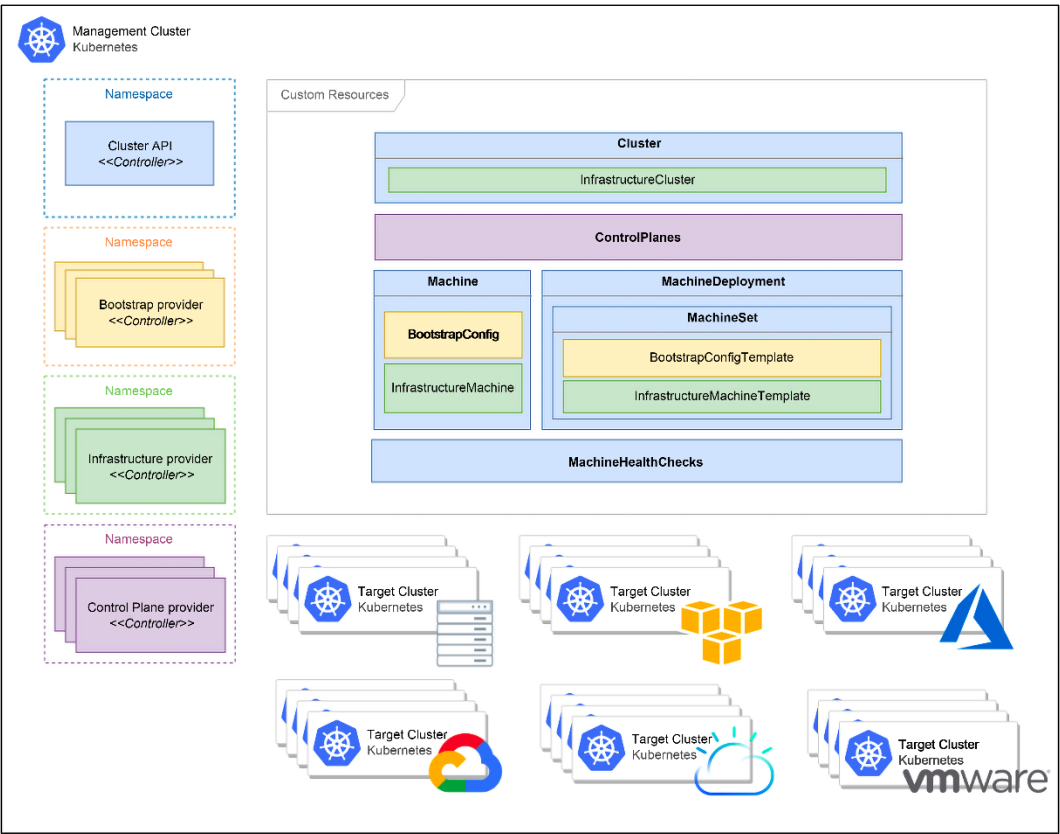


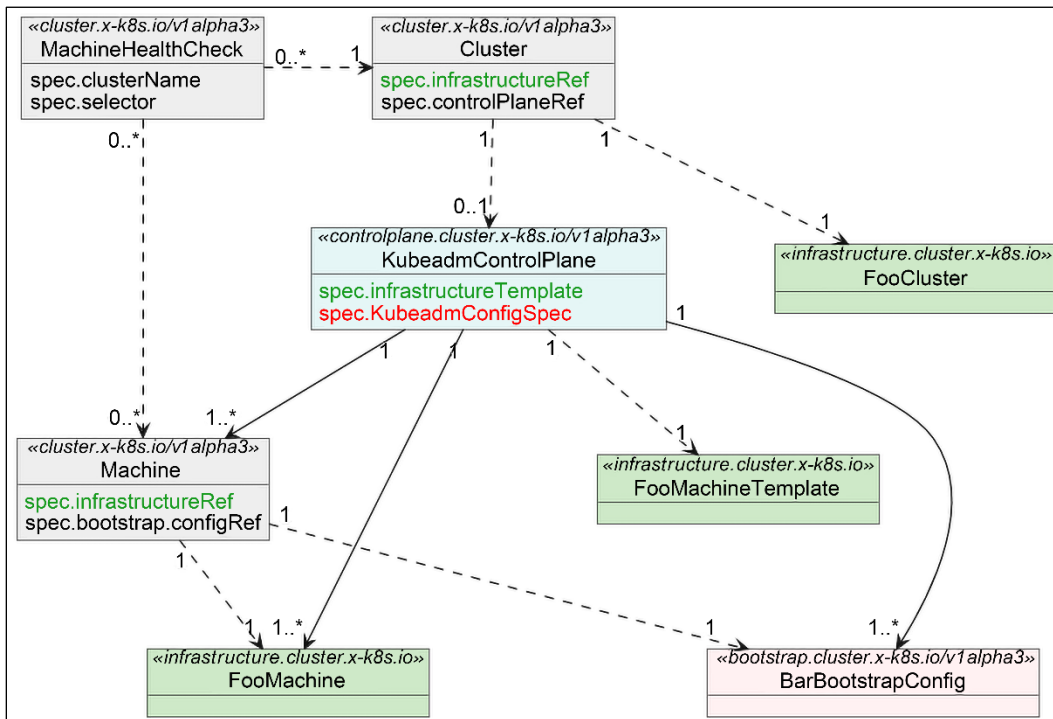


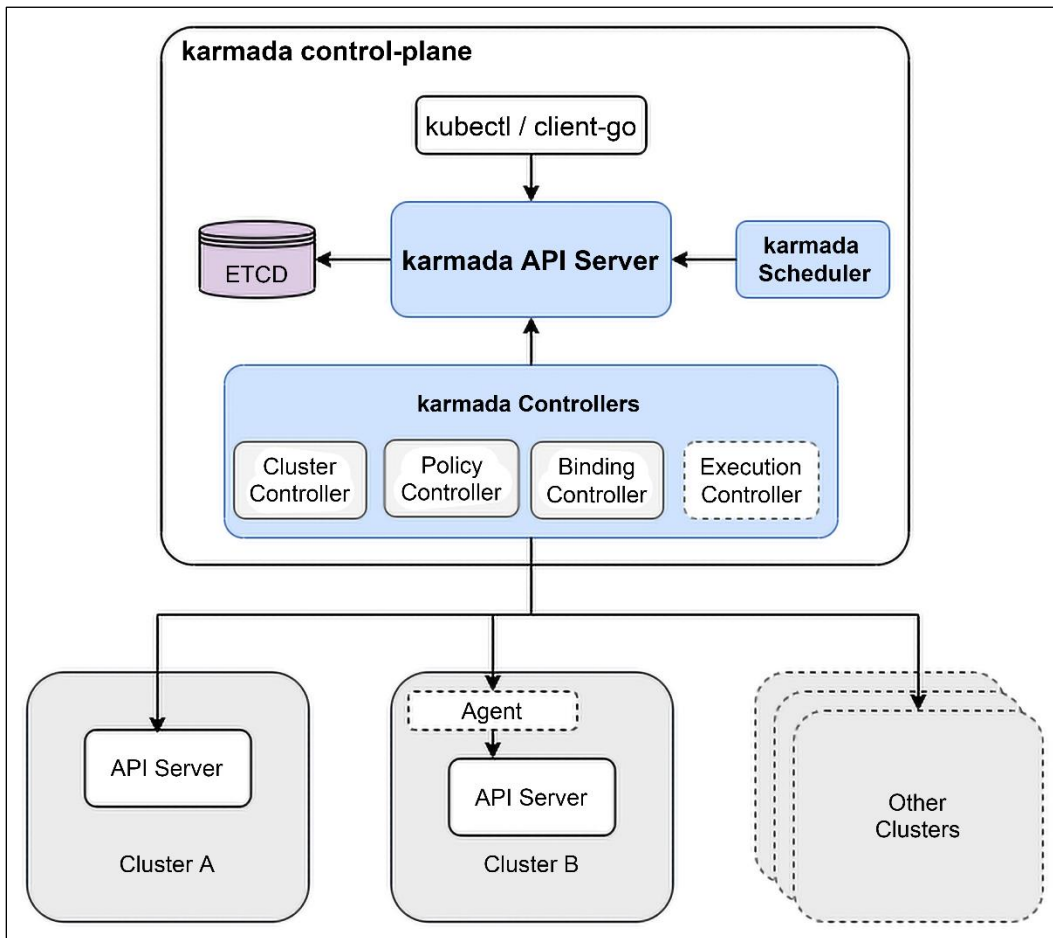


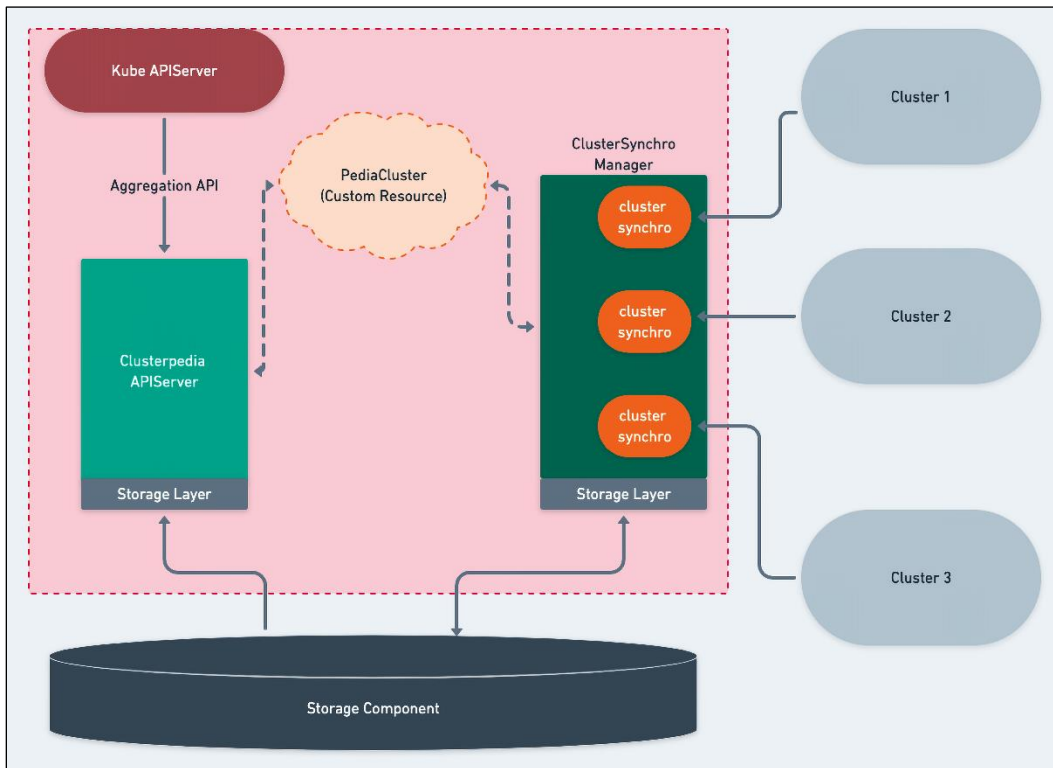
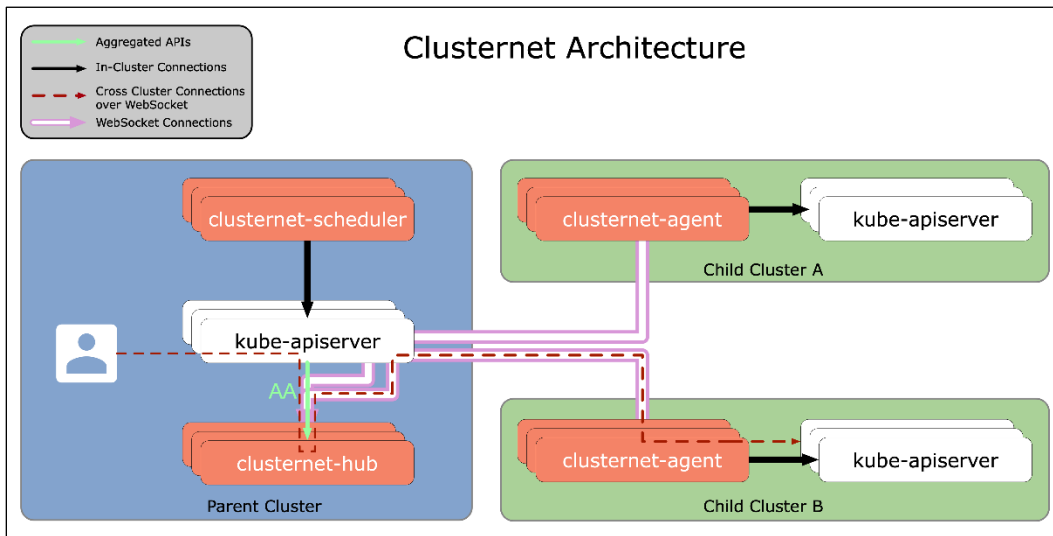
Chapter 11: Running Kubernetes on Multiple Clusters

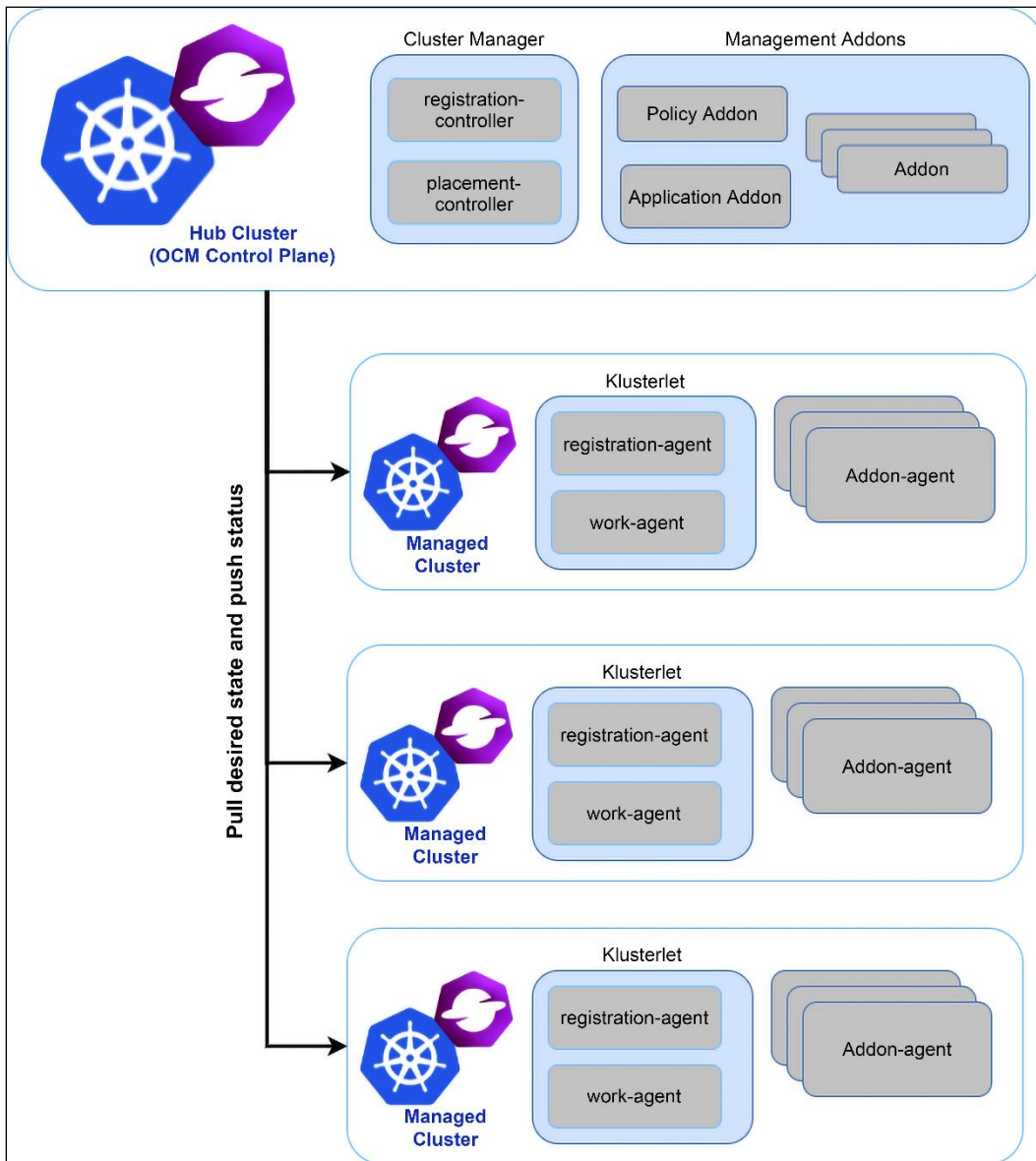


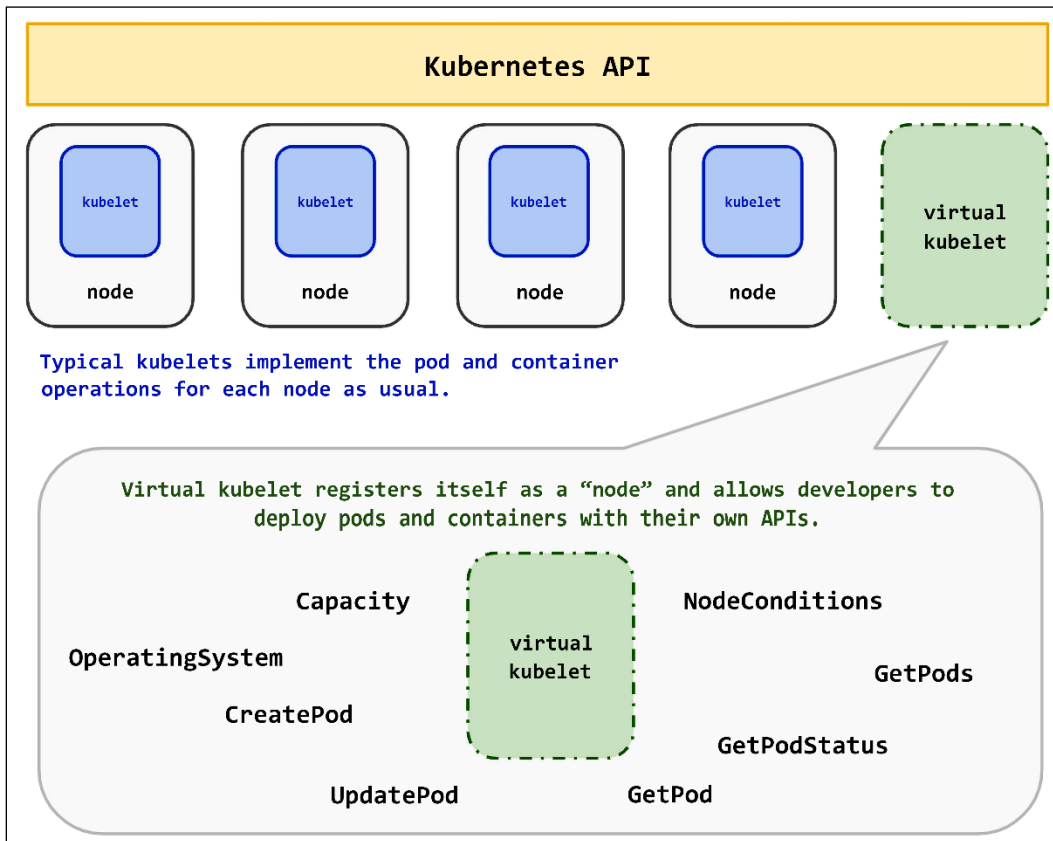
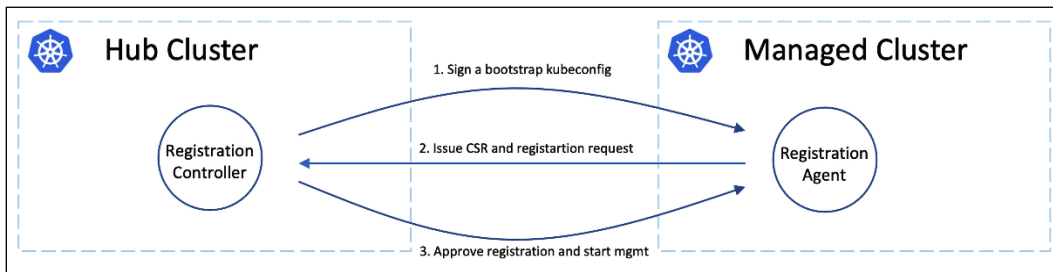




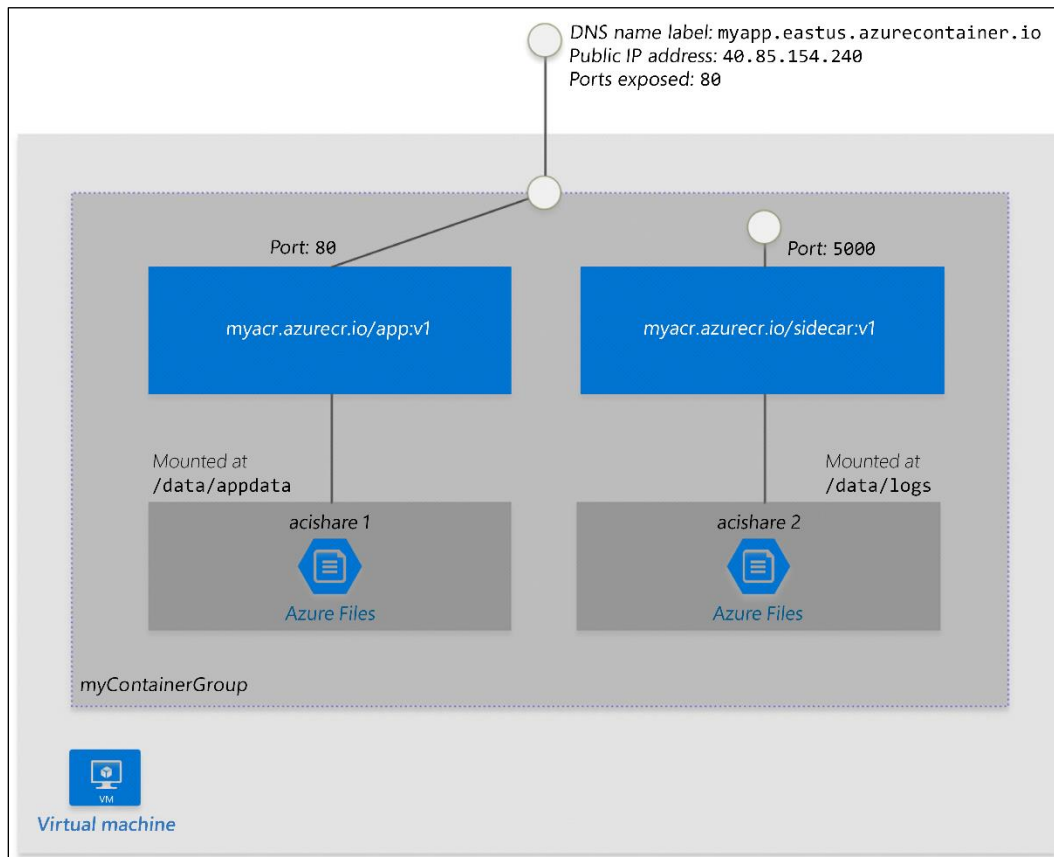




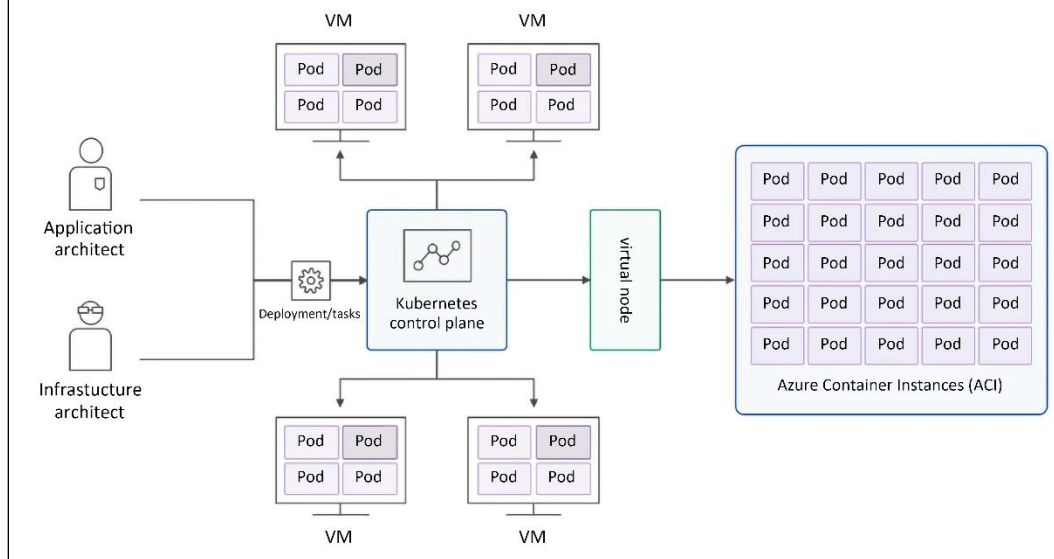


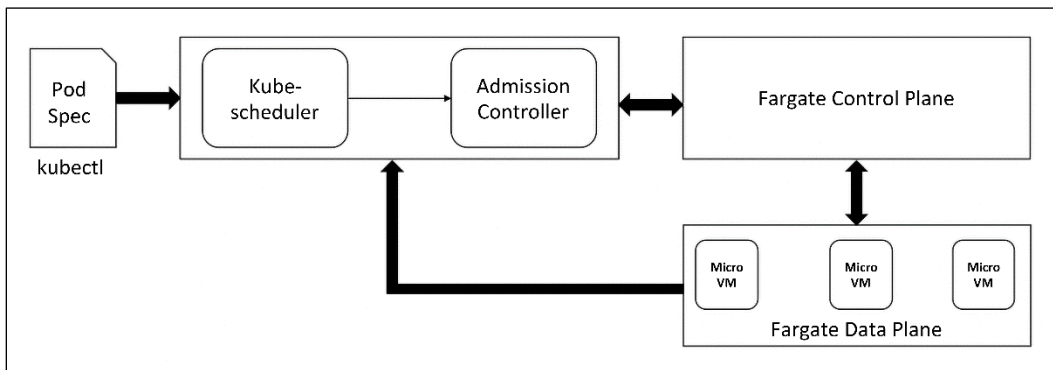
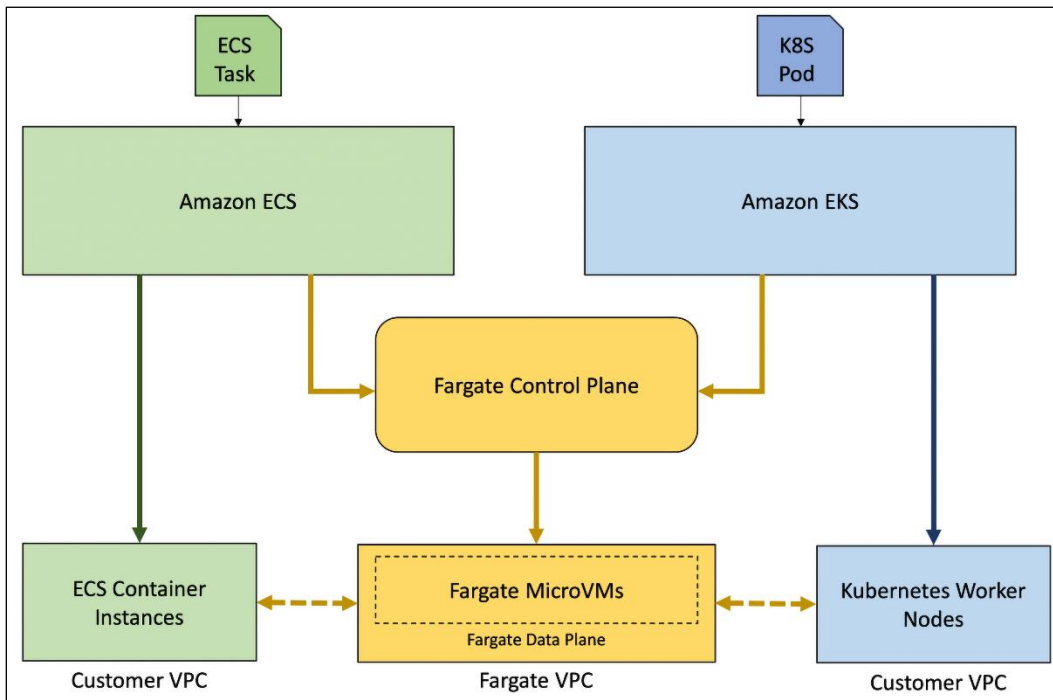


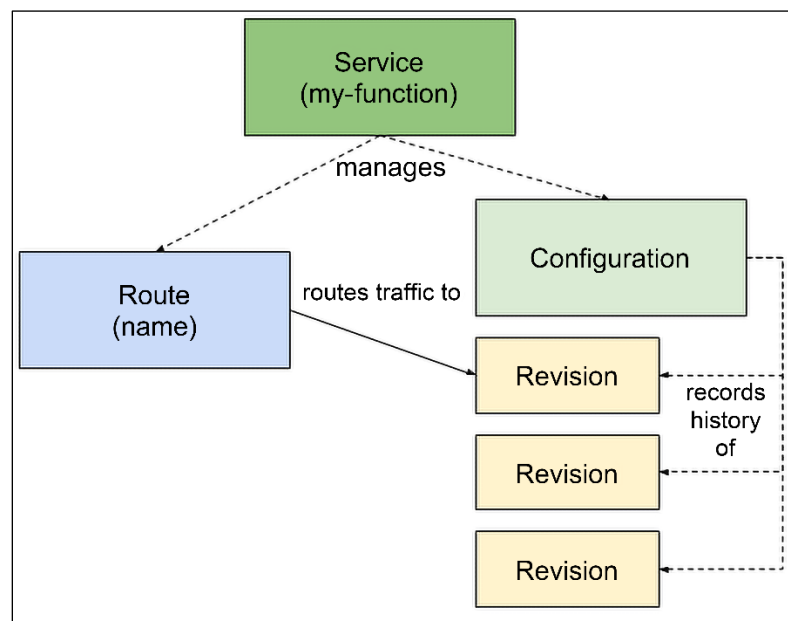
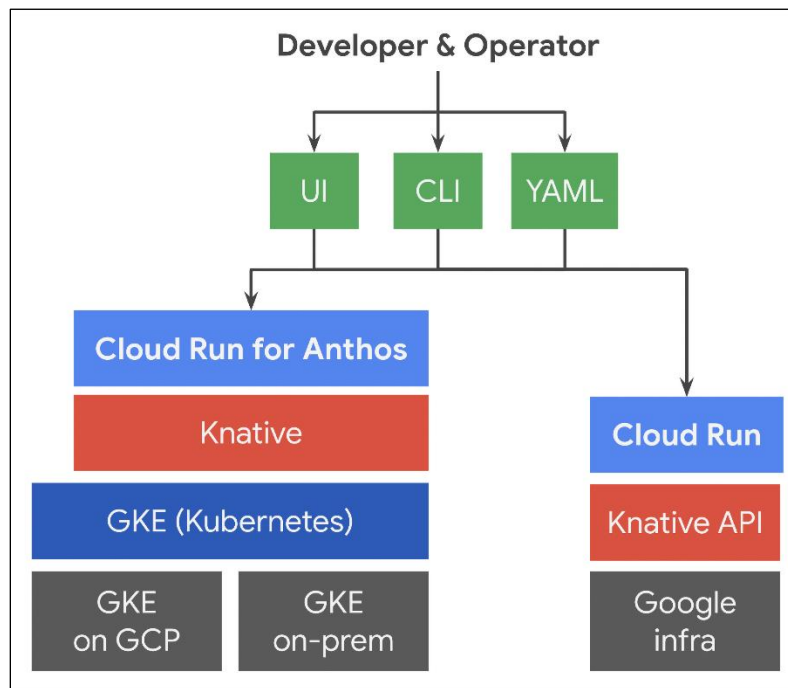
Chapter 12: Serverless Computing on Kubernetes

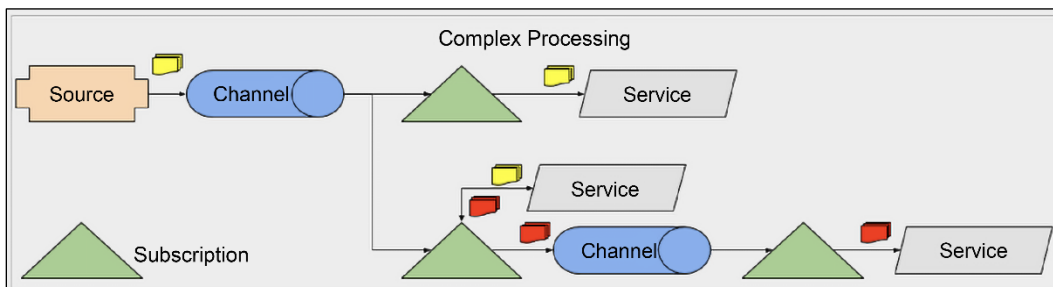
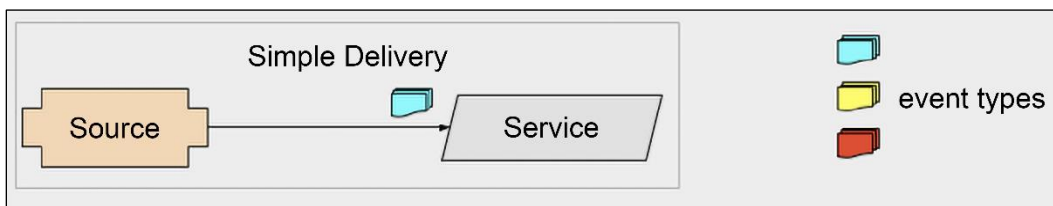
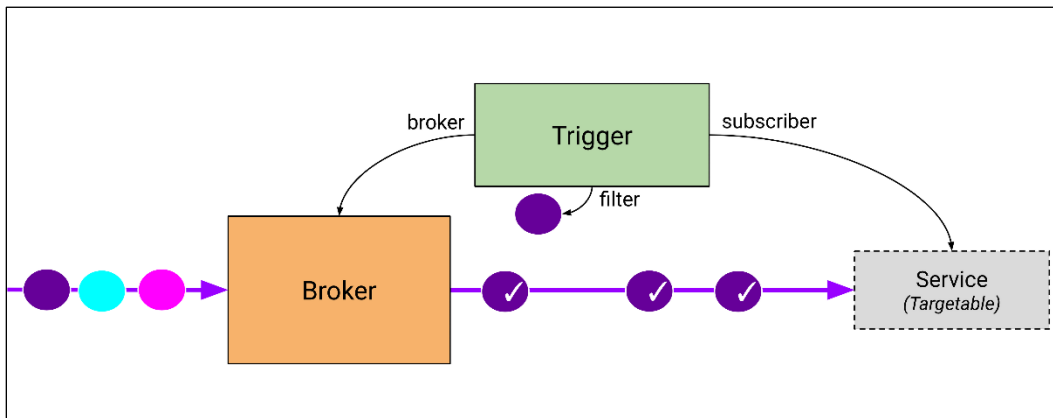


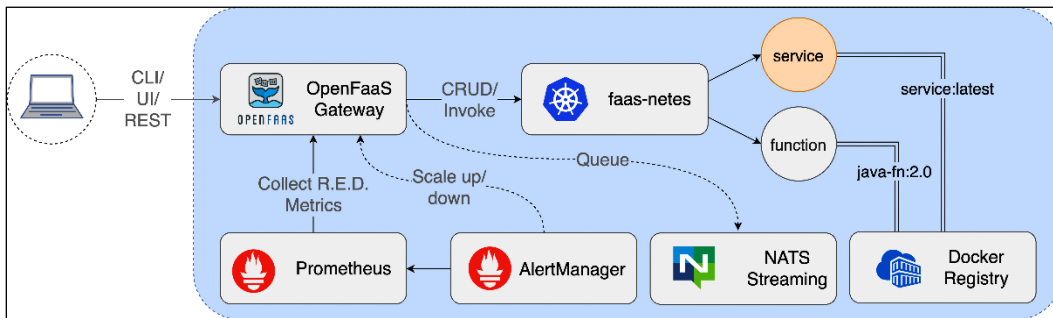
Virtual node architecture in AKS











127.0.0.1:8080/ui/

OPENFAAS

Deploy New Function

Search for Function

openfaas-go

Status	Replicas	Invocation count
Ready	1	7

Image: docker.io/g1g1/openfaas-go:latest

URL: http://127.0.0.1:8080/function/openfaas-go

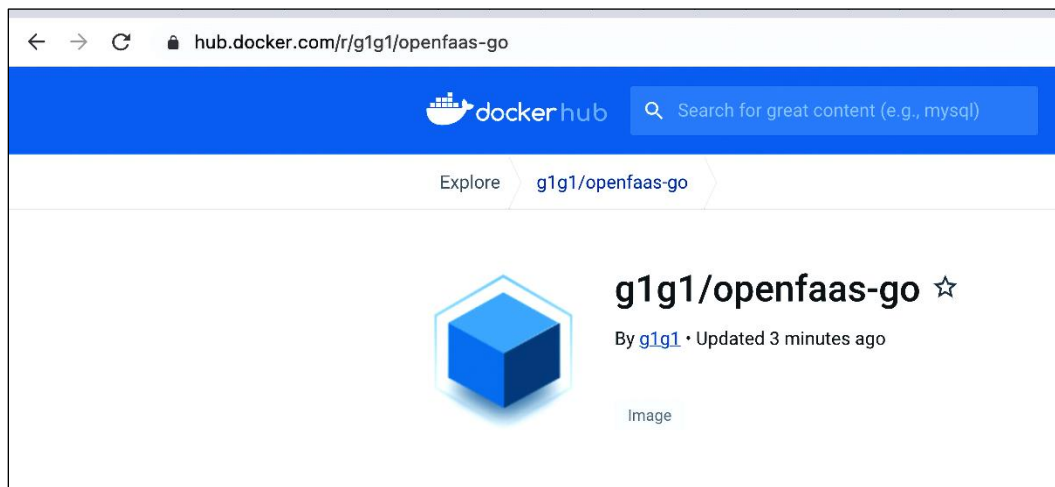
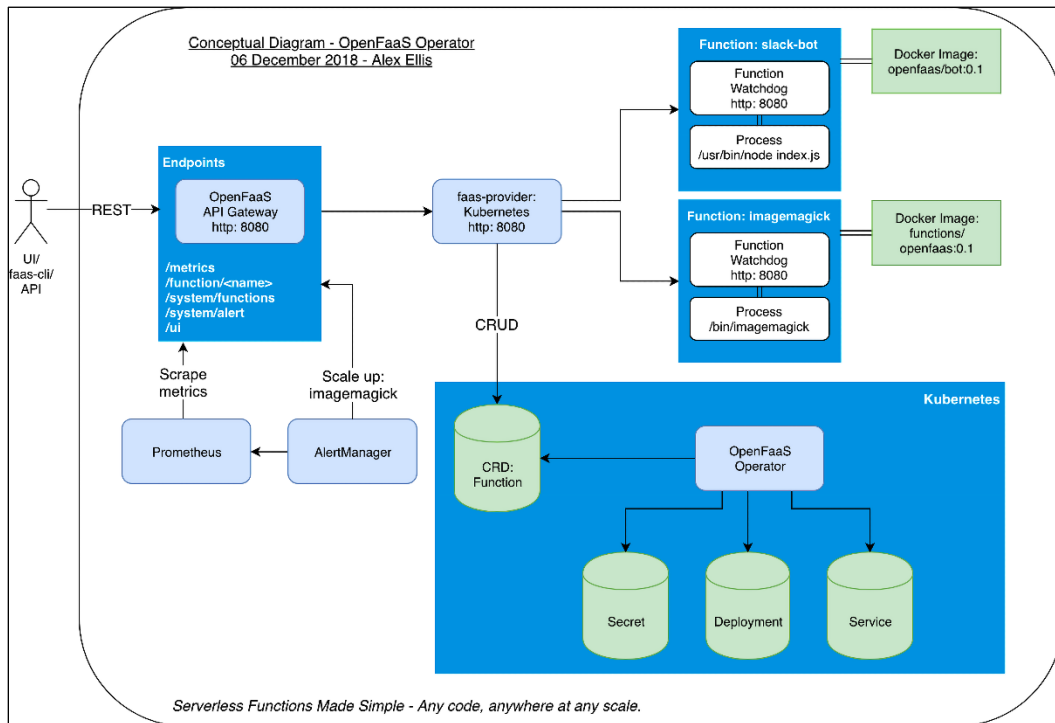
Function process: ./handler

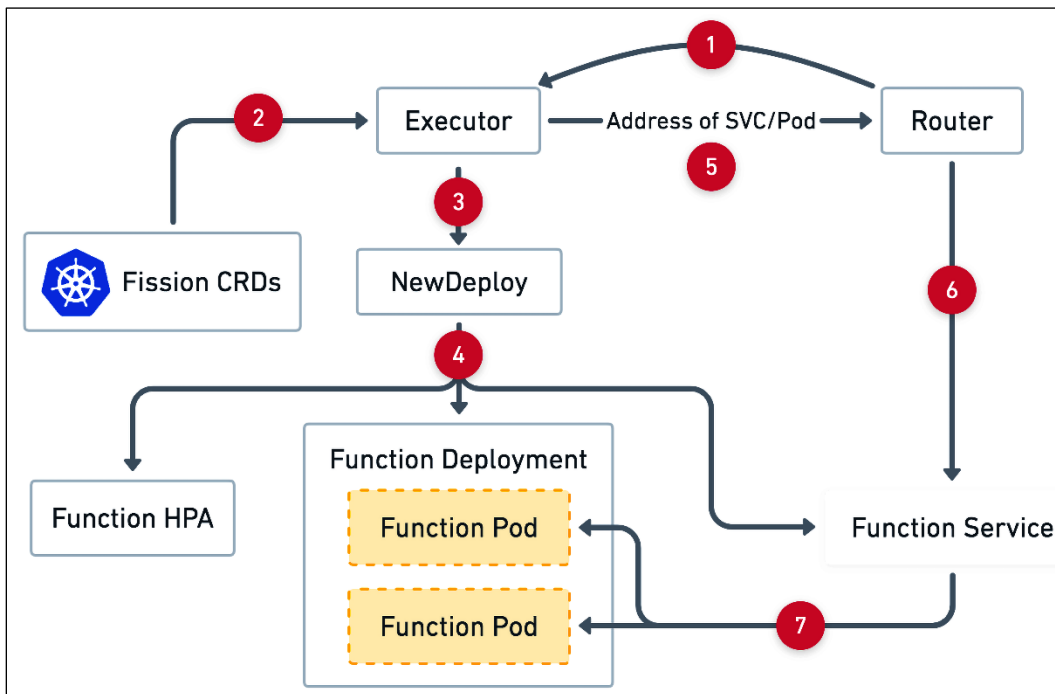
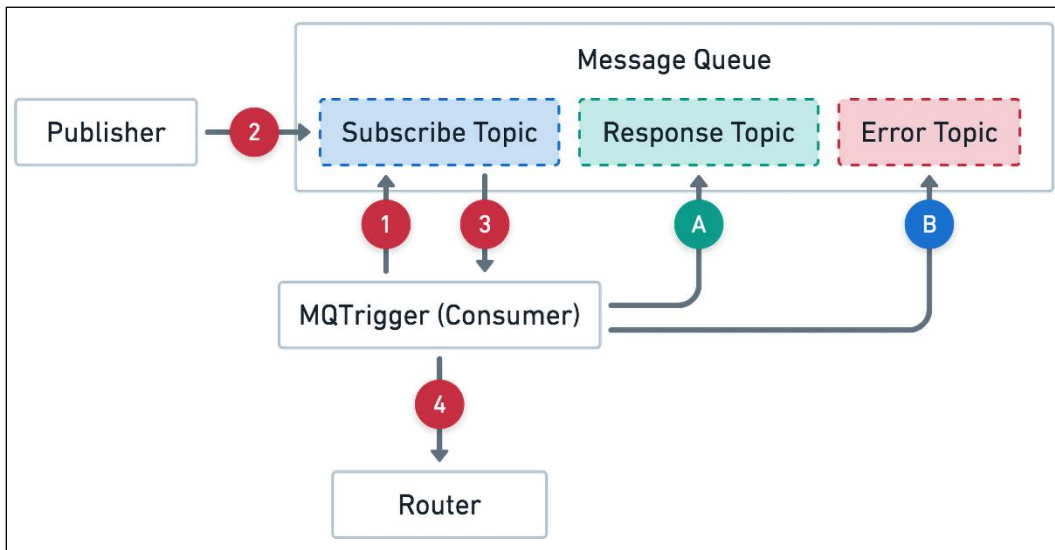
Invoke function

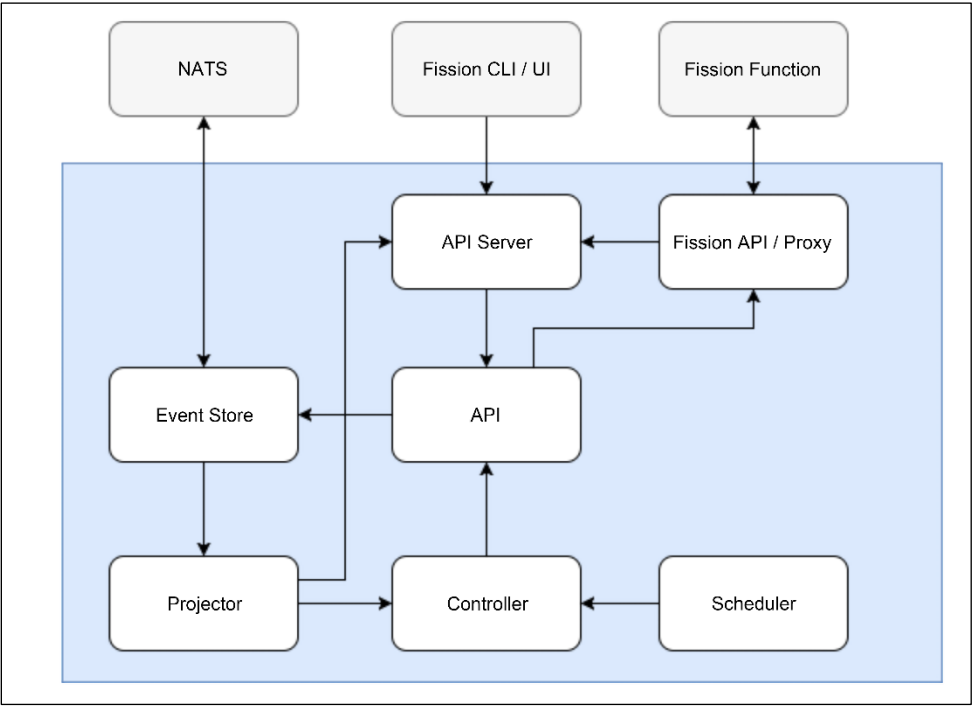
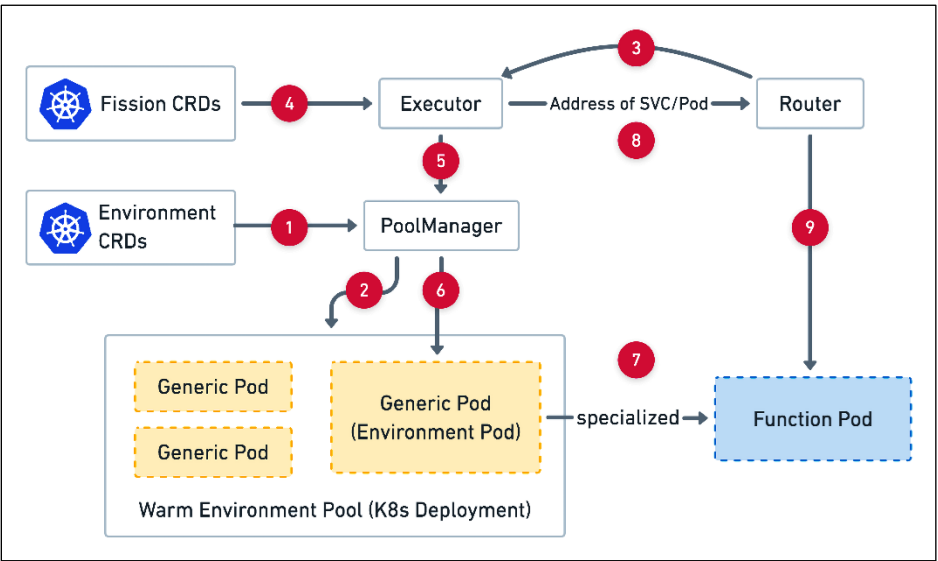
INVOKE

☒ Text ☐ JSON ☐ Download

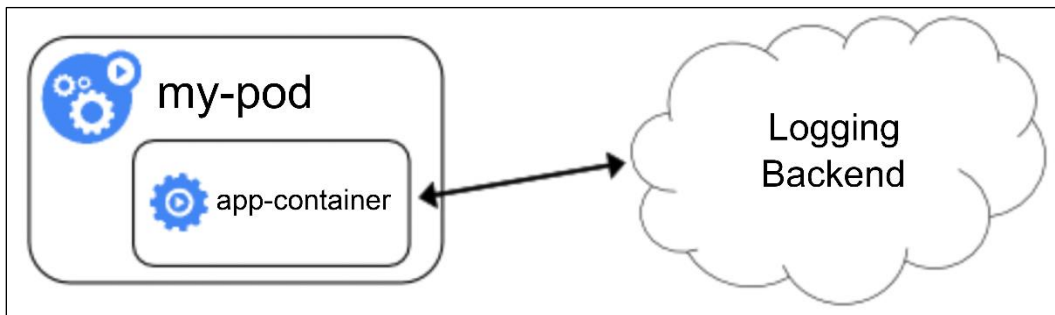
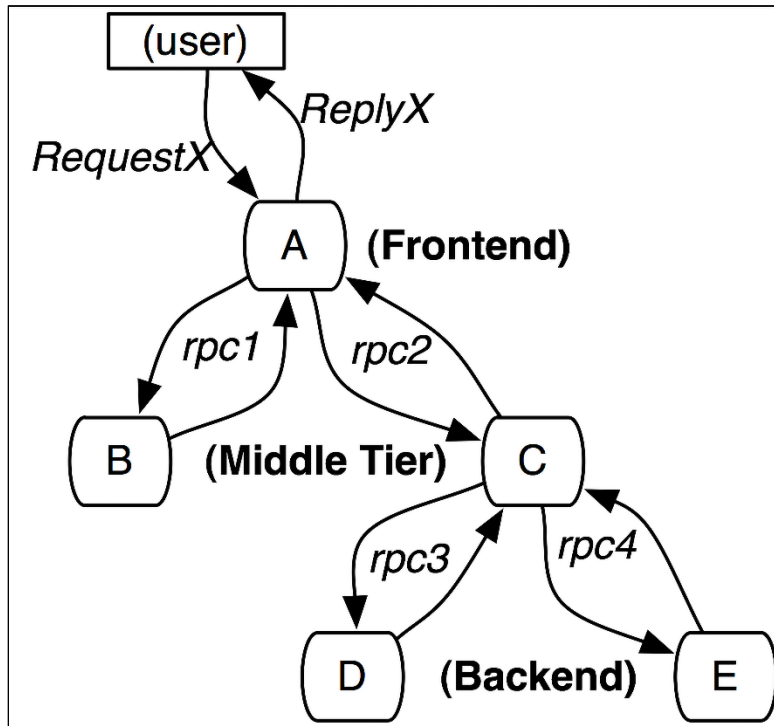
Request body

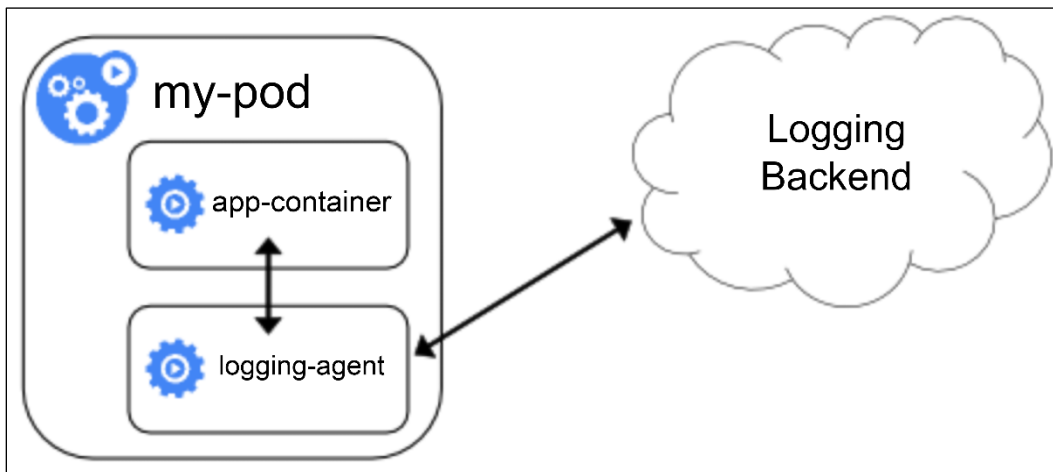
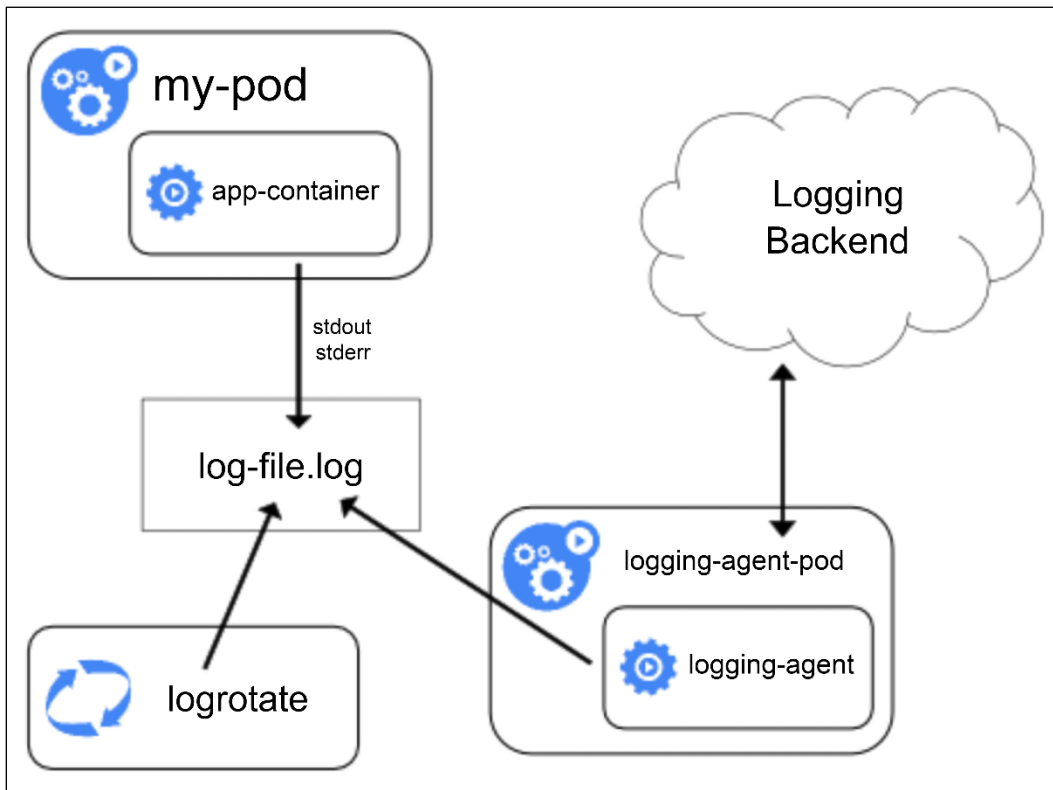


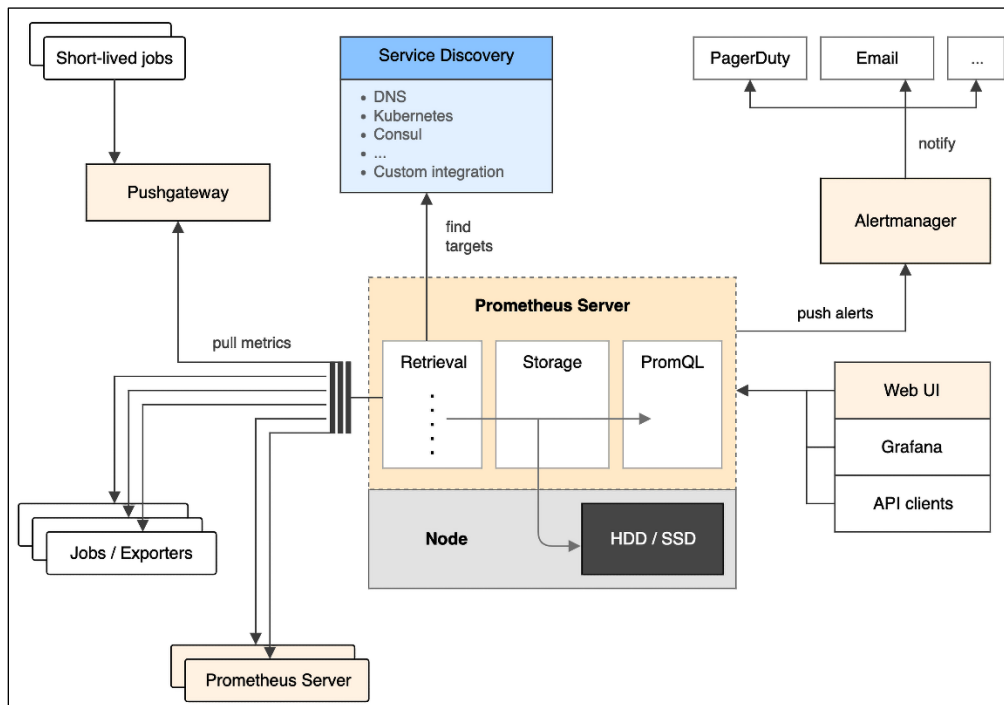
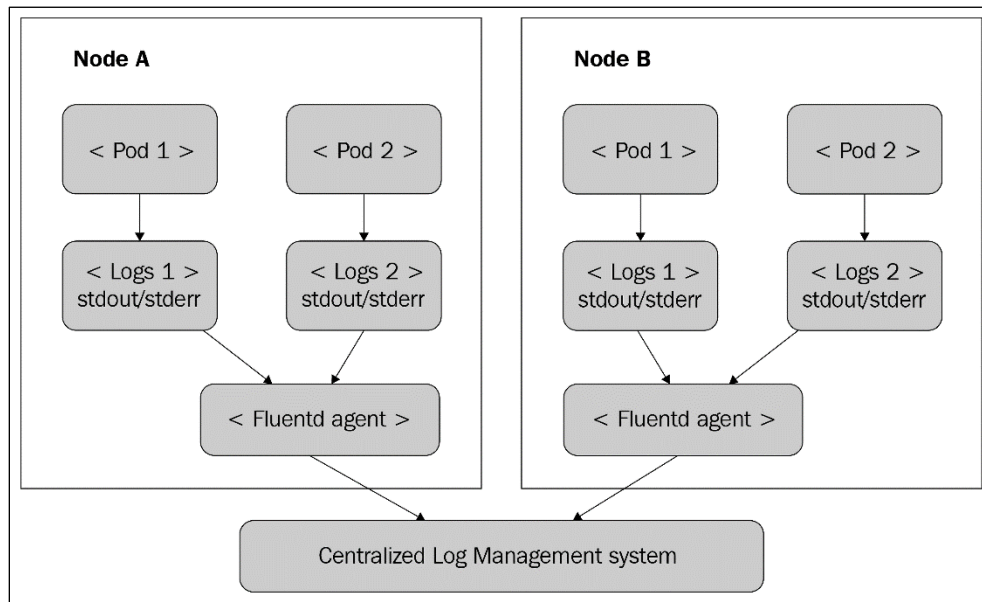


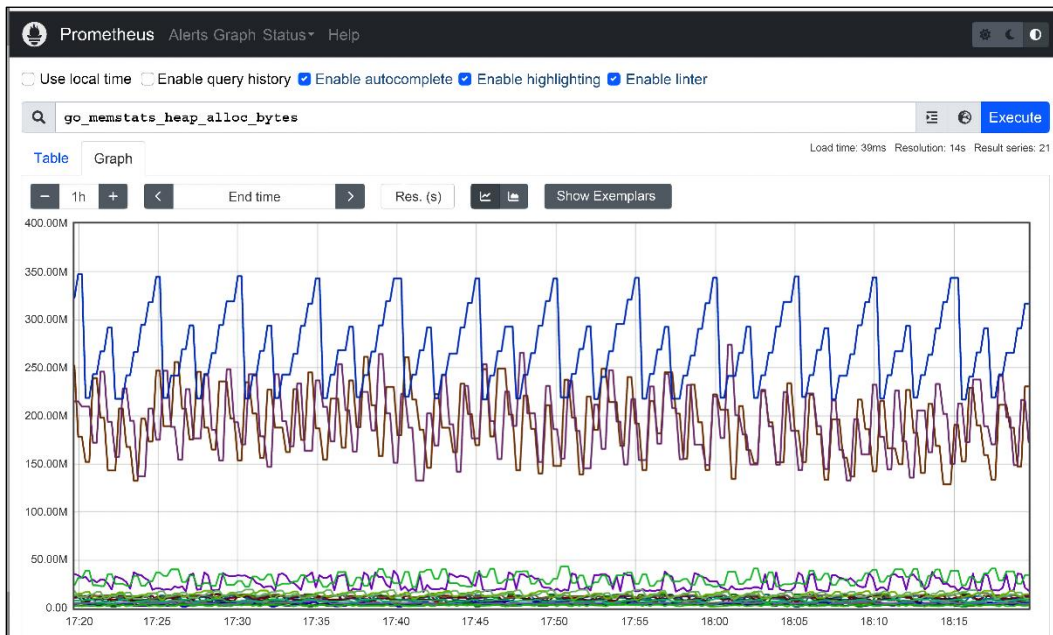


Chapter 13: Monitoring Kubernetes Clusters









Prometheus Alerts Graph Status Help

☐ Use local time ☐ Enable query history ☒ Enable autocomplete ☒ Enable highlighting ☒ Enable linter

Q kube_service Execute

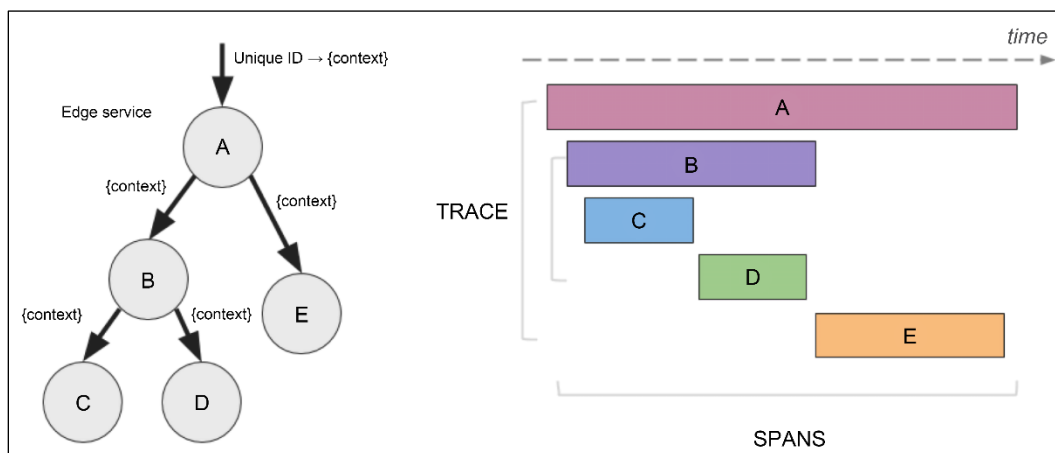
Table Graph Evaluation No data queried yet Add Panel Remove Panel

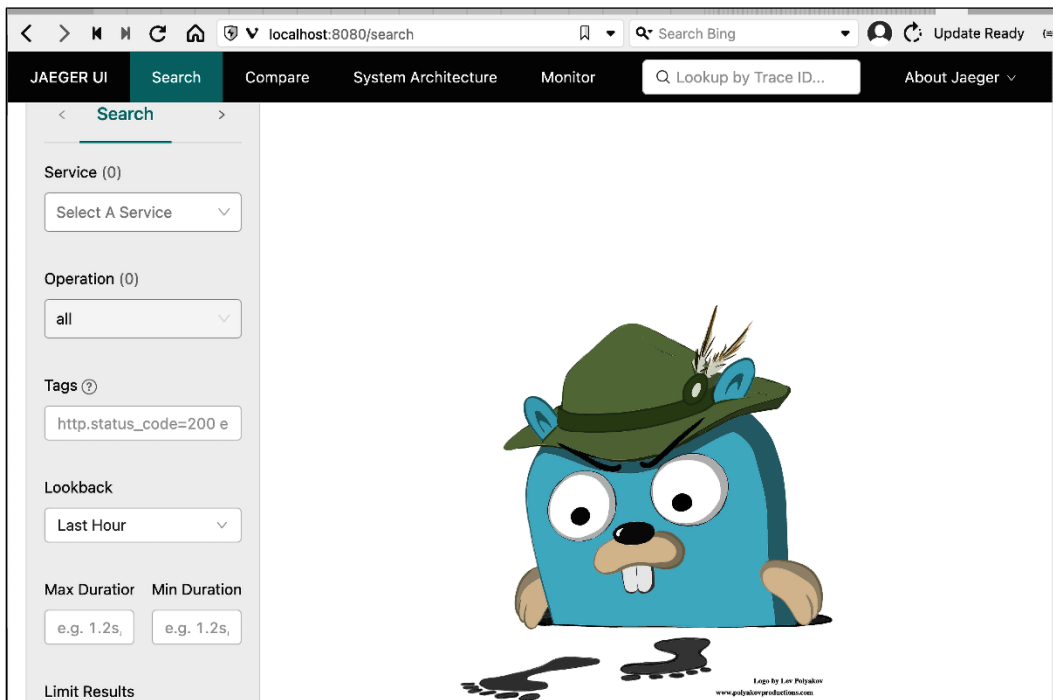
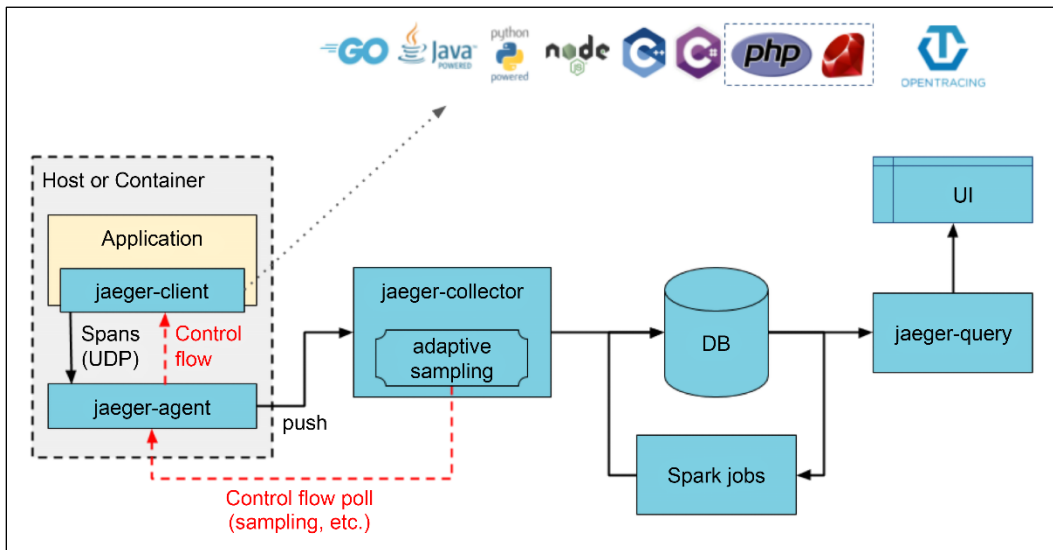
Metrics Explorer

- node_arp_entries
- node_authorizer_graph_actions_duration_seconds_bucket
- node_authorizer_graph_actions_duration_seconds_count
- node_authorizer_graph_actions_duration_seconds_sum
- node_boot_time_seconds
- node_context_switches_total
- node_cpu_guest_seconds_total
- node_cpu_seconds_total
- node_disk_discard_time_seconds_total
- node_disk_discarded_sectors_total
- node_disk_discards_completed_total
- node_disk_discards_merged_total

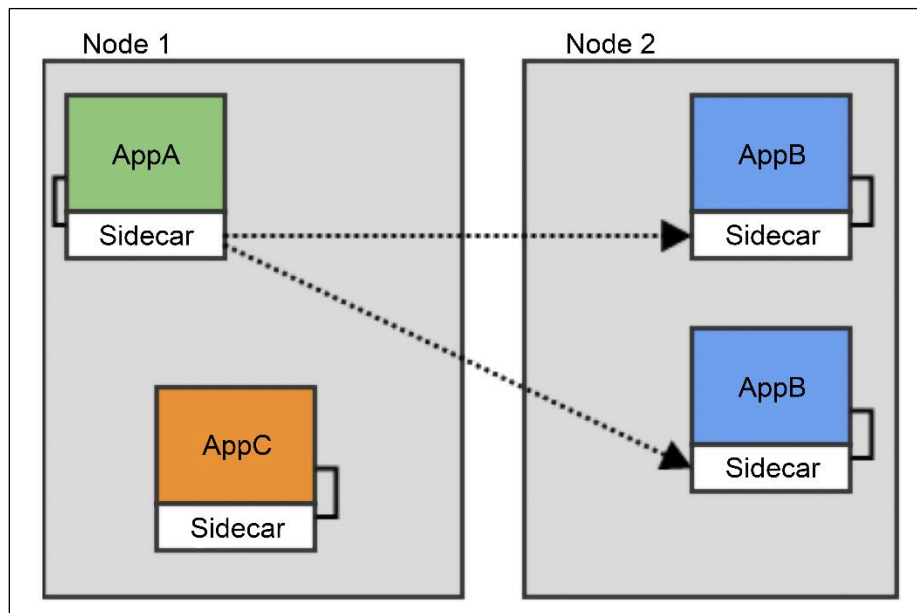
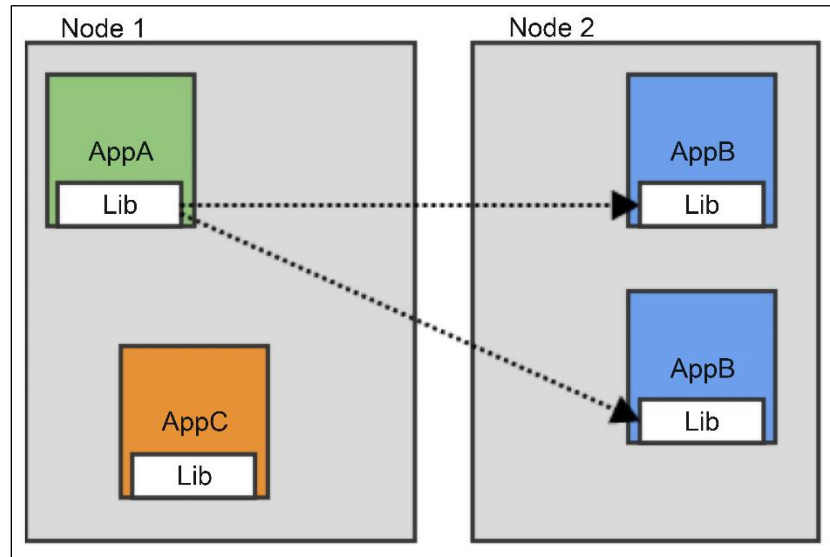


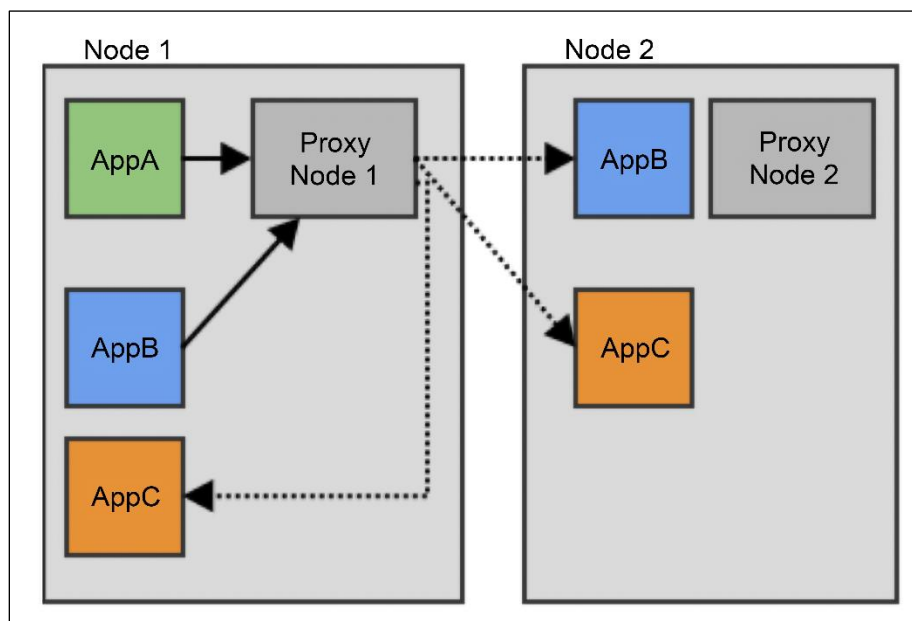
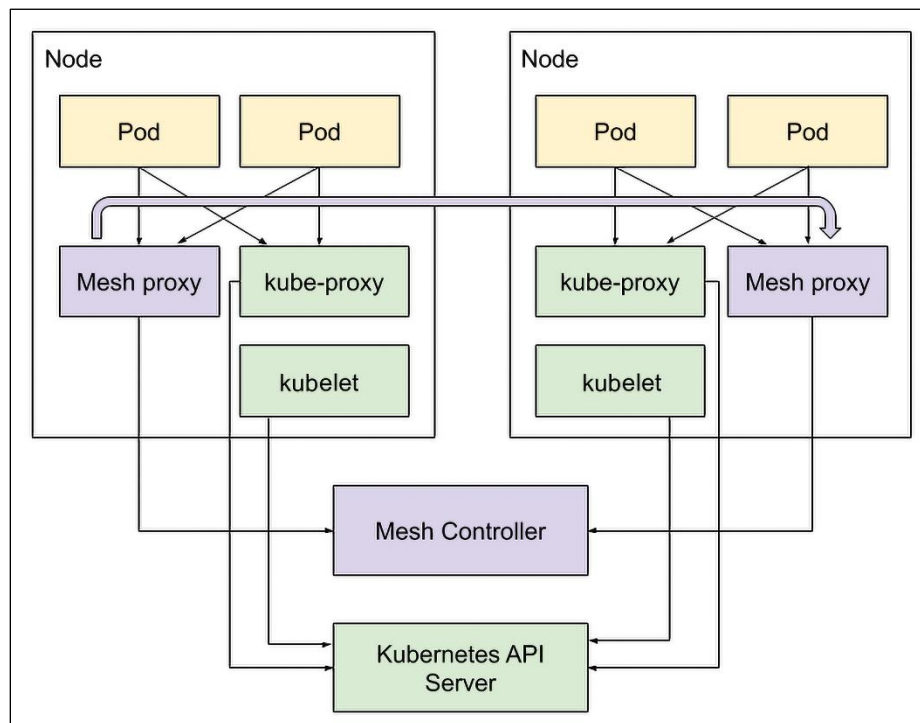
Kubernetes / Networking / Namespace (P...
Kubernetes / Networking / Namespace (...
Kubernetes / Networking / Pod
Kubernetes / Networking / Workload
Kubernetes / Persistent Volumes
Kubernetes / Proxy
Kubernetes / Scheduler
Node Exporter / MacOS
Node Exporter / Nodes
Node Exporter / USE Method / Cluster
Node Exporter / USE Method / Node
Prometheus / Overview

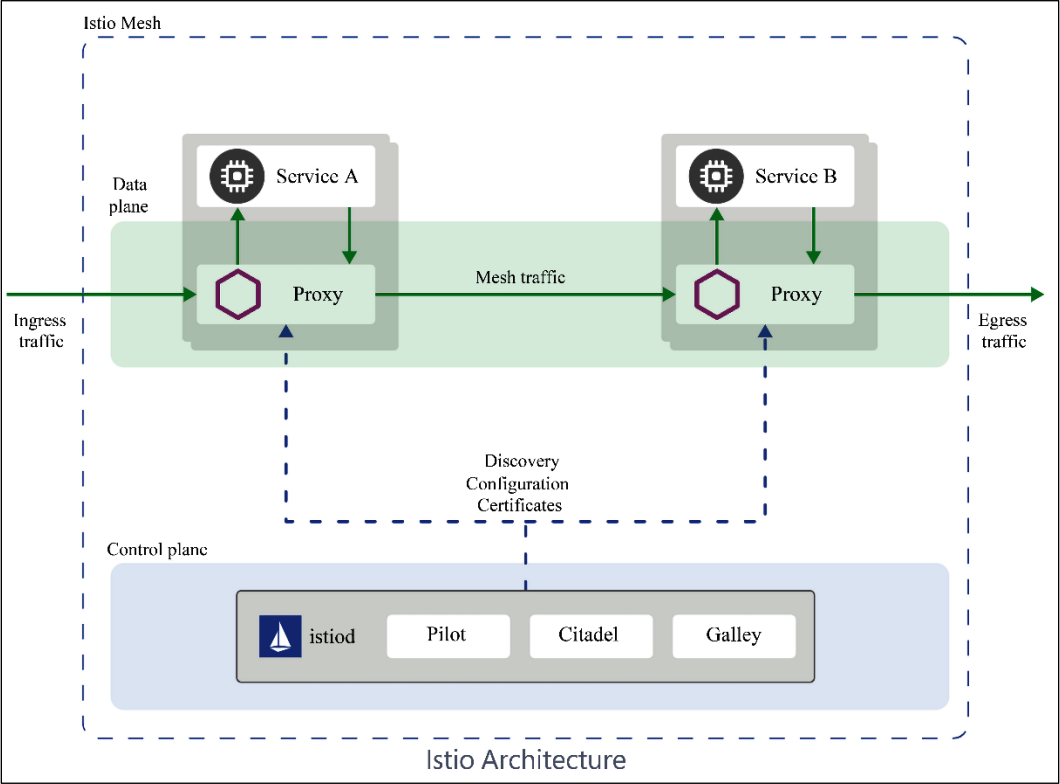


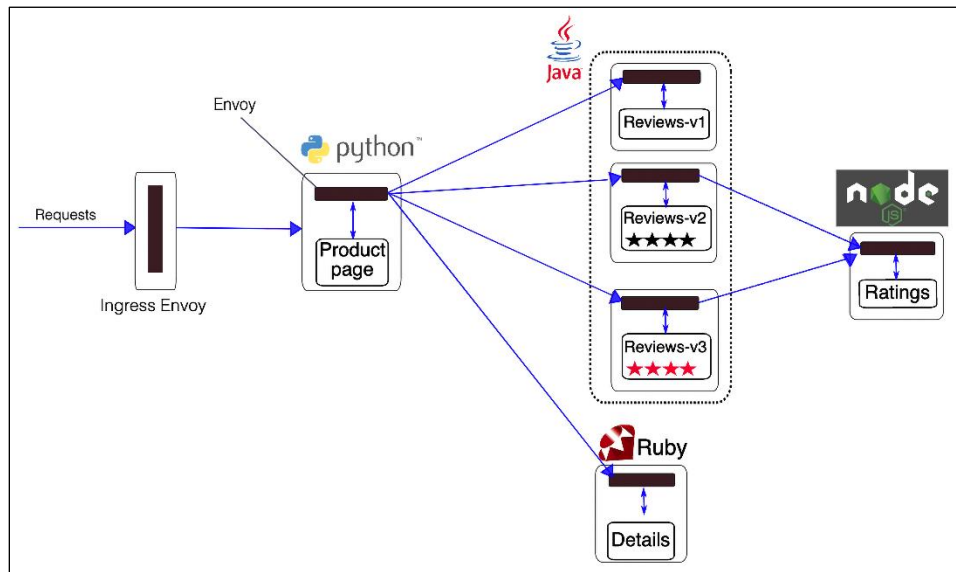


Chapter 14: Utilizing Service Meshes









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Summary: [Wikipedia Summary](#): The Comedy of Errors is one of **William Shakespeare's** early plays. It is his shortest and one of his most farcical comedies, with a major part of the humour coming from slapstick and mistaken identity, in addition to puns and word play.

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Pages:
200
Publisher:
PublisherA
Language:
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ISBN-10:
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Book Reviews

An extremely entertaining play by Shakespeare. The slapstick humour is refreshing!

— Reviewer1

★★★★★

Absolutely fun and entertaining. The play lacks thematic depth when compared to other plays by Shakespeare.

— Reviewer2

★★★★☆

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The Comedy of Errors

Summary: [Wikipedia Summary](#): The Comedy of Errors is one of **William Shakespeare's** early plays. It is his shortest and one of his most farcical comedies, with a major part of the humour coming from slapstick and mistaken identity, in addition to puns and word play.

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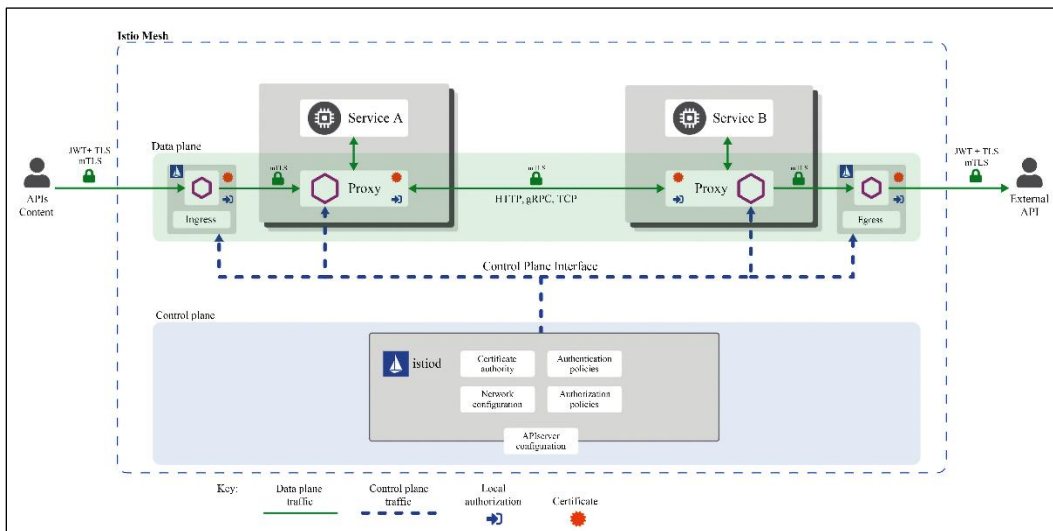
★★★★★

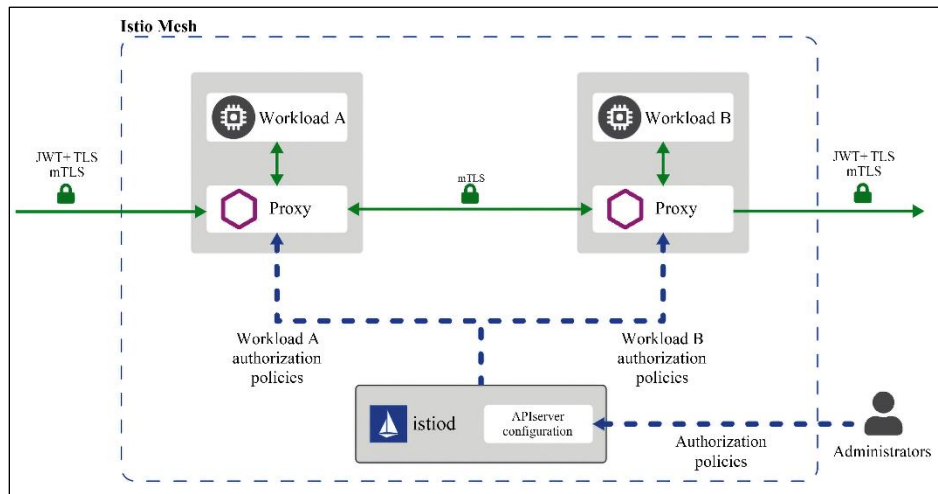
Absolutely fun and entertaining. The play lacks thematic depth when compared to other plays by Shakespeare.

— Reviewer2

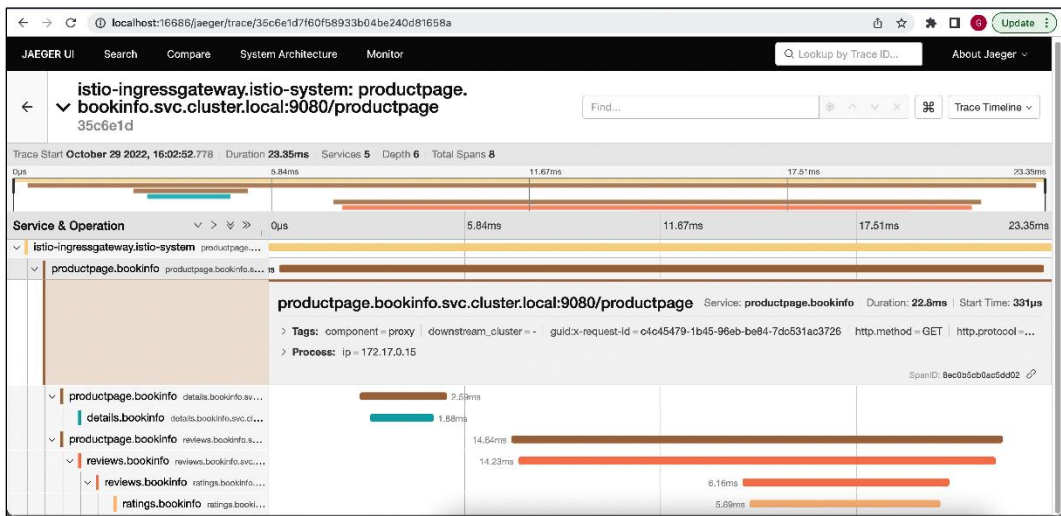
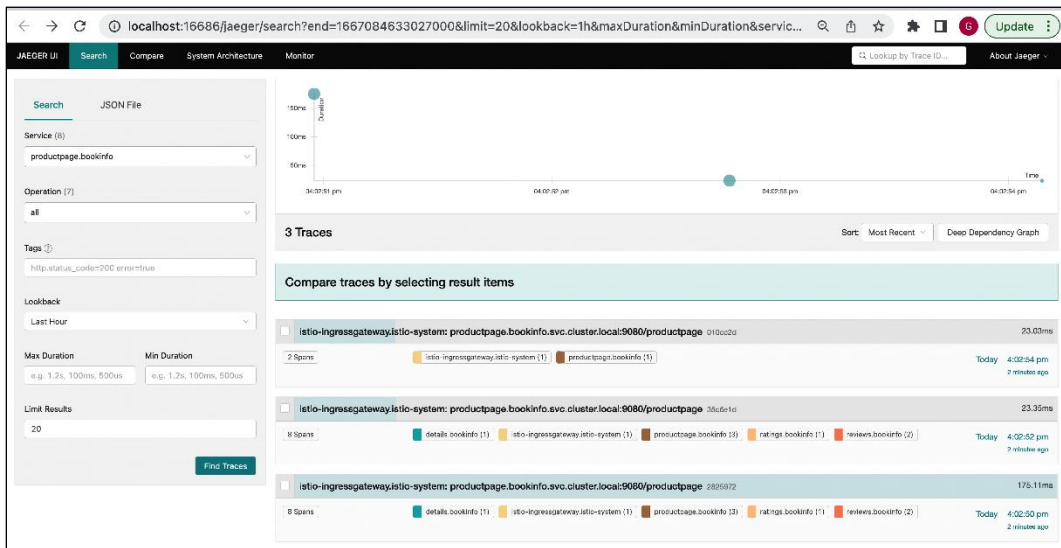
★★★★☆

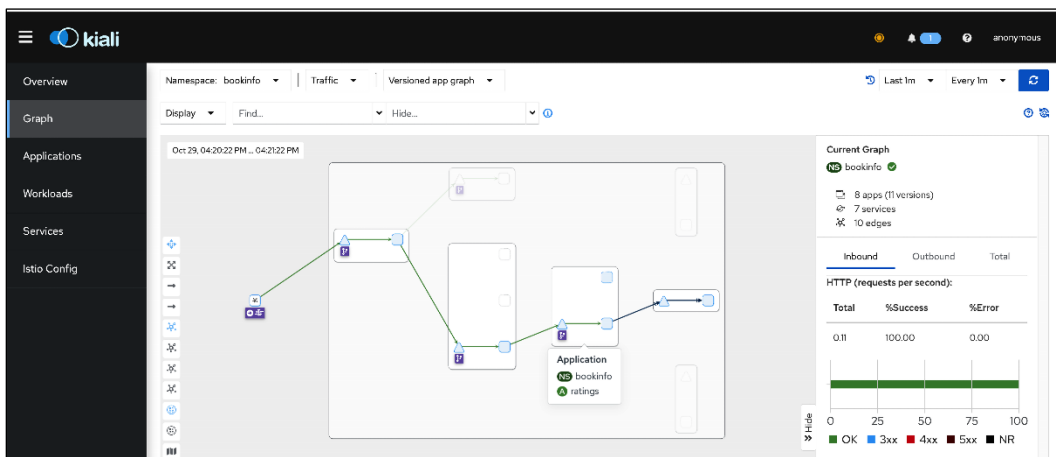
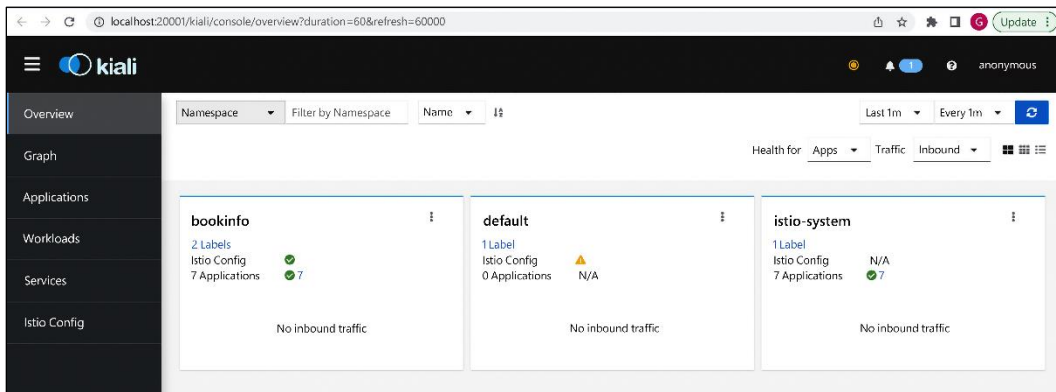
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istio_build
istio_double_request_count
istio_mcp_clients_total
istio_mcp_message_sizes_bytes_bucket
istio_mcp_message_sizes_bytes_count
istio_mcp_message_sizes_bytes_sum
istio_mcp_reconnections
istio_mcp_recv_failures_total
istio_mcp_request_acks_total
istio_request_bytes_bucket
istio_request_bytes_count
istio_request_bytes_sum
istio_request_duration_seconds_bucket
istio_request_duration_seconds_count
istio_request_duration_seconds_sum
✓ istio_requests_total
istio_response_bytes_bucket
istio_response_bytes_count
istio_response_bytes_sum
istio_tcp_connections_closed_total
istio_tcp_connections_opened_total
istio_tcp_received_bytes_total
istio_tcp_sent_bytes_total





Chapter 15: Extending Kubernetes

http://localhost:8080/apis/batch/v1

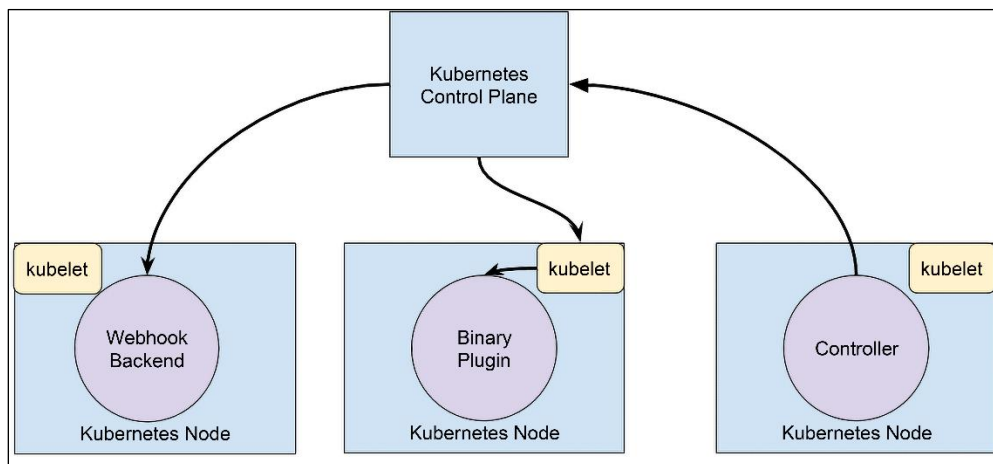
GET http://localhost:8080/apis/batch/v1

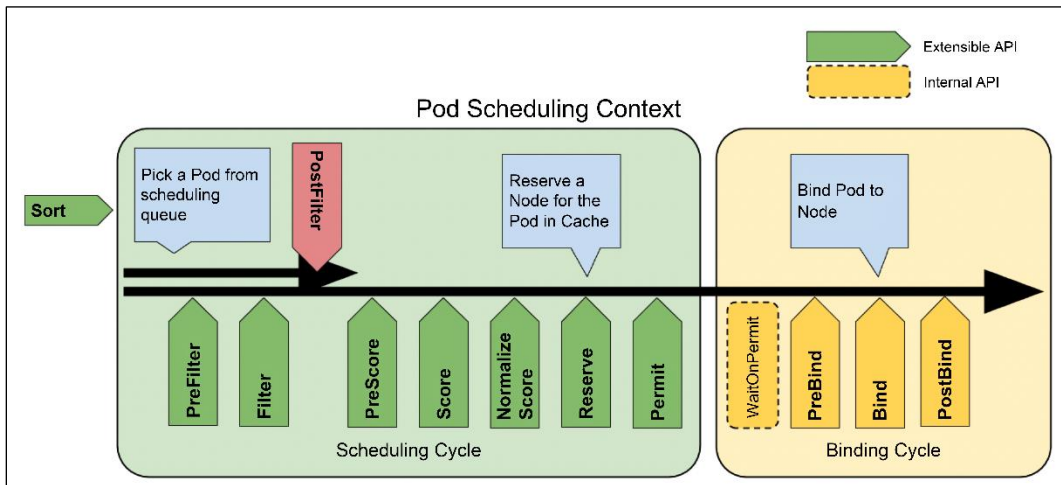
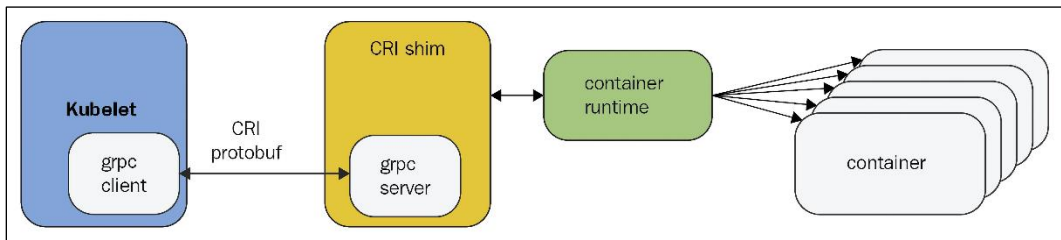
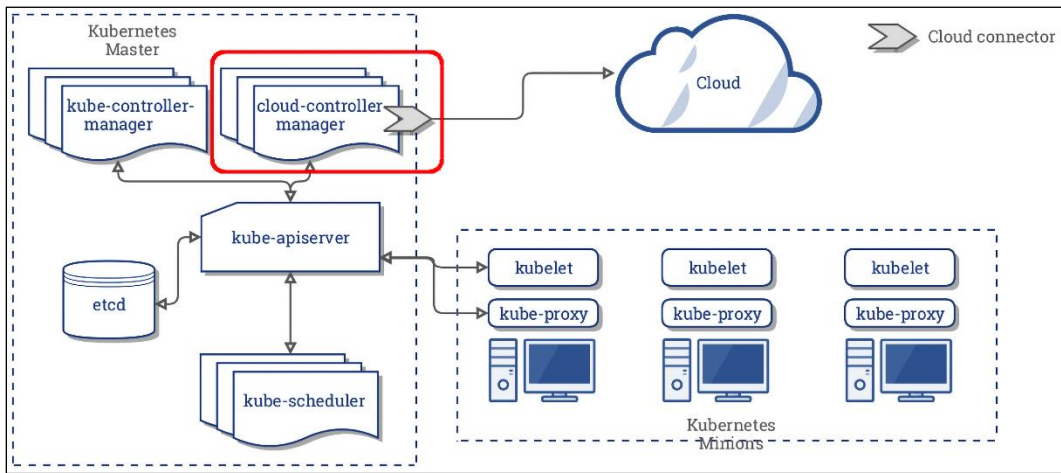
Params Authorization Headers (6) Body Pre-request Script Tests Settings Cookies

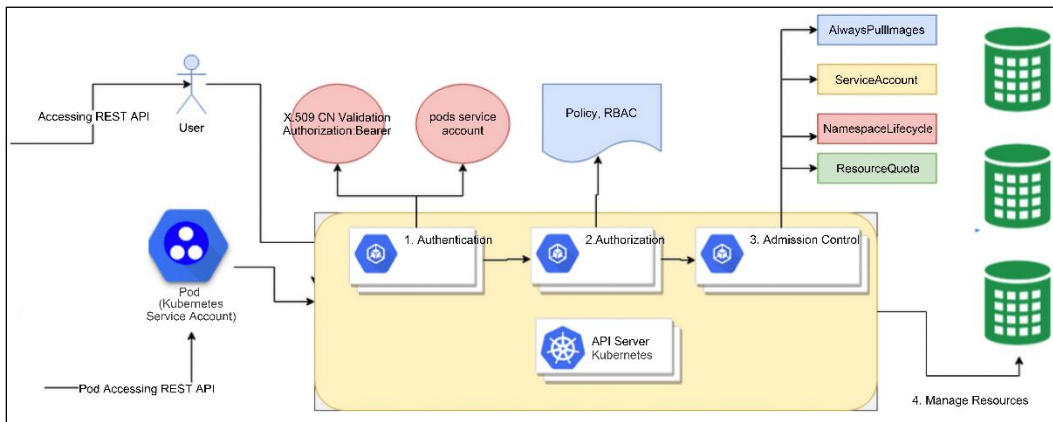
Body Cookies Headers (7) Test Results 200 OK 13 ms 1.05 KB Save Response

Pretty Raw Preview Visualize JSON

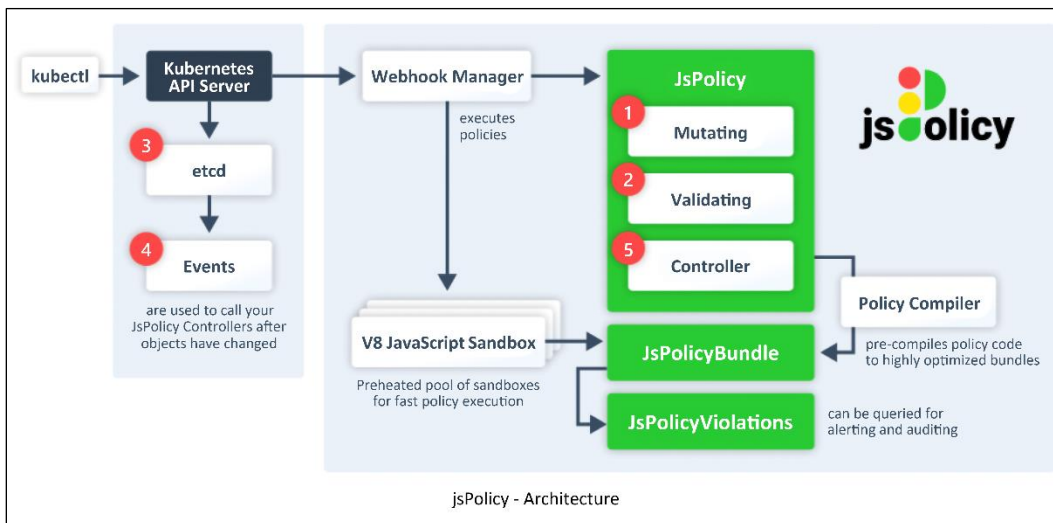
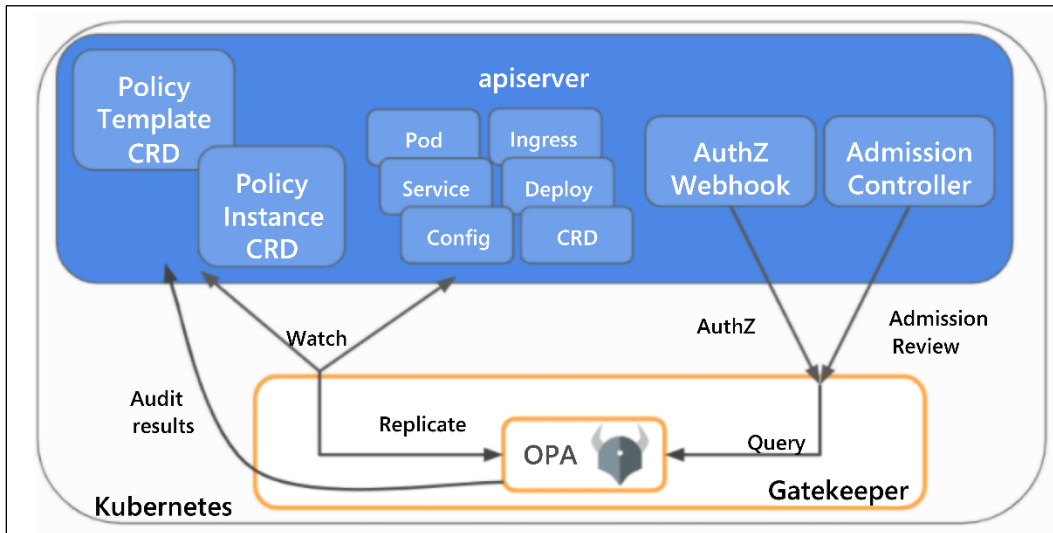
```
1  {
2    "kind": "APIResourceList",
3    "apiVersion": "v1",
4    "groupVersion": "batch/v1",
5    "resources": [
6      {
7        "name": "cronjobs",
8        "singularName": "",
9        "namespaced": true,
10       "kind": "CronJob",
11       "verbs": [
12         "create",
13         "delete",
14         "deletecollection",
15         "get",
16         "list",
17         "patch",
18         "update",
19         "watch"
20       ]
21     ]
22   }
```

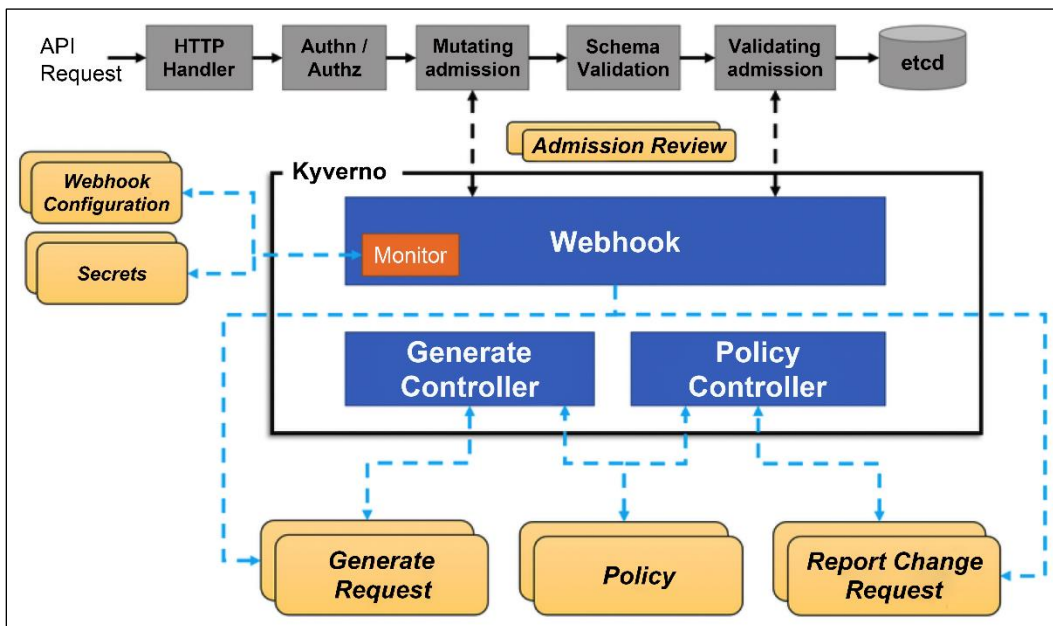
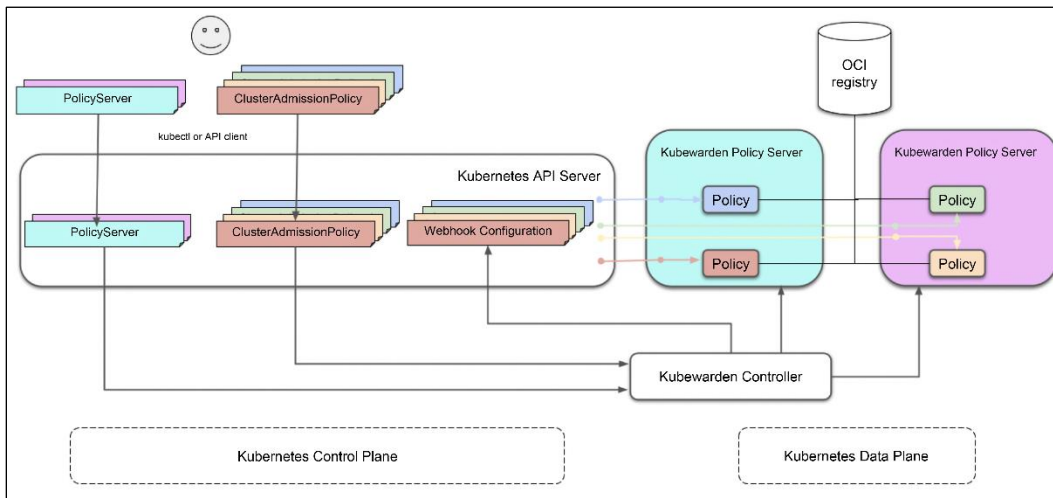


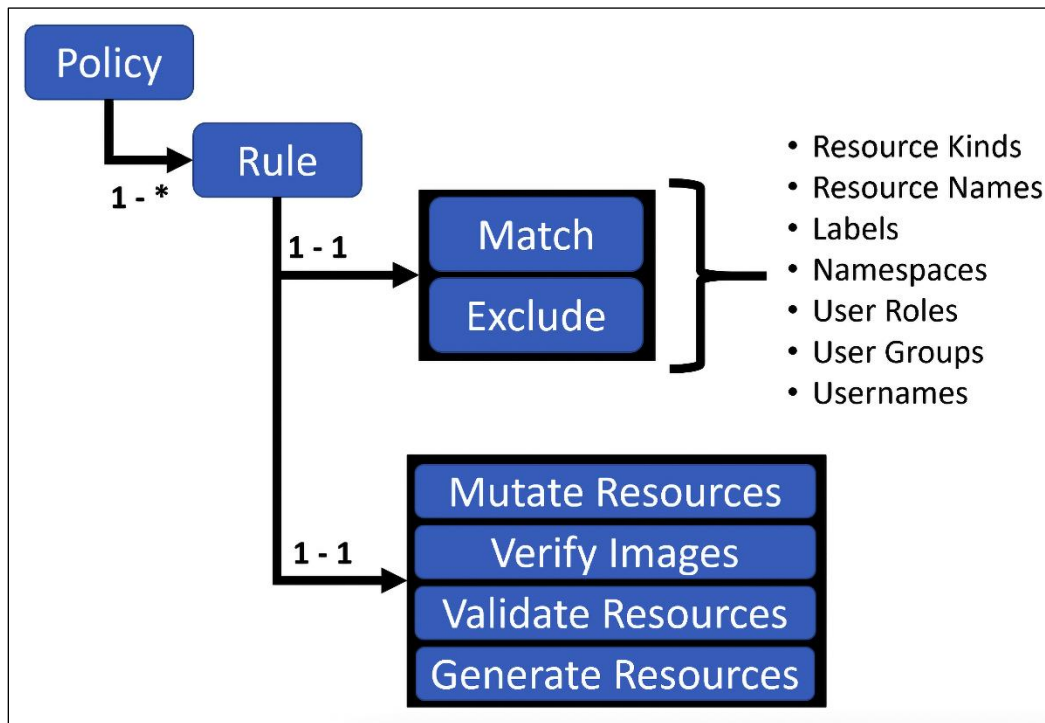
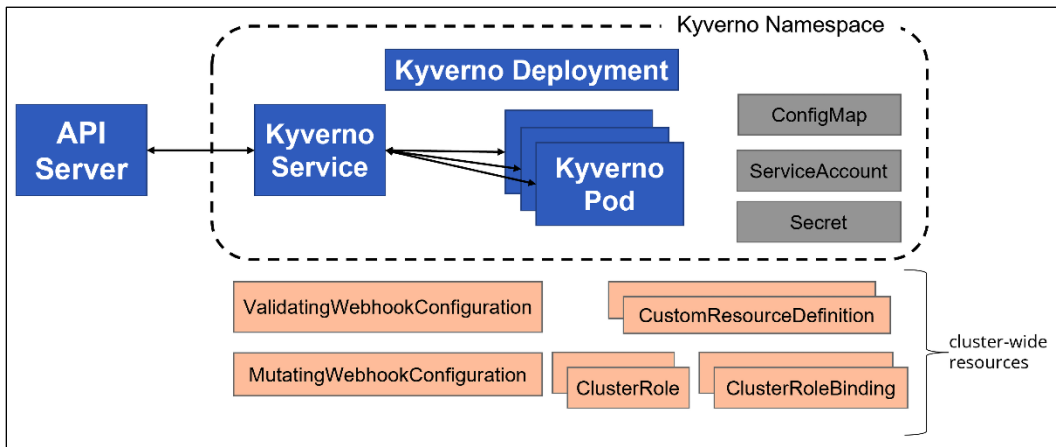


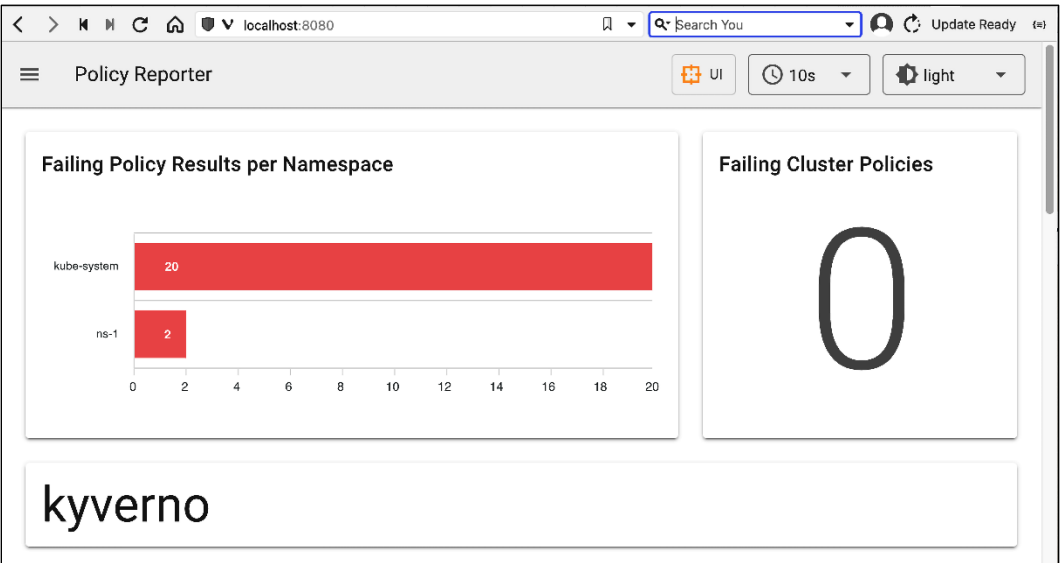


Chapter 16: Governing Kubernetes







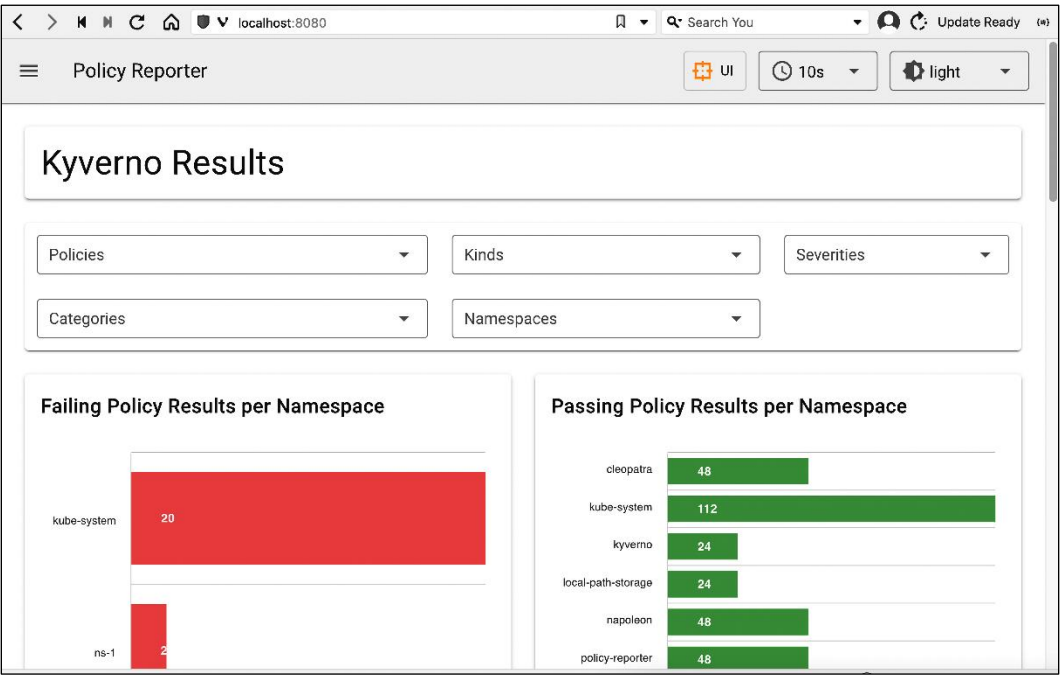


localhost:8080 Search You Update Ready (4)

Policy Reporter UI 10s light

kube-system	Pod	kube-proxy-fgg64	disallow-host-namespaces	host-namespaces	medium	fail
kube-system	Pod	kube-proxy-fgg64	disallow-host-path	host-path	medium	fail
kube-system	Pod	kube-proxy-fgg64	disallow-privileged-containers	privileged-containers	medium	fail
kube-system	Pod	kube-scheduler-kind-control-plane	disallow-host-namespaces	host-namespaces	medium	fail
kube-system	Pod	kube-scheduler-kind-control-plane	disallow-host-path	host-path	medium	fail
ns-1	Service	service-3	disallow-some-services	some-rule		fail
ns-1	Service	service-4	disallow-some-services	some-rule		fail

Rows per page: All 1 22 of 22







Chapter 17: Running Kubernetes in Production

playground

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Quotas for project "playground"

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<input type="checkbox"/>	Service	Quota	Dimensions (e.g. location)	Limit	Current usage percentage ↓	Current usage	7 day peak usage percentage
<input type="checkbox"/>	Compute Engine API	Networks		5	<div><div></div></div> 20%	1	<div><div></div></div> 20%
<input type="checkbox"/>	Compute Engine API	Subnetwork ranges per VPC Network	network_id : default	300	<div><div></div></div> 12.67%	38	<div><div></div></div> 12.67%
<input type="checkbox"/>	Compute Engine API	Firewall rules		100	<div><div></div></div> 5%	5	<div><div></div></div> 5%
<input type="checkbox"/>	Compute Engine API	VM instances	region : us-central1	24	<div><div></div></div> 4.17%	1	<div><div></div></div> 4.17%

Chapter 18: The Future of Kubernetes

