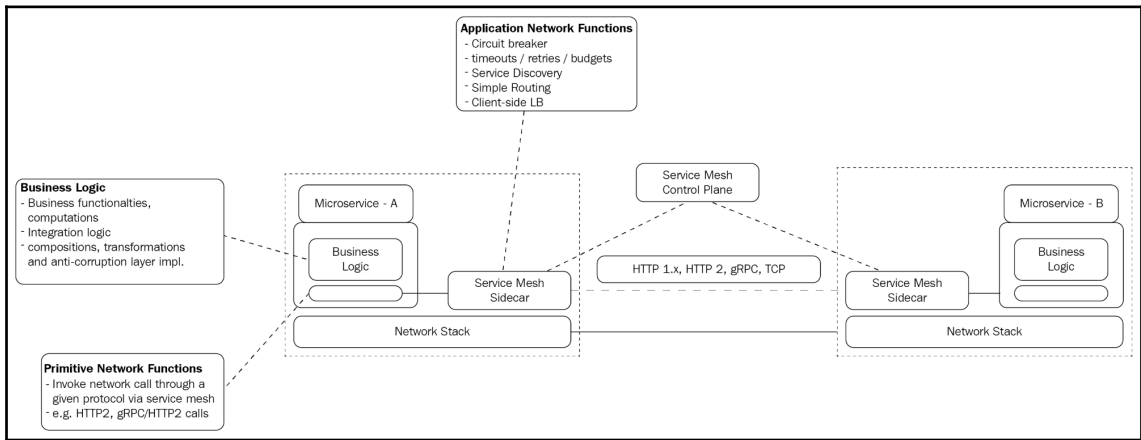
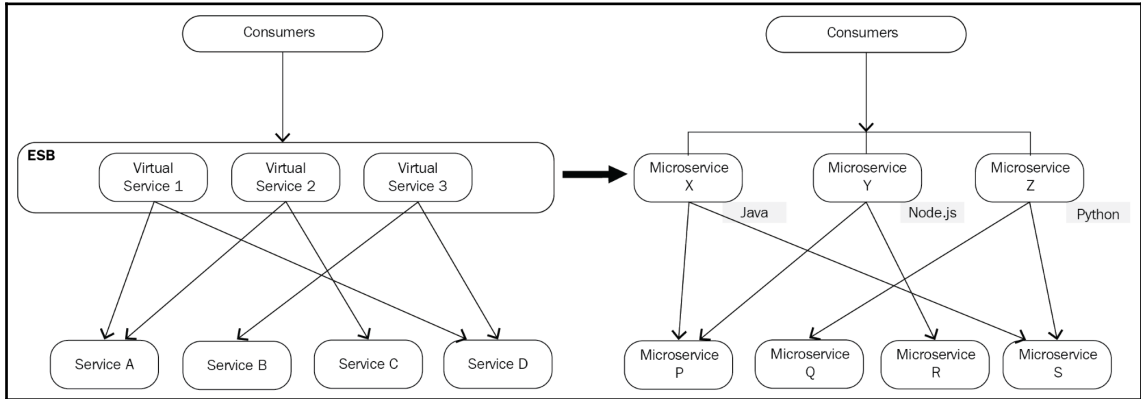


Chapter 1: Demystifying the Site Reliability Engineering Paradigm



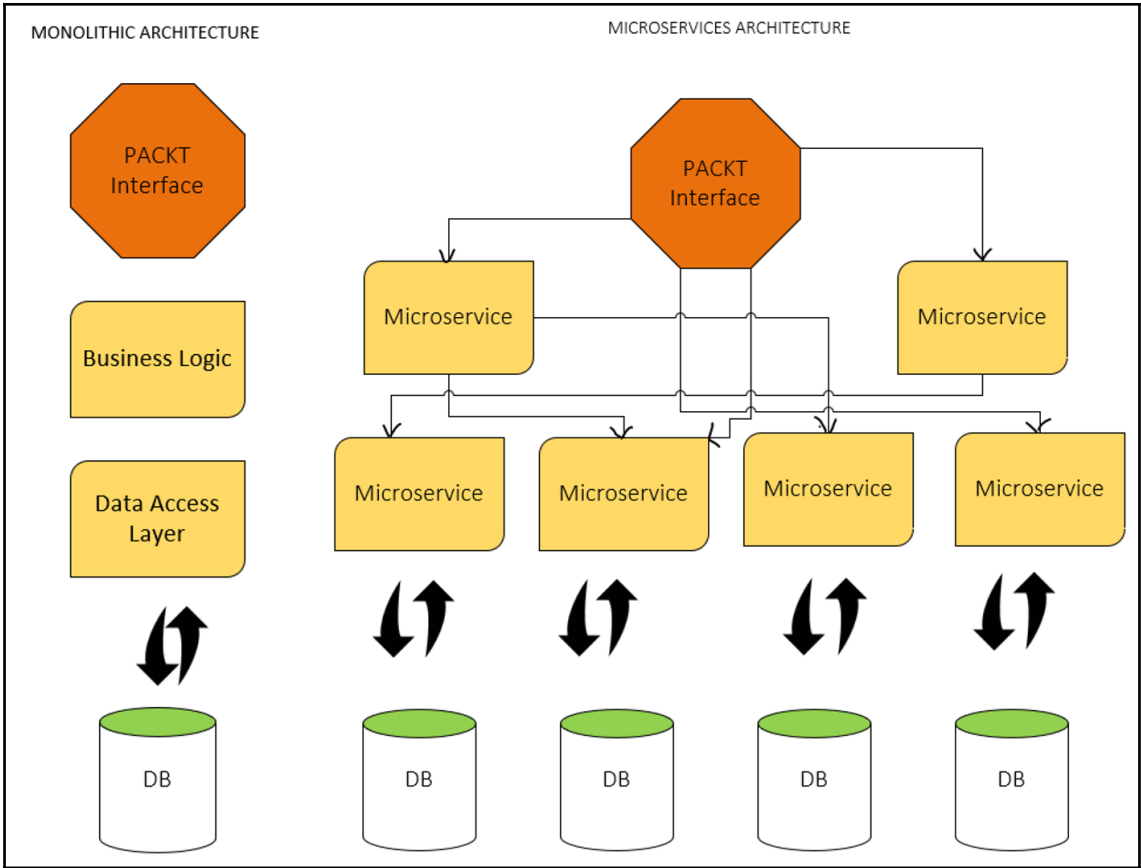
Chapter 2: Microservices Architecture and Containers

```
NAME                                DESIRED  CURRENT  UP-TO-DATE  AVAILABLE  AGE
my-hello-packt-application-deployment  3        0        0            0          1s
```

```
NAME                                DESIRED  CURRENT  UP-TO-DATE  AVAILABLE  AGE
my-hello-packt-application-deployment  3        3        3            3          18s
```

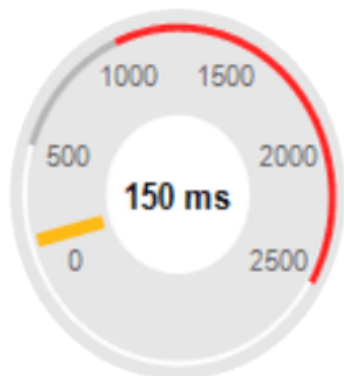
```
NAME                                DESIRED  CURRENT  READY  AGE
my-hello-packt-application-deployment-2035384211  3        3        3      18s
```

```
NAME                                READY  STATUS  RESTARTS  AGE  LABELS
my-hello-packt-application-deployment-2035384211-7ci7o  1/1   Running  0         18s  app=my-hello-packt-application,pod-template-hash=203
my-hello-packt-application-deployment-2035384211-kzszj  1/1   Running  0         18s  app=my-hello-packt-application,pod-template-hash=203
my-hello-packt-application-deployment-2035384211-gqcnm  1/1   Running  0         18s  app=my-hello-packt-application,pod-template-hash=203
```



Average Response Time & Packet Loss

THRESHOLDS EDIT HELP



Avg Resp Time



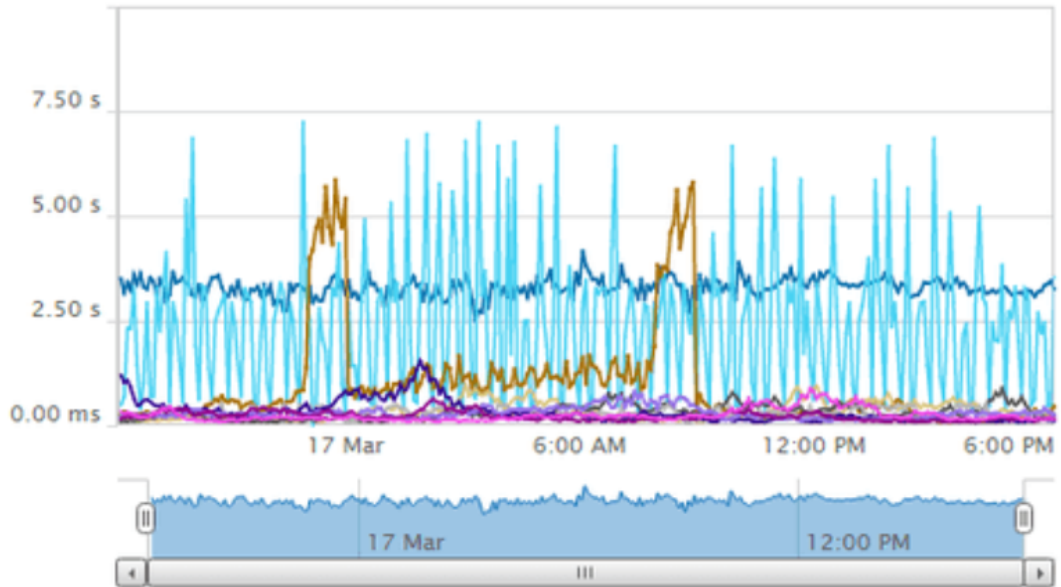
Packet Loss

Top 10 Application Response Time (Time to First Byte)

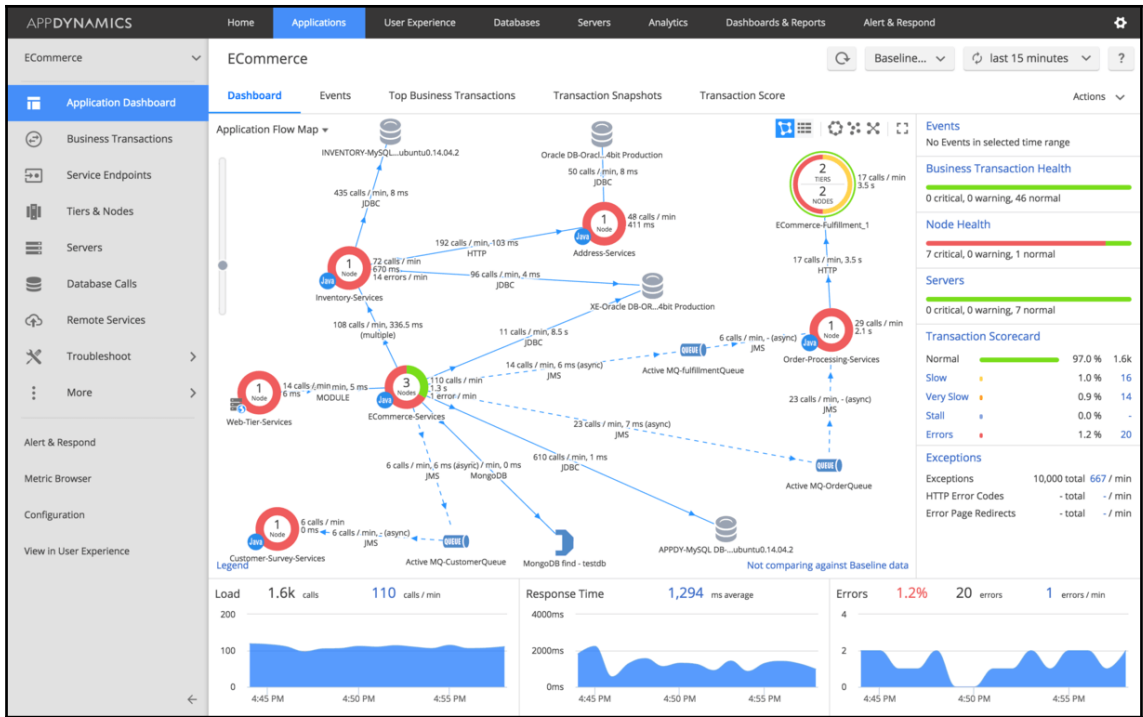
EXPORT HELP

LAST 24 HOURS

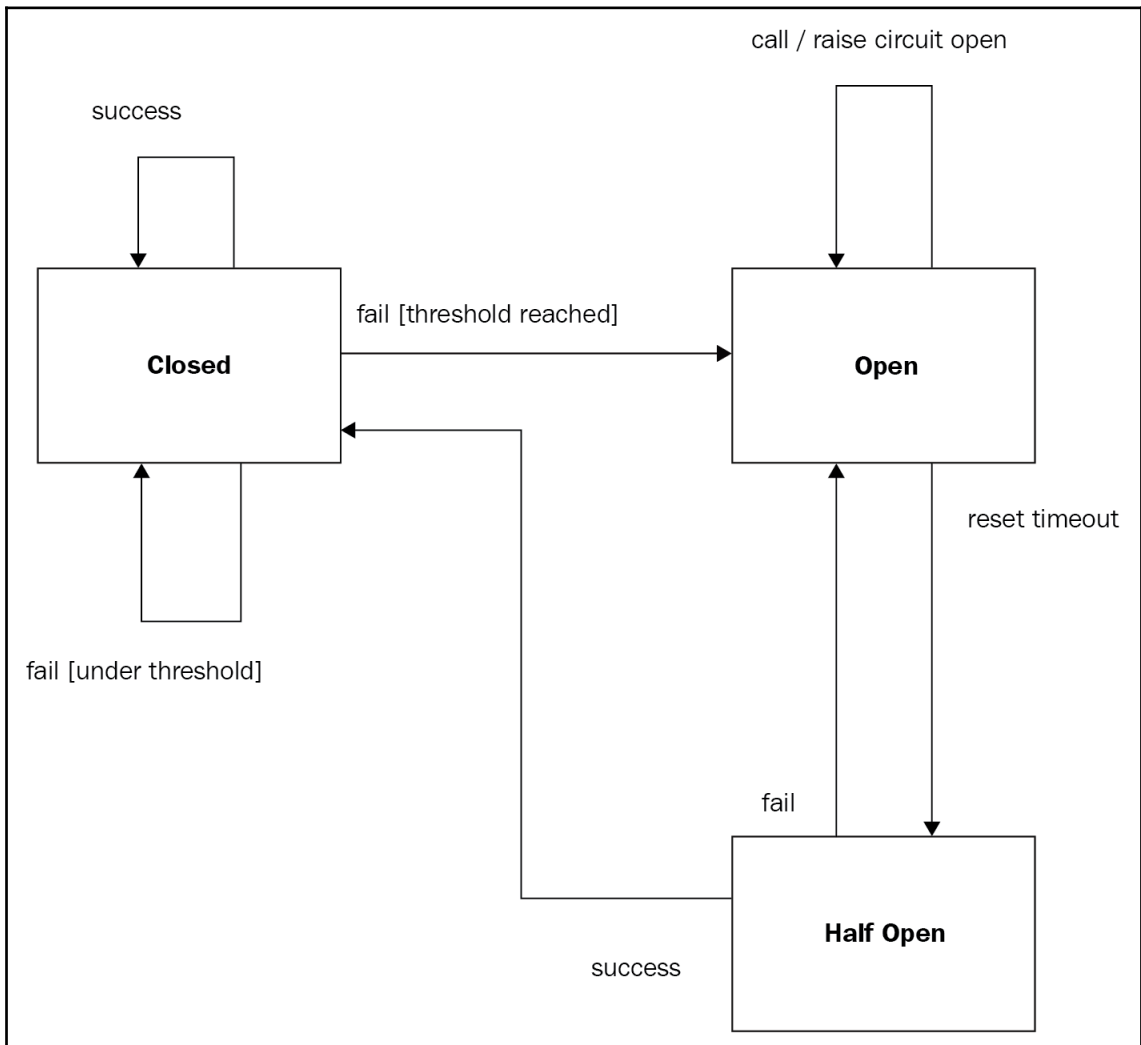
Zoom 30m 1h 2h

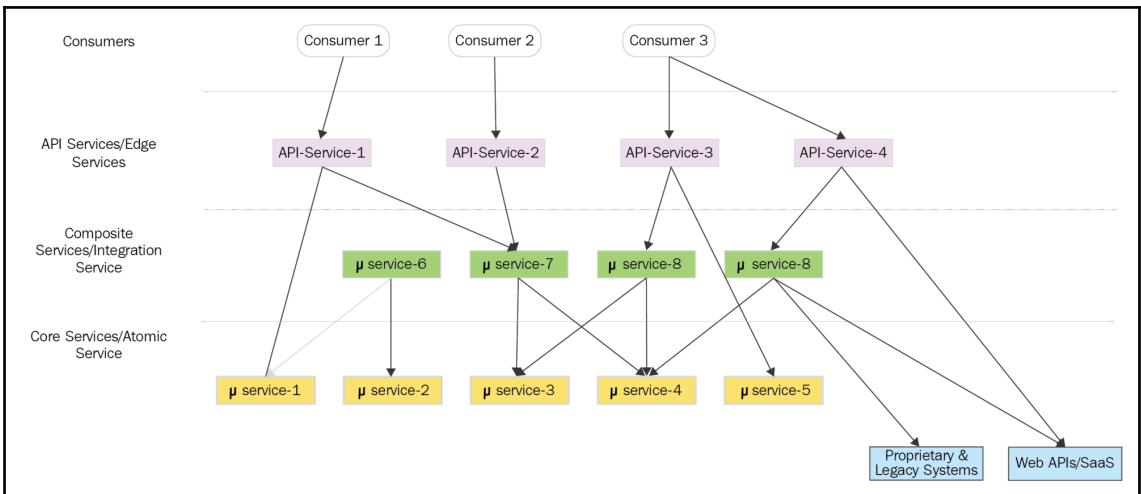
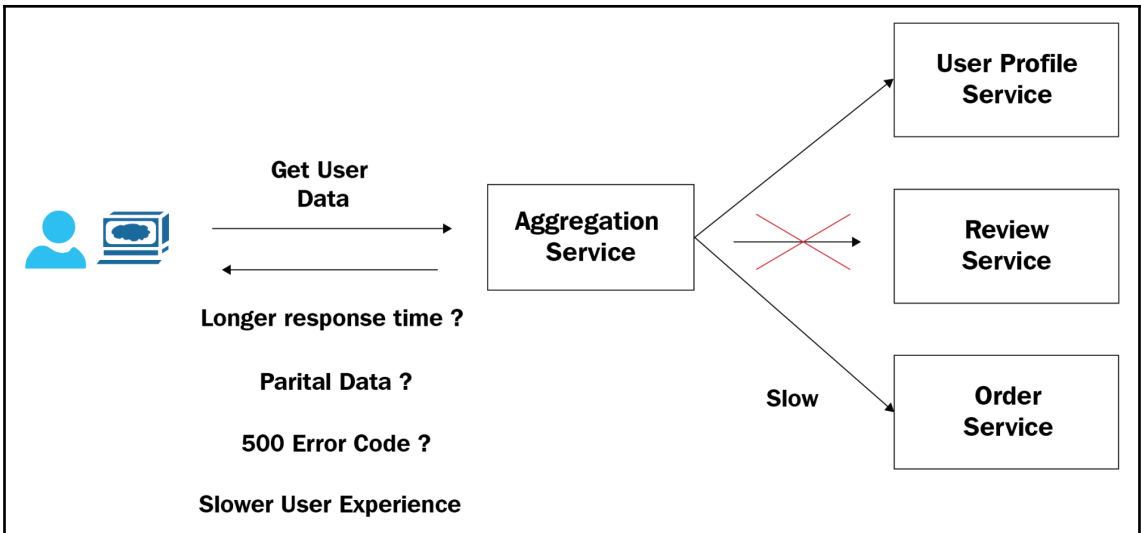


QOE APPLICATION	AVERAGE APPLICATION RESPONSE TIME	PEAK VALUE
MS SQL	3.28 s	4.67 s
CIFS	1.26 s	7.24 s
HTTP	1.01 s	13.48 s
Amazon Web Services	367.34 ms	1.36 s
KMPP	354.46 ms	878.99 ms

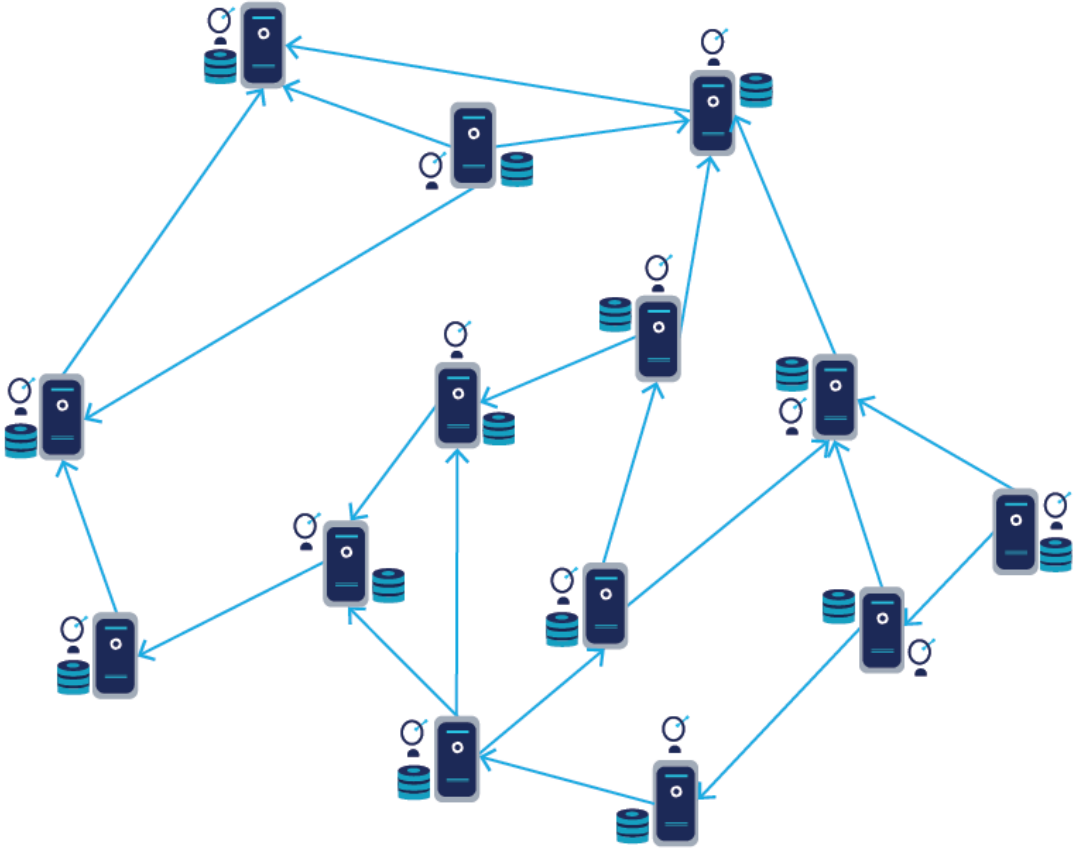


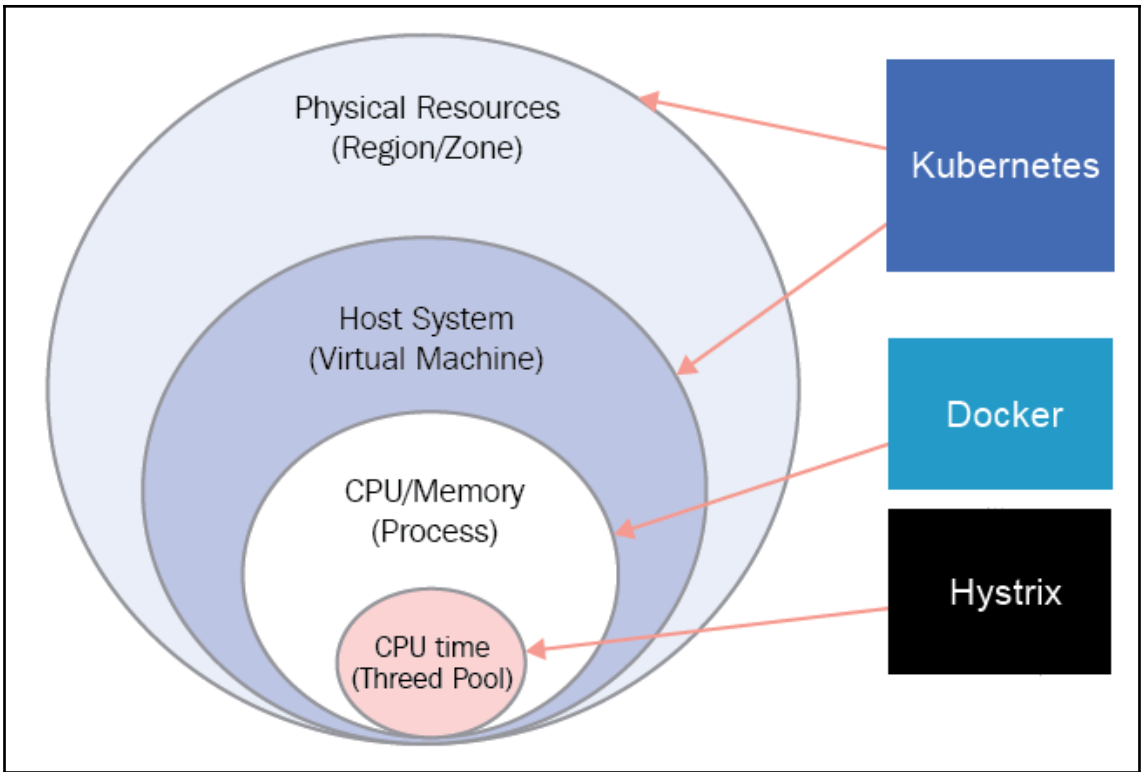
Chapter 3: Microservice Resiliency Patterns

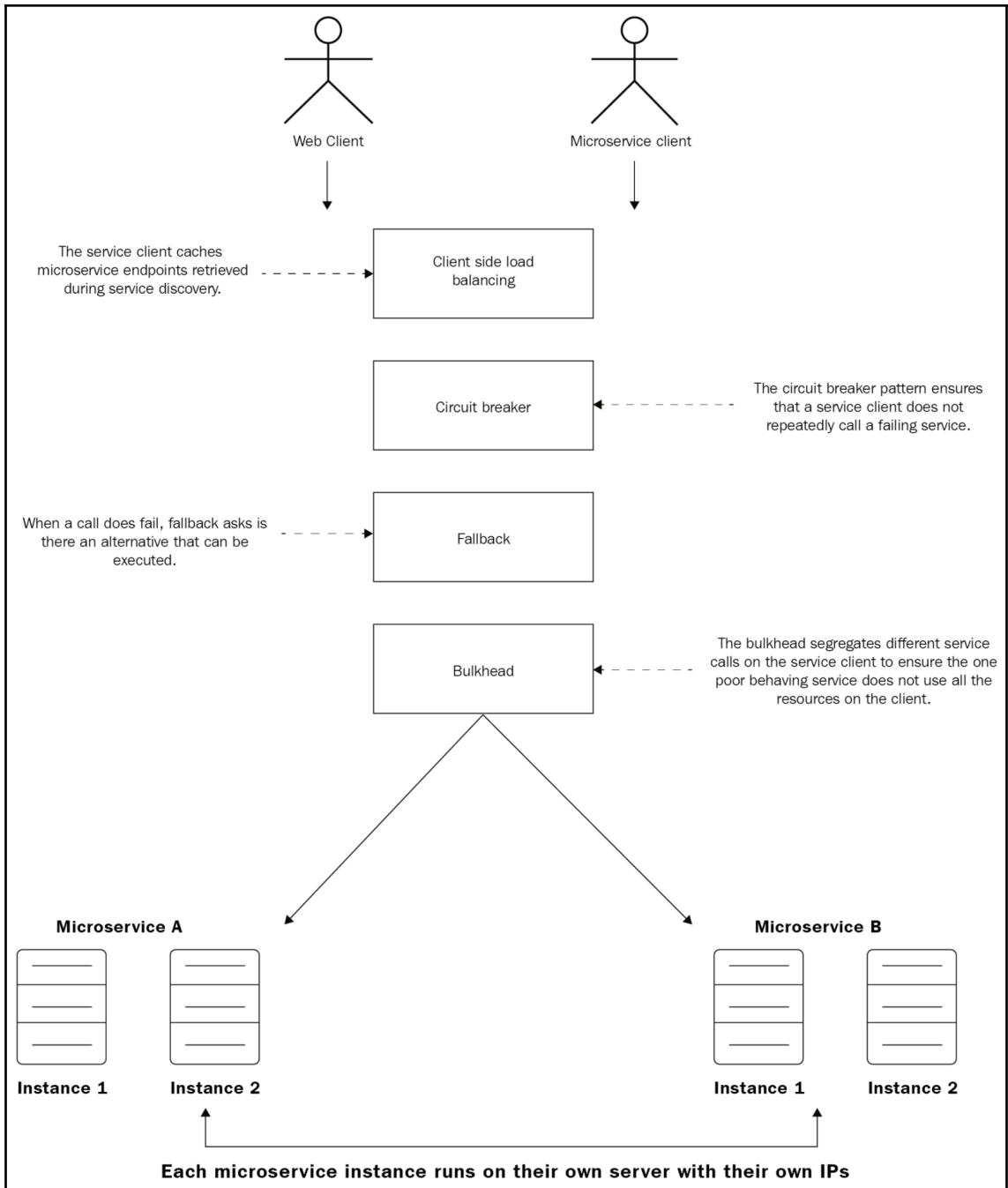


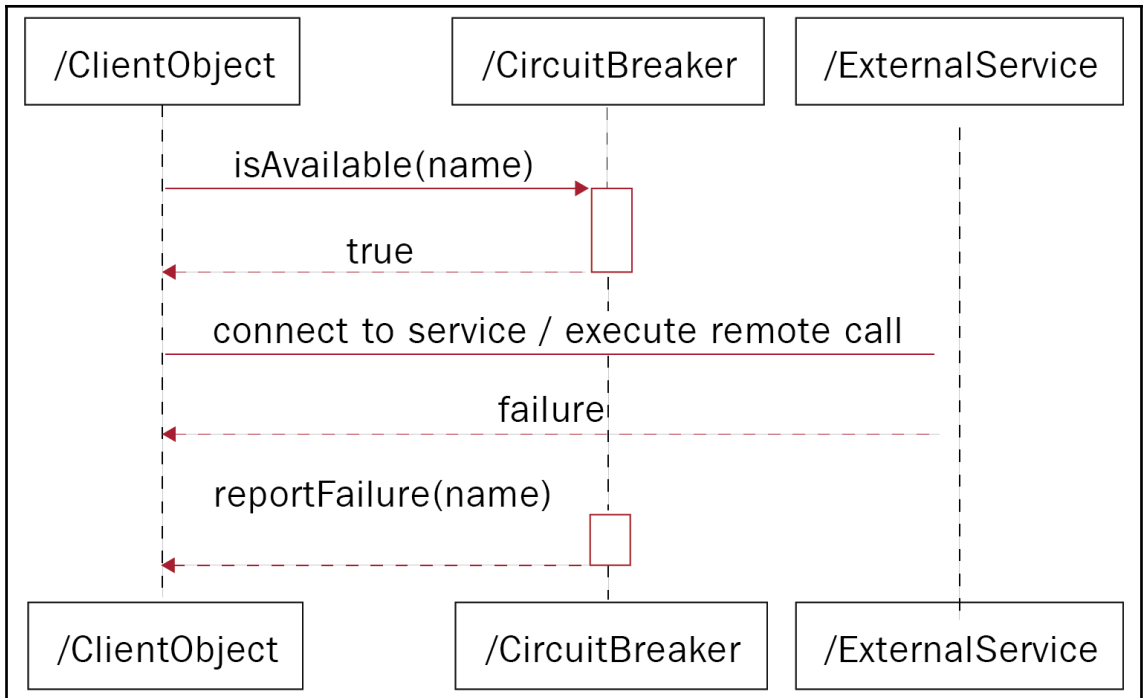


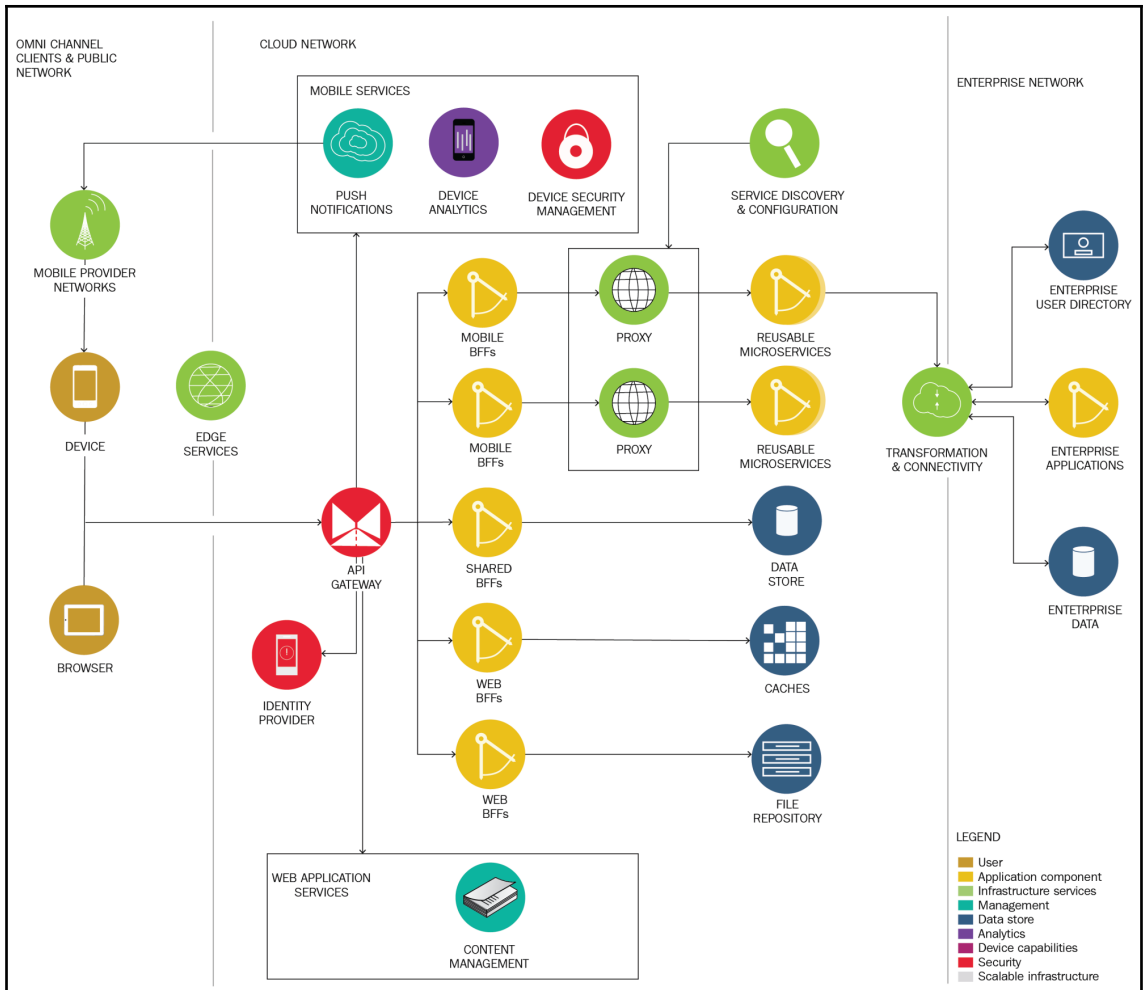
Microservices architecture

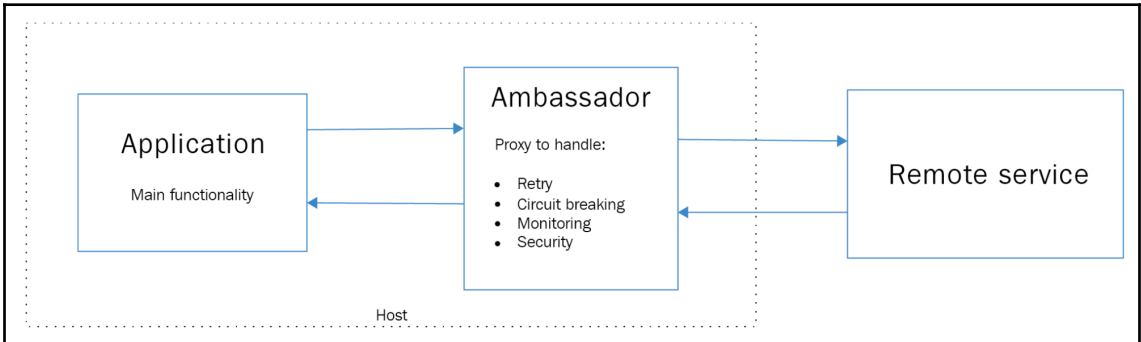


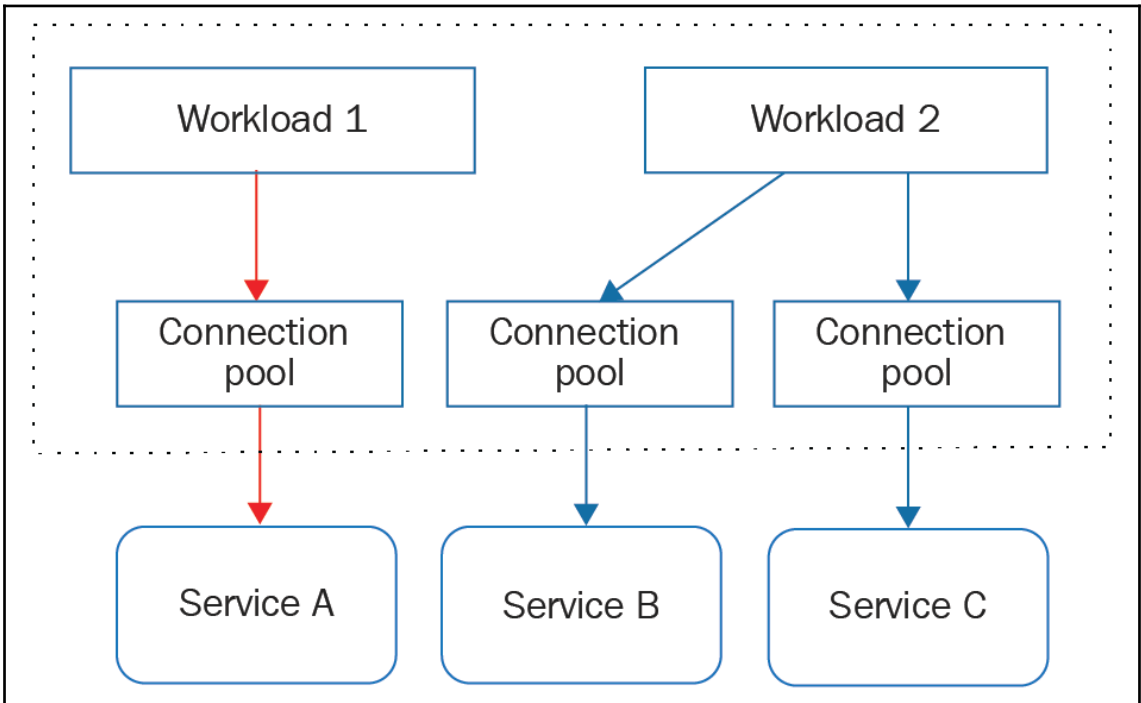
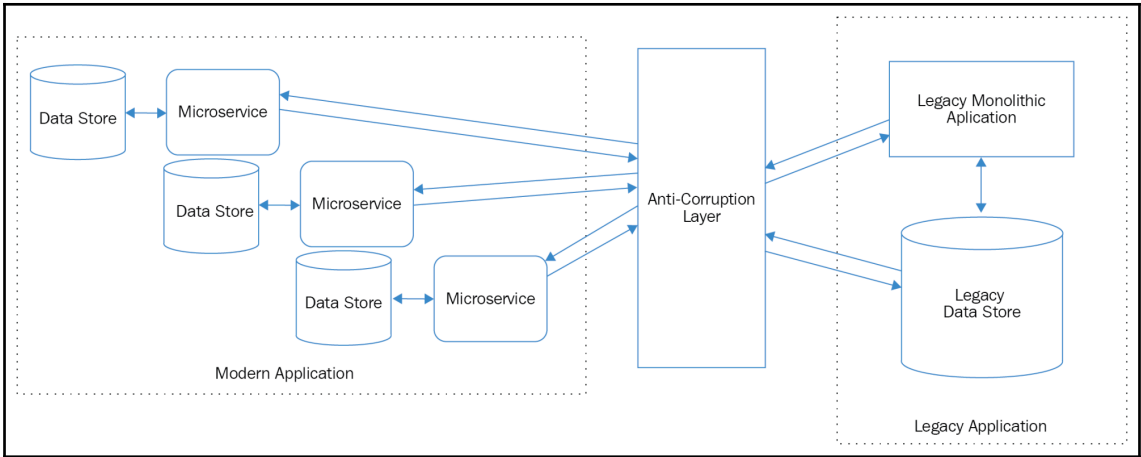


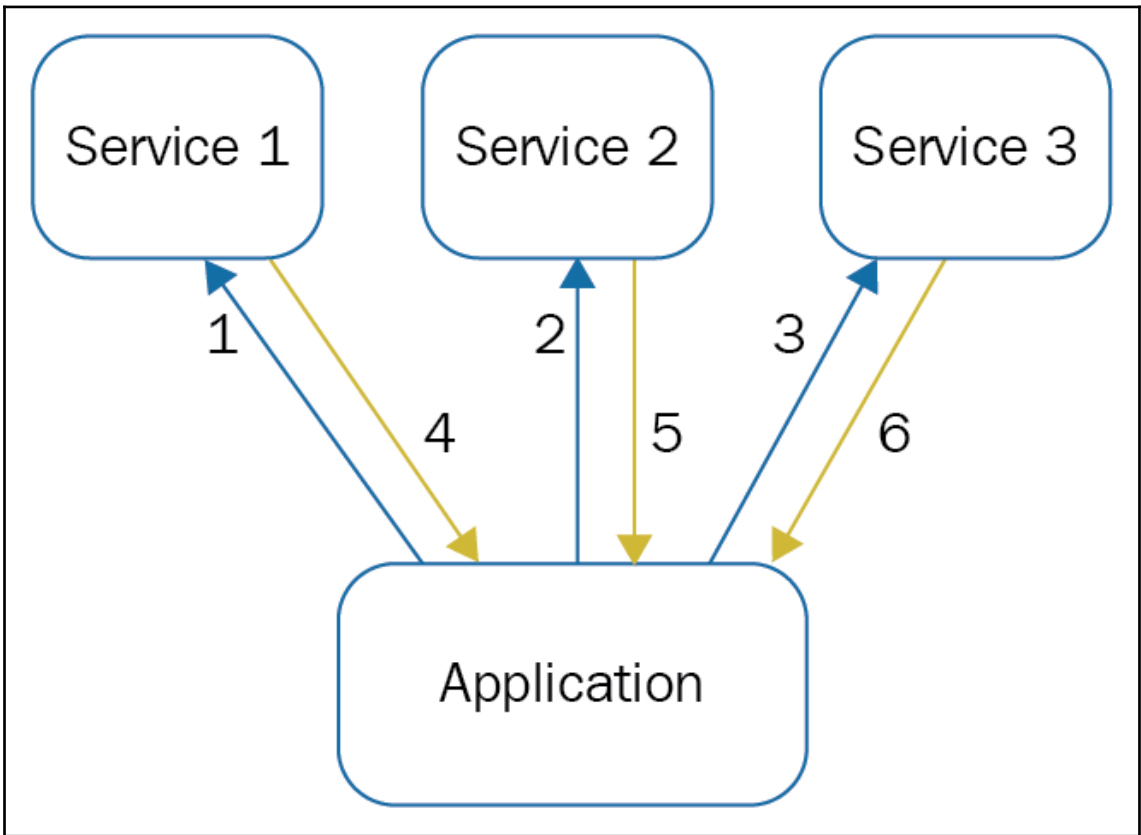
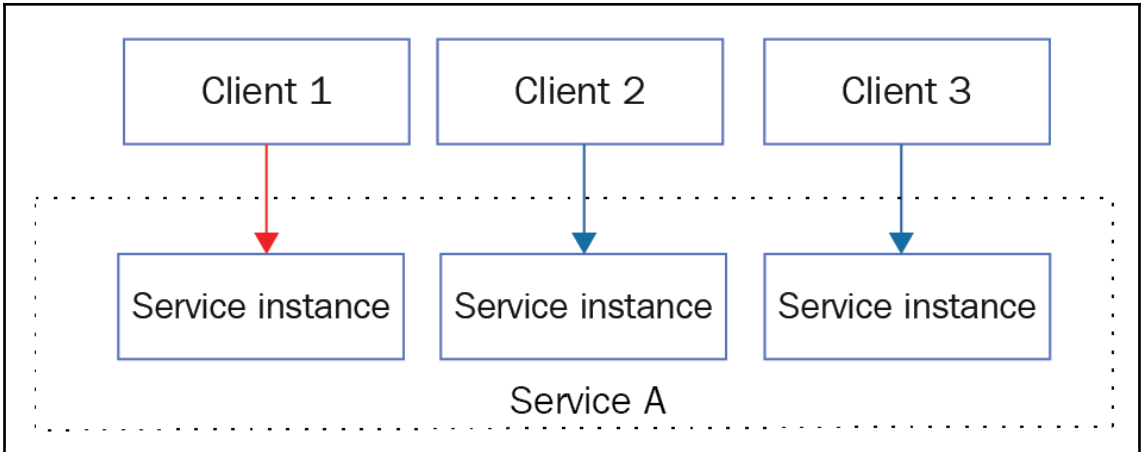


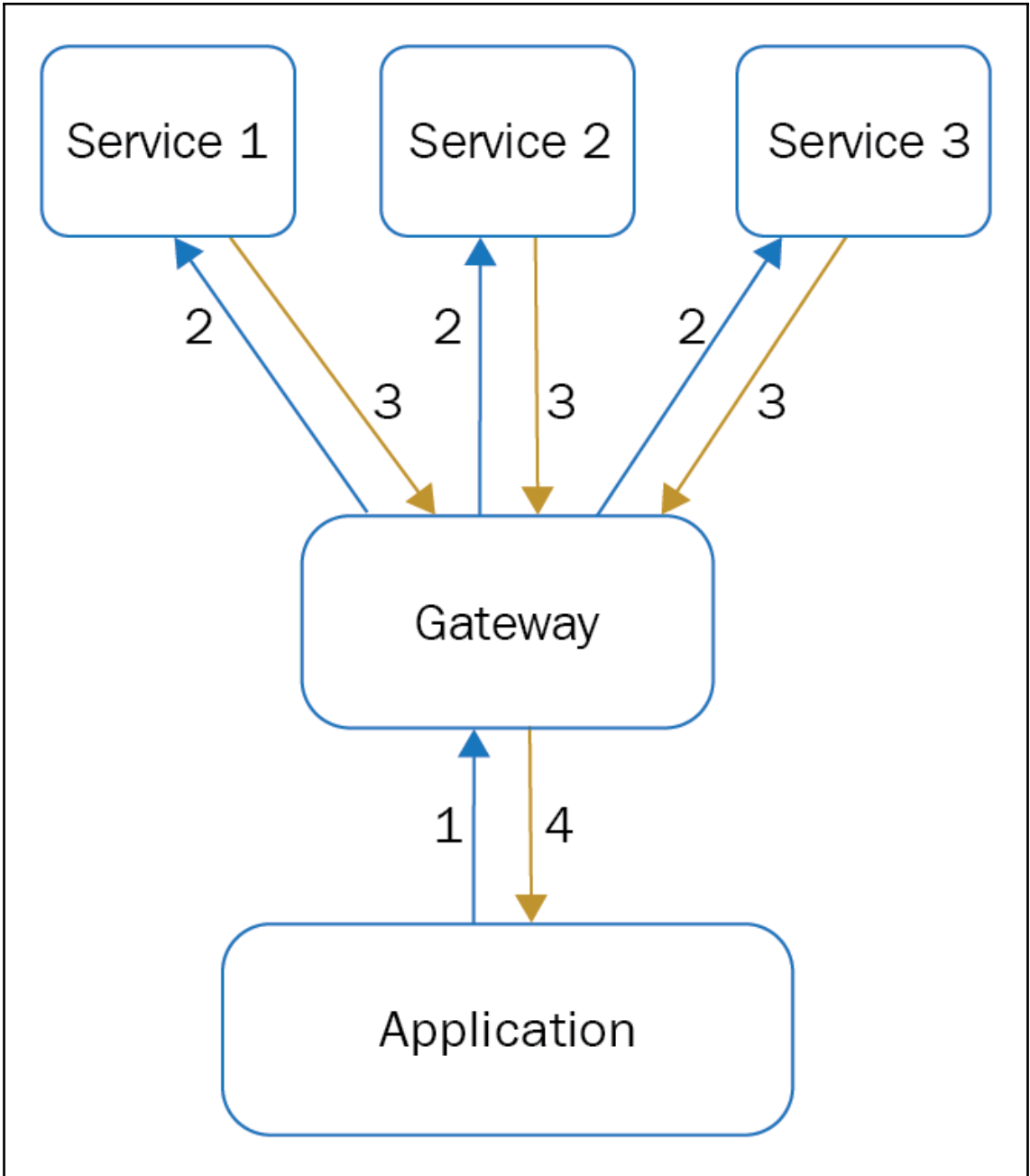


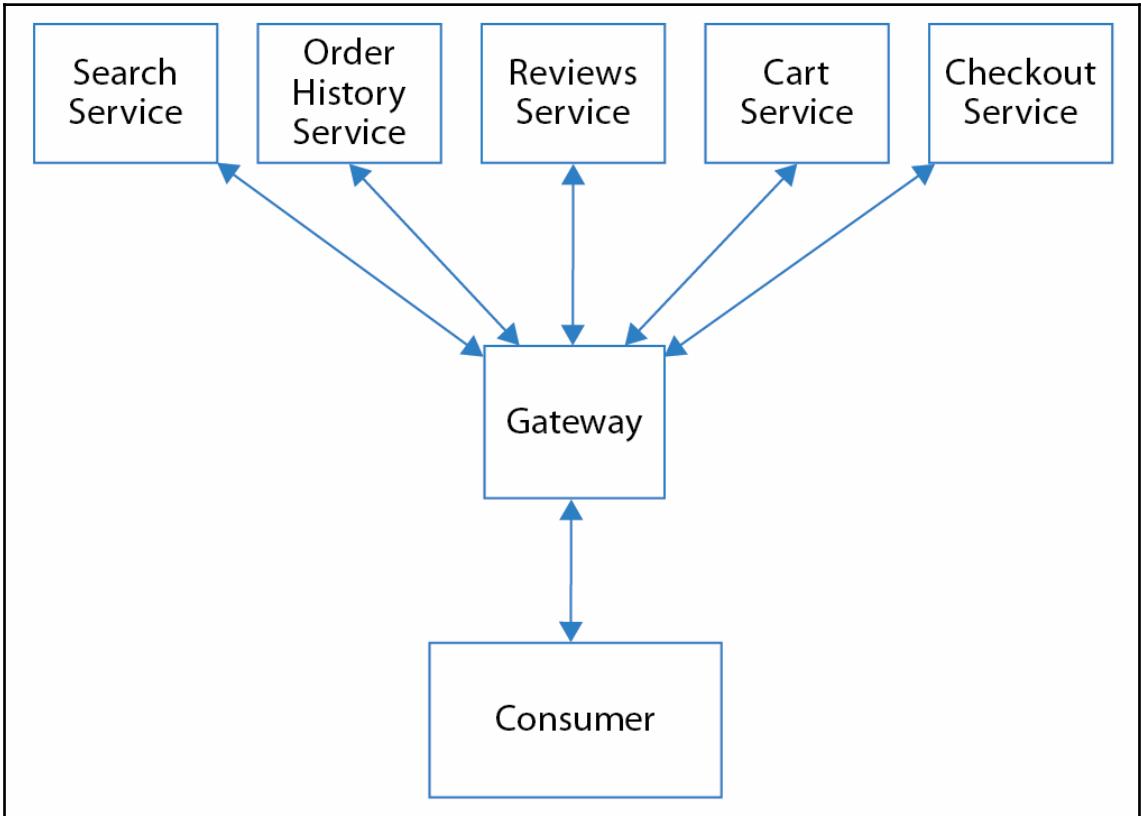
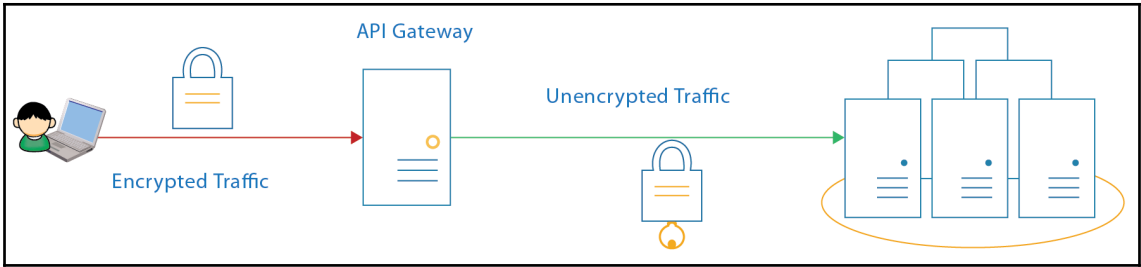


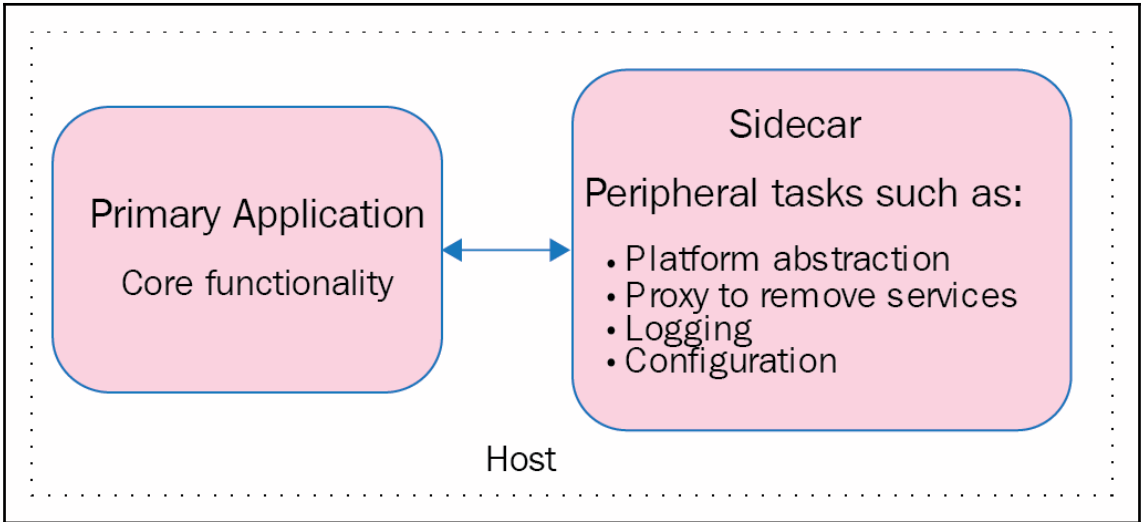




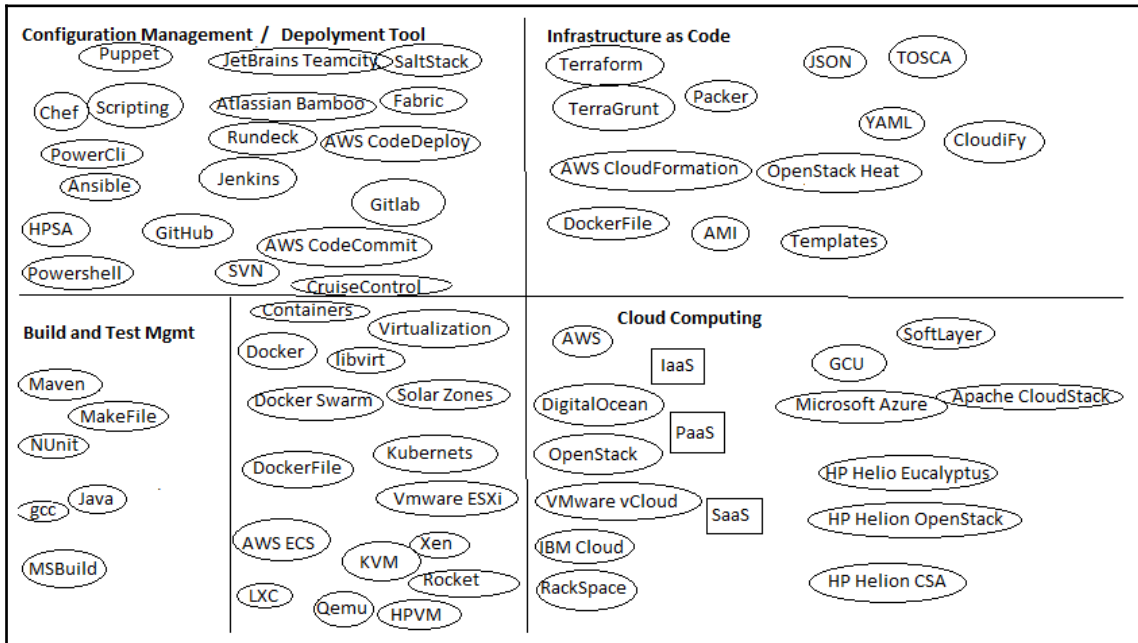








Chapter 4: DevOps as a Service



Assessing Development Practices

The DevOps Quadrant Maturity Model is derived from the real-world transformations of Fortune 500 organizations in a variety of industries. This model helps companies assess the state of their current development practices, where they need to improve and what steps must be taken to reach their goals. To frame the space representing non-DevOps and DevOps organizations, the model establishes two axes: the phases of the software development lifecycle on the horizontal x-axis, and the levels of adoption of various DevOps practices on the vertical y-axis (see Figure 1).

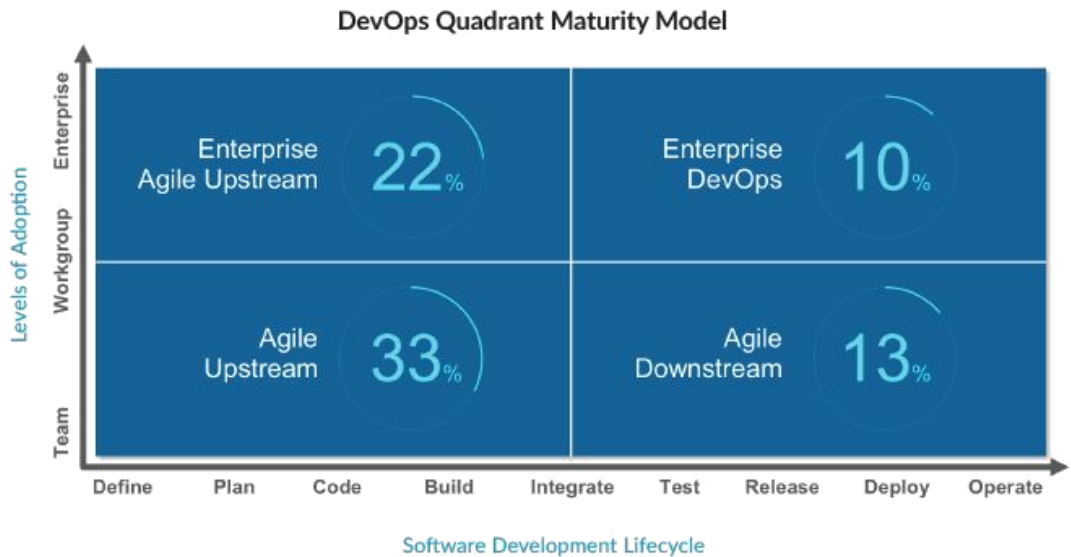


Figure 1: Two axes of DevOps adoption

53%

of companies are currently investigating or planning a DevOps journey

Source: CloudBees® webinar, *Introduction to the Four Quadrants of DevOps Maturity*, 2016



Jenkins

Jenkins > All >

Enter an item name

» *Required field*



Freestyle project

This is the central feature of Jenkins. Jenkins will build something other than software build.

General Source Code Management Build Triggers

This build requires reusable resources

Restrict build execution causes

This project is parameterized

Add Parameter ▼

This project is parameterized

String Parameter

Name

Default Value

String Parameter

Name

Default Value

String Parameter

Name

Default Value

Description

Build

Execute shell

Command `#!/bin/bash
/packt-one-click-deploy.sh|`

Jenkins ▶



Up



Status



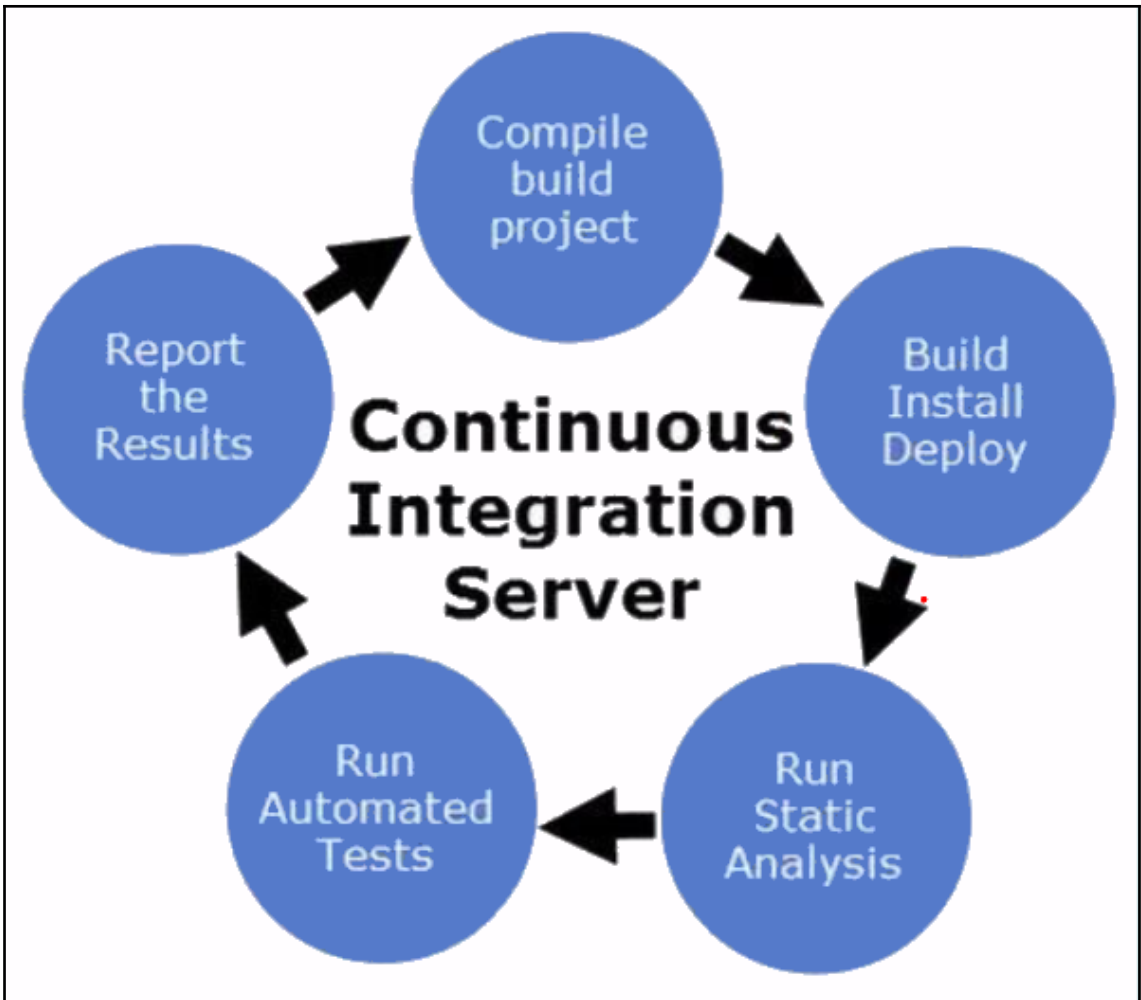
Changes

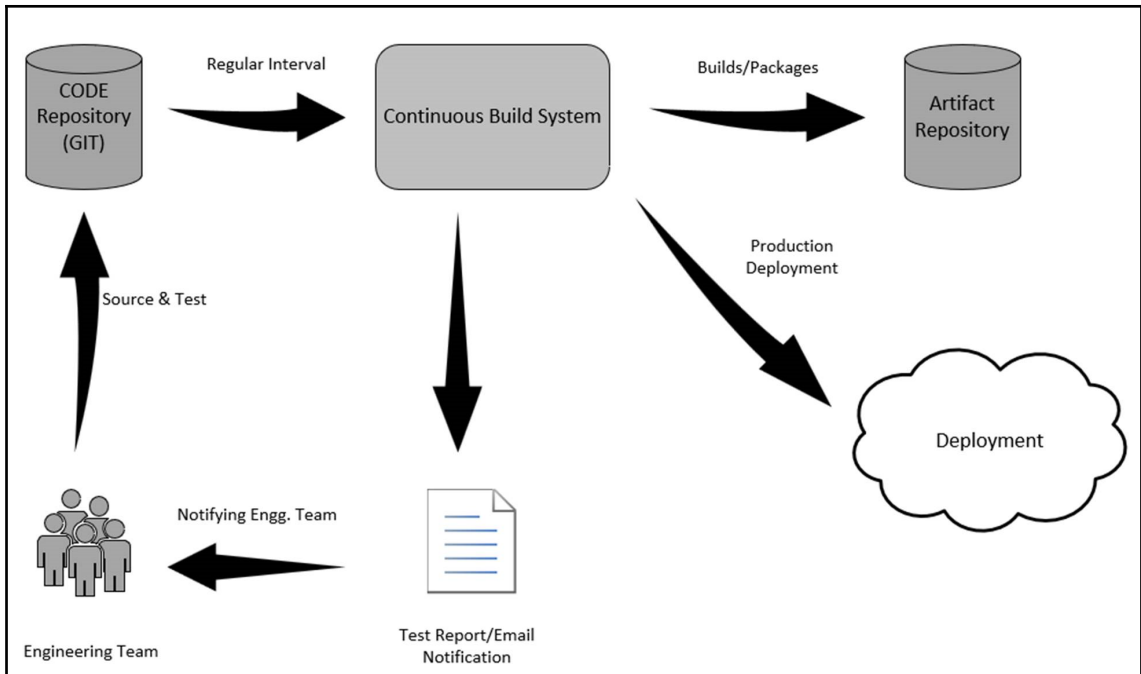


Build Now



Configure





```

[root@PacktPub ~]# yum install java
Loaded plugins: langpacks, product-id, search-disabled-repos
Resolving Dependencies
--> Running transaction check
--> Package java-1.8.0-ibm.x86_64 1:1.8.0.5.20-1jpp.1.e17 will be installed
--> Processing Dependency: copy-jdk-configs >= 2.2 for package: 1:java-1.8.0-ibm-1.8.0.5.20-1jpp.1.e17.x86_64
--> Processing Dependency: jpackage-utils >= 1.5.38 for package: 1:java-1.8.0-ibm-1.8.0.5.20-1jpp.1.e17.x86_64
--> Processing Dependency: libXext.so.6()(64bit) for package: 1:java-1.8.0-ibm-1.8.0.5.20-1jpp.1.e17.x86_64
--> Processing Dependency: libXft.so.2()(64bit) for package: 1:java-1.8.0-ibm-1.8.0.5.20-1jpp.1.e17.x86_64
--> Processing Dependency: libXi.so.6()(64bit) for package: 1:java-1.8.0-ibm-1.8.0.5.20-1jpp.1.e17.x86_64
--> Processing Dependency: libXrender.so.1()(64bit) for package: 1:java-1.8.0-ibm-1.8.0.5.20-1jpp.1.e17.x86_64
--> Processing Dependency: libXtst.so.6()(64bit) for package: 1:java-1.8.0-ibm-1.8.0.5.20-1jpp.1.e17.x86_64
  
```

```

[root@PacktPub ~]# java -version
java version "1.8.0_181"
Java(TM) SE Runtime Environment (build 8.0.5.20 - pxa6480sr5fp20-20180802_01(SR5 FP20))
IBM J9 VM (build 2.9, JRE 1.8.0 Linux amd64-64-Bit Compressed References 20180731_393394 (JIT enabled, AOT enabled)
OpenJ9 - bd23af8
OMR - ca1411c
IBM - 98805ca)
JCL - 20180719_01 based on Oracle jdk8u181-b12
  
```

```

[root@PacktPub ~]# wget https://archive.apache.org/dist/tomcat/tomcat-7/v7.0.42/bin/apache-tomcat-7.0.42.zip
--2018-10-04 12:33:55-- https://archive.apache.org/dist/tomcat/tomcat-7/v7.0.42/bin/apache-tomcat-7.0.42.zip
Resolving archive.apache.org (archive.apache.org)... 163.172.17.199
Connecting to archive.apache.org (archive.apache.org)|163.172.17.199|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 8463515 (8.1M) [application/zip]
Saving to: 'apache-tomcat-7.0.42.zip'

100%[=====>] 8,463,515 7.64MB/s in 1.1s

2018-10-04 12:33:57 (7.64 MB/s) - 'apache-tomcat-7.0.42.zip' saved [8463515/8463515]
  
```

```
[root@PacktPub webapps]# wget https://updates.jenkins-ci.org/latest/jenkins.war
--2018-10-04 12:43:08-- https://updates.jenkins-ci.org/latest/jenkins.war
Resolving updates.jenkins-ci.org (updates.jenkins-ci.org)... 52.202.51.185
Connecting to updates.jenkins-ci.org (updates.jenkins-ci.org)|52.202.51.185|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://updates.jenkins-ci.org/download/war/2.144/jenkins.war [following]
--2018-10-04 12:43:08-- https://updates.jenkins-ci.org/download/war/2.144/jenkins.war
Reusing existing connection to updates.jenkins-ci.org:443.
HTTP request sent, awaiting response... 302 Found
Location: http://mirrors.jenkins-ci.org/war/2.144/jenkins.war [following]
--2018-10-04 12:43:08-- http://mirrors.jenkins-ci.org/war/2.144/jenkins.war
Resolving mirrors.jenkins-ci.org (mirrors.jenkins-ci.org)... 52.202.51.185
Connecting to mirrors.jenkins-ci.org (mirrors.jenkins-ci.org)|52.202.51.185|:80... connected.
HTTP request sent, awaiting response... 302 Found
Location: http://ftp-nyc.osuosl.org/pub/jenkins/war/2.144/jenkins.war [following]
--2018-10-04 12:43:08-- http://ftp-nyc.osuosl.org/pub/jenkins/war/2.144/jenkins.war
Resolving ftp-nyc.osuosl.org (ftp-nyc.osuosl.org)... 64.50.233.100, 2600:3404:200:237::2
Connecting to ftp-nyc.osuosl.org (ftp-nyc.osuosl.org)|64.50.233.100|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 75820252 (72M) [application/x-java-archive]
Saving to: 'jenkins.war'

100%[=====] 75,820,252 16.9MB/s in 4.4s

2018-10-04 12:43:13 (16.6 MB/s) - 'jenkins.war' saved [75820252/75820252]
```

```
*****
*****
*****
Jenkins initial setup is required. An admin user has been created and a password generated.
Please use the following password to proceed to installation:

127cff69efa448ef9e44f2abb1c4c76d

This may also be found at: /root/.jenkins/secrets/initialAdminPassword

*****
*****
*****
```

Getting Started

Unlock Jenkins

To ensure Jenkins is securely set up by the administrator, a password has been written to the log ([not sure where to find it?](#)) and this file on the server:

```
/root/.jenkins/secrets/initialAdminPassword
```

Please copy the password from either location and paste it below.

Administrator password

← → ↻ 🏠 23.96.21.153:8080/jenkins/

Jenkins

Jenkins ▾

- New Item
- People
- Build History
- Manage Jenkins
- My Views
- Credentials
- Lockable Resources
- New View

Welcome to Jenkins!

Please **create new jobs** to get started.

← → ↻ 🏠 23.96.21.153:8080/jenkins/manage 🔍 search

Jenkins

Jenkins ▾

- New Item
- People
- Build History
- Manage Jenkins**
- My Views
- Credentials
- Lockable Resources
- New View

Build Queue —

No builds in the queue.

Build Executor Status —

1 Idle
2 Idle

Manage Jenkins

- Configure System**
Configure global settings and paths.
- Configure Global Security**
Secure Jenkins; define who is allowed to access/use the system.
- Configure Credentials**
Configure the credential providers and types
- Global Tool Configuration**
Configure tools, their locations and automatic installers.
- Reload Configuration from Disk**
Discard in memory and reload everything from file system. Useful when you modified config files directly on disk
- Manage Plugins**
Add, remove, disable or enable plugins that can extend the functionality of Jenkins.

Jenkins search

Jenkins > Plugin Manager

[Back to Dashboard](#)
[Manage Jenkins](#)

Filter:

Install ↓	Name	Version
<input checked="" type="checkbox"/>	GitHub plugin This plugin integrates Jenkins with Github projects.	1.17.1

Update

Jenkins search

All >

Enter an item name

* Required field

- Freestyle project**
 This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.
- Pipeline**
 Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.
- Multi-configuration project**
 Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.
- Folder**
 Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.
- GitHub Organization**
 Scans a GitHub organization (or user account) for all repositories matching some defined markers.
- Multibranch Pipeline**
 Creates a set of Pipeline projects according to detected branches in one SCM repository.

23.96.21.153:8080/jenkins/job/Packt-GitHub/configure

Jenkins

Packt-GitHub

General Source Code Management Build Triggers Build Environment Build Post-build Actions

Description: This Project is to create Continuous Integration scenario using GitHub.

[Plain text] [Preview](#)

Discard old builds

GitHub project

Project url:

This build requires lockable resources

This project is parameterized

Throttle builds

Disable this project

Execute concurrent builds if necessary

Source Code Management

None

Git

Repositories

Repository URL:

Credentials: [Add](#)

Build Triggers

- Trigger builds remotely (e.g., from scripts)
- Build after other projects are built
- Build periodically

Schedule

10 ***

⚠ Spread load evenly by using 'H 0 ***' rather than '10 ***'

Would last have run at Friday, October 5, 2018 12:01:26 AM UTC; would next run at Saturday, October 6, 2018 12:01:26 AM UTC.

This field follows the syntax of cron (with minor differences). Specifically, each line consists of 5 fields separated by TAB or whitespace:

MINUTE HOUR DOM MONTH DOW

MINUTE Minutes within the hour (0–59)

HOUR The hour of the day (0–23)

DOM The day of the month (1–31)

MONTH The month (1–12)

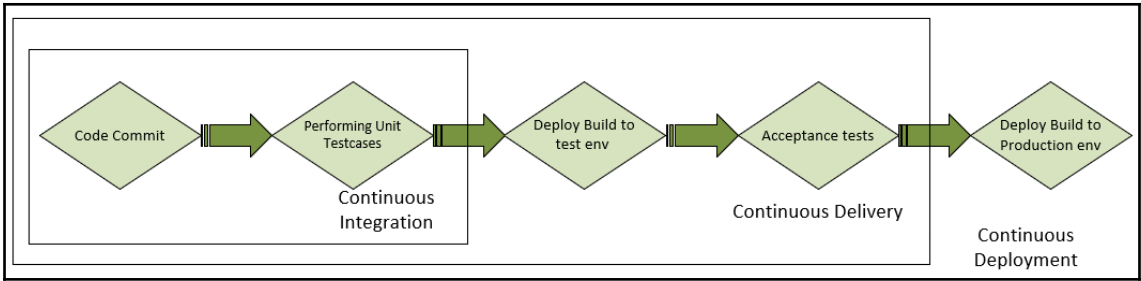
DOW The day of the week (0–7) where 0 and 7 are Sunday.

To specify multiple values for one field, the following operators are available. In the order of precedence,

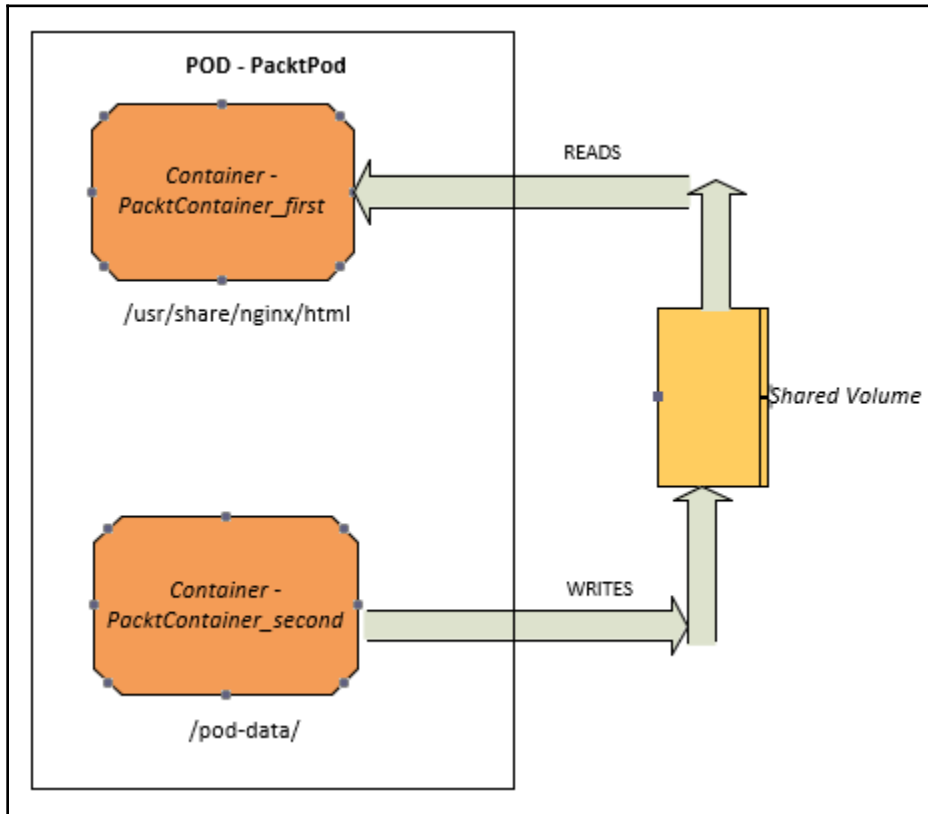
- * specifies all valid values
- M-N specifies a range of values
- M-N/X or */X steps by intervals of X through the specified range or whole valid range
- A,B,...,Z enumerates multiple values

The screenshot shows a web browser window with the address bar displaying "23.96.21.153:8080/jenkins/job/Packt-GitHub/3/console". The Jenkins interface includes a sidebar with navigation options: Back to Project, Status, Changes, Console Output (selected), View as plain text, Edit Build Information, Delete Build, Git Build Data, No Tags, and Previous Build. The main content area is titled "Console Output" and shows the following text:

```
Started by user Shreyash Naithani
Building in workspace /root/.jenkins/workspace/Packt-GitHub
> git rev-parse --is-inside-work-tree # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/shreyash91/Packt_Hello.git # timeout=10
Fetching upstream changes from https://github.com/shreyash91/Packt_Hello.git
> git --version # timeout=10
using GIT_ASKPASS to set credentials
> git fetch --tags --progress https://github.com/shreyash91/Packt_Hello.git +refs/heads/*:refs/remotes/origin/*
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
> git rev-parse refs/remotes/origin/origin/master^{commit} # timeout=10
Checking out Revision 157ee76ce127d16ae7e5b4d811b08f3df9871a37 (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f 157ee76ce127d16ae7e5b4d811b08f3df9871a37
Commit message: "Merge branch 'master' of github.com:efsave/hello-world-war"
> git rev-list --no-walk 157ee76ce127d16ae7e5b4d811b08f3df9871a37 # timeout=10
Finished: SUCCESS
```



Chapter 5: Container Cluster and Orchestration Platforms



root@PacktPub:/opt/kubePact

```
apiVersion: v1
kind: Pod
metadata:
  name: PacktPod
spec:

  volumes:
  - name: shared-data
    emptyDir: {}

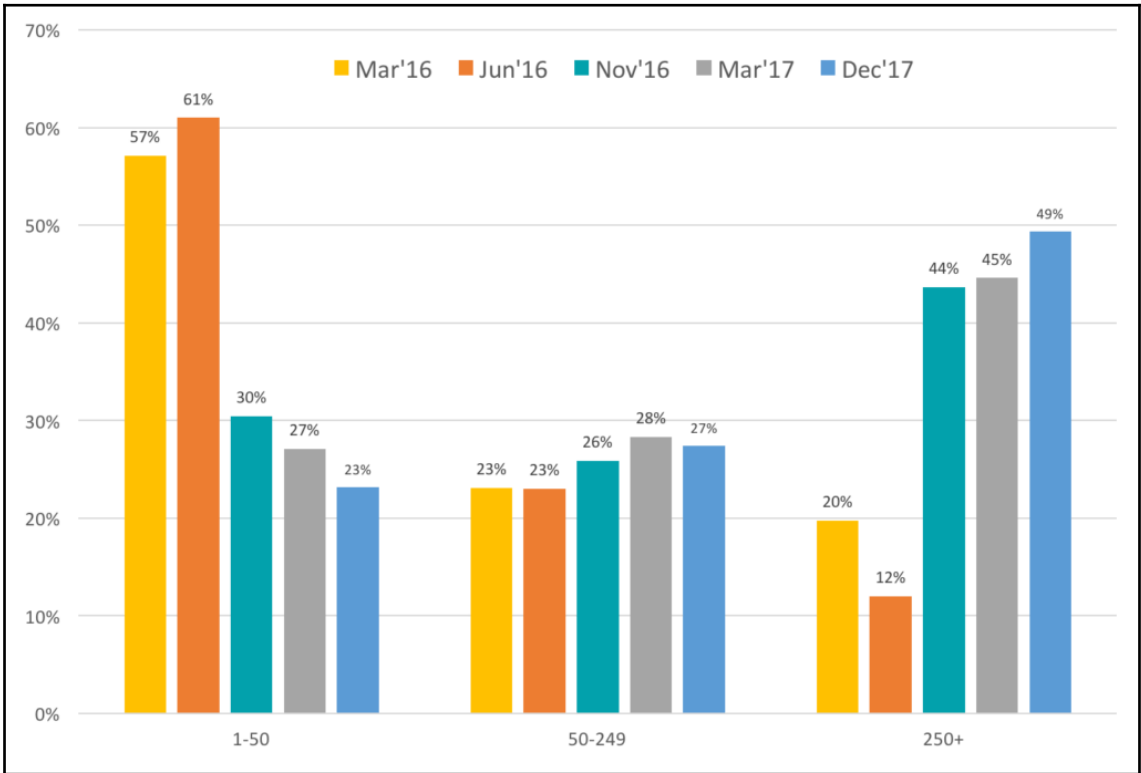
  containers:

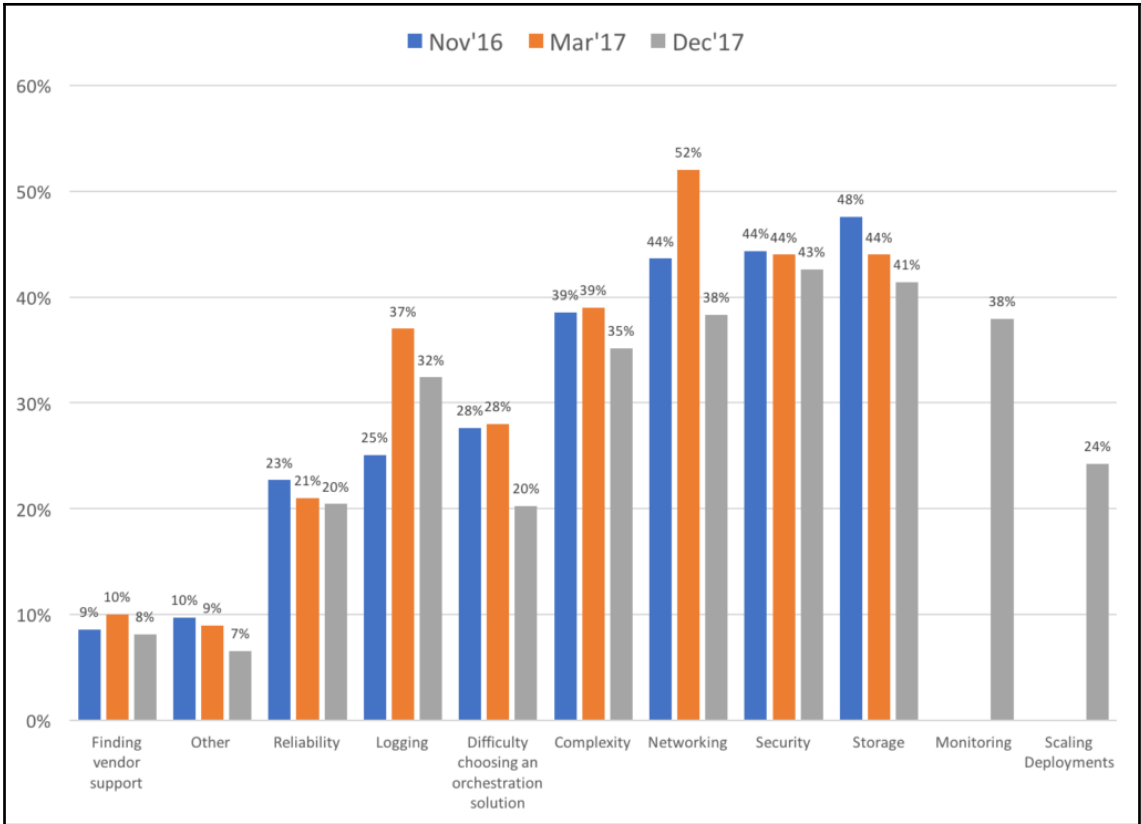
  - name: PacktContainer_first
    image: nginx
    volumeMounts:
    - name: shared-data
      mountPath: /usr/share/nginx/html

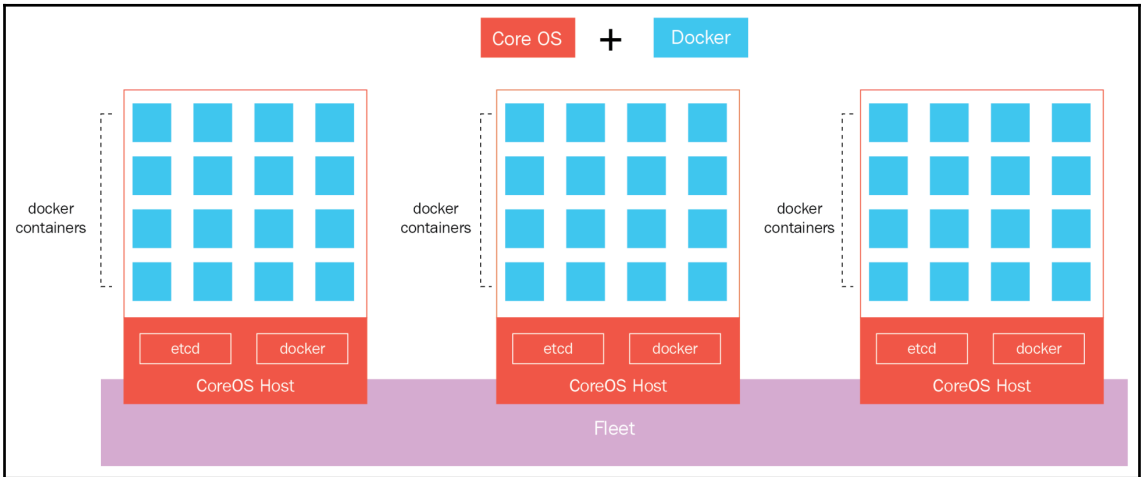
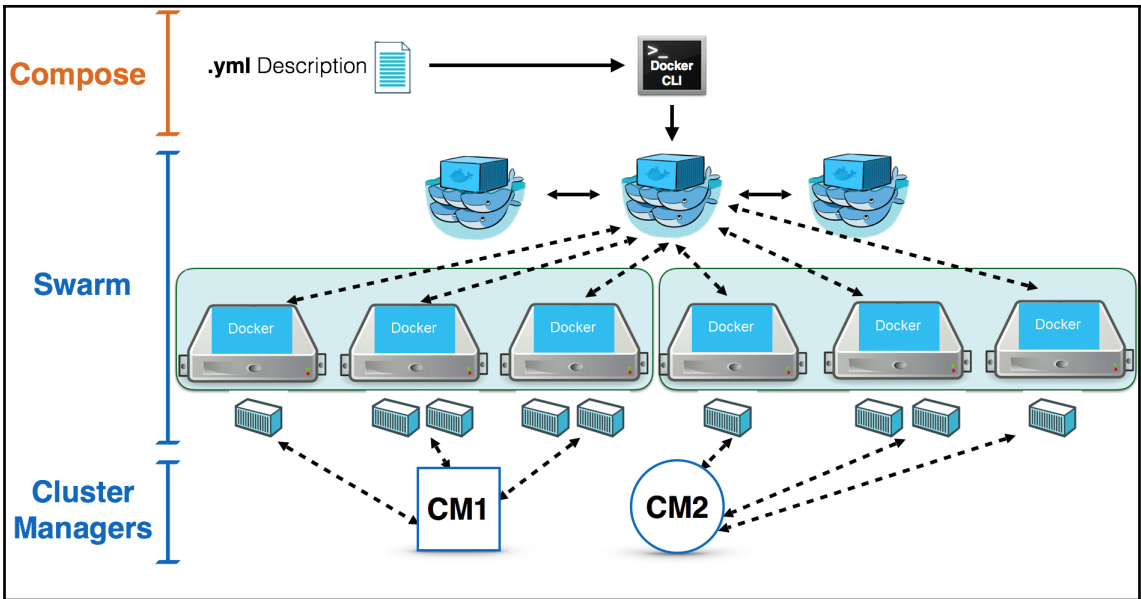
  - name: PacktContainer_second
    image: debian
    volumeMounts:
    - name: shared-data
      mountPath: /pod-data
    command: ["/bin/sh"]
    args:
    - "-c"
    - >
      while true; do
        date >> /pod-data/index.html;

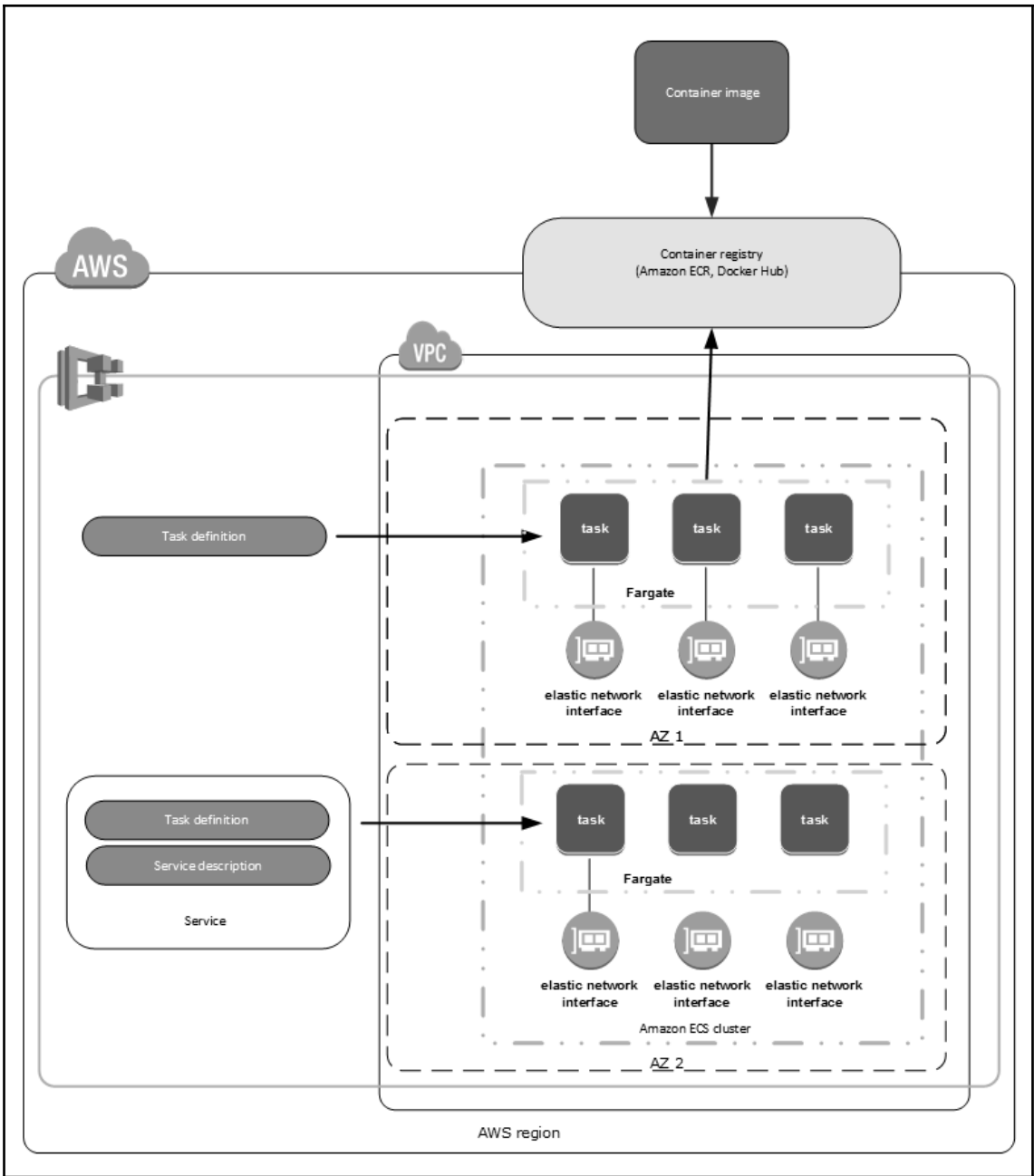
        echo This is Packt Second Container >> /pod-data/index.html;
        sleep 1;
      done
```

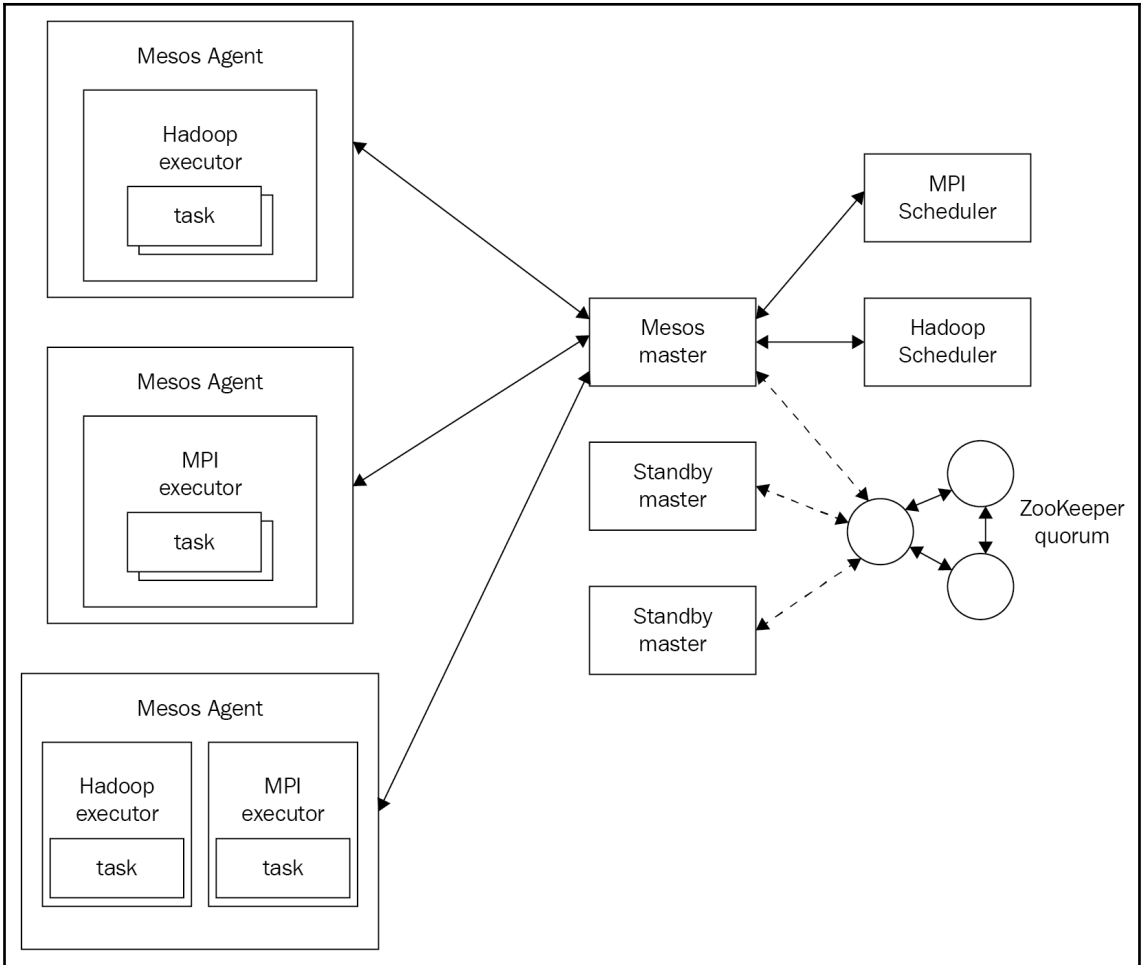
```
[root@PacktPub kubePact]# tail /usr/share/nginx/html/index.html  
  
Tue Oct 16 08:42:41 UTC 2018  
  
This is Packt Second Container  
  
Tue Oct 16 08:42:51 UTC 2018  
  
This is Packt Second Container
```

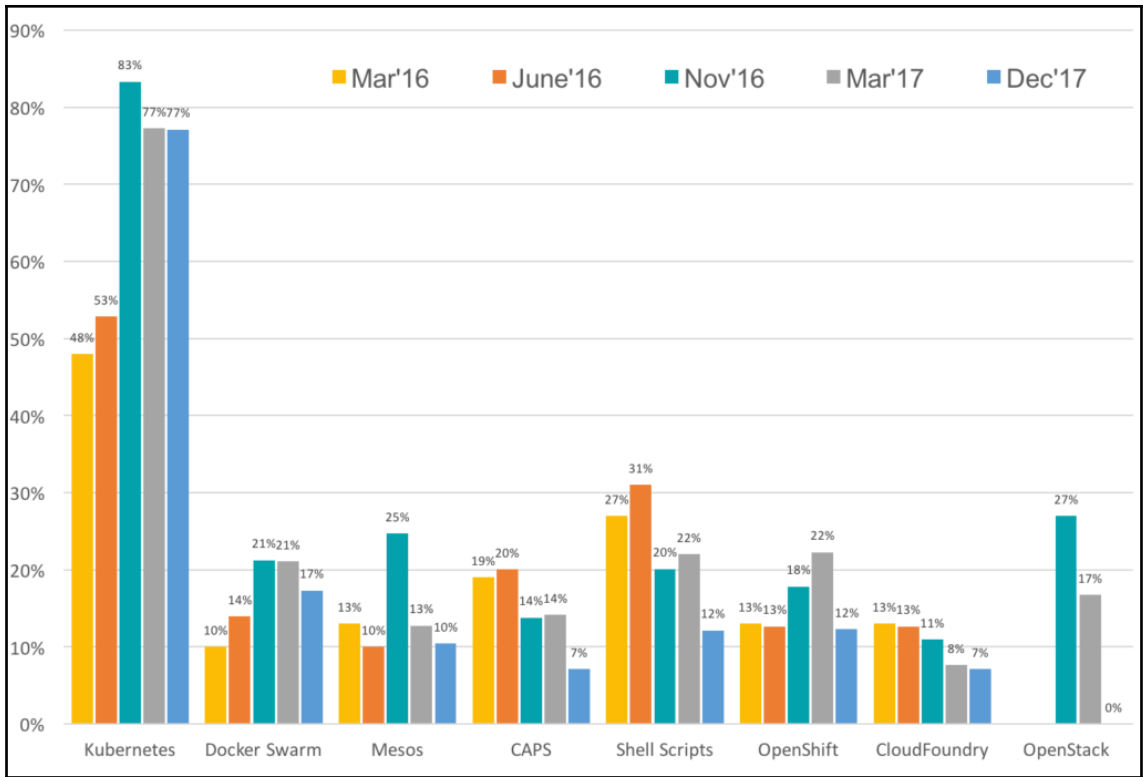


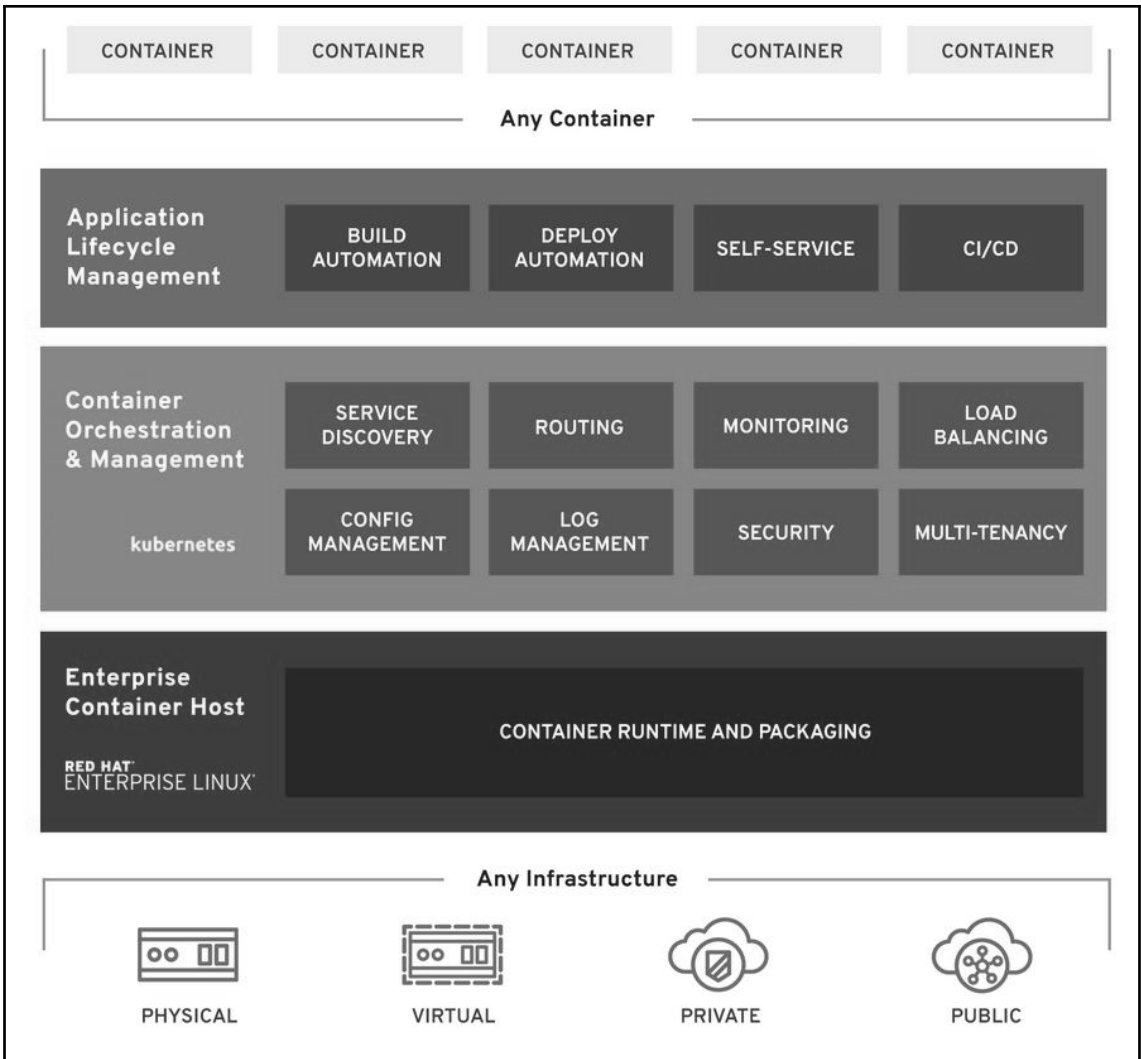












Project Hello OpenShift **1** Add to project **2** admin

3 Overview

4 Applications

5 Builds

6 Resources

7 Storage

8 Monitoring

NODEJS

Build nodejs, #1 Complete 9 minutes ago [View Log](#)

nodejs Deployment: nodejs - 7 minutes ago **#1**

CONTAINER: NODEJS

- Image: hello-openshift/nodejs
- Ports: 8080/TCP

1 pod

postgresql Deployment: postgresql - 8 days ago **#1**

CONTAINER: POSTGRESQL

- Image: centos/postgresql-95-centos7
- Ports: 5432/TCP

3 pods

RAILS POSTGRESQL EXAMPLE

Build rails-postgresql-example, #1 Complete 8 days ago [View Log](#)

rails-postgresql-example Deployment: rails-postgresql-example - 8 days ago **#1**

CONTAINER: RAILS-POSTGRESQL-EXAMPLE

- Image: hello-openshift/rails-postgresql-example
- Ports: 8080/TCP

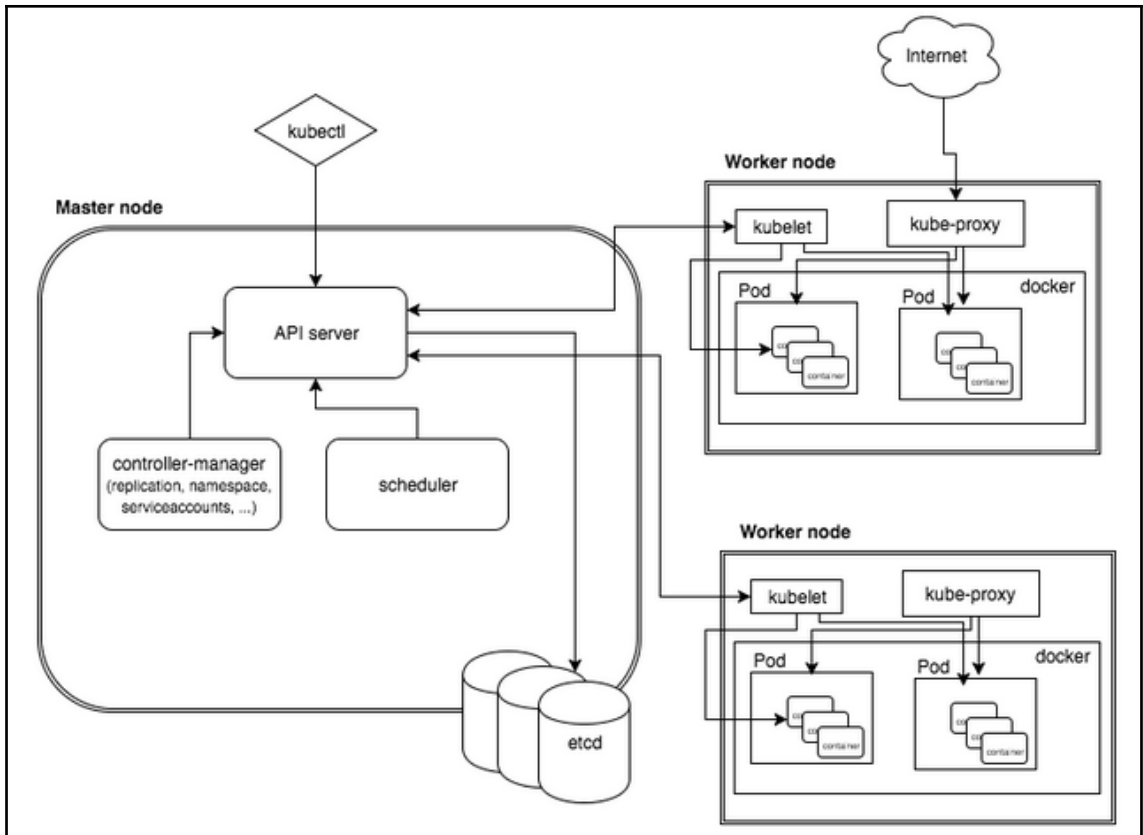
1 pod

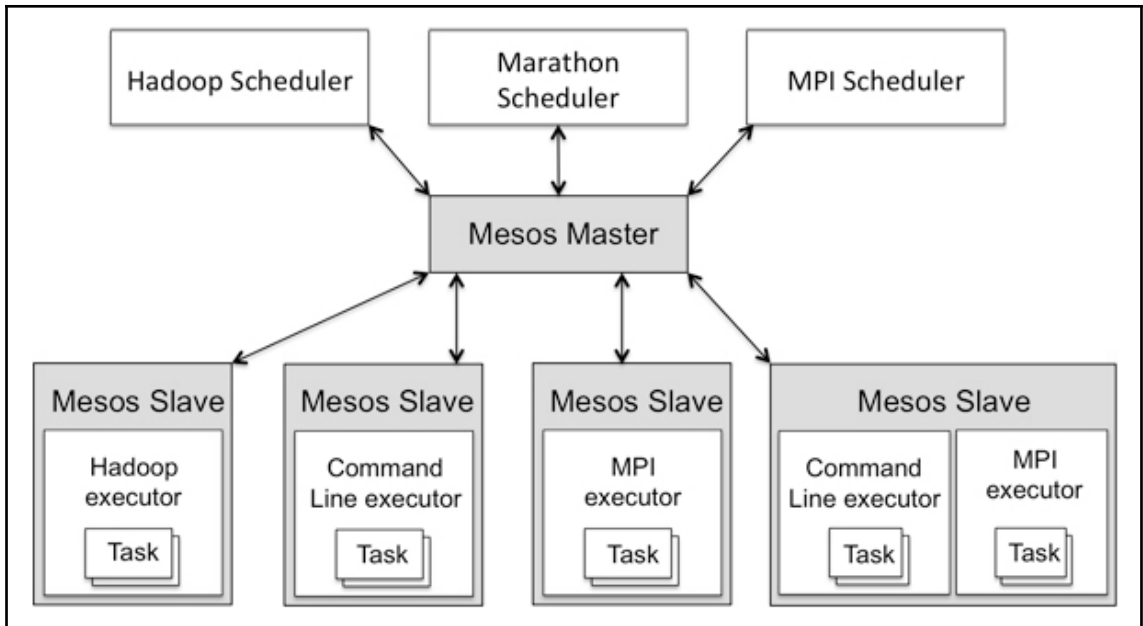
postgresql Deployment: postgresql - 8 days ago **#1**

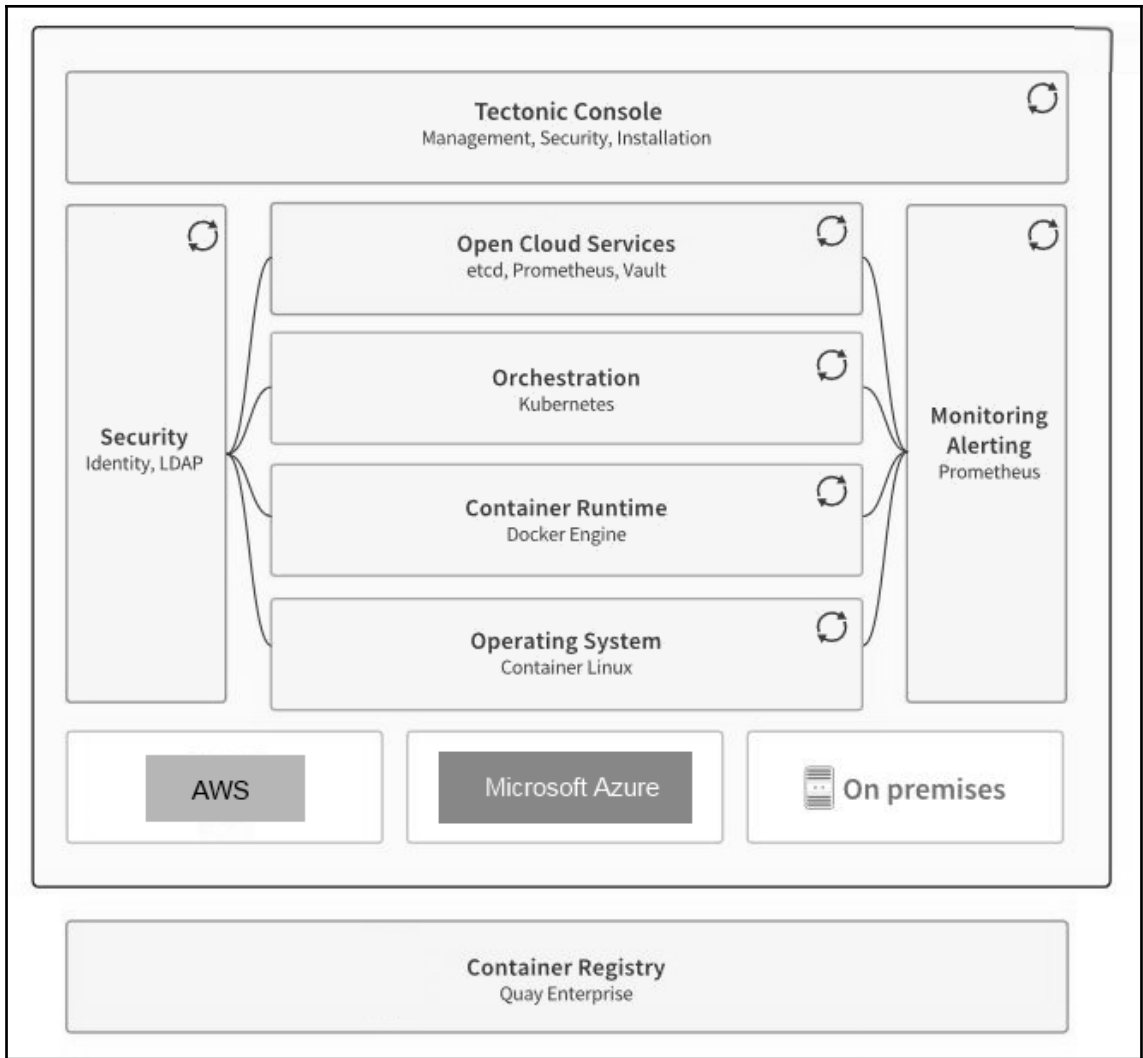
CONTAINER: POSTGRESQL

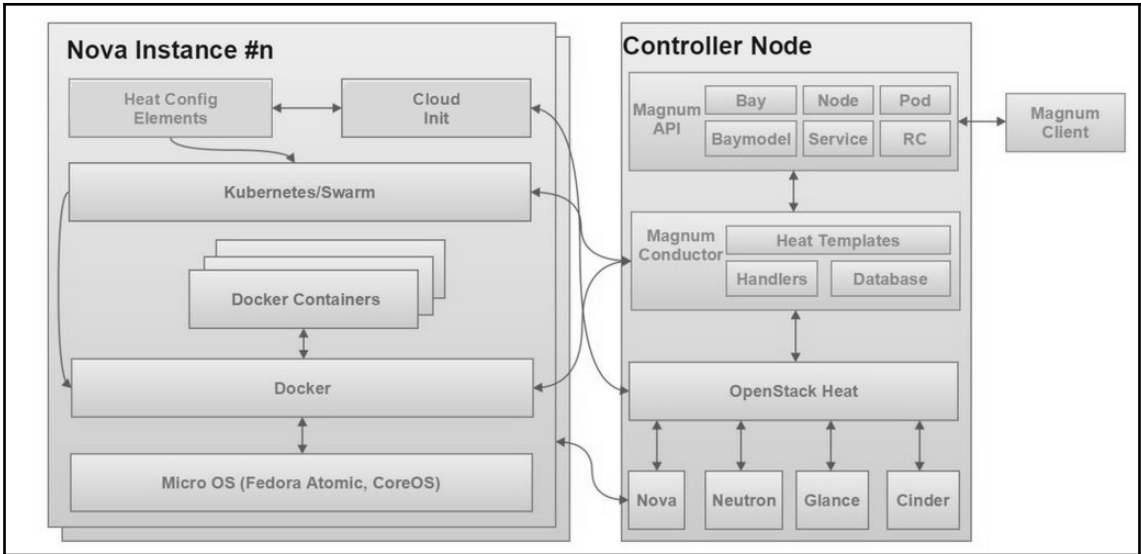
- Image: centos/postgresql-95-centos7
- Ports: 5432/TCP

3 pods

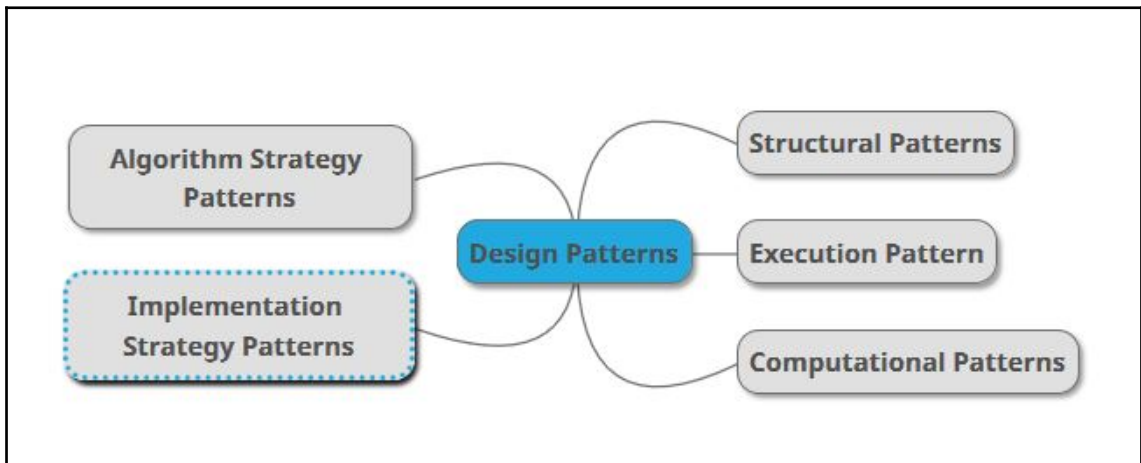
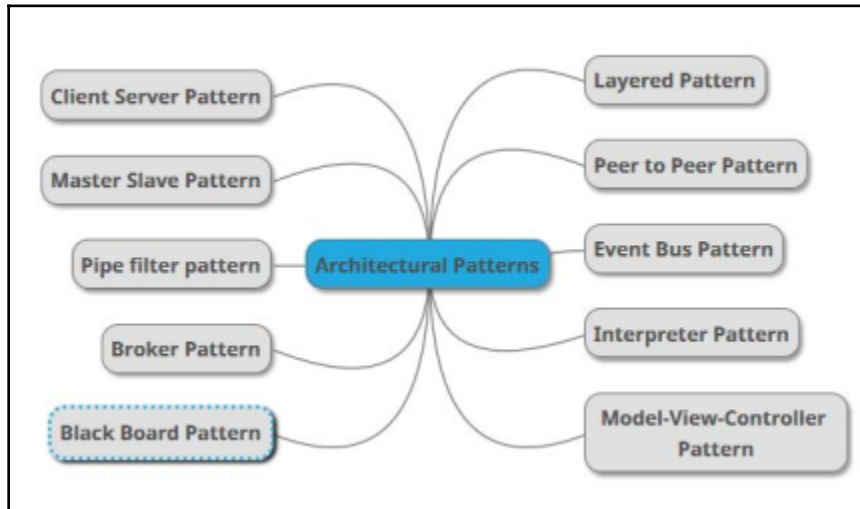








Chapter 6: Architectural and Design Patterns



NEW GENERATION SERVICES BASED ON FOLLOWING FOUNDATIONAL DESIGN PILLARS

Security

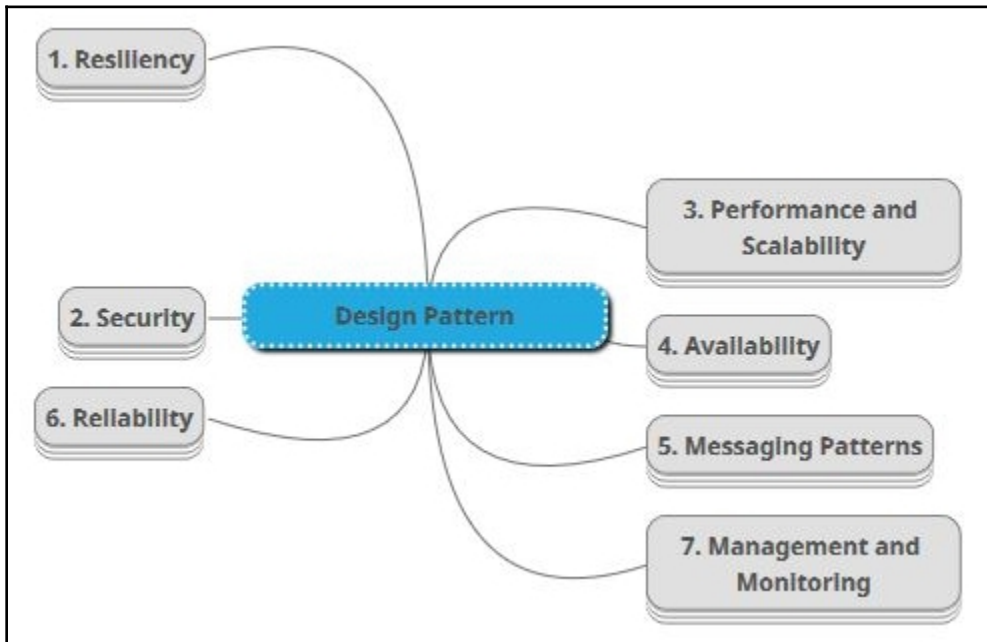
Resiliency

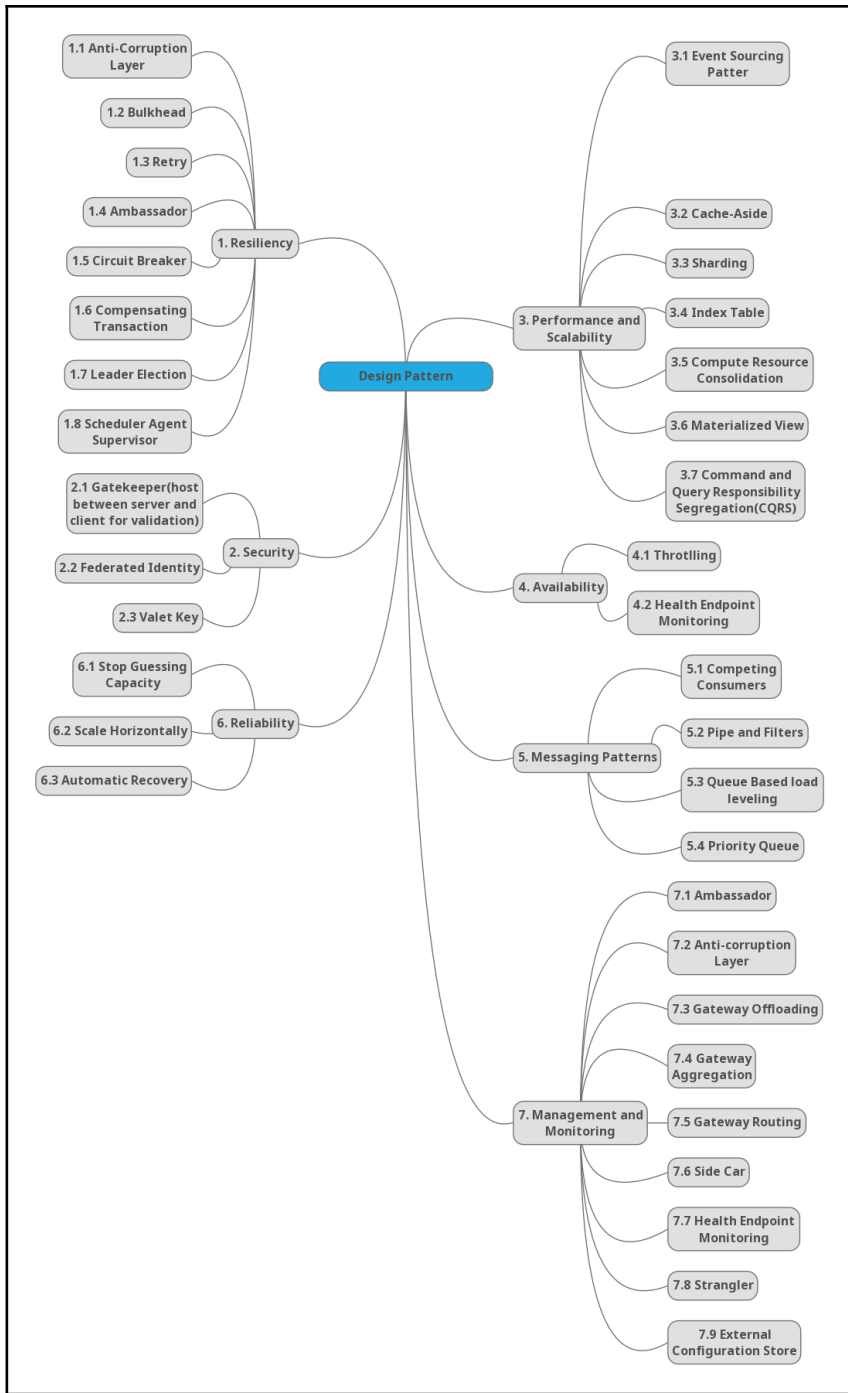
Performance

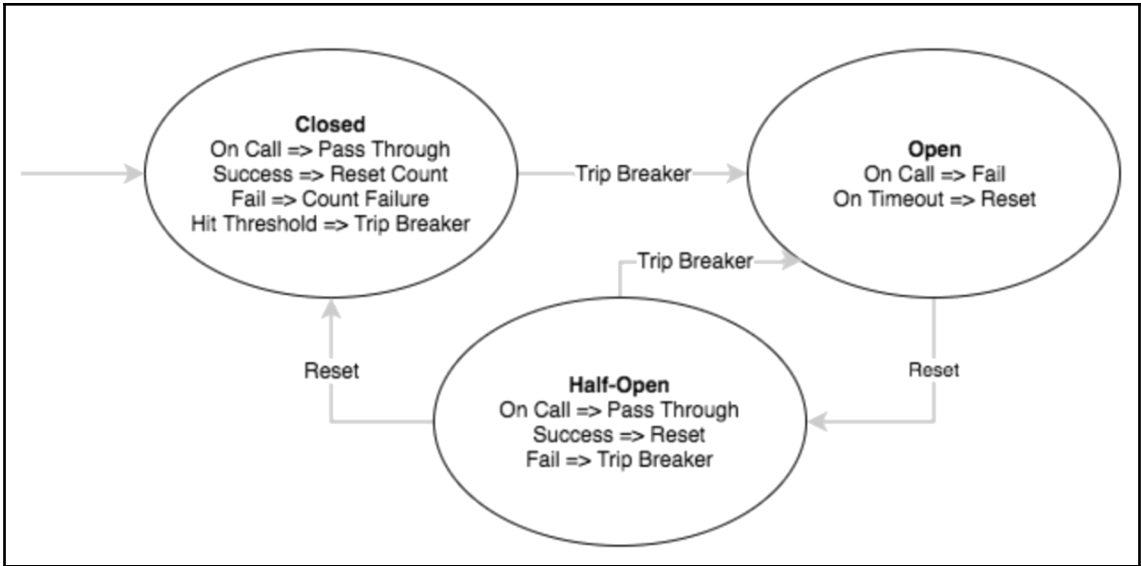
Scalability

Availability

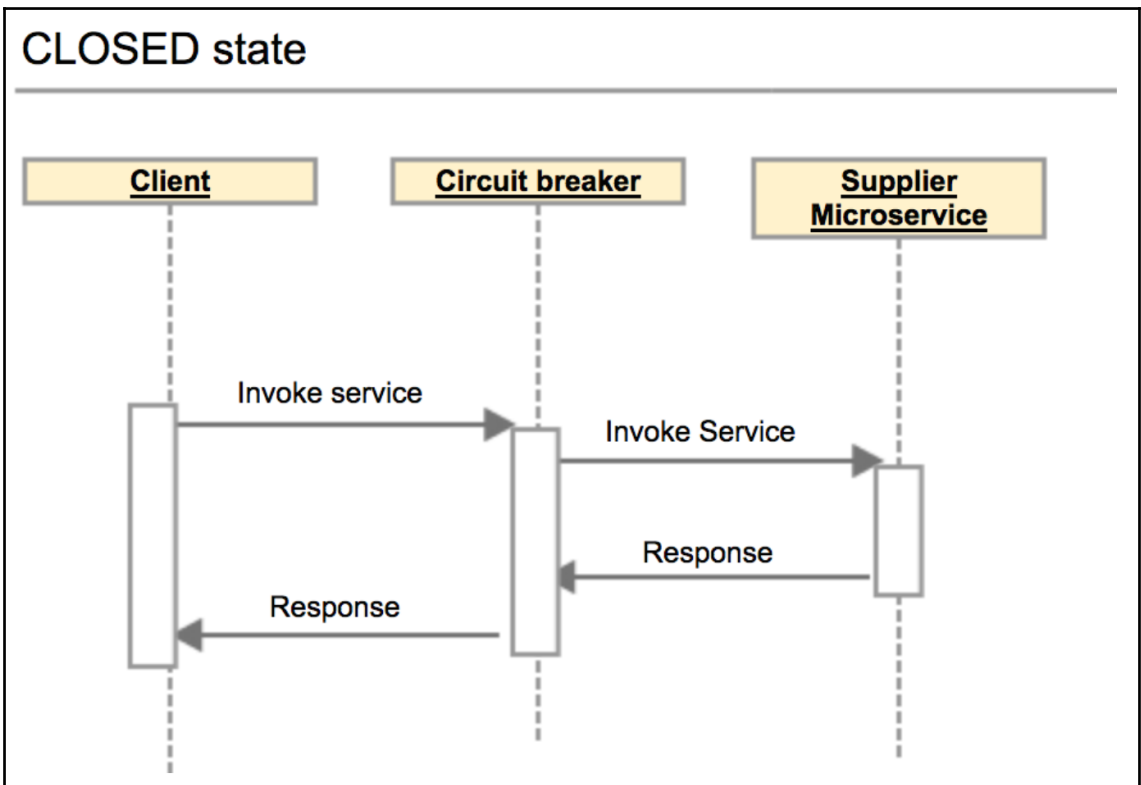
Reliability



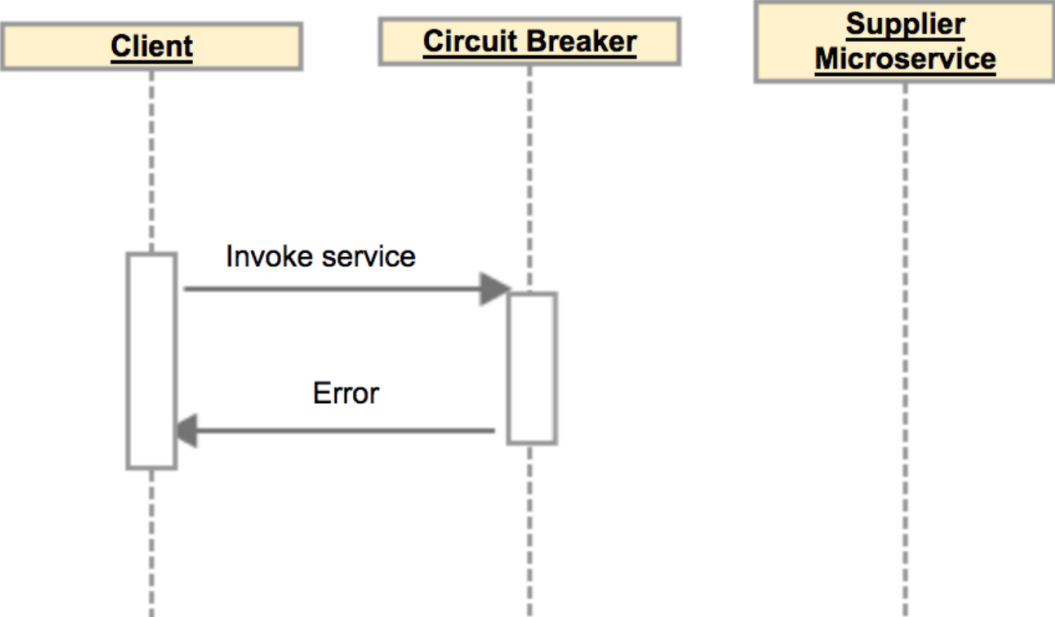




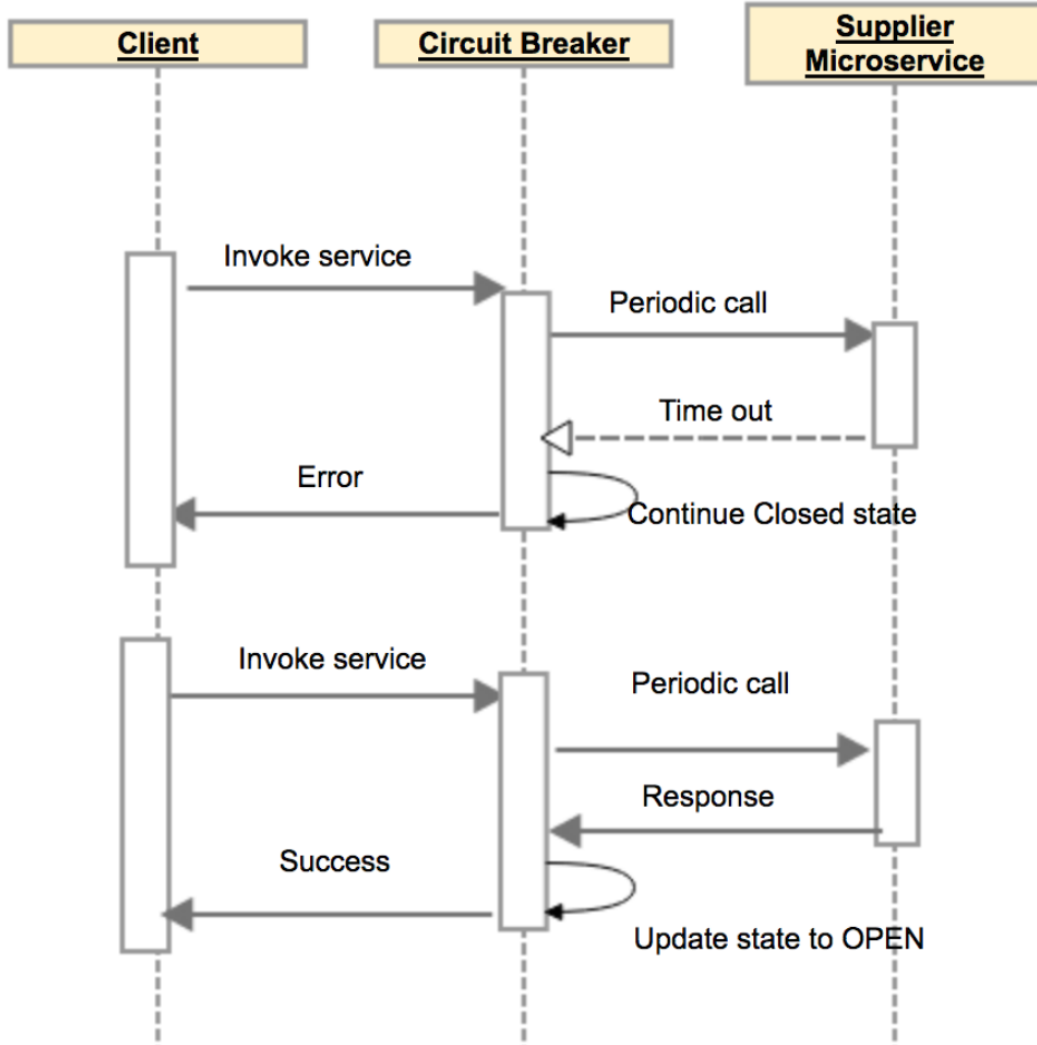
CLOSED state



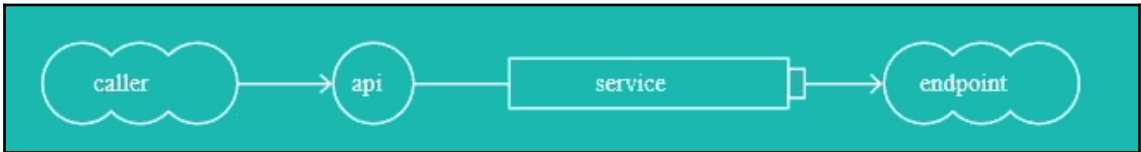
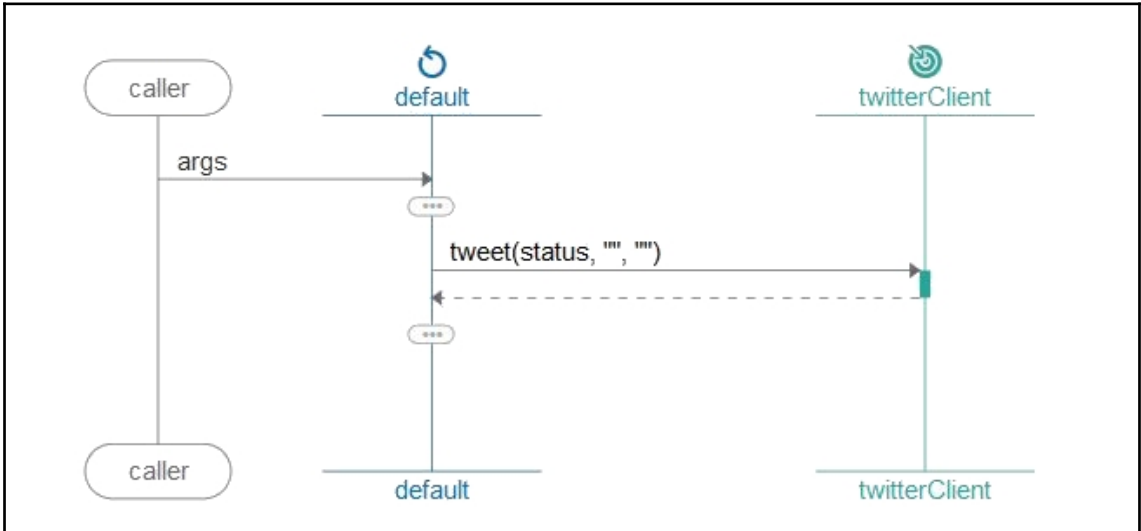
OPEN state



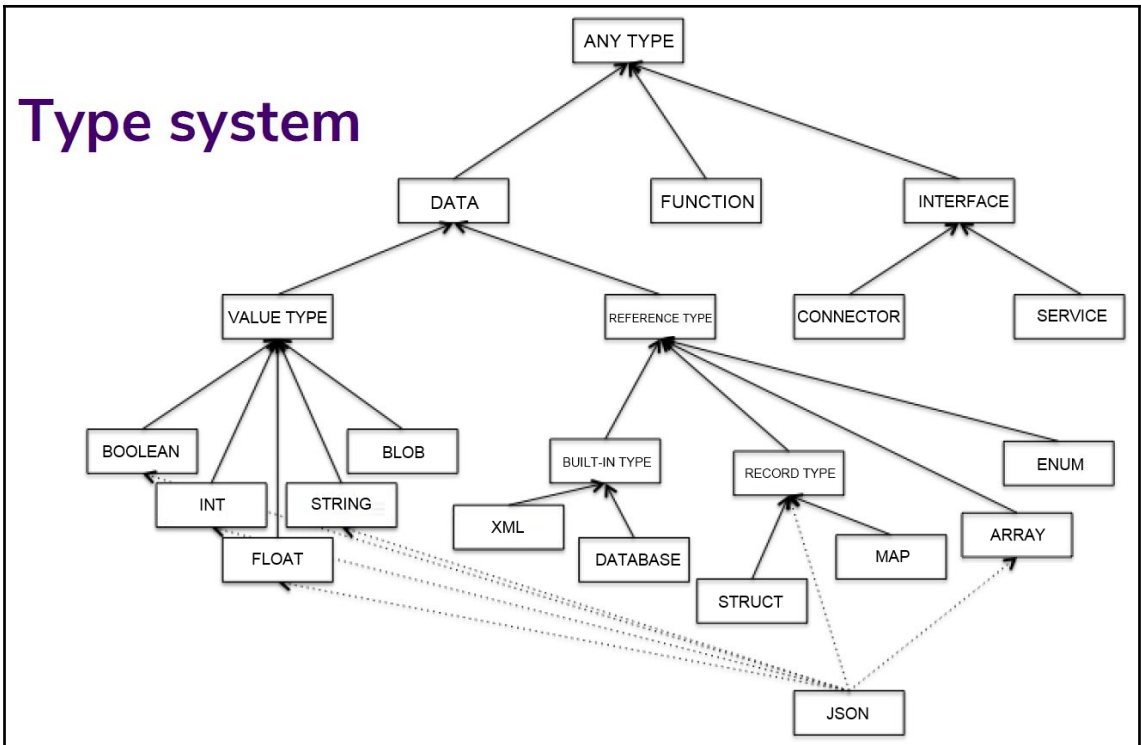
HALF-OPEN state



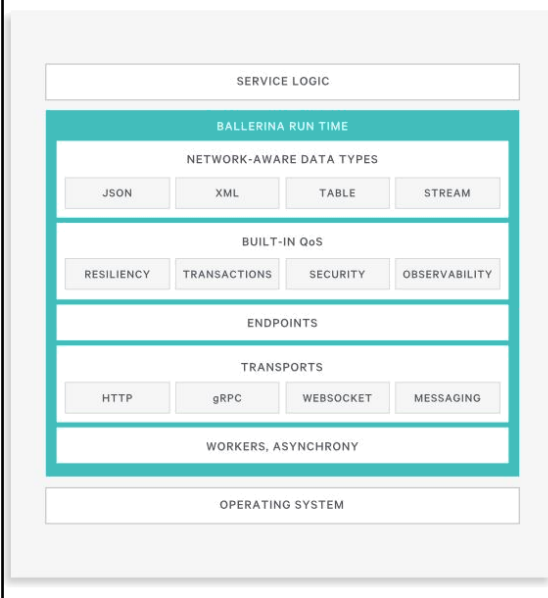
Chapter 7: Reliability Implementation Techniques



Type system



RUNTIME
DEPLOYMENT
LIFECYCLE



NETWORK-AWARE DATA TYPES

Ballerina has built-in network aware data types such as JSON, XML, table & stream. Service code can directly work with these data types.

BUILT-IN QoS

Built-in QoS in Ballerina enable developers to write resilient, transactional, secure & observable code without any additional libraries.

ENDPOINTS

Service endpoints represent entry points to services. Client endpoints represent connections to external systems & APIs. These endpoints are bound to transport protocols.

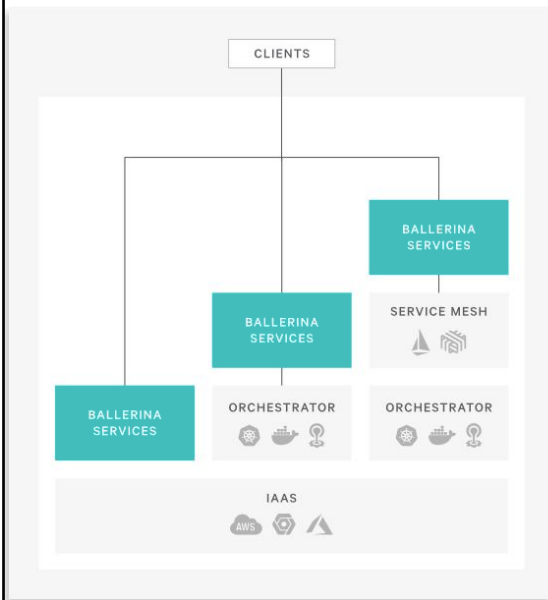
TRANSPORTS

The standard library has support for HTTP, gRPC, WebSocket, messaging and other transport protocols.

WORKERS & ASYNCHRONY

A worker is a parallel unit of execution in Ballerina. Every bit of code runs within the context of a worker. Therefore, service logic runs within a worker. Also, the runtime is designed to have inherent asynchronous execution features, such as seamless non-blocking I/O

**RUNTIME
DEPLOYMENT
LIFECYCLE**



IAAS

Using code annotations and the build system, Ballerina services and other runtime components like the API gateway can be packaged for deployment into any cloud native environment. On IaaS environments, Ballerina services can run as a VM or a container, with images optionally pushed to a registry during build.

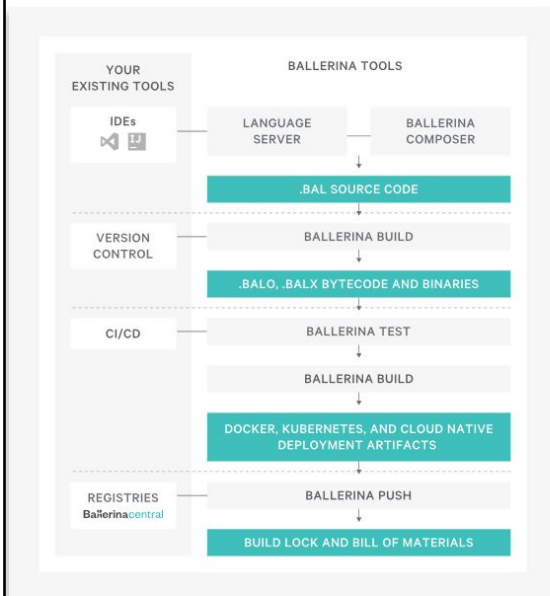
ORCHESTRATOR

Code annotations trigger compiler extensions that generate artifact packages of Ballerina components for different orchestrators such as Kubernetes or Cloud Foundry. Vendors or DevOps can add custom code annotations to generate environment-specific deployments, such as a custom blue-green deployment algorithm.

SERVICE MESH

Ballerina services can optionally delegate circuit breaking and transaction flow logic to a service mesh like Istio or Envoy if present. Ballerina services embed equivalent capabilities, if a service mesh is missing.

**RUNTIME
DEPLOYMENT
LIFECYCLE**



BALLERINA TOOLS

The language server enables autocompletion and debugging with VS Code and IntelliJ. Ballerina's keyword and syntax structure is designed to represent sequence diagrams. Visualize and edit Ballerina code with Ballerina Composer. Bonus - it also visualizes runtime dev traces.

BALLERINA BUILD

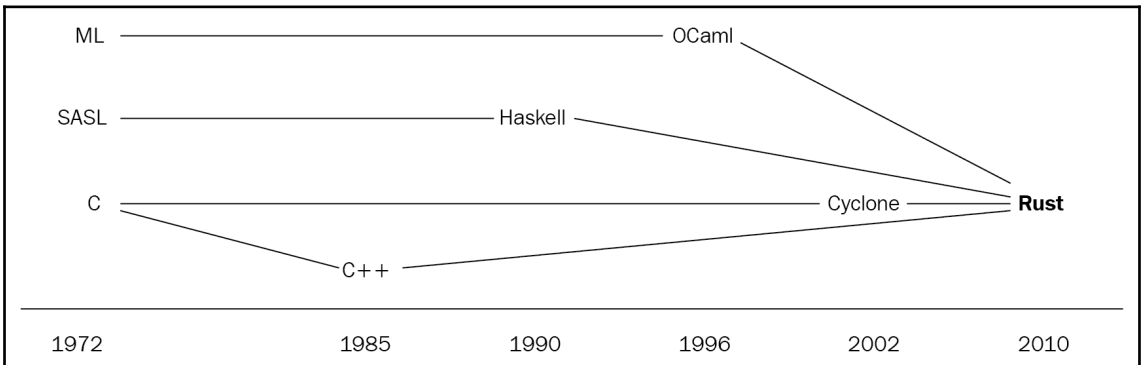
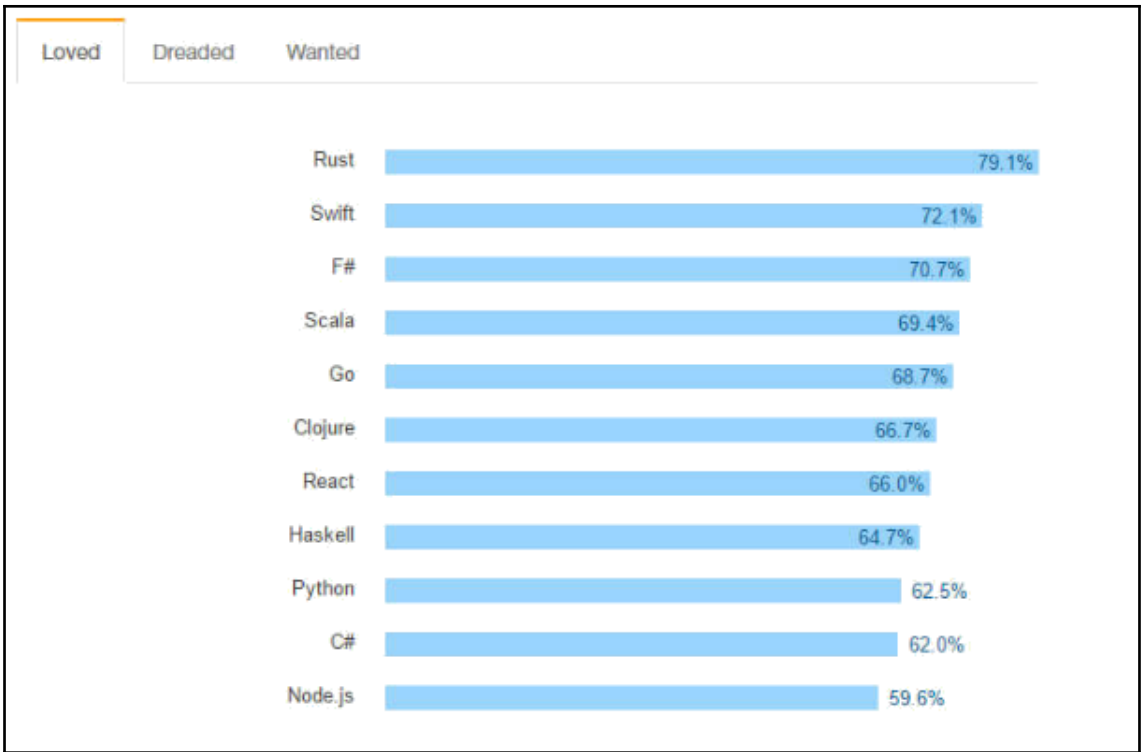
Compiles services into optimized byte code for execution with a memory-tuned BVM. Project structure, dependency management, package management, and unit testing with Testerina are provided. Build locks make it easy to recreate services and deployments. Generate executables (.bab) or libraries (.balo).

CI/CD DEPLOYMENT

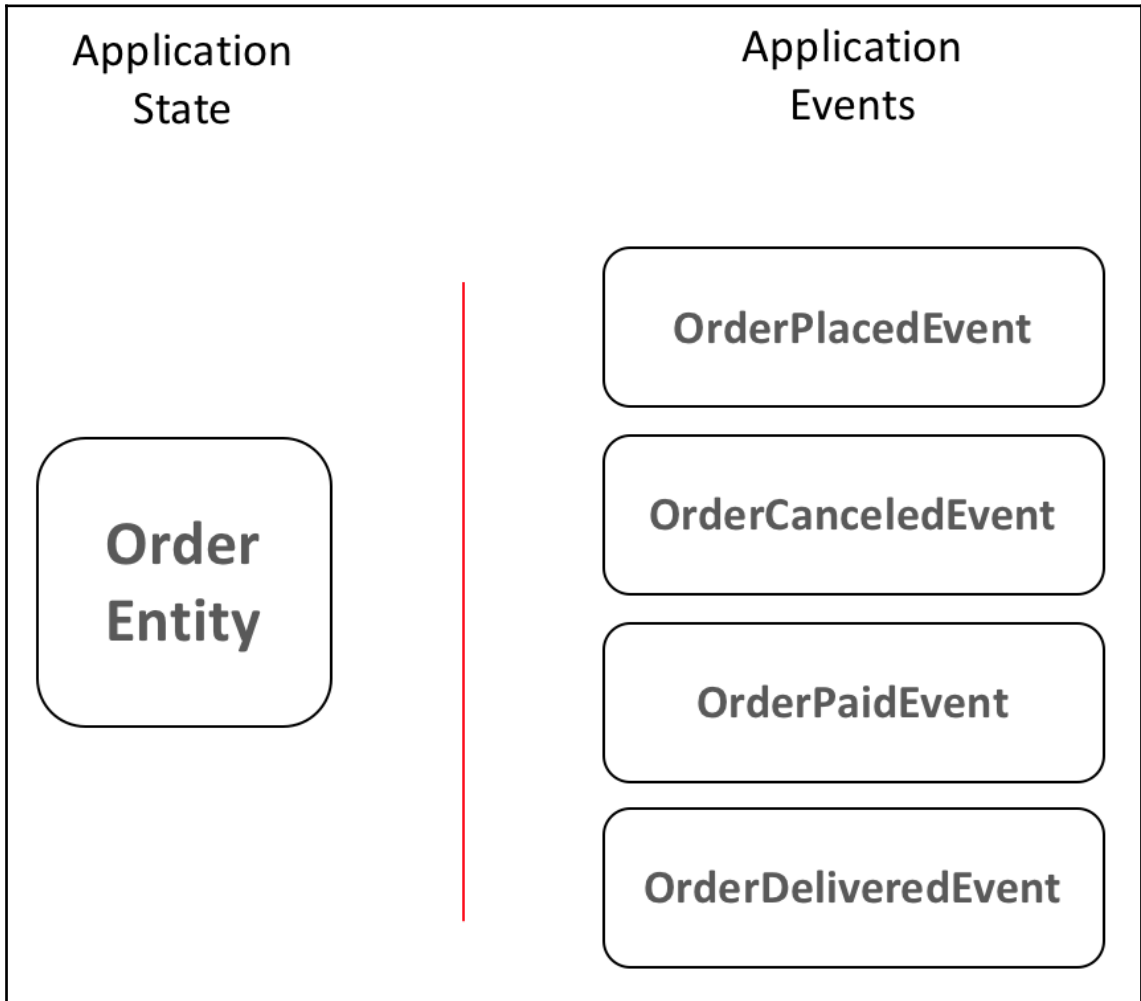
Deployment code annotations trigger build extensions that generate artifacts for continuous integration, continuous delivery, or orchestrator environments. Push build artifacts to your CI / CD system or skip it entirely.

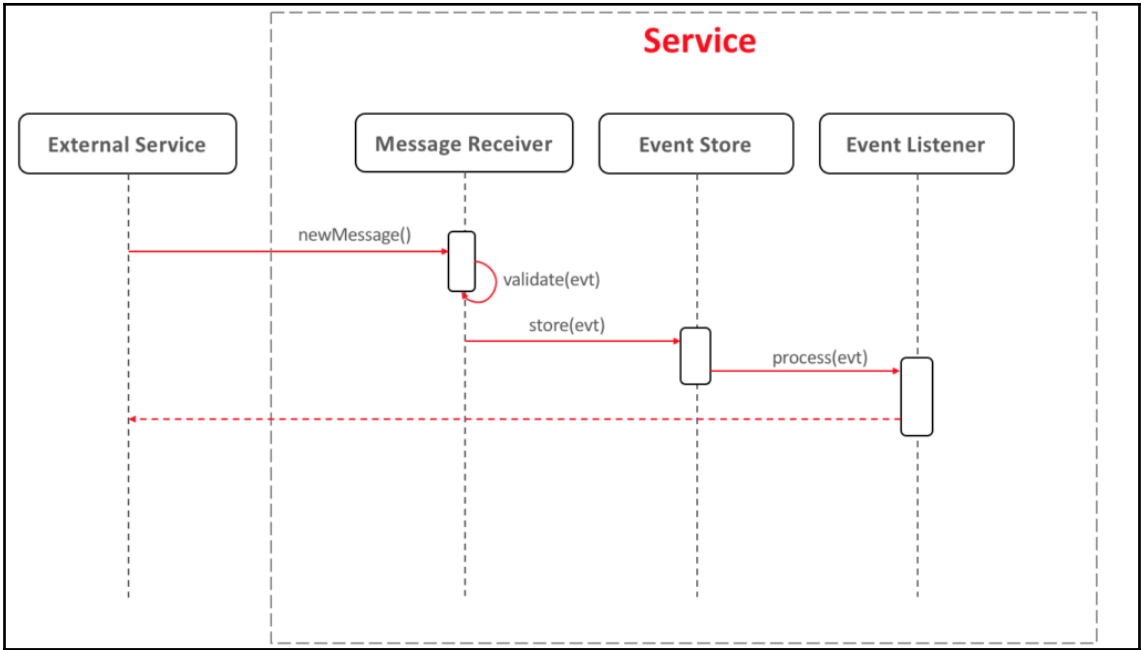
REGISTRIES

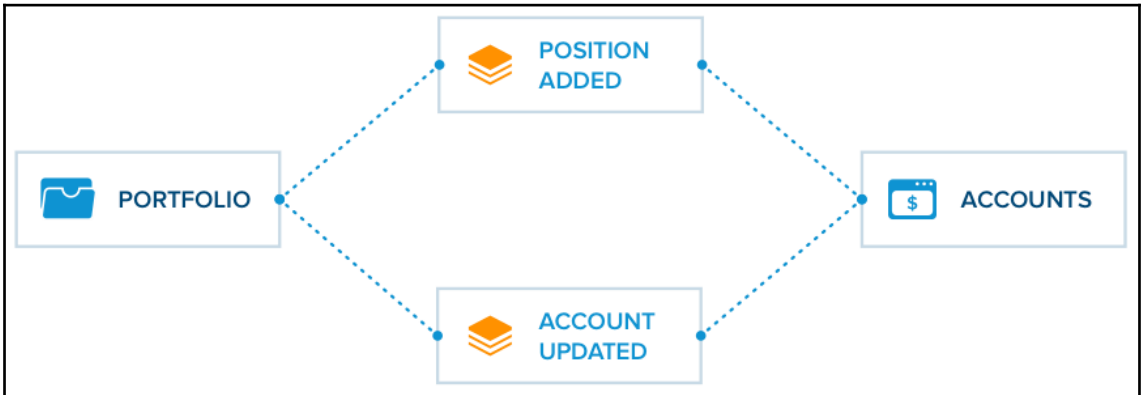
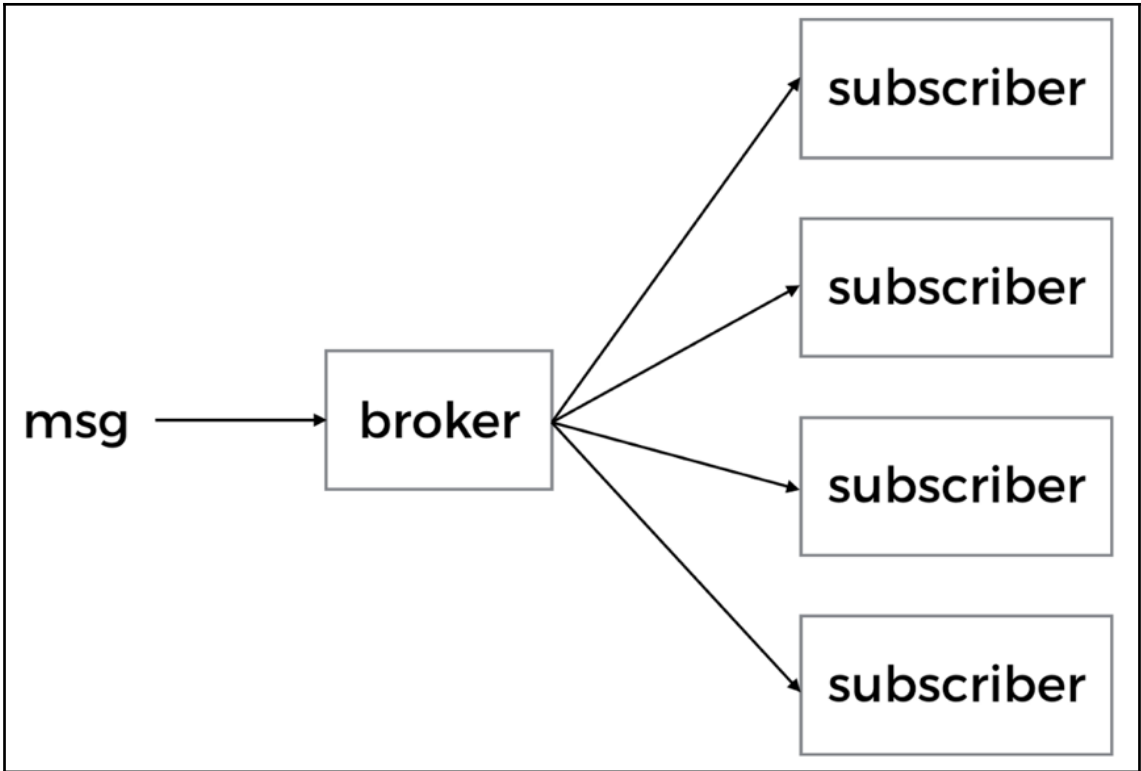
Use or combine endpoint connectors, custom annotations and code functions as shareable packages. Push and pull versioned packages with Ballerina Central, a shared global repository.

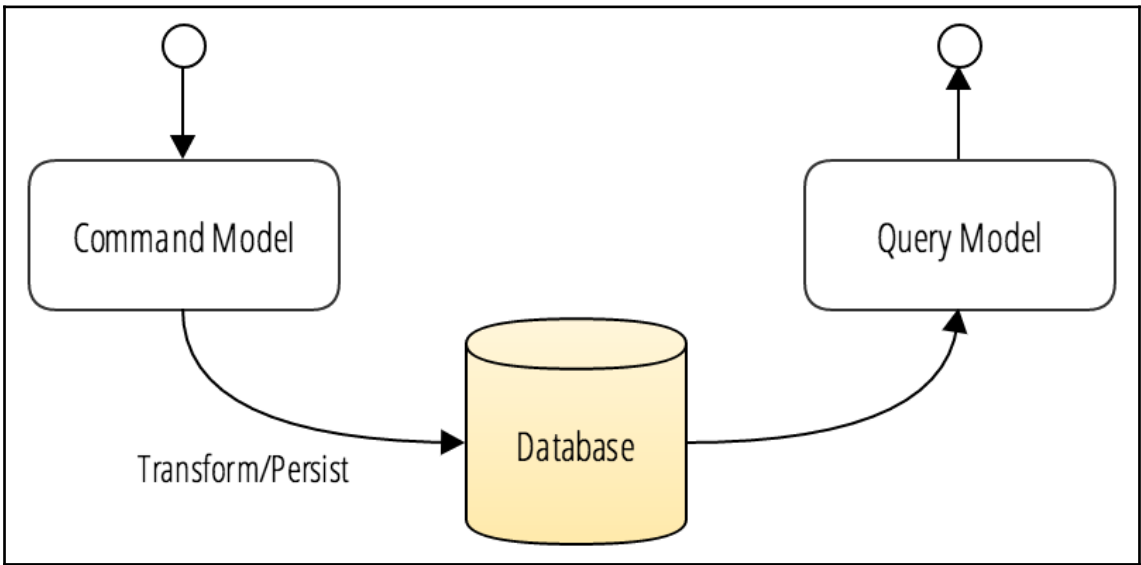
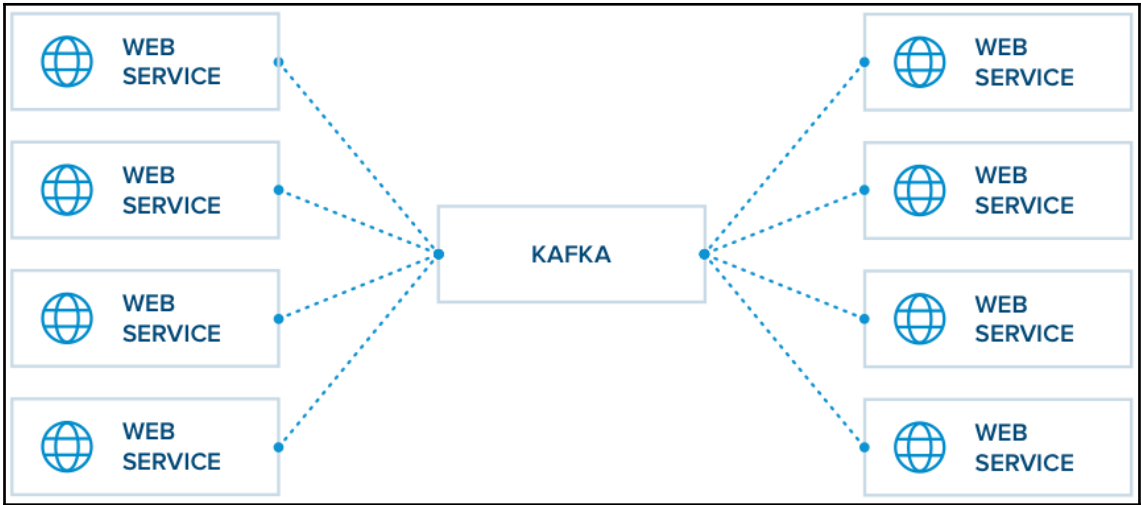


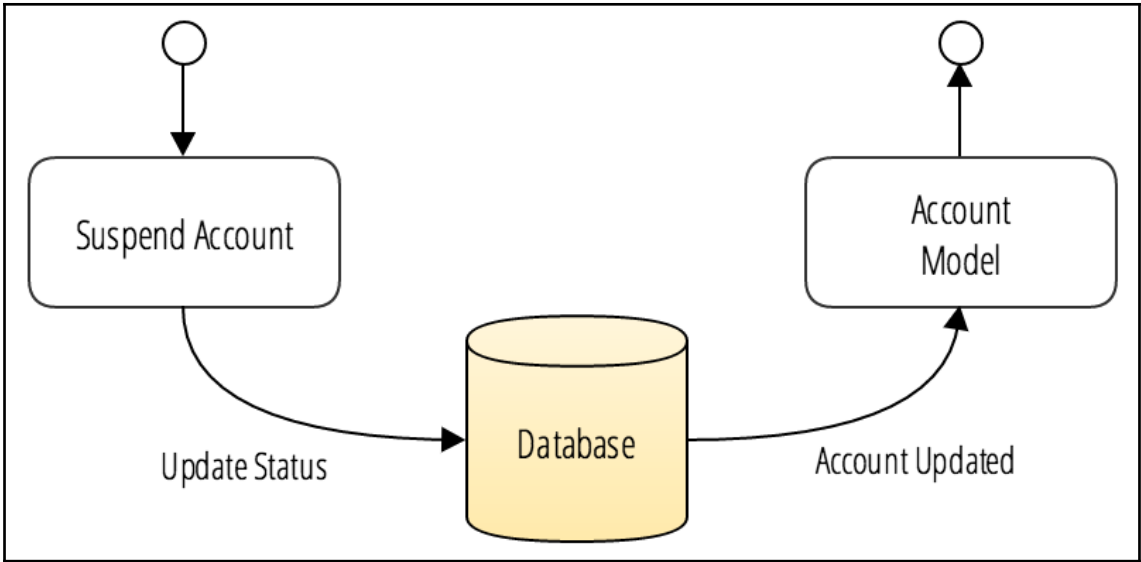
Chapter 8: Realizing Reliable Systems - the Best Practices

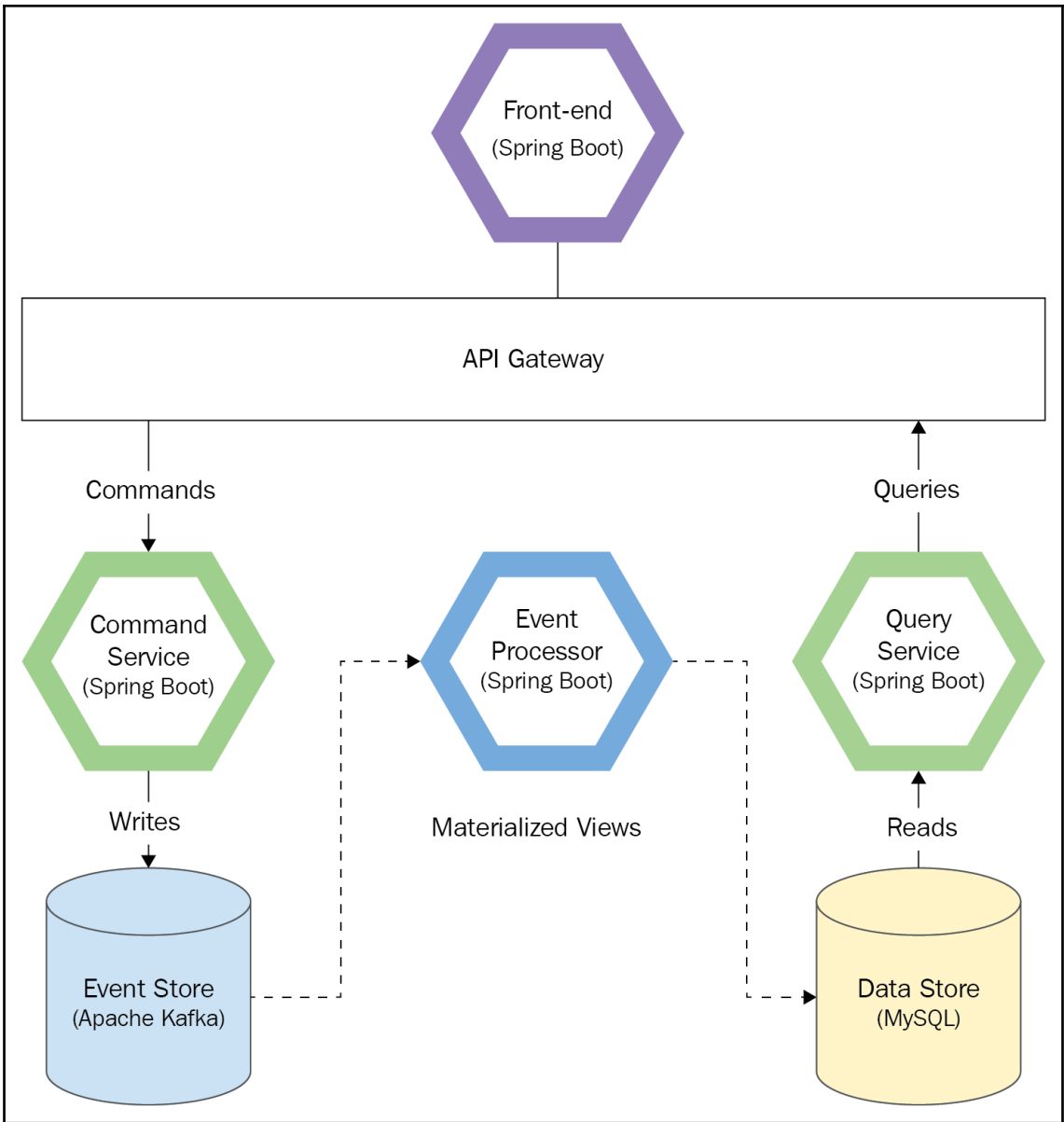


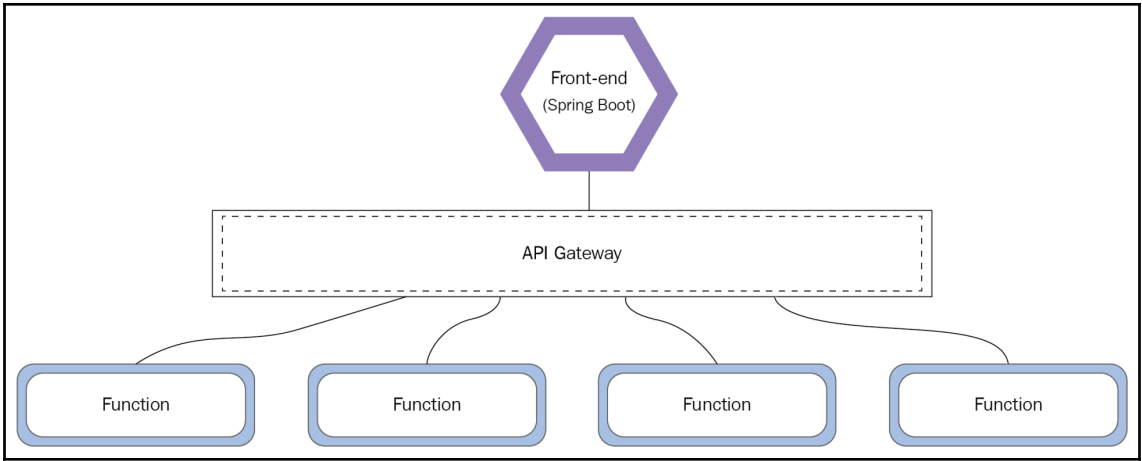


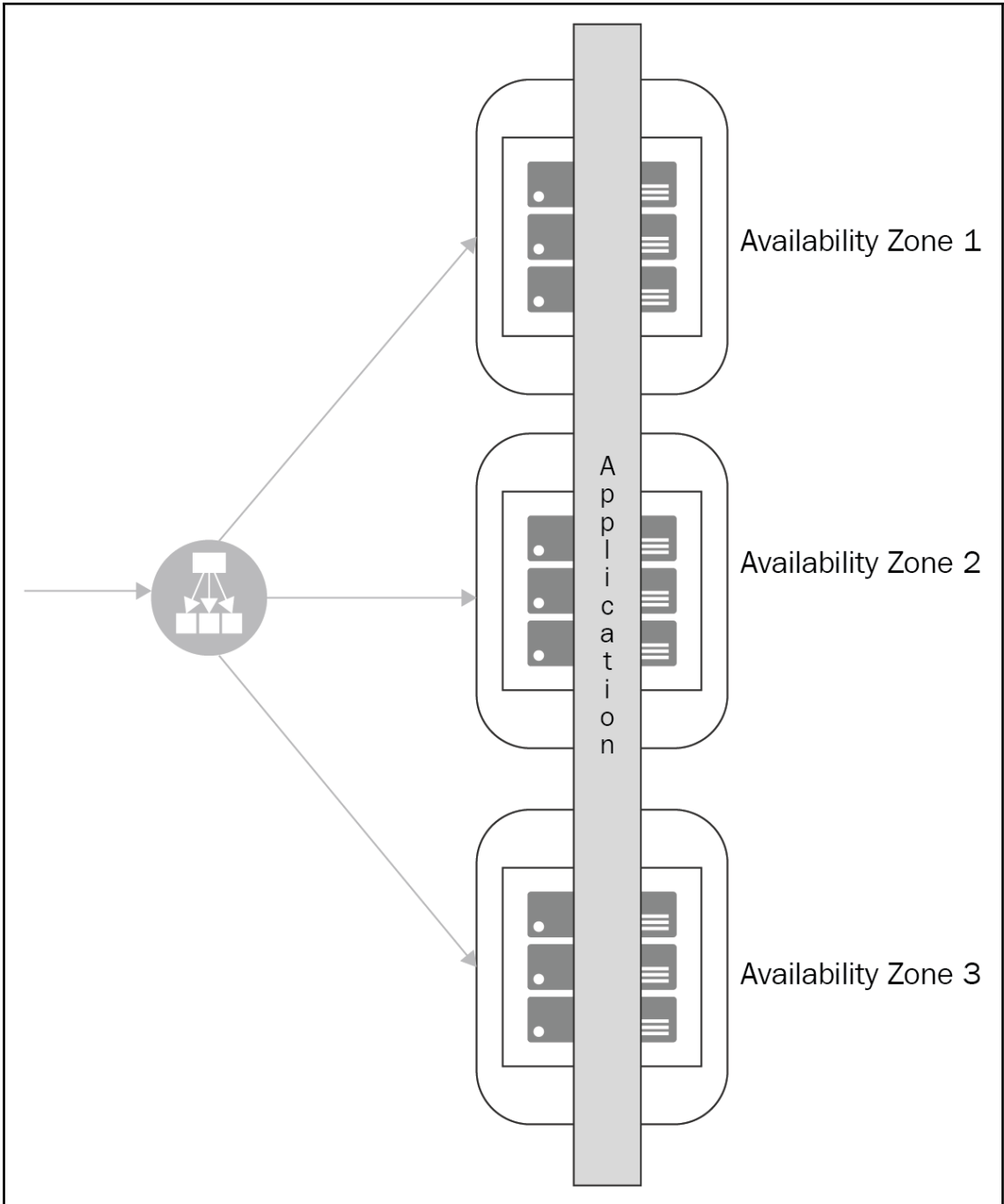


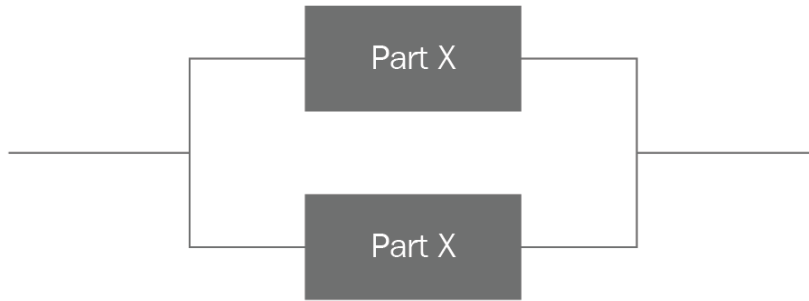






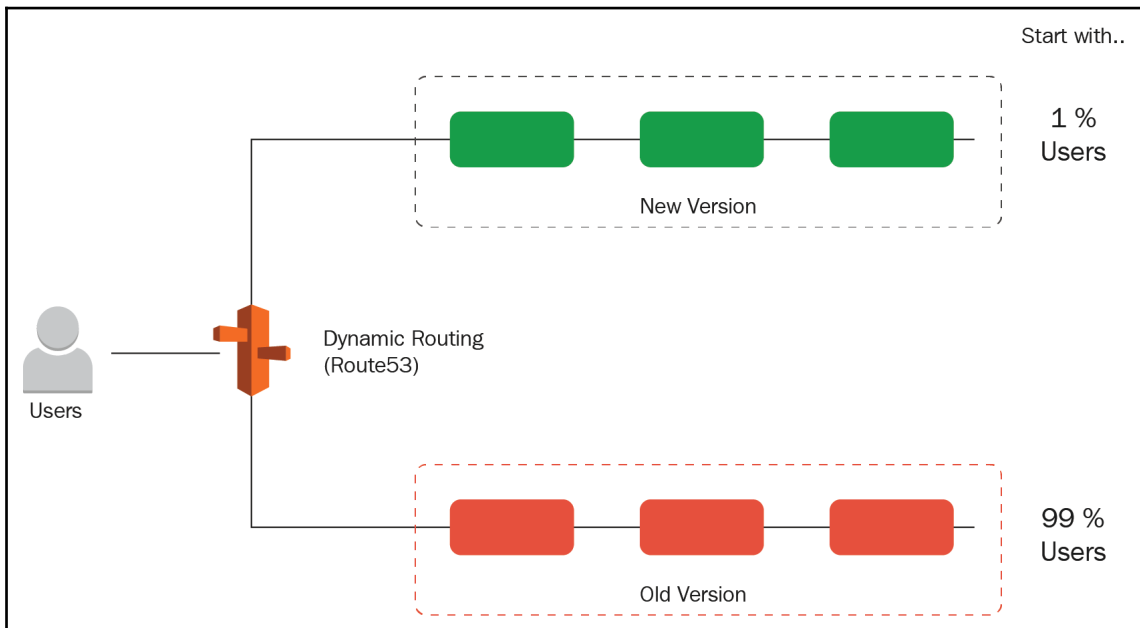






$$A = 1 - (1 - Ax)^2$$

Component	Availability	Downtime
X	99 % (2-nines)	3 days 15 hours
Two X in parallel	99.99% (4-nines)	52 minutes
Three X in parallel	99.9999% (6-nines)	31 seconds



```

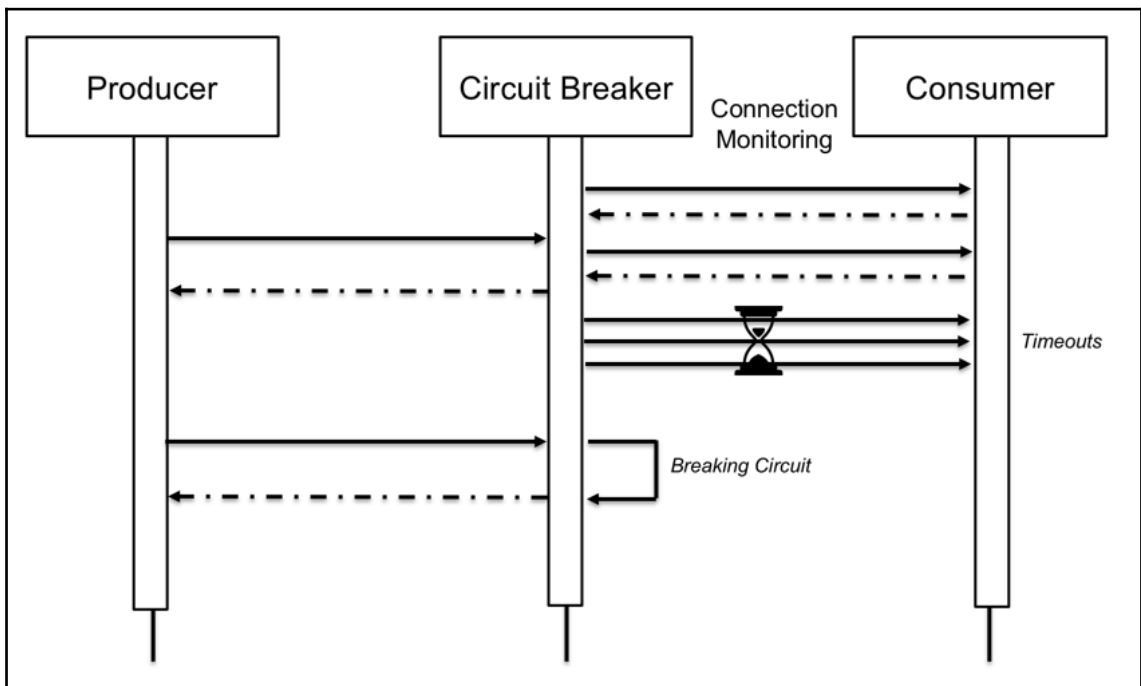
retries = 0
DO
    wait(2^retries * 100 milliseconds)

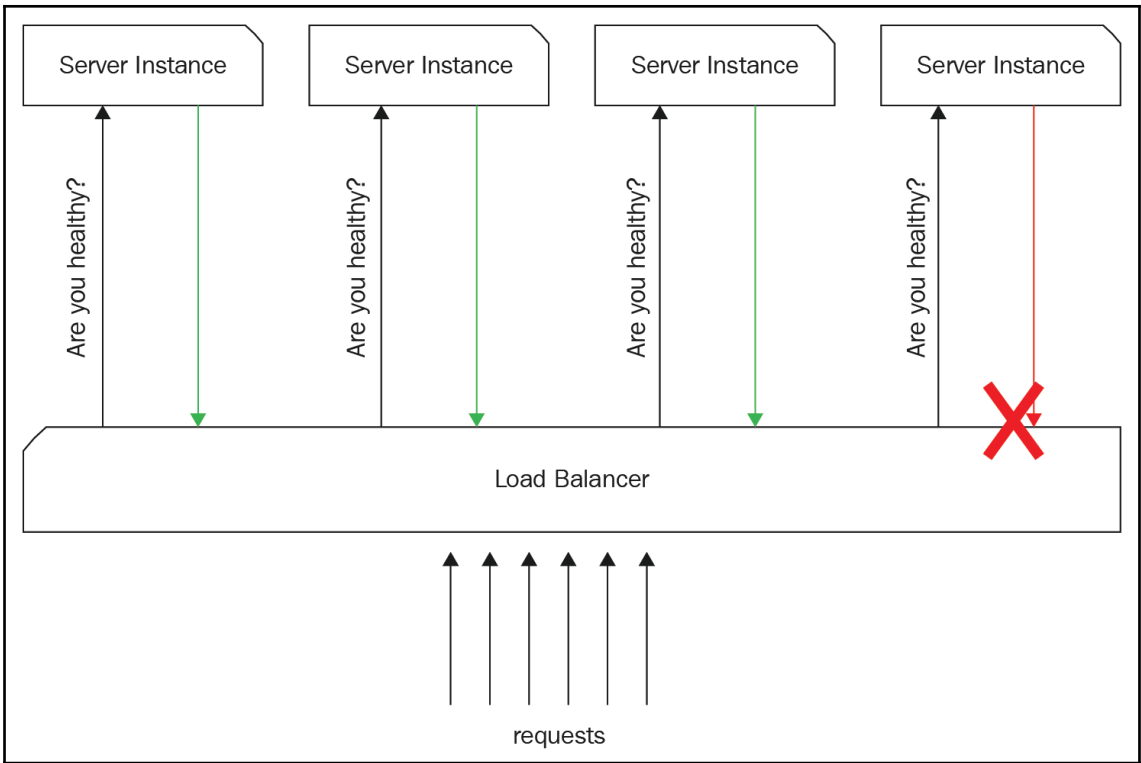
    status = do_request() OR get_async_result()

    IF status = SUCCESS
        retry = false
    ELSE
        retry = true
        retries = retries + 1

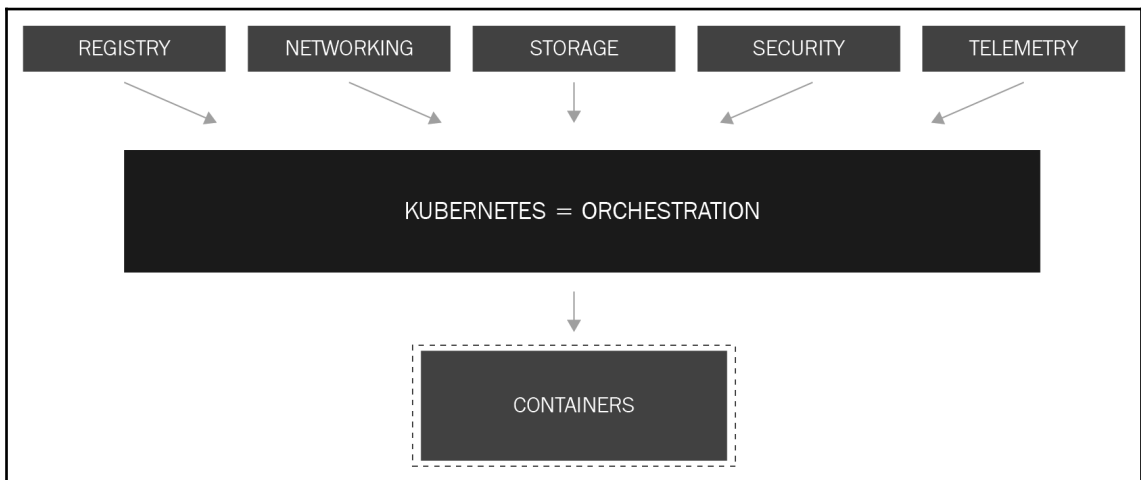
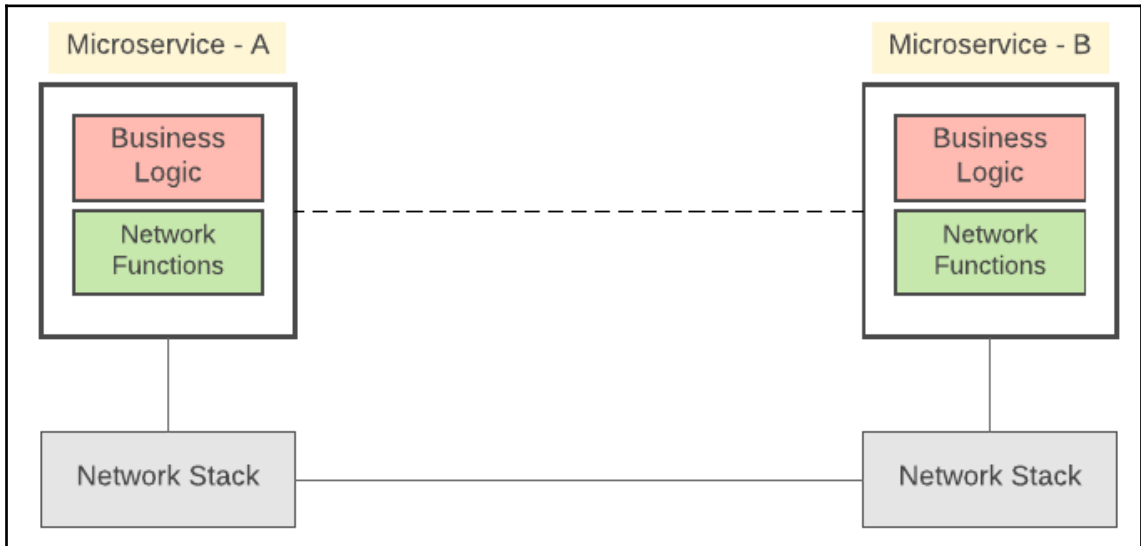
WHILE (retry AND (retries < MAX_RETRIES))

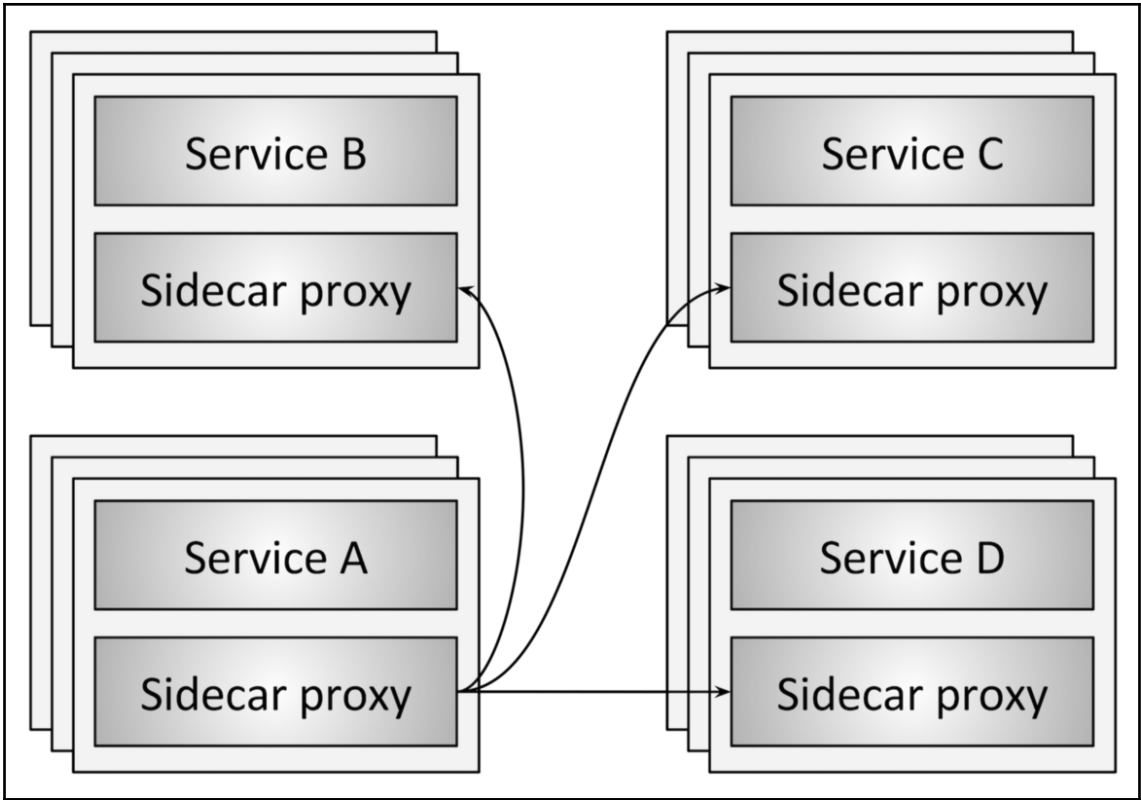
```

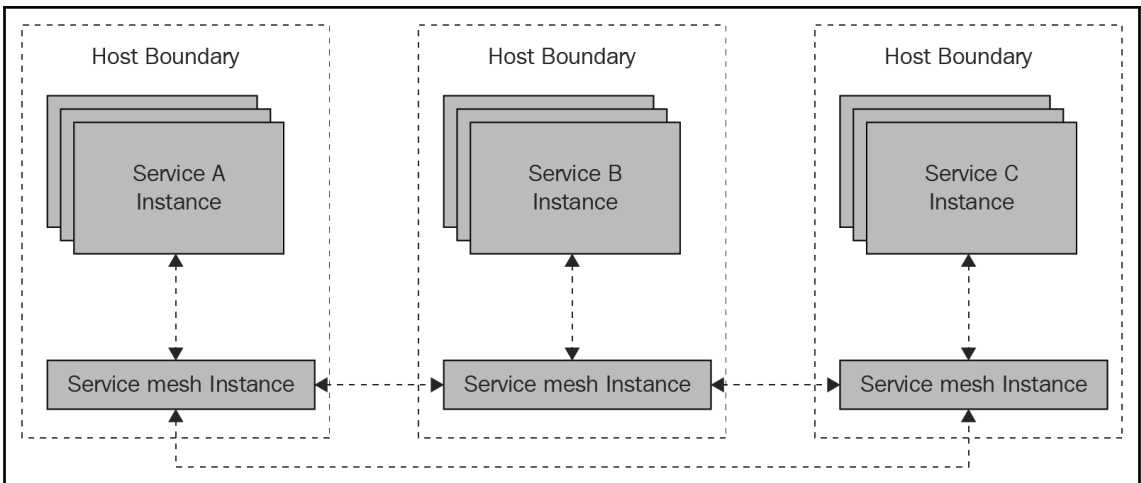
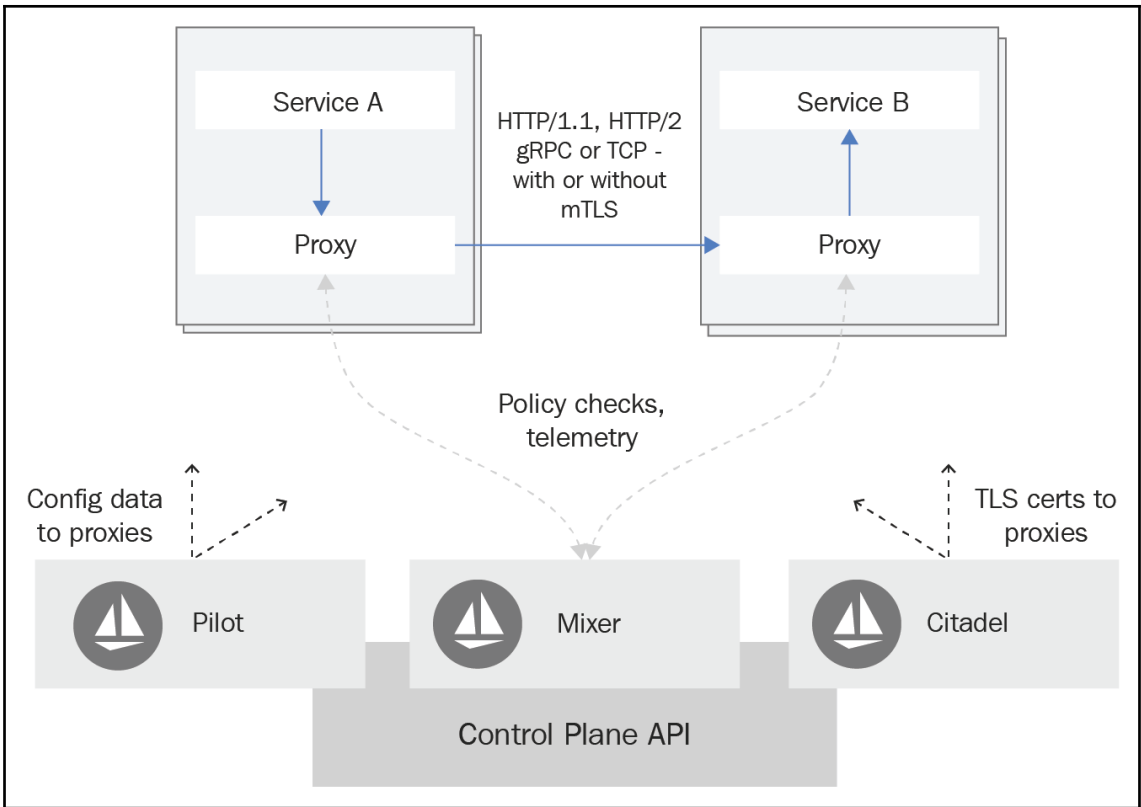


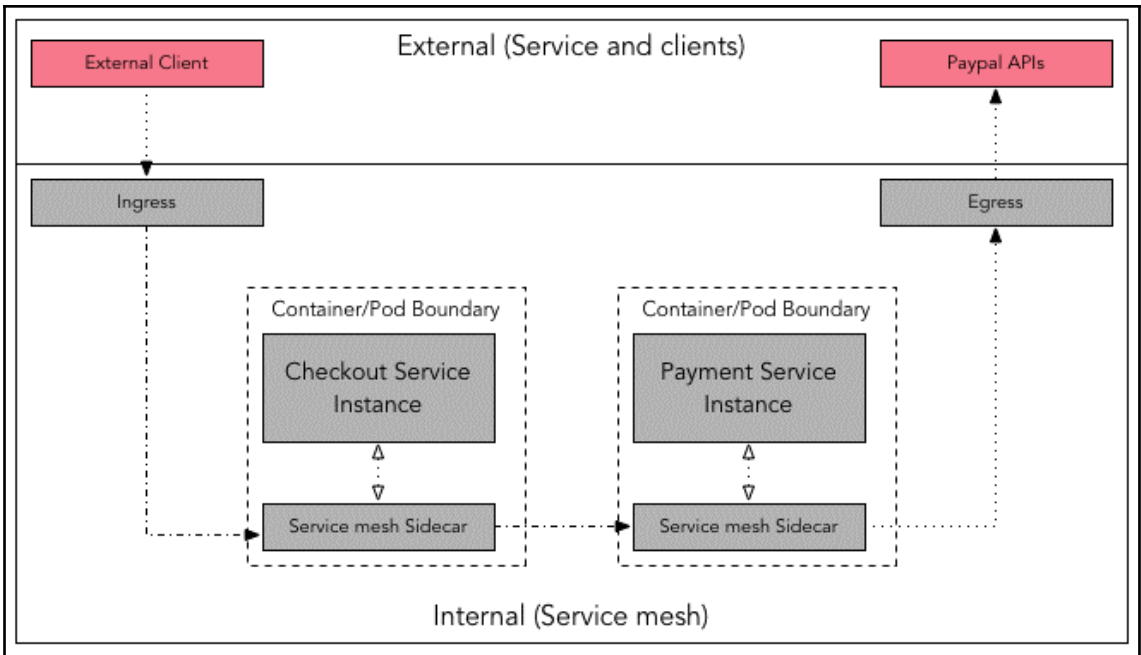
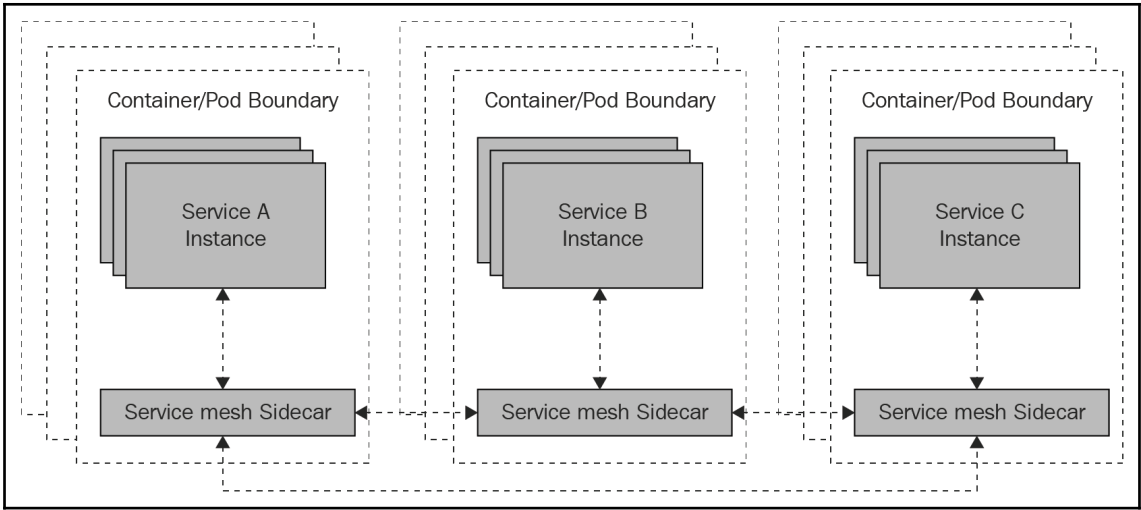


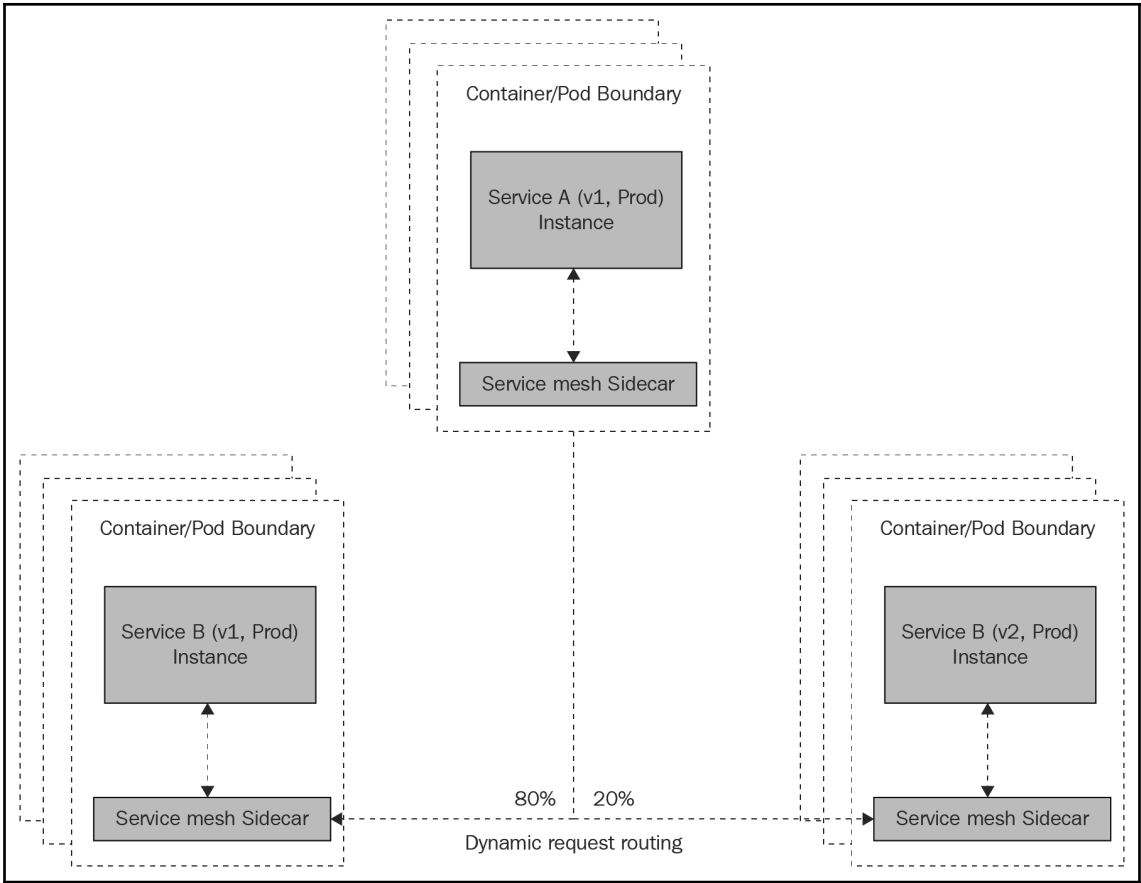
Chapter 9: Service Resiliency

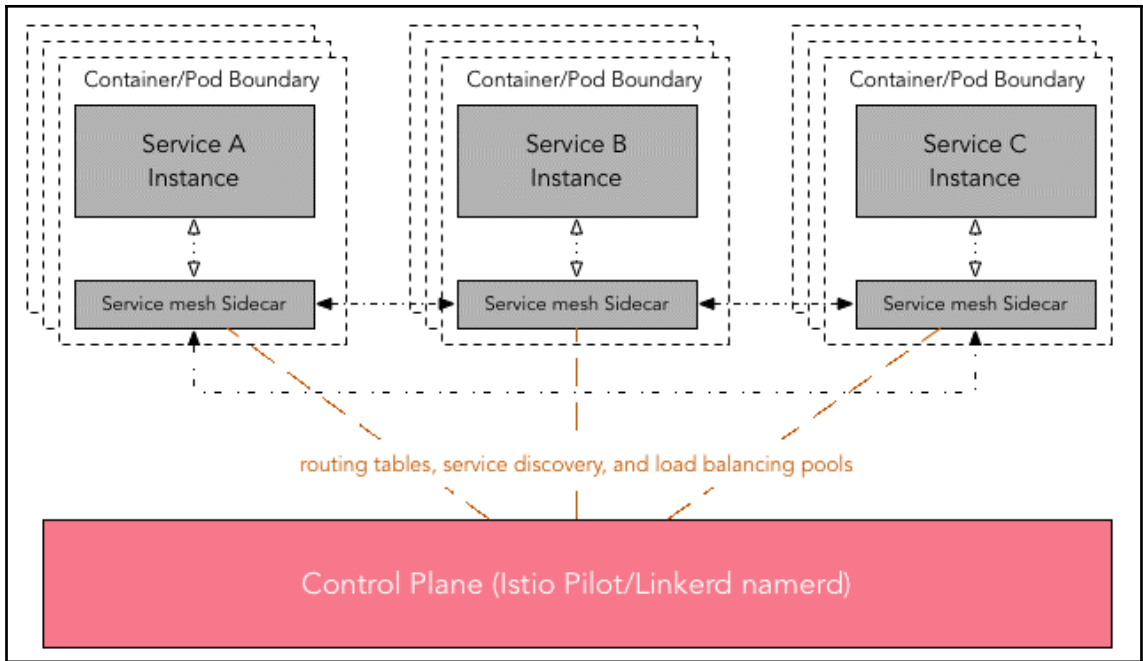


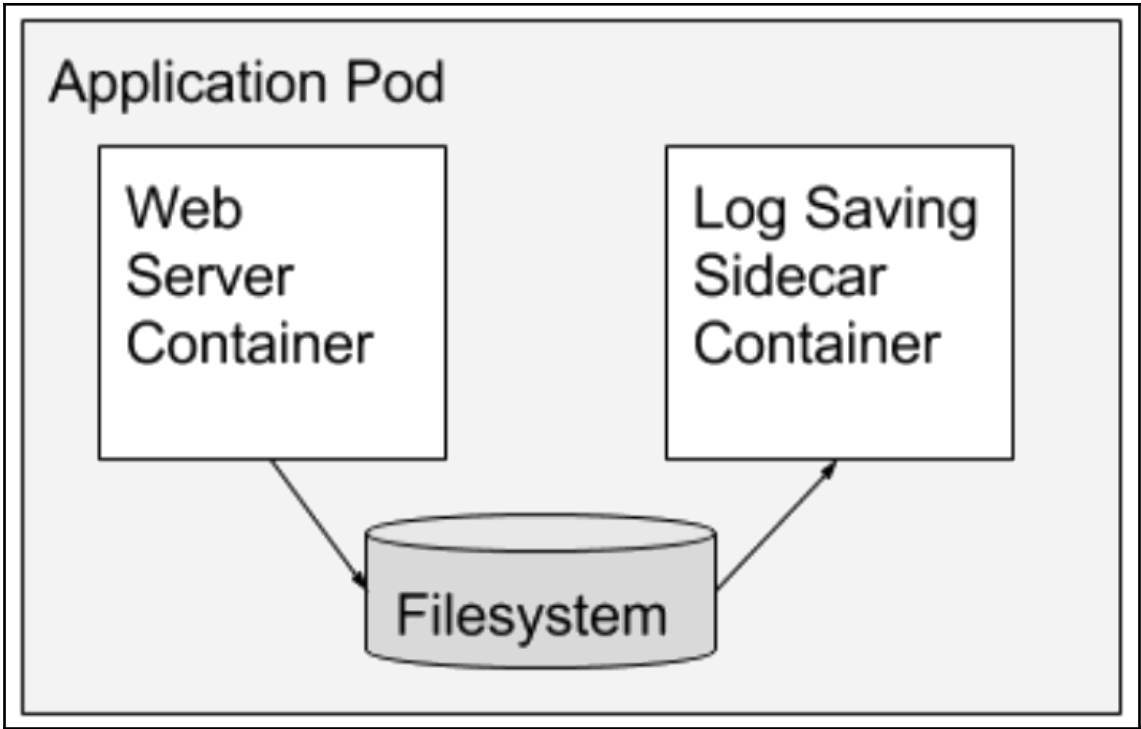




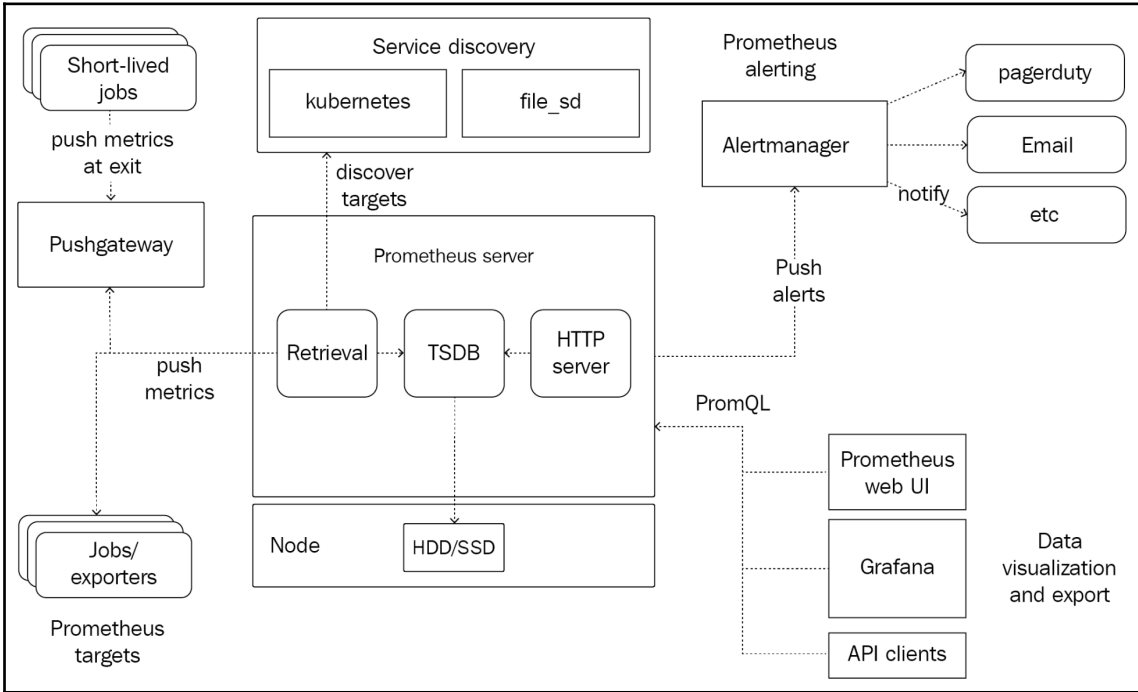








Chapter 10: Containers, Kubernetes, and Istio Monitoring



```
Kube@Kubernetes:/opt/istio/istio-0.7.1$ kubectl apply -f install/kubernetes/addons/prometheus.yaml
configmap/prometheus created
service/prometheus created
deployment.extensions/prometheus created
serviceaccount/prometheus created
clusterrole.rbac.authorization.k8s.io/prometheus created
clusterrolebinding.rbac.authorization.k8s.io/prometheus created
```

```
master@Kubemaster:~$ kubectl -n istio-system get svc prometheus
NAME         TYPE        CLUSTER-IP      EXTERNAL-IP      PORT(S)      AGE
prometheus   ClusterIP   10.105.135.113  <none>           9090/TCP     4d19h
master@Kubemaster:~$
```

```
[1] 35637
master@Kubemaster:~$ Forwarding from 127.0.0.1:9090 -> 9090
Forwarding from [::1]:9090 -> 9090

master@Kubemaster:~$ █
```

```
C:\Users\...> ssh -L 9090:127.0.0.1:9090 master@40.76.212.128
master@40.76.212.128's password:
Welcome to Ubuntu 17.10 (GNU/Linux 4.13.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

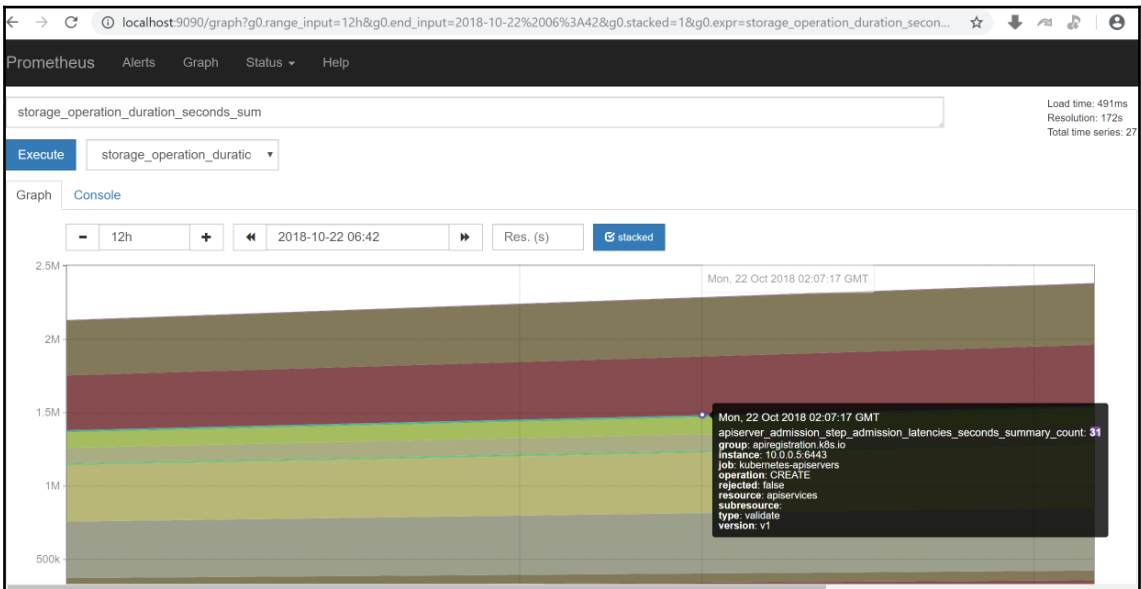
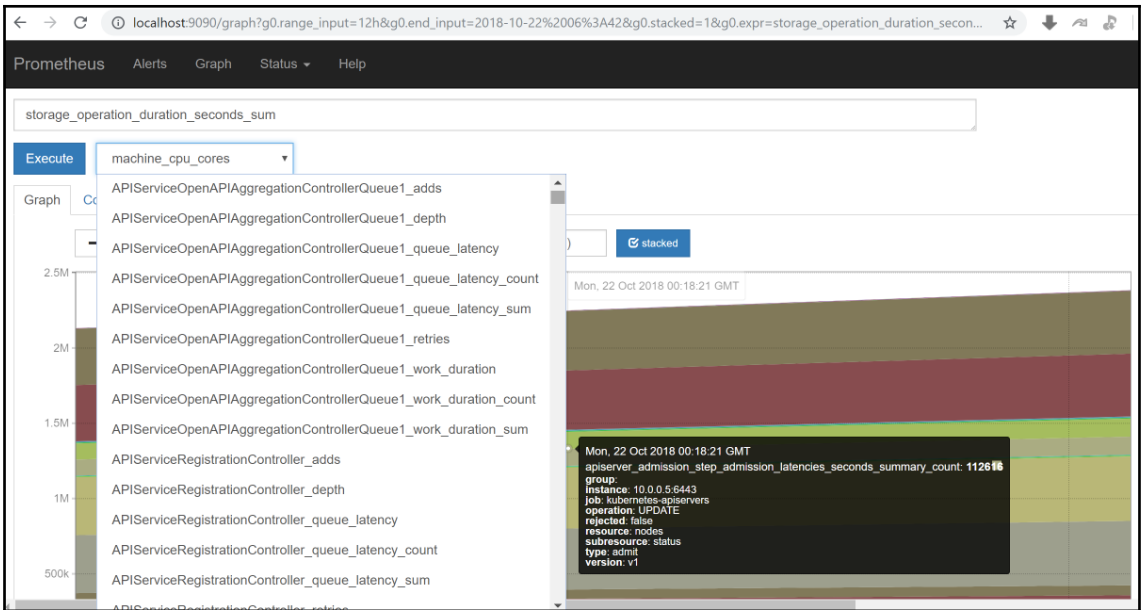
Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

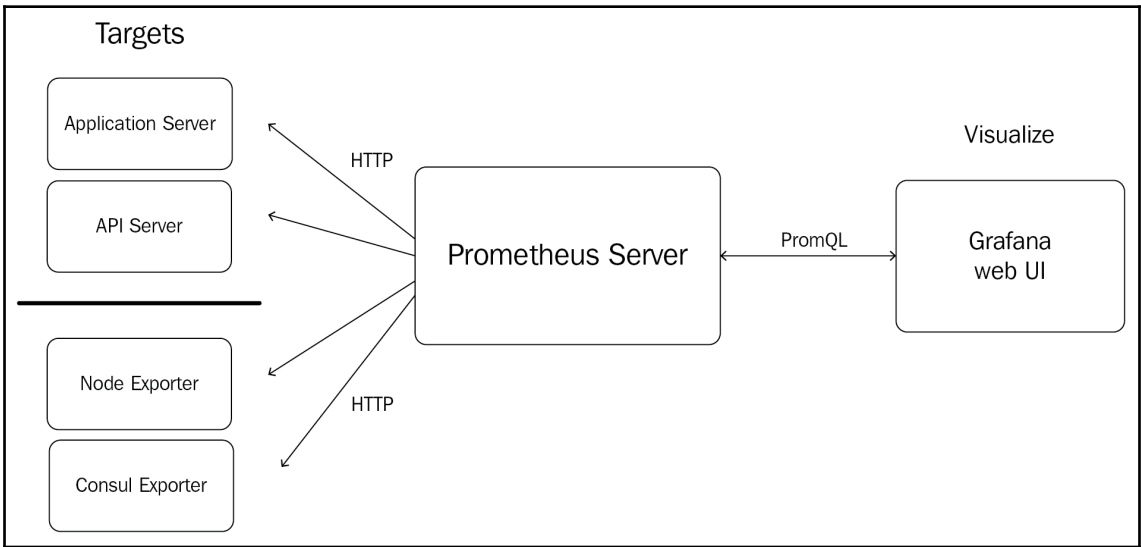
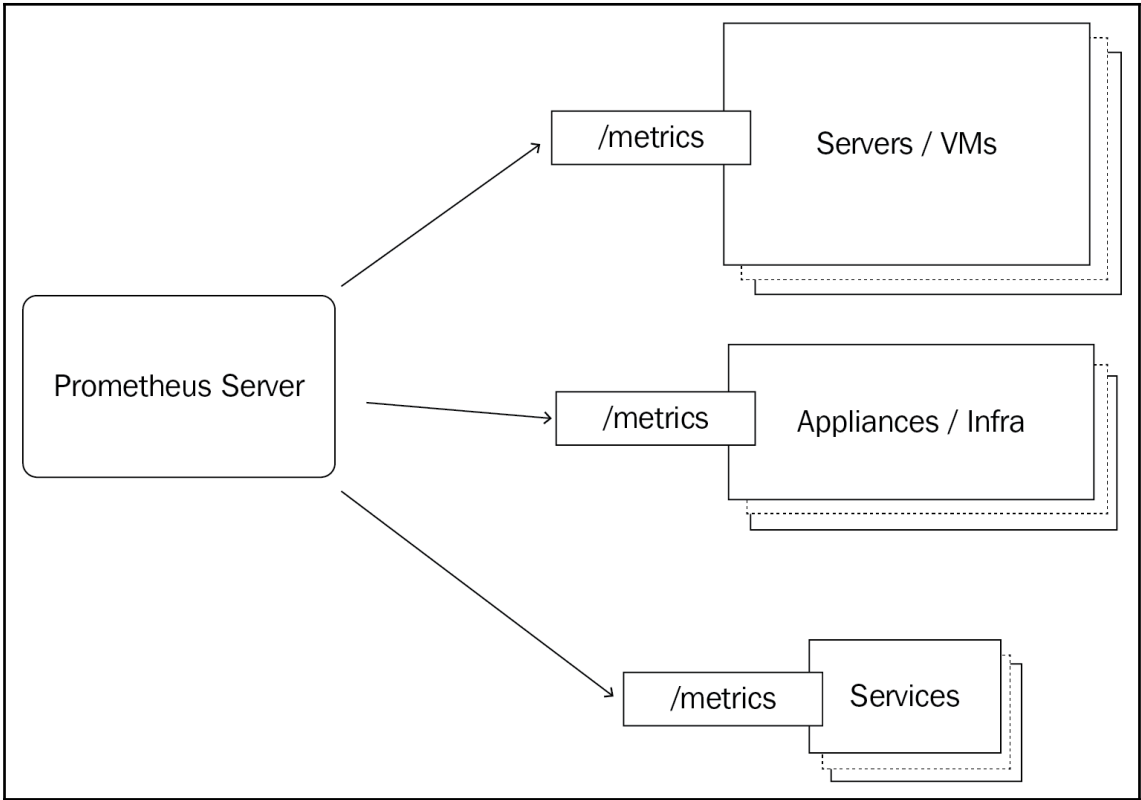
0 packages can be updated.
0 updates are security updates.

Your Ubuntu release is not supported anymore.
For upgrade information, please visit:
http://www.ubuntu.com/releaseendoflife

New release '18.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Mon Oct 22 06:39:44 2018 from 167.220.238.138
master@Kubemaster:~$
```





```
master@Kubemaster:/opt/Istio_prom_grafana/istio-0.7.1$ kubectl create -f install/kubernetes/addons/grafana.yaml
Error from server (AlreadyExists): error when creating "install/kubernetes/addons/grafana.yaml": services "grafana" already exists
Error from server (AlreadyExists): error when creating "install/kubernetes/addons/grafana.yaml": deployments.extensions "grafana" already exists
Error from server (AlreadyExists): error when creating "install/kubernetes/addons/grafana.yaml": serviceaccounts "grafana" already exists
master@Kubemaster:/opt/Istio_prom_grafana/istio-0.7.1$
```

```
[1] 90165
```

```
master@Kubemaster:/opt/Istio_prom_grafana/istio-0.7.1$ Forwarding from 127.0.0.1:3000 -> 3000
Forwarding from [::1]:3000 -> 3000
```

```
C:\Users\...> ssh -L 9090:127.0.0.1:9090 master@40.76.212.128
master@40.76.212.128's password:
Welcome to Ubuntu 17.10 (GNU/Linux 4.13.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

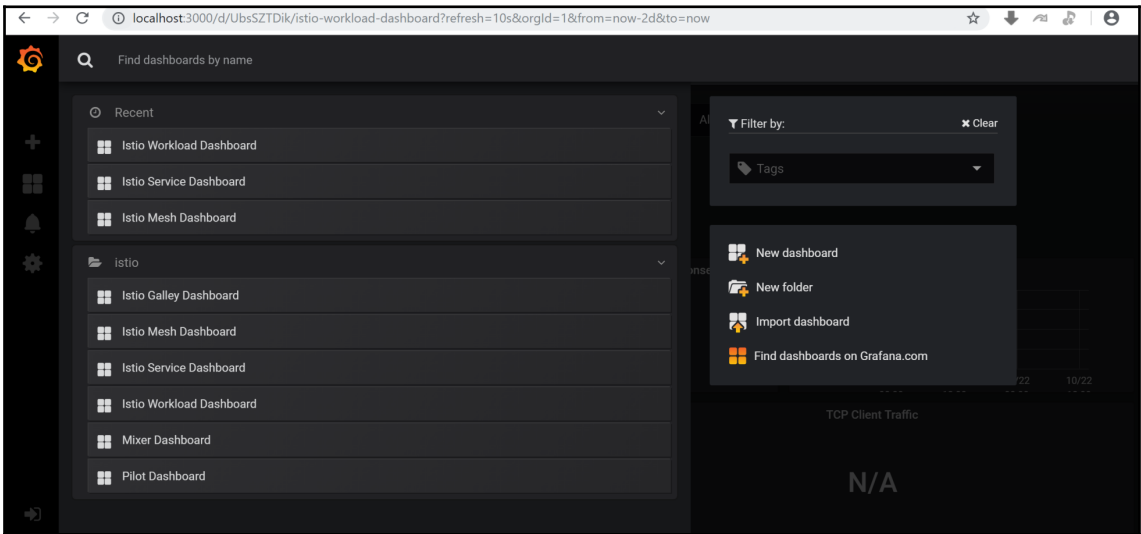
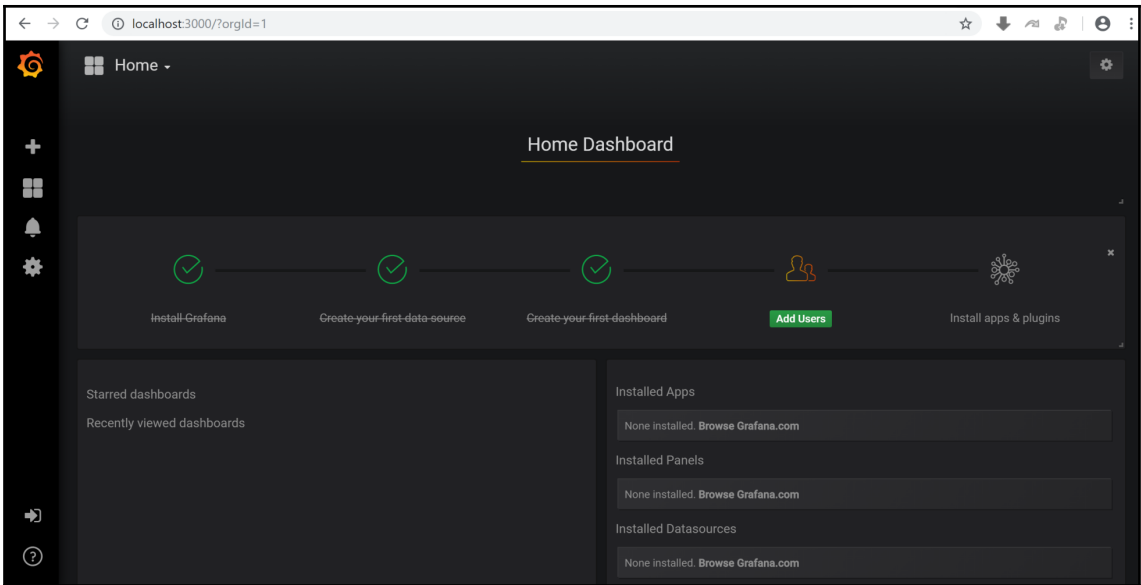
Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

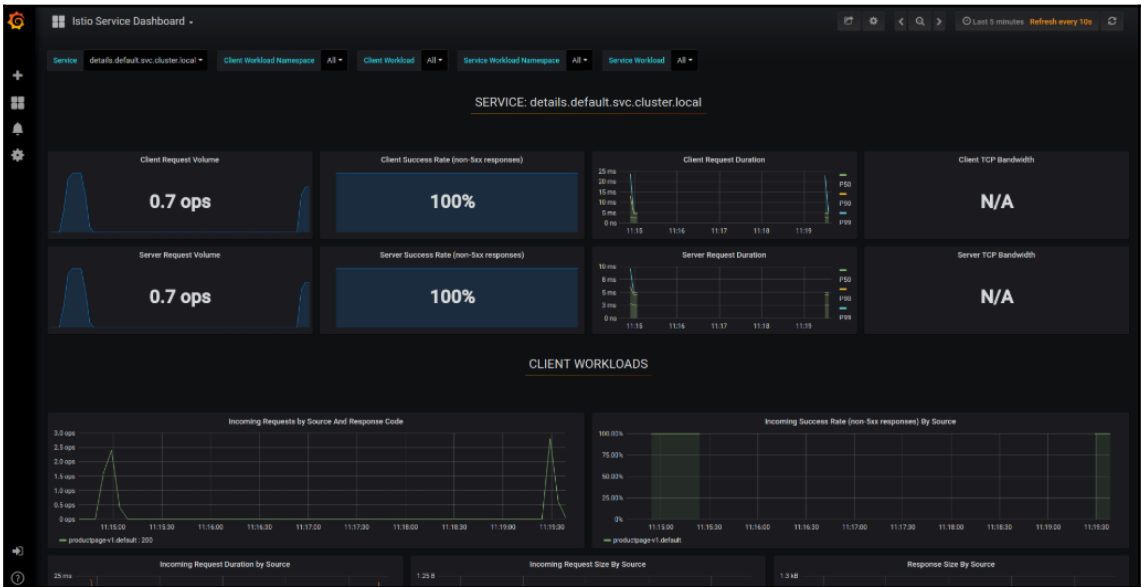
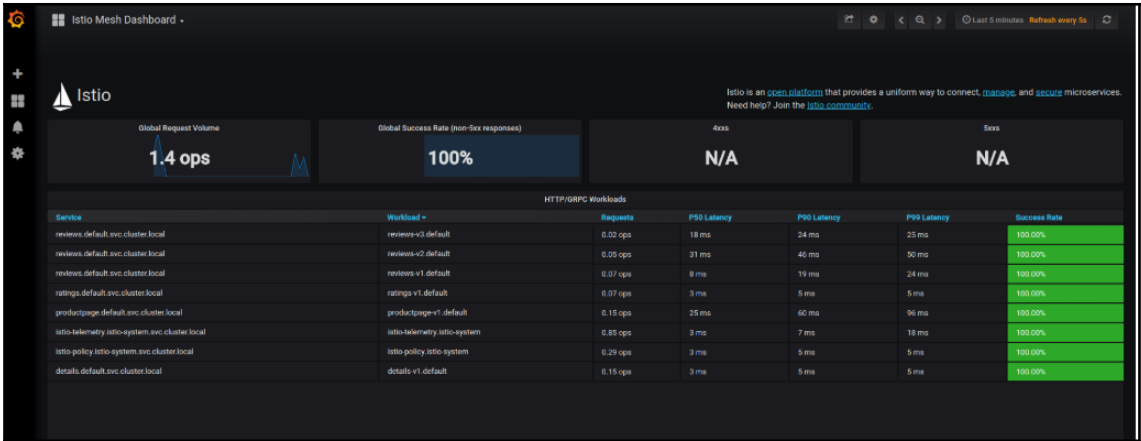
0 packages can be updated.
0 updates are security updates.

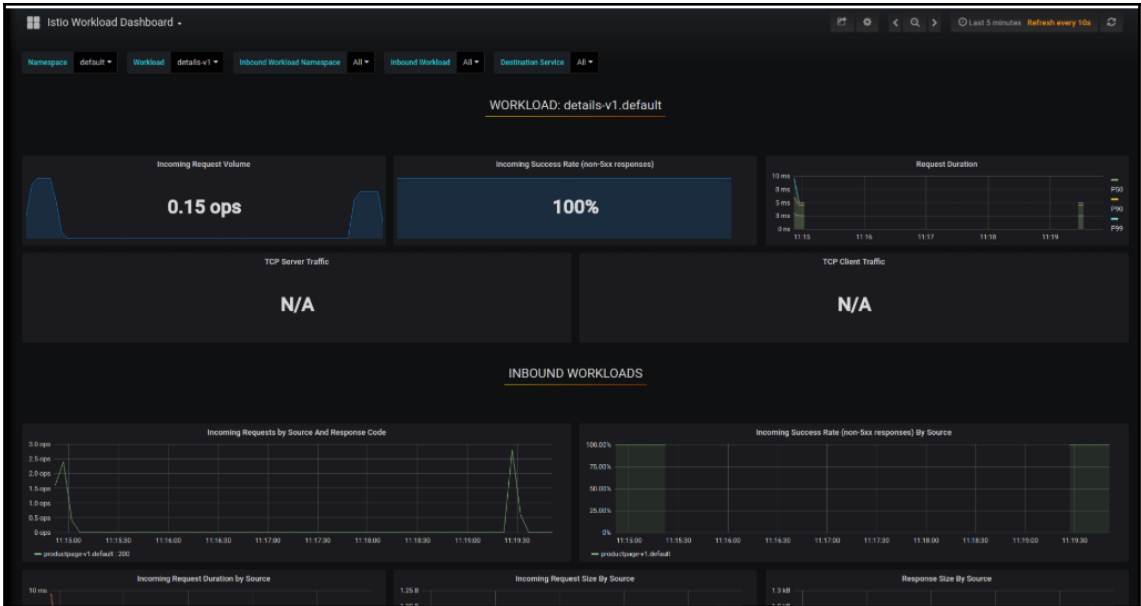
Your Ubuntu release is not supported anymore.
For upgrade information, please visit:
http://www.ubuntu.com/releaseendoflife

New release '18.04.1 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Mon Oct 22 06:39:44 2018 from 167.220.238.138
master@Kubemaster:~$
```







Alerting
Alert rules & notifications

Alert Rules | Notification channels

[+ New Channel](#)

Name	Type
ApplicationLoad	slack



Alerting

Alert rules & notifications

☰ Alert Rules

👤 Notification channels

New Notification Channel

Name	PacktNotify
Type	Email
Send on all alerts	<input type="checkbox"/>
Include image	<input checked="" type="checkbox"/>

Email addresses

abcxyz@gmail.com

You can enter multiple email addresses using a ";" separator

localhost:3000/dashboard/new?orgId=1

New dashboard

New Panel Add Paste

Panel Search Filter

Graph Singlestat Table Text Heatmap Alert List Dashboard list Row Plugin list

Panel Title

View Edit Share More ... Remove

Storage Alert

Graph

General Metrics Axes Legend Display Alert Time range

Data Source Prometheus

Options Query Inspector

storage_operation_duration_seconds_sum

Legend format legend format Min step 30s Resolution 1/1 Format as Time series Instant

Add Query

Graph | General | Metrics | Axes | Legend | Display | Alert | Time range

Info

Title	Storage Alert
Description	This is Storage Alert
Transparent	<input type="checkbox"/>

Repeat

For each value of ▼

Graph | General | Metrics | Axes | Legend | Display | **Alert** | Time range

Alert Config

Alert Config

Notifications (1)

Name	Storage alerts	Evaluate every	60s
------	----------------	----------------	-----

State history

Conditions

Delete	WHEN	avg ()	OF	query (A, 5m, now)	IS ABOVE	10	
	+						

If no data or all values are null	SET STATE TO	No Data	▼
If execution error or timeout	SET STATE TO	Alerting	▼

Alert Config

Alert Config

Notifications (1)

Name	Storage alerts	Evaluate every	60s
------	----------------	----------------	-----

State history

Conditions

Delete

WHEN	avg ()	OF	query (A, 5m, now)	IS ABOVE	10	🗑️
------	--------	----	--------------------	----------	----	----

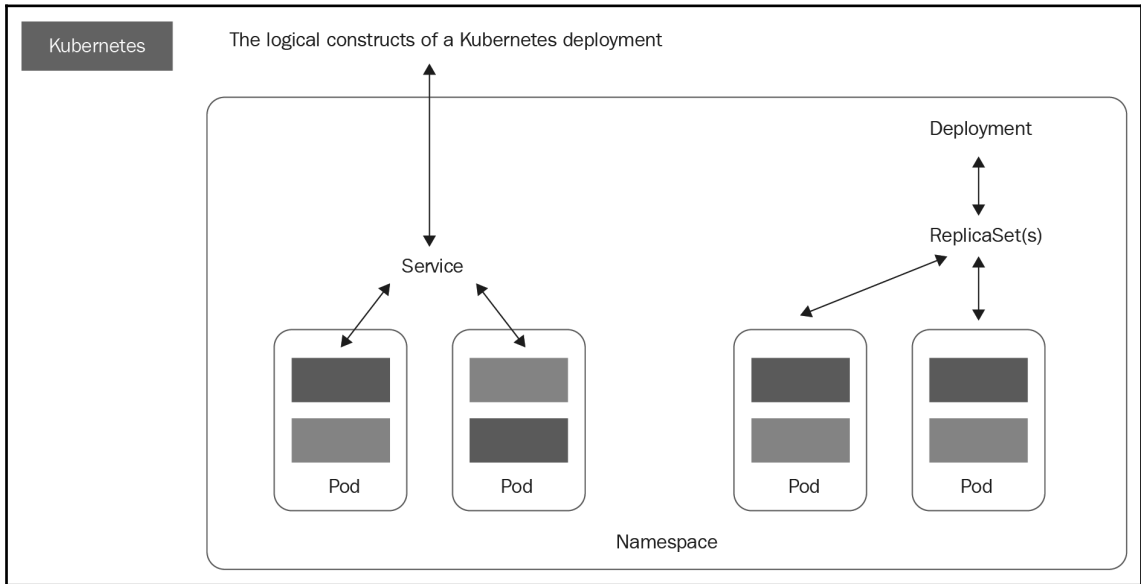
+

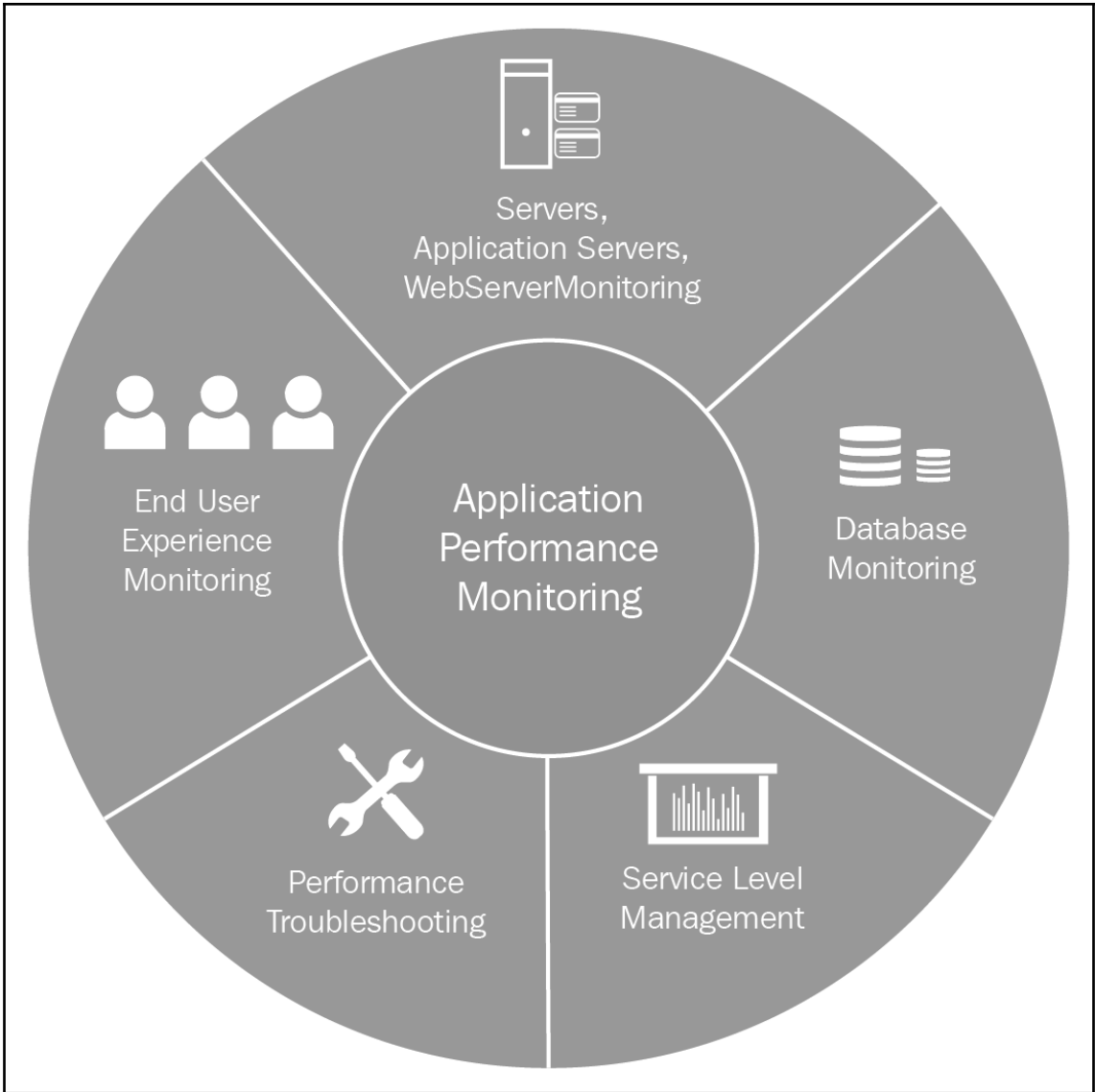
If no data or all values are null	SET STATE TO	No Data	▼
If execution error or timeout	SET STATE TO	Alerting	▼

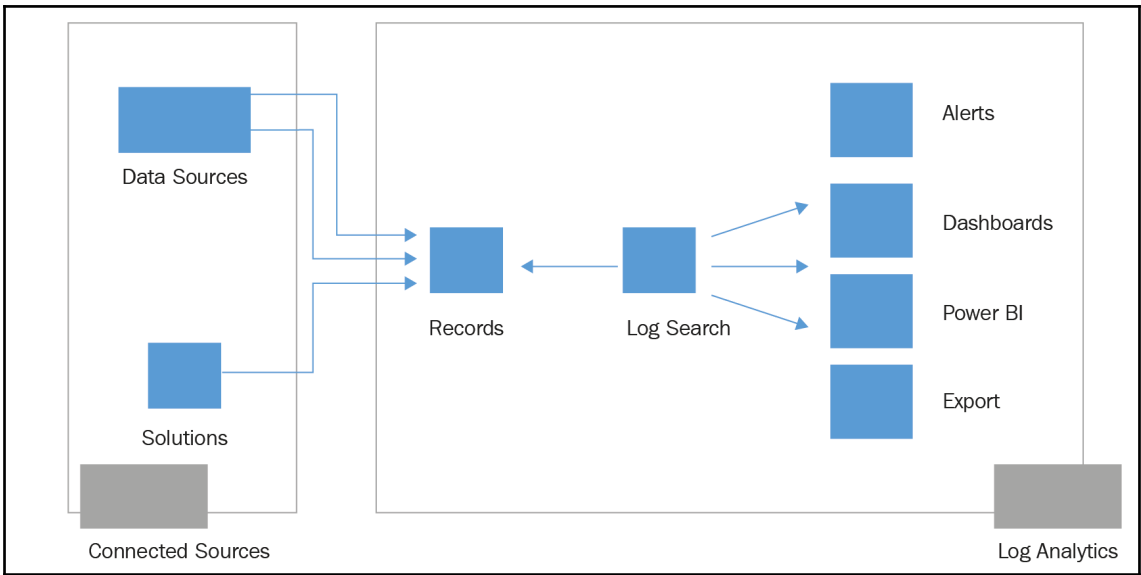
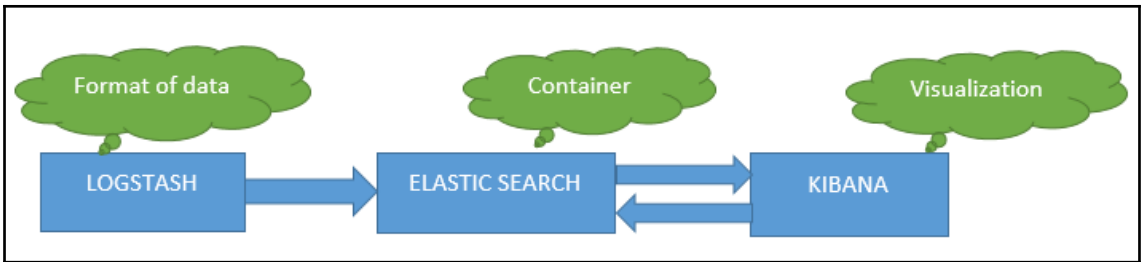
Test Rule

```
firing: true
state: "alerting"
conditionEvals: "true = true"
timeMs: "18.276ms"
matches: Array[5]
  0: Object
    metric: "storage_operation_duration_seconds_sum(beta_kubernetes_io_arch="amd64", beta_kubernetes_io_os="linux", instance="kubec1ent1", job="kubernetes-nodes", kubernetes_io_hostname="kubec1ent1", operation_name="volume_mount", volume_plugin="kubernetes.io/configmap")"
```

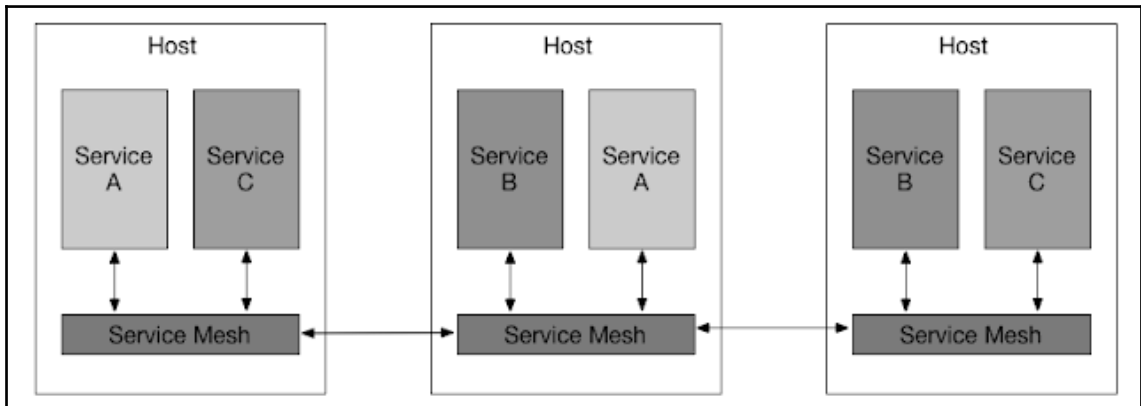
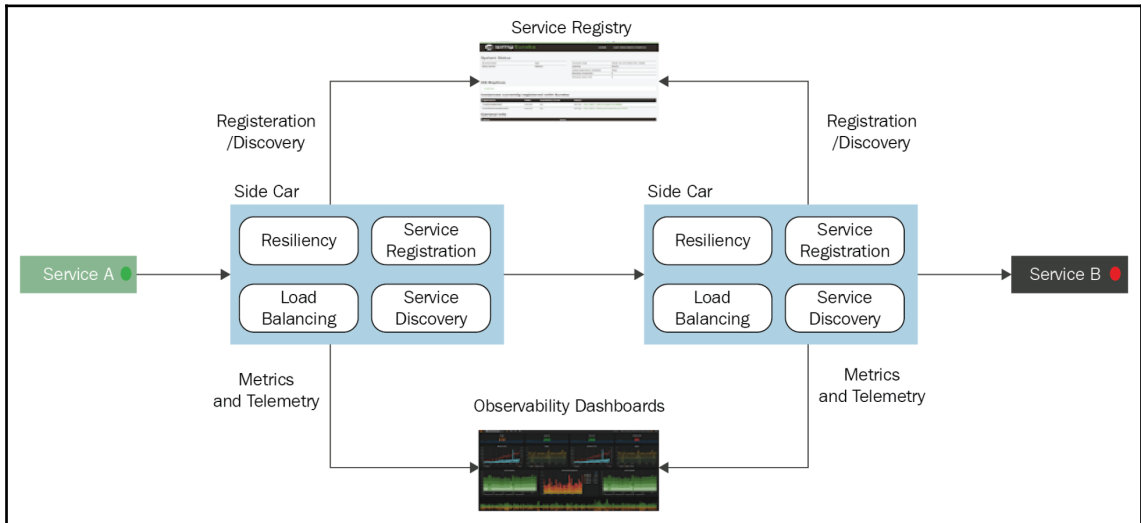
Chapter 11: Post-Production Activities for Ensuring and Enhancing IT Reliability

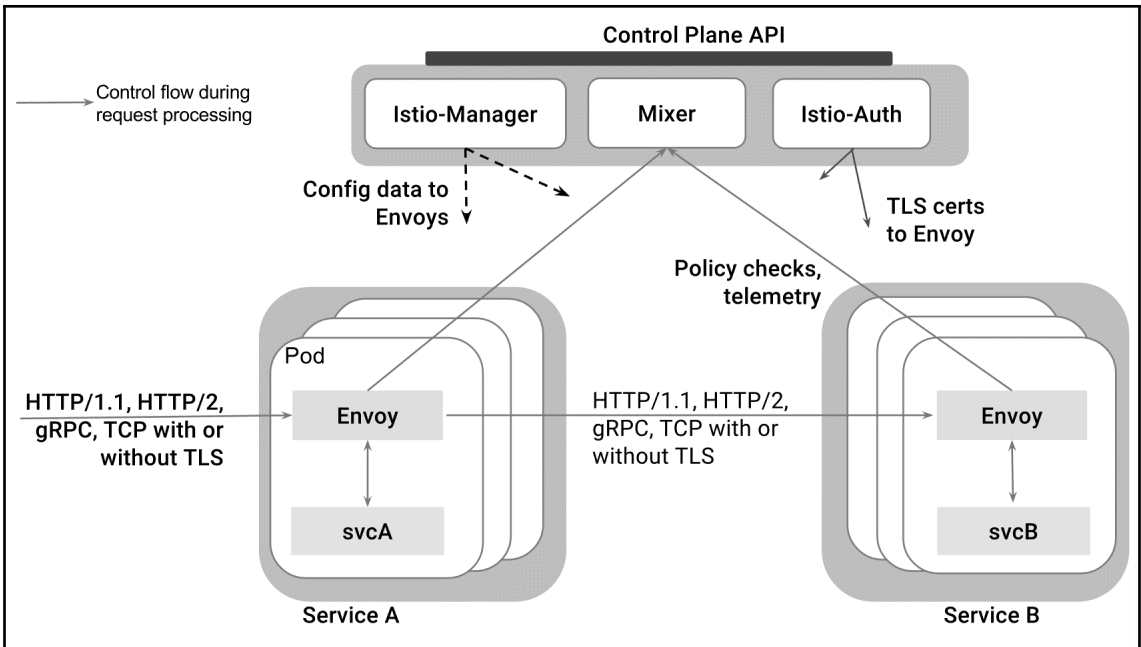


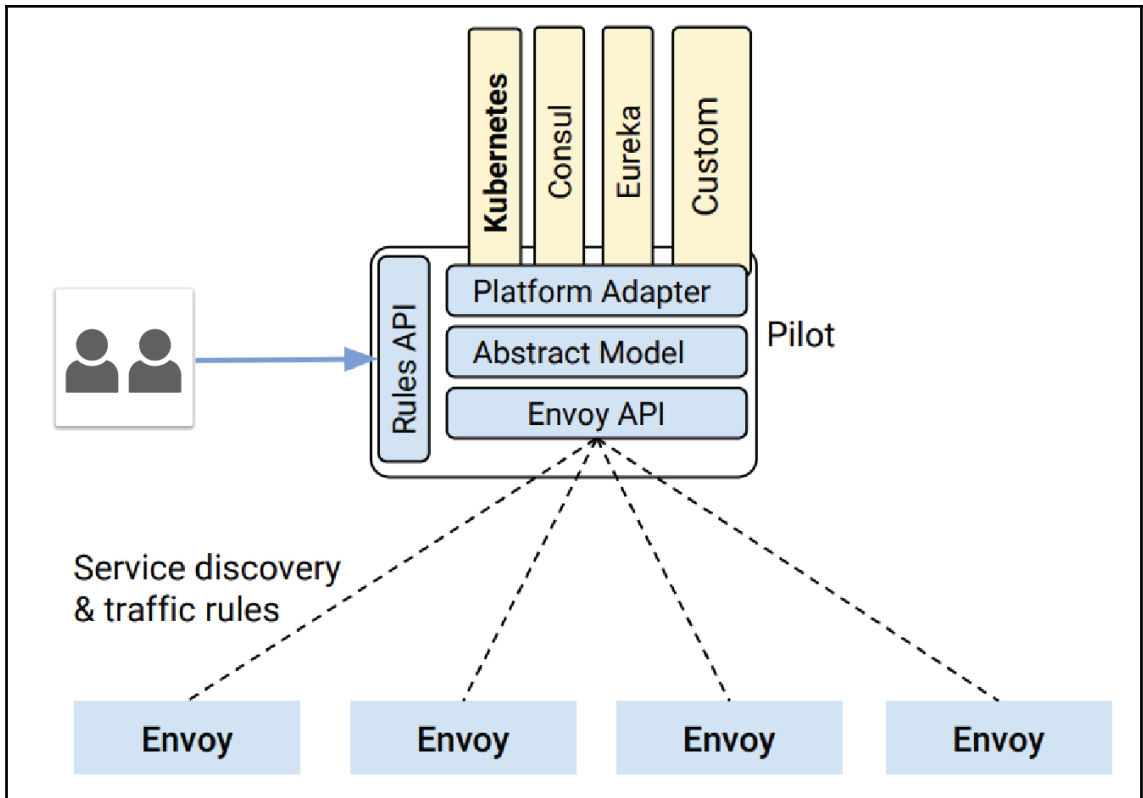


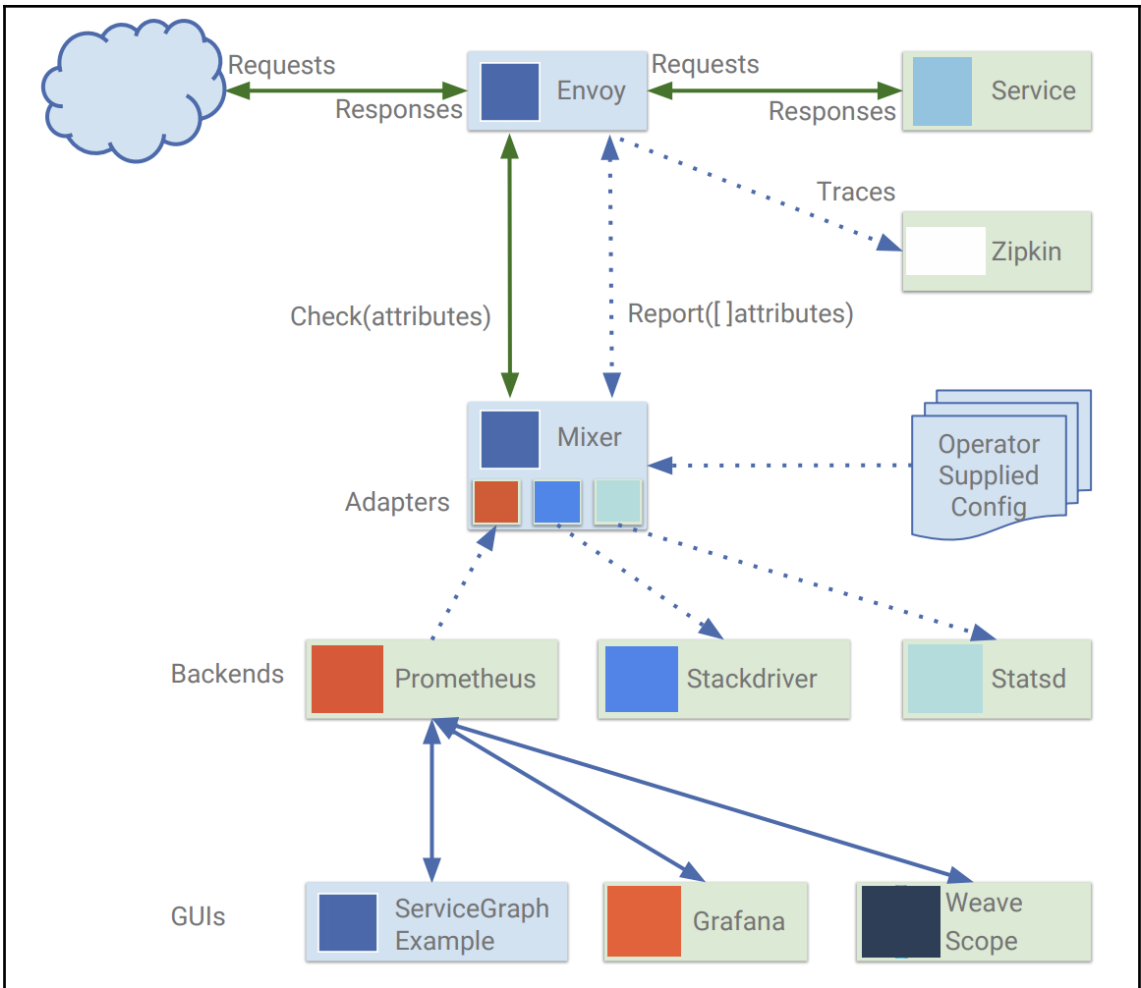


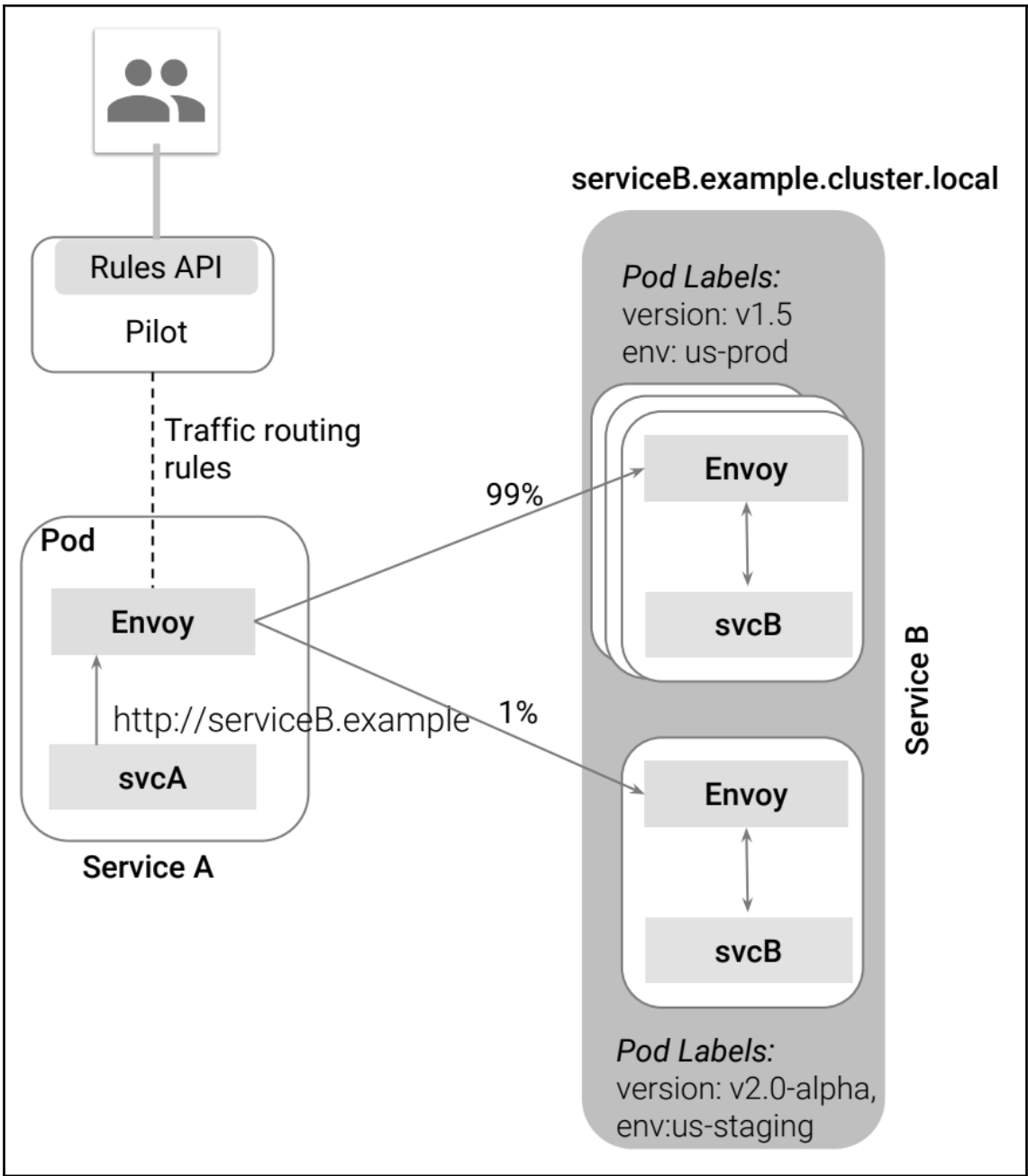
Chapter 12: Service Meshes and Container Orchestration Platforms

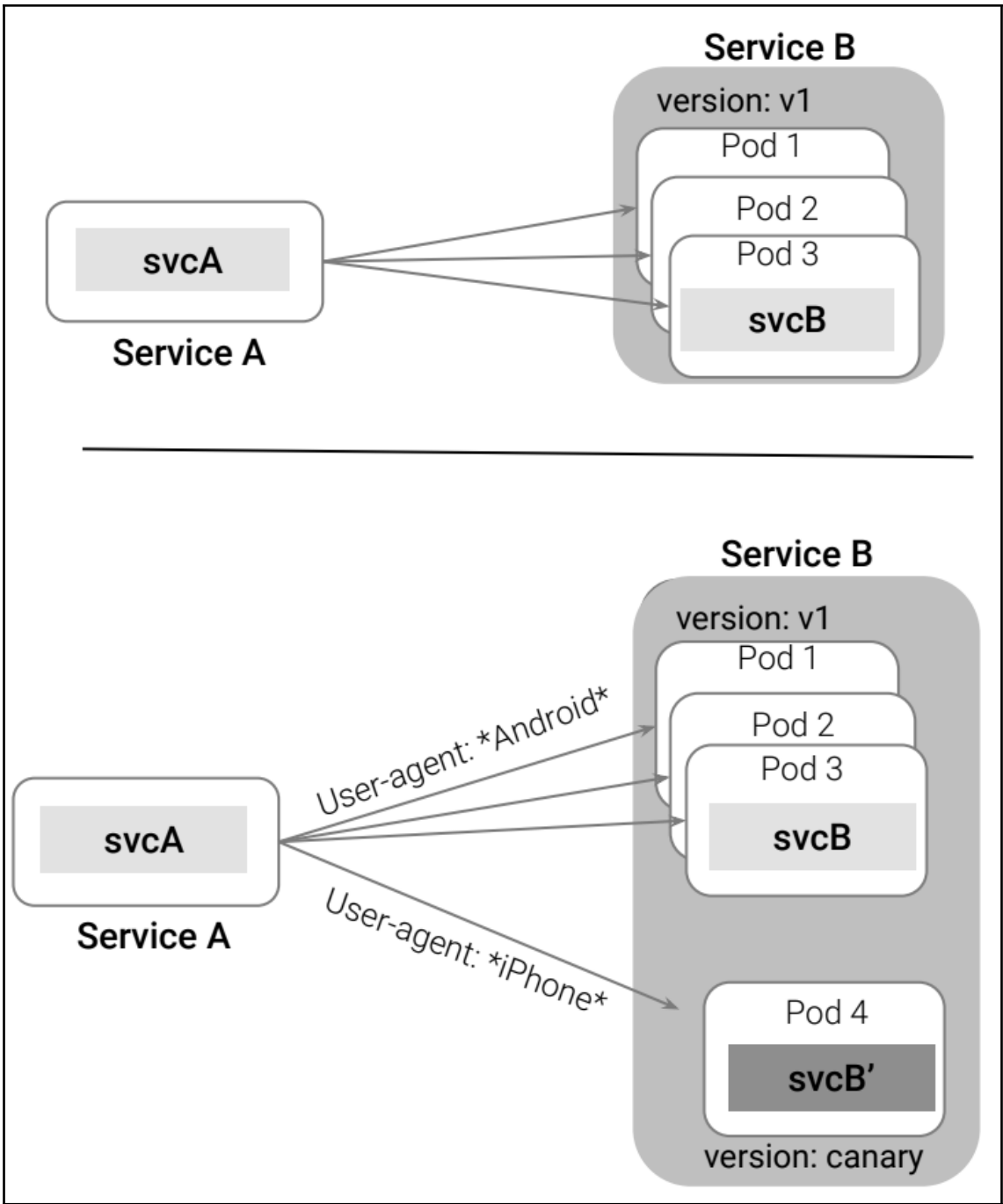


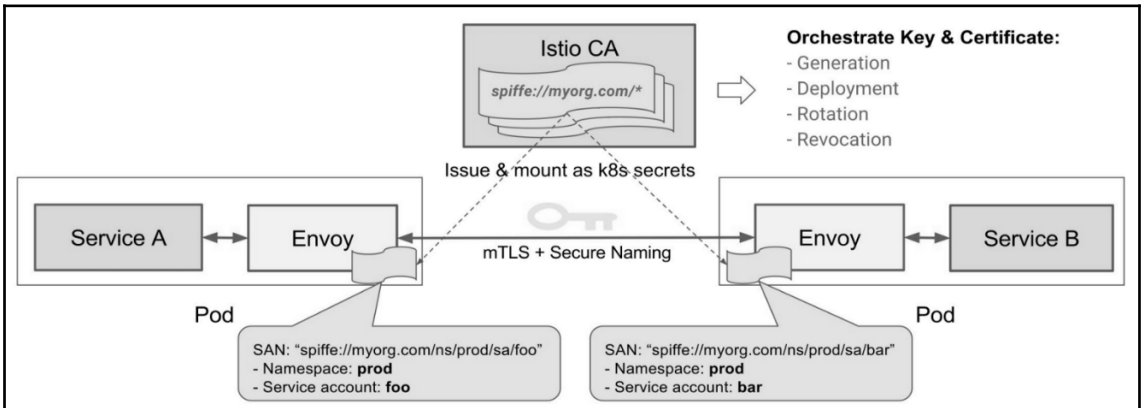
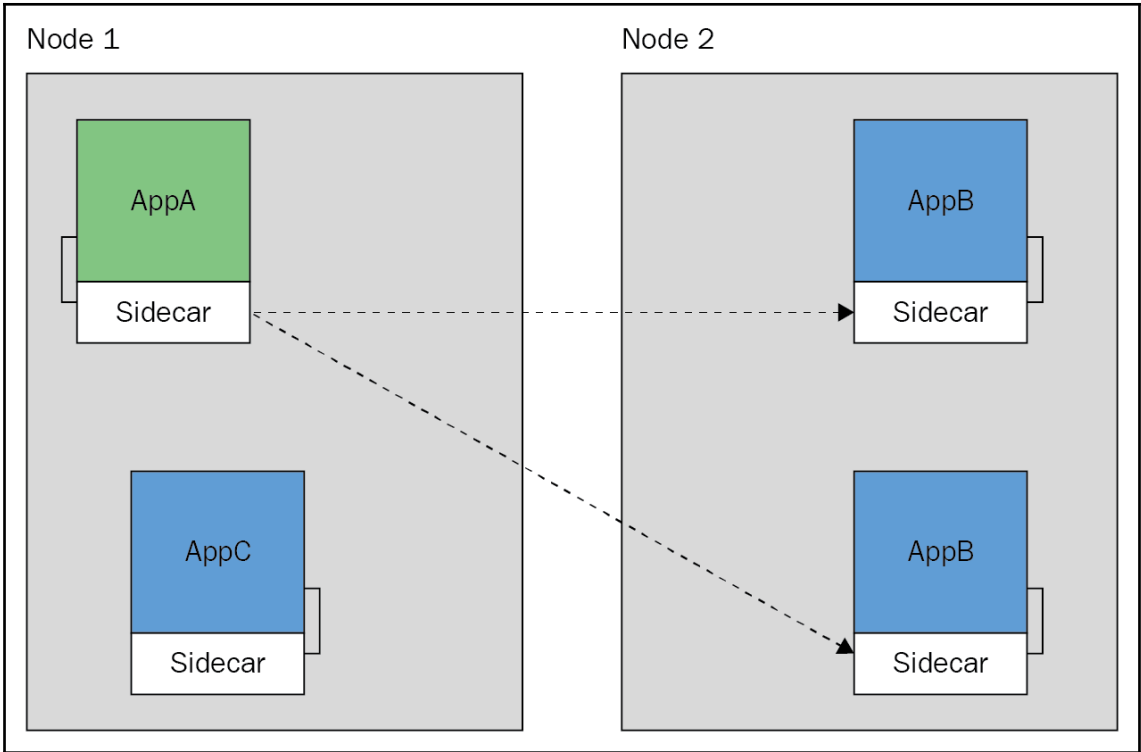


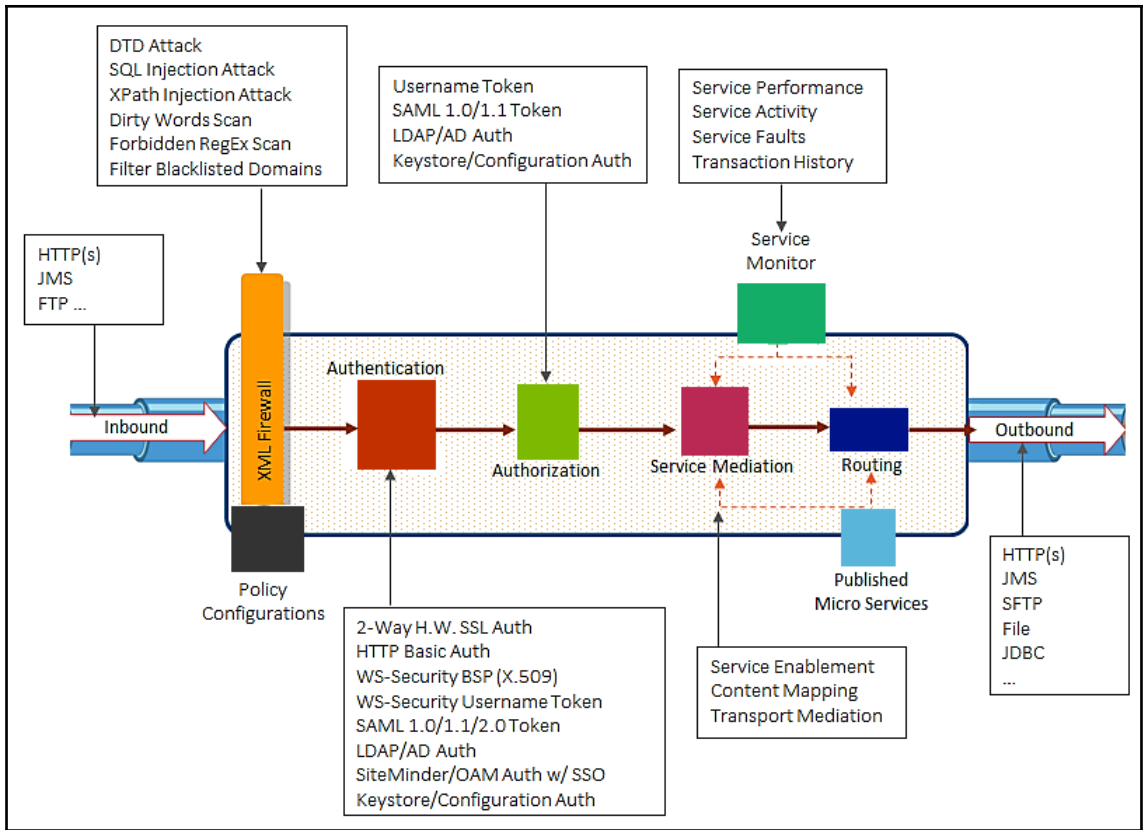


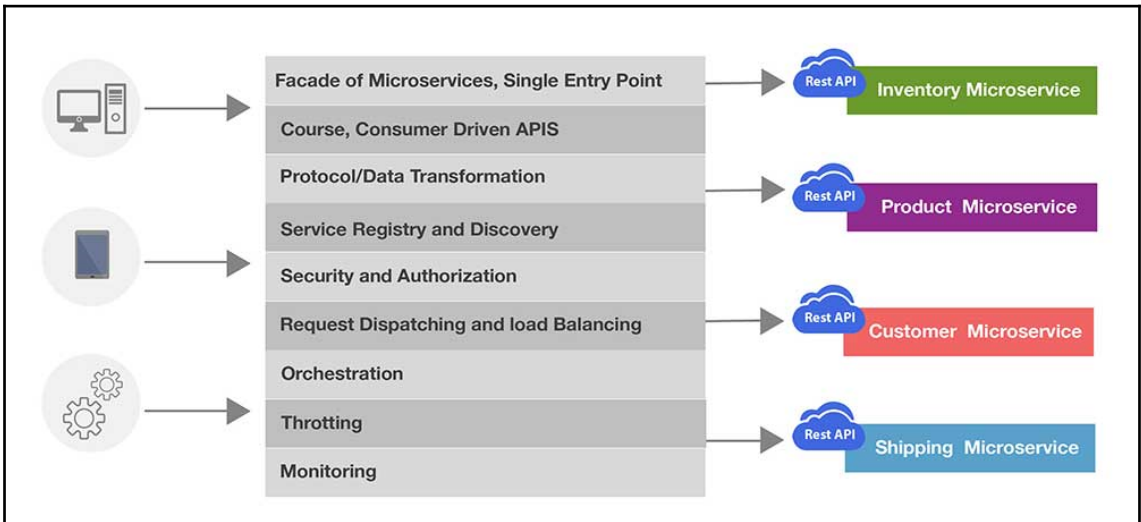
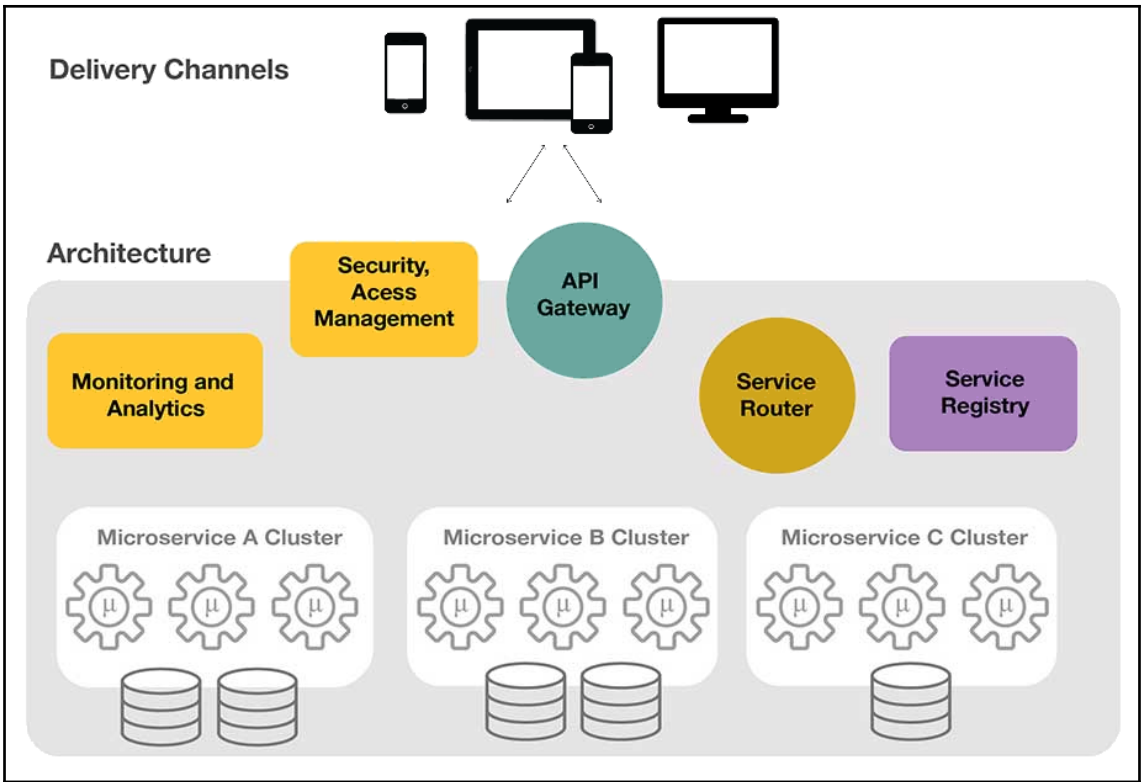


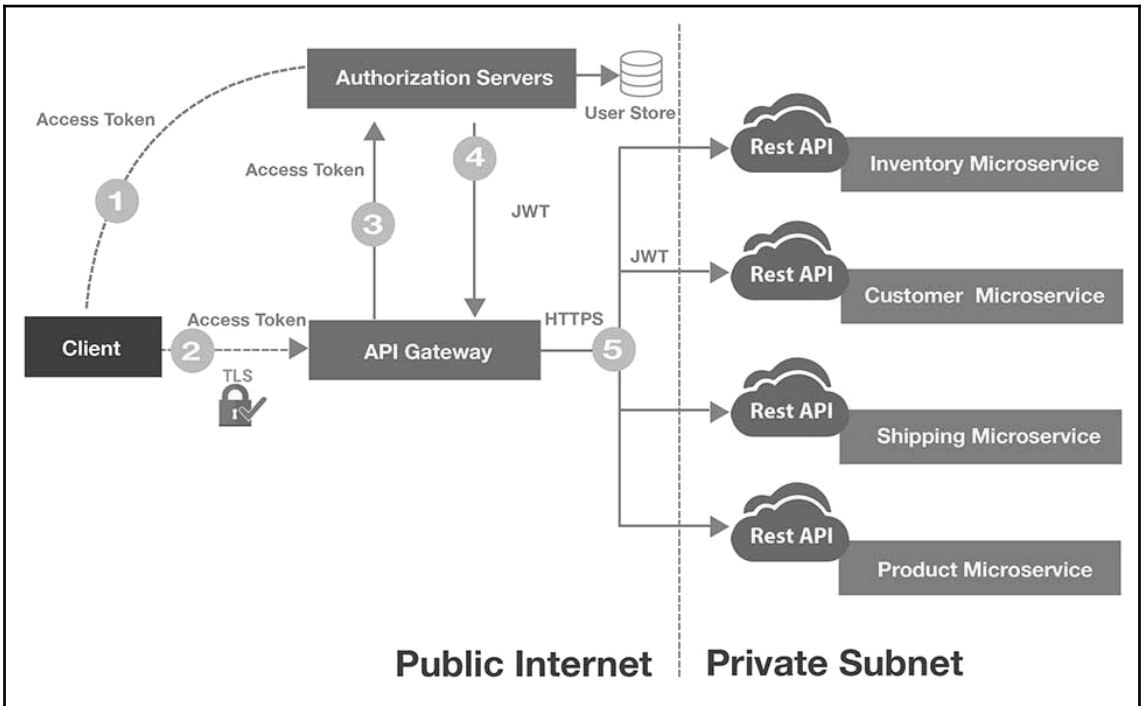
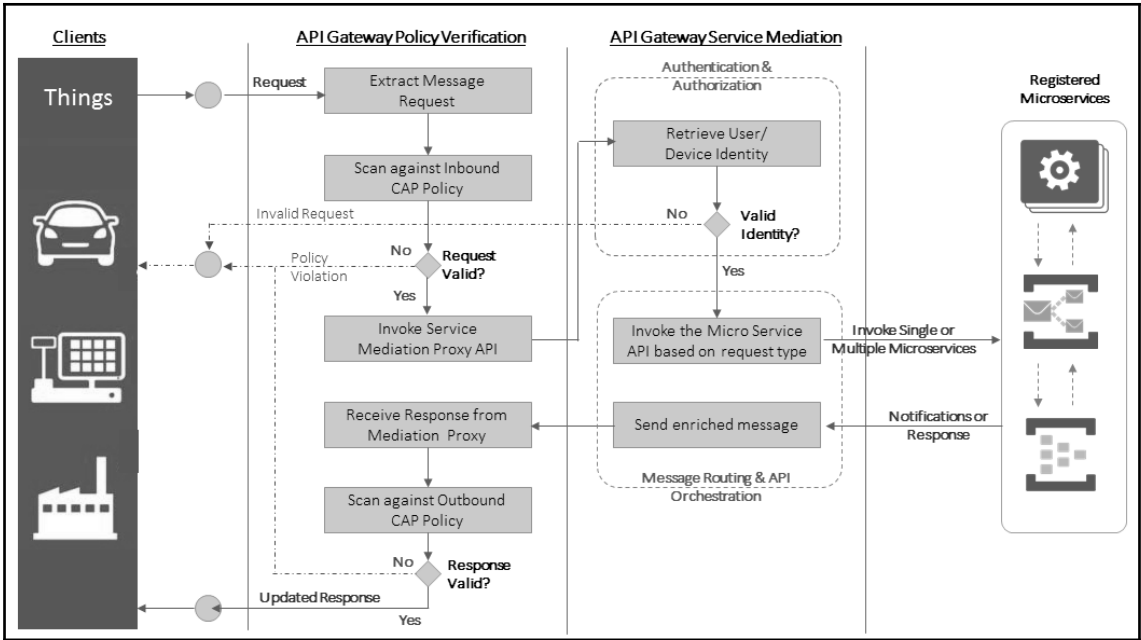


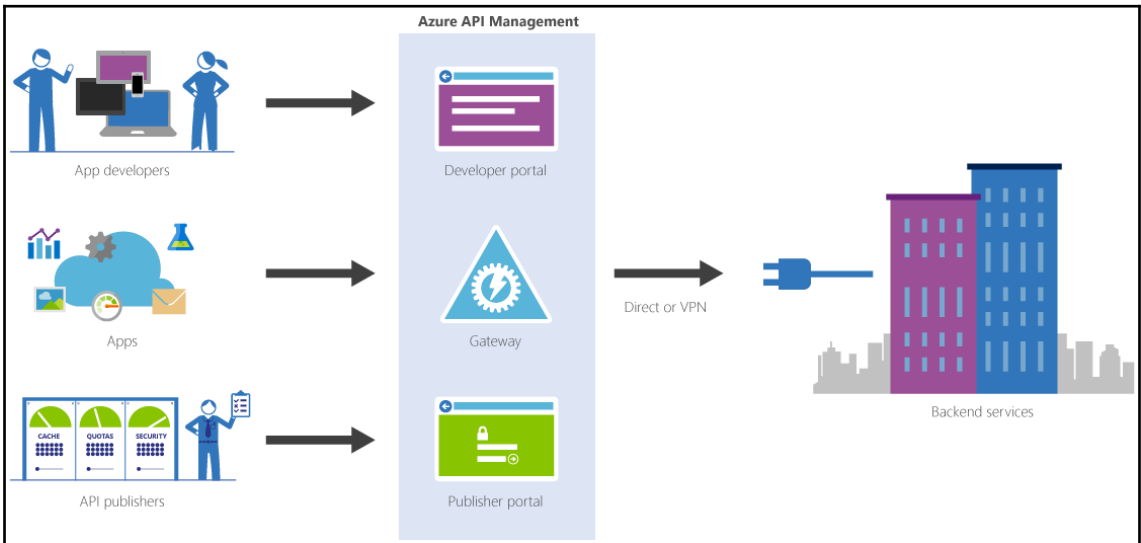
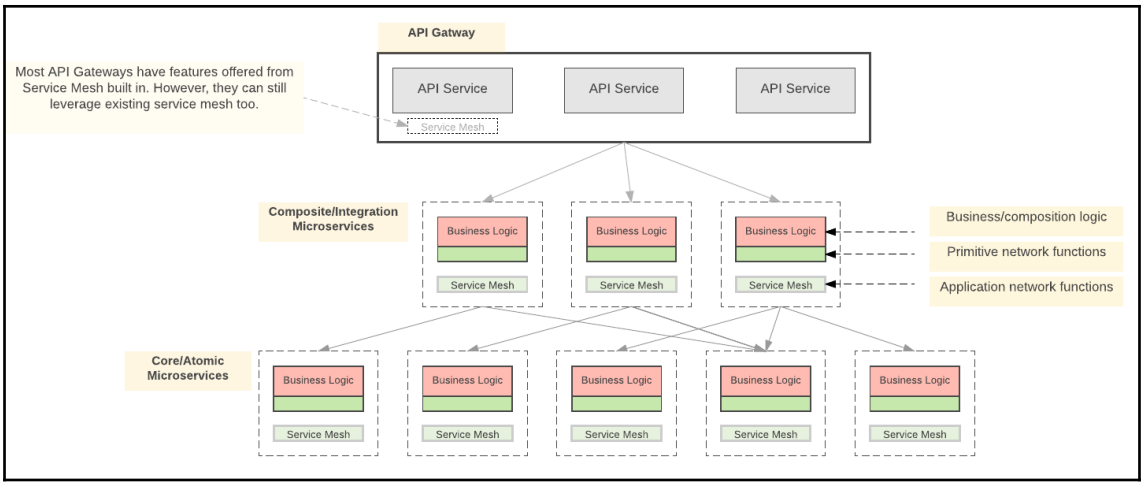


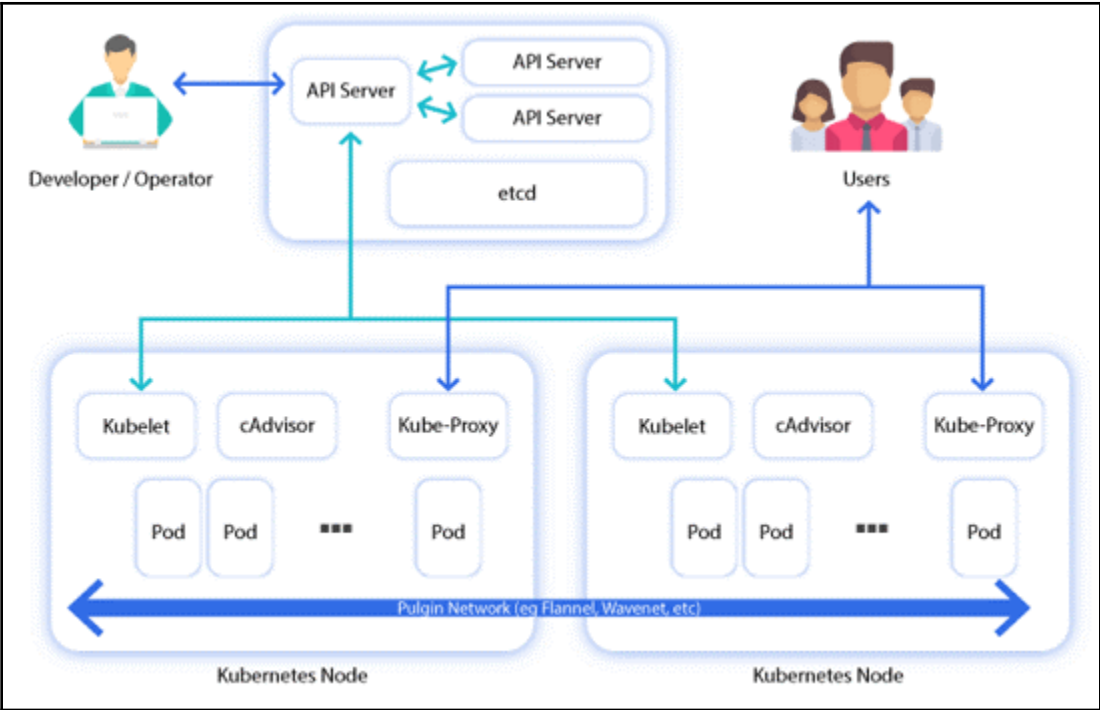


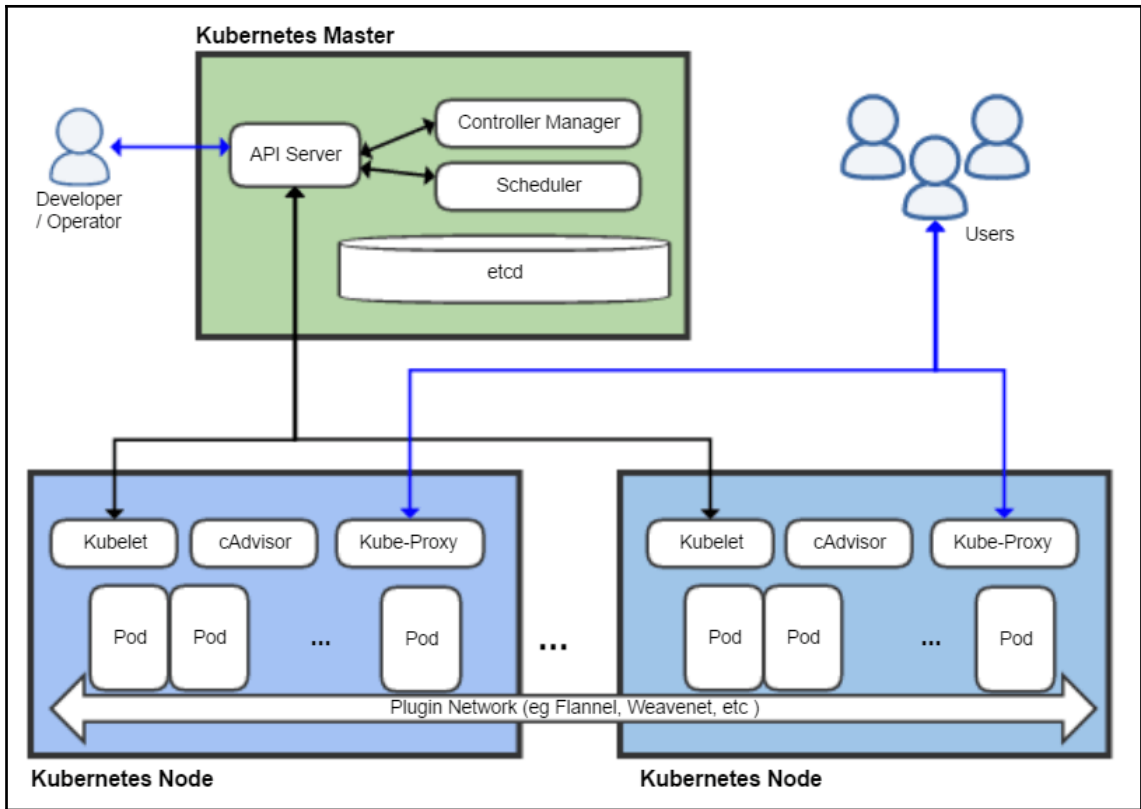












```

root@Kubemaster:~# apt update && sudo apt upgrade -y
Hit:1 http://azure.archive.ubuntu.com/ubuntu artful InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu artful-updates InRelease [88.7 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu artful-backports InRelease [74.6 kB]

```

```

root@Kubemaster:~# sudo apt install docker.io apt-transport-https -qy
Reading package lists...
Building dependency tree...
Reading state information...
The following additional packages will be installed:
  bridge-utils cgroupfs-mount ubuntu-fan
Suggested packages:
  ifupdown aufs-tools debootstrap docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  apt-transport-https bridge-utils cgroupfs-mount docker.io ubuntu-fan
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.
Need to get 15.3 MB of archives.
After this operation, 69.3 MB of additional disk space will be used.
Get:1 http://azure.archive.ubuntu.com/ubuntu artful-updates/main amd64 apt-transport-https amd64 1.5.2 [34.8 kB]
Get:2 http://azure.archive.ubuntu.com/ubuntu artful/main amd64 bridge-utils amd64 1.5-9ubuntu2 [29.2 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu artful/universe amd64 cgroupfs-mount all 1.4 [6320 B]
Get:4 http://azure.archive.ubuntu.com/ubuntu artful/universe amd64 docker.io amd64 1.13.1-0ubuntu6 [15.2 MB]
Get:5 http://azure.archive.ubuntu.com/ubuntu artful-updates/main amd64 ubuntu-fan all 0.12.9~17.10.1 [34.5 kB]

```



```

root@Kubemaster:/etc/apt/sources.list.d# apt install docker-ce kubelet kubeadm kubectl kubernetes-cni -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  bridge-utils ubuntu-fan
Use 'apt autoremove' to remove them.
The following additional packages will be installed:
  aufs-tools cri-tools libltdl7 pigz socat
The following packages will be REMOVED:
  docker.io
The following NEW packages will be installed:
  aufs-tools cri-tools docker-ce kubeadm kubectl kubelet kubernetes-cni libltdl7 pigz socat
0 upgraded, 10 newly installed, 1 to remove and 0 not upgraded.
Need to get 95.3 MB of archives.
After this operation, 493 MB of additional disk space will be used.
Get:1 https://download.docker.com/linux/ubuntu artful/stable amd64 docker-ce amd64 18.06.1-ce-3-0-ubuntu [40.2 MB]
Get:3 http://azure.archive.ubuntu.com/ubuntu artful/universe amd64 pigz amd64 2.3.4-1 [55.3 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu artful-updates/universe amd64 aufs-tools amd64 1:4.1+20161219-lubuntu0.1 [102 kB]
Get:6 http://azure.archive.ubuntu.com/ubuntu artful/main amd64 libltdl7 amd64 2.4.6-2 [38.8 kB]
Get:7 http://azure.archive.ubuntu.com/ubuntu artful/universe amd64 socat amd64 1.7.3.2-1 [342 kB]
Get:2 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 cri-tools amd64 1.12.0-00 [5343 kB]
Get:5 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubernetes-cni amd64 0.6.0-00 [5910 kB]
Get:8 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubelet amd64 1.12.1-00 [24.7 MB]
Get:9 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubectl amd64 1.12.1-00 [9594 kB]
Get:10 https://packages.cloud.google.com/apt kubernetes-xenial/main amd64 kubeadm amd64 1.12.1-00 [8987 kB]

```

```

root@Kubemaster:/etc/apt/sources.list.d# sudo kubeadm init --kubernetes-version stable
[init] using Kubernetes version: v1.12.1
[preflight] running pre-flight checks
[preflight/images] Pulling images required for setting up a Kubernetes cluster
[preflight/images] This might take a minute or two, depending on the speed of your internet connection
[preflight/images] You can also perform this action in beforehand using 'kubeadm config images pull'
[kubelet] Writing kubelet environment file with flags to file "/var/lib/kubelet/kubeadm-flags.env"
[kubelet] Writing kubelet configuration to file "/var/lib/kubelet/config.yaml"
[preflight] Activating the kubelet service
[certificates] Generated front-proxy-ca certificate and key.
[certificates] Generated front-proxy-client certificate and key.
[certificates] Generated etcd/ca certificate and key.
[certificates] Generated etcd/server certificate and key.
[certificates] etcd/server cert is signed for DNS names [kubemaster localhost] and IPs [127.0.0.1 ::1]
[certificates] Generated etcd/peer certificate and key.
[certificates] etcd/peer serving cert is signed for DNS names [kubemaster localhost] and IPs [10.0.0.5 127.0.0.1 ::1]
[certificates] Generated apiserver-etcd-client certificate and key.
[certificates] Generated etcd/healthcheck-client certificate and key.
[certificates] Generated ca certificate and key.
[certificates] Generated apiserver certificate and key.
[certificates] apiserver serving cert is signed for DNS names [kubemaster kubernetes kubernetes.default kubernetes.default.svc k
[certificates] Generated apiserver-kubelet-client certificate and key.
[certificates] Valid certificates and keys now exist in "/etc/kubernetes/pki"
[certificates] Generated sa key and public key.

```

```

Your Kubernetes master has initialized successfully!

To start using your cluster, you need to run the following as a regular user:

  mkdir -p $HOME/.kube
  sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
  sudo chown $(id -u):$(id -g) $HOME/.kube/config

You should now deploy a pod network to the cluster.
Run "kubectl apply -f [podnetwork].yaml" with one of the options listed at:
  https://kubernetes.io/docs/concepts/cluster-administration/addons/

You can now join any number of machines by running the following on each node
as root:

  kubeadm join 10.0.0.5:6443 --token j8pddx.ev4rvqdp6px6seclp --discovery-token-ca-cert-hash sha256:00d43aef55fe0fc73041f57e4ebf7676b332bb4c0f53b67a70d2f837a9e30dc8

```

```

master@Kubemaster:/etc/apt/sources.list.d$ mkdir -p $HOME/.kube
master@Kubemaster:/etc/apt/sources.list.d$ sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
master@Kubemaster:/etc/apt/sources.list.d$ sudo chown $(id -u):$(id -g) $HOME/.kube/config
master@Kubemaster:/etc/apt/sources.list.d$ export KUBECONFIG=$HOME/.kube/config
master@Kubemaster:/etc/apt/sources.list.d$ export KUBECONFIG=$HOME/.kube/config | tee -a ~/.bashrc

```

```
master@Kubemaster:/etc/apt/sources.list.d$ kubectl apply -f http://docs.projectcalico.org/v2.3/getting-started/kubernetes/installation/hosted/kubeadm/1.6/calico
configmap/calico-config created
daemonset.extensions/calico-etcd created
service/calico-etcd created
daemonset.extensions/calico-node created
deployment.extensions/calico-policy-controller created
clusterrolebinding.rbac.authorization.k8s.io/calico-cni-plugin created
clusterrole.rbac.authorization.k8s.io/calico-cni-plugin created
serviceaccount/calico-cni-plugin created
clusterrolebinding.rbac.authorization.k8s.io/calico-policy-controller created
clusterrole.rbac.authorization.k8s.io/calico-policy-controller created
serviceaccount/calico-policy-controller created
```

```
master@Kubemaster:/root$ systemctl enable kubelet && systemctl start kubelet
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-unit-files ====
Authentication is required to manage system service or unit files.
Authenticating as: Ubuntu (master)
Password:
==== AUTHENTICATION COMPLETE ====
==== AUTHENTICATING FOR org.freedesktop.systemd1.reload-daemon ====
Authentication is required to reload the systemd state.
Authenticating as: Ubuntu (master)
Password:
==== AUTHENTICATION COMPLETE ====
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ====
Authentication is required to start 'kubelet.service'.
Authenticating as: Ubuntu (master)
Password:
==== AUTHENTICATION COMPLETE ====
master@Kubemaster:/root$
```

```
root@KubeClient1:~# apt update && sudo apt upgrade -y
Hit:1 http://azure.archive.ubuntu.com/ubuntu artful InRelease
Get:2 http://azure.archive.ubuntu.com/ubuntu artful-updates InRelease [88.7 kB]
Get:3 http://azure.archive.ubuntu.com/ubuntu artful-backports InRelease [74.6 kB]
Get:4 http://security.ubuntu.com/ubuntu artful-security InRelease [83.2 kB]
```

```
root@KubeClient1:~# sudo apt install docker.io apt-transport-https -qy
Reading package lists...
Building dependency tree...
Reading state information...
The following additional packages will be installed:
  bridge-utils cgroupfs-mount ubuntu-fan
Suggested packages:
  ifupdown aufs-tools debootstrap docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  apt-transport-https bridge-utils cgroupfs-mount docker.io ubuntu-fan
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.
Need to get 15.3 MB of archives.
```

```

root@KubeClient1:~# apt install docker-ce kubelet kubeadm kubect1 kubernetes-cni -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  bridge-utils ubuntu-fan
Use 'apt autoremove' to remove them.
The following additional packages will be installed:
  aufs-tools cri-tools libltdl7 pigz socat
The following packages will be REMOVED:
  docker.io
The following NEW packages will be installed:
  aufs-tools cri-tools docker-ce kubeadm kubect1 kubelet kubernetes-cni libltdl7 pigz socat
0 upgraded, 10 newly installed, 1 to remove and 0 not upgraded.
Need to get 95.3 MB of archives.

```

```

client1@KubeClient1:/root$ mkdir -p $HOME/.kube
client1@KubeClient1:/root$ sudo cp -i /etc/kubernetes/admin.conf $HOME/.kube/config
cp: cannot stat '/etc/kubernetes/admin.conf': No such file or directory
client1@KubeClient1:/root$ sudo chown $(id -u):$(id -g) $HOME/.kube/config
chown: cannot access '/home/client1/.kube/config': No such file or directory
client1@KubeClient1:/root$ export KUBECONFIG=$HOME/.kube/config
client1@KubeClient1:/root$ export KUBECONFIG=$HOME/.kube/config | tee -a ~/.bashrc

```

```

[preflight] running pre-flight checks
[WARNING RequiredIPVSKernelModulesAvailable]: the IPVS proxier will not be used, because the following required kernel modules
are not loaded: [ip_vs_rr ip_vs_wrr ip_vs_sh ip_vs] or no b
ipvs support: map[nf_conntrack_ipv4:{} ip_vs:{} ip_vs_rr:{} ip_vs_wrr:{} ip_vs_sh:{}]
you can solve this problem with following methods:
1. Run 'modprobe -- ' to load missing kernel modules;
2. Provide the missing builtin kernel ipvs support

[discovery] Trying to connect to API Server "10.0.0.5:6443"
[discovery] Created cluster-info discovery client, requesting info from "https://10.0.0.5:6443"
[discovery] Requesting info from "https://10.0.0.5:6443" again to validate TLS against the pinned public key
[discovery] Cluster info signature and contents are valid and TLS certificate validates against pinned roots, will use API Server "10.0.0.5:6443"
[discovery] Successfully established connection with API Server "10.0.0.5:6443"
[kubelet] Downloading configuration for the kubelet from the "kubelet-config-1.12" ConfigMap in the kube-system namespace
[kubelet] Writing kubelet configuration to file "/var/lib/kubelet/config.yaml"
[kubelet] Writing kubelet environment file with flags to file "/var/lib/kubelet/kubeadm-flags.env"
[preflight] Activating the kubelet service
[tlstransport] Waiting for the kubelet to perform the TLS Bootstrap...
[patchnode] Uploading the CRI Socket information "/var/run/dockerhim.sock" to the Node API object "kubeclient1" as an annotation

This node has joined the cluster:
* Certificate signing request was sent to apiserver and a response was received.
* The Kubelet was informed of the new secure connection details.

Run 'kubectl get nodes' on the master to see this node join the cluster.

```

```

master@Kubemaster:/root$ kubectl get nodes
NAME           STATUS    ROLES    AGE   VERSION
kubeclient1    Ready    <none>   12m   v1.12.1
kubemaster     Ready    master   89m   v1.12.1
master@Kubemaster:/root$ █

```

```

master@Kubemaster:/root$ kubectl get nodes
NAME                STATUS    ROLES    AGE   VERSION
kubeclient1        Ready    <none>   22h   v1.12.1
kubeclient2        Ready    <none>   69s   v1.12.1
kubemaster         Ready    master   23h   v1.12.1
master@Kubemaster:/root$

```

```

root@Kubemaster:/opt/istio$ wget https://github.com/istio/istio/releases/download/1.1.0.snapshot.1/istio-1.1.0.snapshot.1-linux.tar.gz
--2018-10-18 10:22:26-- https://github.com/istio/istio/releases/download/1.1.0.snapshot.1/istio-1.1.0.snapshot.1-linux.tar.gz
Resolving github.com (github.com)... 192.30.253.113, 192.30.253.112
Connecting to github.com (github.com)[192.30.253.113]:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://github-production-release-asset-2e65be.s3.amazonaws.com/74175805/18d8e900-clb2-11e8-9cd2-fb330dd176b07X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=msz-Date=20181018T102226Z&X-Amz-Expires=300&X-Amz-Signature=d9bd701ade0794d1179b94690572ec27a05d29ef35673262ca1964d2dbd6a16X-Amz-SignedHeaders=host&actor_id=0&response-content-type=application/octet-stream [following]
--2018-10-18 10:22:26-- https://github-production-release-asset-2e65be.s3.amazonaws.com/74175805/18d8e900-clb2-11e8-9cd2-fb330dd176b07X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Request-Id=20181018T102226Z&X-Amz-Expires=300&X-Amz-Signature=d9bd701ade0794d1179b94690572ec27a05d29ef35673262ca1964d2dbd6a16X-Amz-SignedHeaders=host&actor_id=0.snapshot.1-linux.tar.gz[response-content-type=application/octet-stream]
Resolving github-production-release-asset-2e65be.s3.amazonaws.com (github-production-release-asset-2e65be.s3.amazonaws.com)... 52.216.1.208
Connecting to github-production-release-asset-2e65be.s3.amazonaws.com (github-production-release-asset-2e65be.s3.amazonaws.com)[52.216.1.208]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 15203708 (14M) [application/octet-stream]
Saving to: 'istio-1.1.0.snapshot.1-linux.tar.gz'

istio-1.1.0.snapshot.1-linux.tar.gz          100%[=====]
2018-10-18 10:22:27 (93.4 MB/s) = 'istio-1.1.0.snapshot.1-linux.tar.gz' saved [15203708/15203708]

root@Kubemaster:/opt/istio$

```

```

master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$ kubectl apply -f install/kubernetes/istio-demo-auth.yaml
namespace/istio-system created
configmap/istio-galley-configuration created
configmap/istio-grafana-custom-resources created
configmap/istio-grafana-configuration-dashboards created
configmap/istio-grafana created
configmap/prometheus created
configmap/istio-security-custom-resources created
configmap/istio created
configmap/istio-sidecar-injector created
serviceaccount/istio-galley-service-account created
serviceaccount/istio-egressgateway-service-account created
serviceaccount/istio-ingressgateway-service-account created
serviceaccount/istio-grafana-post-install-account created
clusterrole.rbac.authorization.k8s.io/istio-grafana-post-install-istio-system created
clusterrolebinding.rbac.authorization.k8s.io/istio-grafana-post-install-role-binding-istio-system created
job.batch/istio-grafana-post-install created

```

```

master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$ kubectl get service -n istio-system
NAME                TYPE        CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
grafana             ClusterIP   10.105.180.66   <none>            3000/TCP         26s
istio-citadel       ClusterIP   10.105.63.152   <none>            9060/TCP,9093/TCP 26s
istio-egressgateway ClusterIP   10.102.11.192   <none>            80/TCP,443/TCP   26s
istio-galley        ClusterIP   10.105.172.170   <none>            443/TCP,9093/TCP,9901/TCP 26s
istio-ingressgateway LoadBalancer 10.106.88.54     <pending>        80/3390/TCP,443/3390/TCP,31400/31400/TCP,15011/30845/TCP,9060/32578/TCP,853/30848/TCP,15030/32603/TCP,15031/32488/TCP 26s
istio-pilot         ClusterIP   10.107.247.151   <none>            15010/TCP,15011/TCP,8080/TCP,9093/TCP 26s
istio-policy        ClusterIP   10.100.8.229     <none>            9091/TCP,15004/TCP,9093/TCP 26s
istio-sidecar-injector ClusterIP   10.99.470.245    <none>            443/TCP          25s
istio-telemetry     ClusterIP   10.110.112.46    <none>            9091/TCP,15004/TCP,9093/TCP,42422/TCP 26s
jaeger-agent        ClusterIP   None             <none>            5775/UDP,6831/UDP,6832/UDP 23s
jaeger-collector    ClusterIP   10.99.66.64      <none>            14267/TCP,14268/TCP 23s
jaeger-query        ClusterIP   10.111.11.59     <none>            16686/TCP        24s
prometheus          ClusterIP   10.105.135.113   <none>            9090/TCP         26s
servicegraph        ClusterIP   10.96.18.196     <none>            8088/TCP        26s
telemetry           ClusterIP   10.99.201.230    <none>            80/TCP          23s
zipkin              ClusterIP   10.104.42.155    <none>            9411/TCP        23s
master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$

```

```

master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$ kubectl get pods -n istio-system
NAME                                READY   STATUS              RESTARTS   AGE
grafana-85689d5548-2rgsg            1/1    Running             0           107s
istio-citadel-78dc5644c7-4fj5q     1/1    Running             0           106s
istio-cleanup-secrets-zg5rt        0/1    Completed           0           113s
istio-egressgateway-dbfb4d6f7-758m9 1/1    Running             0           107s
istio-galley-7bf74bfd84-qwhbs      0/1    ContainerCreating  0           107s
istio-grafana-post-install-7p5z9    0/1    Completed           0           113s
istio-ingressgateway-5f87694576-svsqh 1/1    Running             0           107s
istio-pilot-76cc4c68d5-77fn9       1/2    Running             0           107s
istio-policy-5b8dffffb64-x8pjs     2/2    Running             0           107s
istio-security-post-install-h2hwq   0/1    Completed           0           113s
istio-sidecar-injector-687fc97947-c8vdh 0/1    ContainerCreating  0           106s
istio-telemetry-5b9bc9fdff-s9nqg   2/2    Running             0           107s
istio-tracing-d444f578-r6v9h       1/1    Running             0           106s
prometheus-6c56b9bf49-6cf9q       1/1    Running             0           106s
servicegraph-b6959f59d-r8cc8       1/1    Running             0           106s
master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$

```

```

master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$ kubectl apply -f samples/bookinfo/platform/kube/bookinfo.yaml
service/details created
deployment.extensions/details-v1 created
service/ratings created
deployment.extensions/ratings-v1 created
service/reviews created
deployment.extensions/reviews-v1 created
deployment.extensions/reviews-v2 created
deployment.extensions/reviews-v3 created
service/productpage created
deployment.extensions/productpage-v1 created
master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$

```

```

master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$ kubectl get services
NAME            TYPE          CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
details         ClusterIP     10.109.51.183   <none>           9080/TCP         39s
kubernetes     ClusterIP     10.96.0.1       <none>           443/TCP          47h
nginx           NodePort      10.97.30.24     <none>           80:30355/TCP    20h
productpage    ClusterIP     10.106.145.20   <none>           9080/TCP         39s
ratings        ClusterIP     10.103.87.183   <none>           9080/TCP         39s
reviews        ClusterIP     10.99.199.61    <none>           9080/TCP         39s
master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$

```

```

master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$ kubectl get pods
NAME                                READY   STATUS              RESTARTS   AGE
details-v1-876bf485f-xcd4b          1/1    Running             0           48s
nginx-55bd7c9fd-5jf9s               1/1    Running             0           20h
productpage-v1-8d69b45c-mzg9d       0/1    ContainerCreating  0           48s
ratings-v1-7c9949d479-k7f7j        1/1    Running             0           48s
reviews-v1-85b7d84c56-25szq        0/1    ContainerCreating  0           48s
reviews-v2-cbd94c99b-qvf2k         0/1    ContainerCreating  0           48s
reviews-v3-748456d47b-2dhv6        0/1    ContainerCreating  0           48s
master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$

```

```

master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$ kubectl apply -f samples/bookinfo/networking/bookinfo-gateway.yaml
gateway.networking.istio.io/bookinfo-gateway unchanged

```

```

master@Kubemaster:/opt/istio/istio-1.1.0.snapshot.1$ kubectl get svc istio-ingressgateway -n istio-system
NAME                                TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)                                     AGE
istio-ingressgateway               LoadBalancer        10.106.88.54    <pending>        80:31380/TCP,443:31390/TCP,31400:31400/TCP,15011:30845/TCP,8060:32578/TCP,853:30848/TCP,15030:32603/TCP,15031:32488/TCP  21h

```

BookInfo Sample Sign in

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.

Book Details

Type:
paperback

Pages:
200

Publisher:
PublisherA

Language:
English

ISBN-10:
1234567890

ISBN-13:
123-1234567890

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

```

master@Kubemaster:/opt/kube$ sudo kubectl create deployment nginx --image=nginx
deployment.apps/nginx created

```

```

master@Kubemaster:/opt/kube$ sudo kubectl create service nodeport nginx --tcp=80:80
service/nginx created

```

```

master@Kubemaster:/opt/kube$ kubectl get svc
NAME            TYPE                CLUSTER-IP      EXTERNAL-IP      PORT(S)                                     AGE
kubernetes      ClusterIP           10.96.0.1        <none>            443/TCP                                     26h
nginx           NodePort            10.97.30.24     <none>            80:30355/TCP                               22s
master@Kubemaster:/opt/kube$

```

```
master@Kubemaster:/opt/kube$ curl Kubemaster:30355
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
  body {
    width: 35em;
    margin: 0 auto;
    font-family: Tahoma, Verdana, Arial, sans-serif;
  }
</style>
</head>
<body>
<h1>Welcome to nginx!</h1>
<p>If you see this page, the nginx web server is successfully installed and
working. Further configuration is required.</p>

<p>For online documentation and support please refer to
<a href="http://nginx.org/">nginx.org</a>.<br/>
Commercial support is available at
<a href="http://nginx.com/">nginx.com</a>.</p>

<p><em>Thank you for using nginx.</em></p>
</body>
</html>
master@Kubemaster:/opt/kube$
```