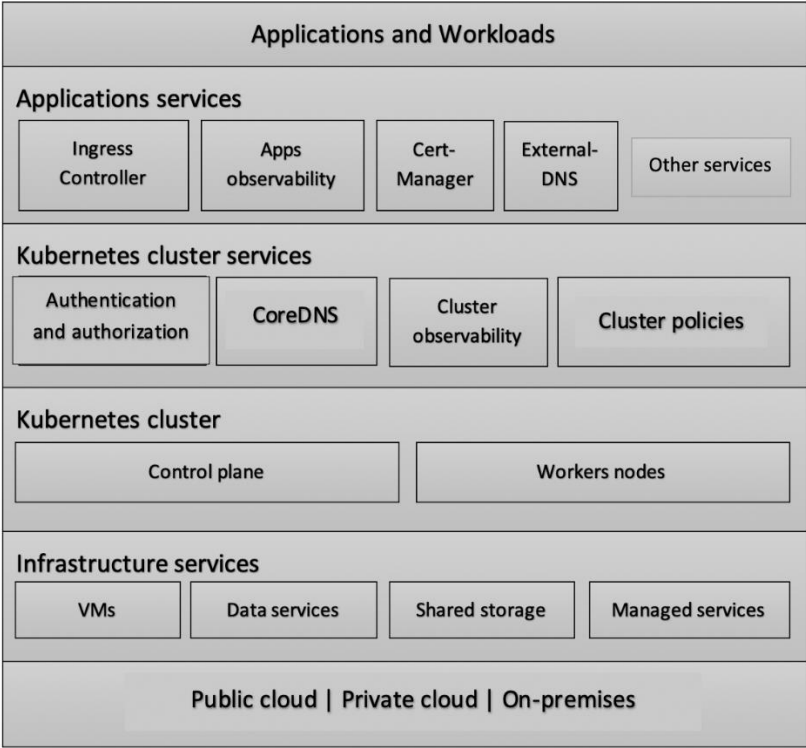
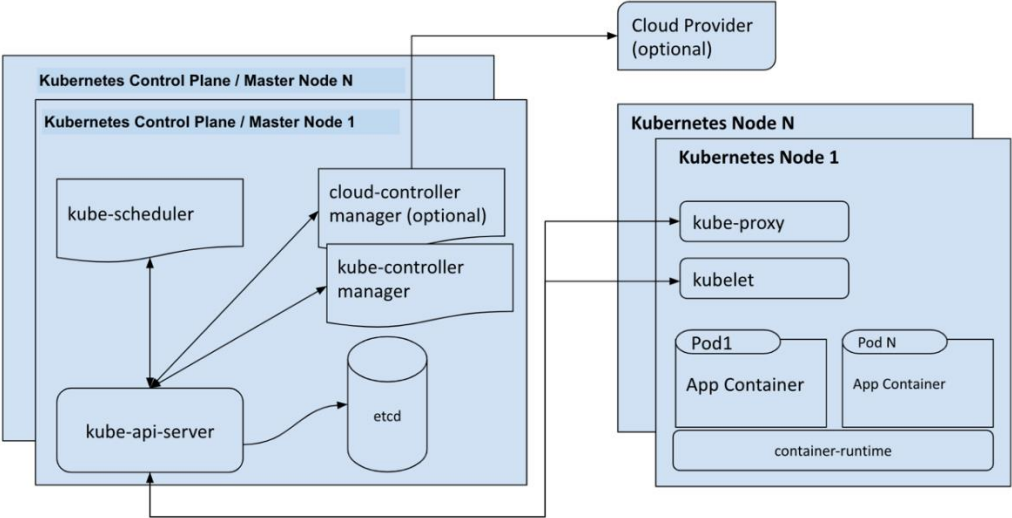
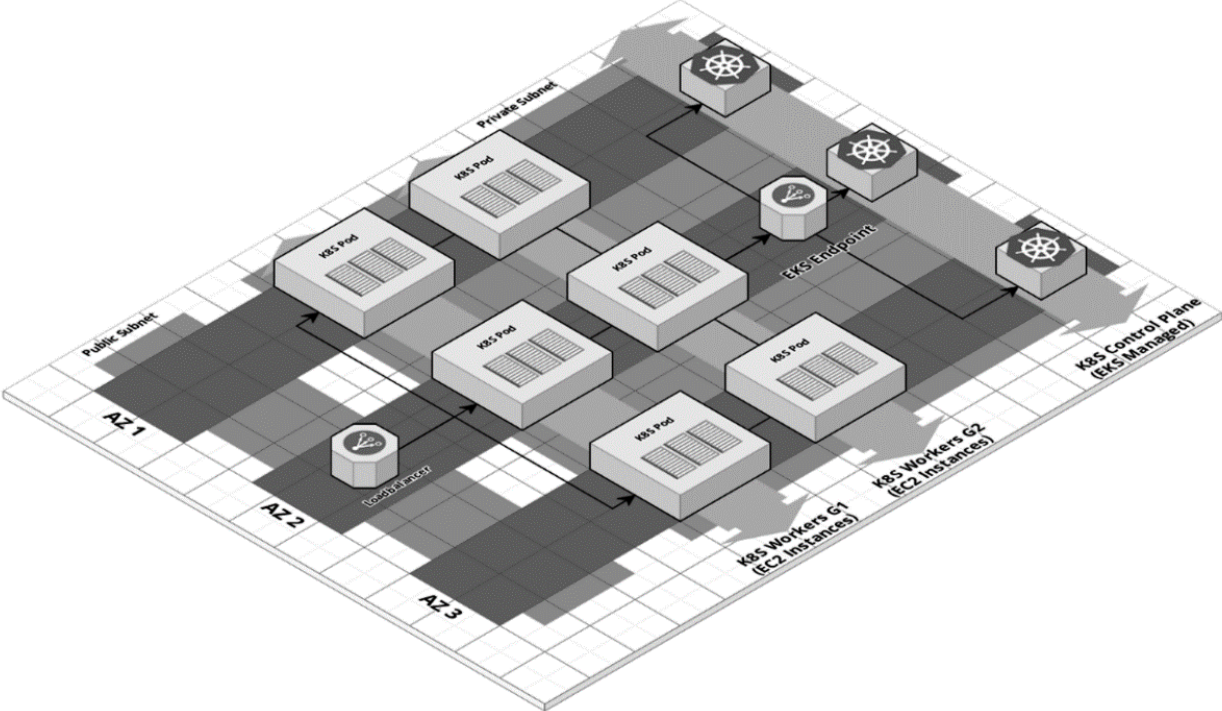


# Chapter 1: Introduction to Kubernetes Infrastructure and Production-Readiness



# Chapter 2: Architecting Production-Grade Kubernetes Infrastructure



## Chapter 3: Provisioning Kubernetes Clusters Using AWS and Terraform

```
.
├── packt-infra-repo
│   └── terraform
│       ├── modules
│       │   ├── cluster
│       │   ├── eks-cp
│       │   ├── eks-vpc
│       │   └── eks-workers
│       ├── packtclusters
│       ├── packtclusters-vpc
│       └── shared-state
```

```
.
├── config.tf
├── terraform.tfvars
├── tf-state-dynamodb.tf
├── tf-state-s3.tf
└── variables.tf
```

**Plan:** 4 to add, 0 to change, 0 to destroy.

-----  
Note: You didn't specify an "-out" parameter to save this plan, so Terraform can't guarantee that exactly these actions will be performed if "terraform apply" is subsequently run.

```
Plan: 4 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

  Enter a value: yes

aws_dynamodb_table.clusters_vpc_dynamodb_tf_state_lock: Creating...
aws_dynamodb_table.clusters_dynamodb_tf_state_lock: Creating...
aws_s3_bucket.clusters_tf_state_s3_bucket: Creating...
aws_s3_bucket.clusters_vpc_tf_state_s3_bucket: Creating...
aws_dynamodb_table.clusters_dynamodb_tf_state_lock: Creation complete after 6s [id=packtclusters-terraform-state-lock-dynamodb]
aws_s3_bucket.clusters_vpc_tf_state_s3_bucket: Creation complete after 7s [id=packtclusters-vpc-terraform-state]
aws_s3_bucket.clusters_tf_state_s3_bucket: Creation complete after 7s [id=packtclusters-terraform-state]
aws_dynamodb_table.clusters_vpc_dynamodb_tf_state_lock: Creation complete after 10s [id=packtclusters-vpc-terraform-state-lock-dynamodb]

Apply complete! Resources: 4 added, 0 changed, 0 destroyed.
```

```
Plan: 28 to add, 0 to change, 0 to destroy.
```

-----

Note: You didn't specify an "-out" parameter to save this plan, so Terraform can't guarantee that exactly these actions will be performed if "terraform apply" is subsequently run.

```
Apply complete! Resources: 28 added, 0 changed, 0 destroyed.
Releasing state lock. This may take a few moments...
```

**Outputs:**

```
private_subnet_ids = [
  "subnet-0c37e5cb11722c92b",
  "subnet-04b21723fb8596167",
  "subnet-0dc7a8f4007ff8c43",
]
public_subnet_ids = [
  "subnet-03ddbfff373c86c36f",
  "subnet-0c7a7dc7780468137",
  "subnet-0282d86270d3d191a",
]
vpc_id = vpc-02479e3540304f977
```

```
Plan: 22 to add, 0 to change, 0 to destroy.
```

-----

Note: You didn't specify an "-out" parameter to save this plan, so Terraform can't guarantee that exactly these actions will be performed if "terraform apply" is subsequently run.

```
Apply complete! Resources: 22 added, 0 changed, 0 destroyed.
Releasing state lock. This may take a few moments...

Outputs:

authconfig = apiVersion: v1
kind: ConfigMap
metadata:
  name: aws-auth
  namespace: kube-system
data:
  mapRoles: |
    - rolearn: "arn:aws:iam::698782116220:role/packtklusters-prod1-workers"
      username: system:node:{{EC2PrivateDNSName}}
      groups:
        - system:bootstrappers
        - system:nodes

aws_region = us-east-1
cluster_api = https://76041A413CDC35C70CE83744FE510577.gr7.us-east-1.eks.amazonaws.com
cluster_full_name = packtklusters-prod1
cluster_tag = kubernetes.io/cluster/packtklusters-prod1
cluster_version = 1.15
worker_iam_role_arn = arn:aws:iam::698782116220:role/packtklusters-prod1-workers
```

```
Destroy complete! Resources: 22 destroyed.
Releasing state lock. This may take a few moments...
```

```
Destroy complete! Resources: 28 destroyed.
Releasing state lock. This may take a few moments...
```

```
Plan: 0 to add, 0 to change, 2 to destroy.
```

```
Do you really want to destroy all resources?
```

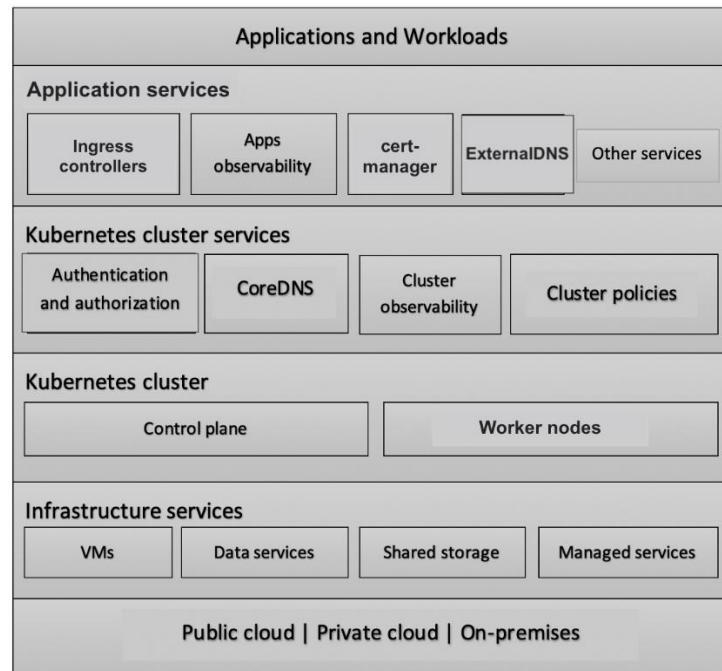
```
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Only 'yes' will be accepted to confirm.
```

```
Enter a value: yes
```

```
aws_dynamodb_table.clusters_dynamodb_tf_state_lock: Destroying... [id=packtklusters-terraform-state-lock-dynamodb]
aws_dynamodb_table.clusters_vpc_dynamodb_tf_state_lock: Destroying... [id=packtklusters-vpc-terraform-state-lock-dynamodb]
aws_dynamodb_table.clusters_dynamodb_tf_state_lock: Destruction complete after 2s
aws_dynamodb_table.clusters_vpc_dynamodb_tf_state_lock: Destruction complete after 4s
```

```
Destroy complete! Resources: 2 destroyed.
```

## Chapter 4: Managing Cluster Configuration with Ansible



```
— k8s-infra
  |— ansible
  |   |— cluster.yaml
  |   |— group_vars
  |   |   |— all
  |   |   |   |— aws-auth.yaml
  |   |   |   |— namespaces.yaml
  |   |— inventories
  |   |   |— packtclusters
  |   |   |   |— group_vars
  |   |   |   |   |— override
  |   |   |   |   |   |— aws-auth.yaml
  |   |   |   |   |   |— namespaces.yaml
  |   |   |   |— hosts
  |   |— tasks
  |   |   |— aws-auth.yaml
  |   |   |— namespaces.yaml
  |   |— templates
  |   |   |— auth
  |   |   |   |— aws-auth.yaml
  |   |   |— namespaces
  |   |   |   |— namespaces.yaml
```

```

(ansible-k8s-workspace) packtclusters % ansible-playbook -i \
  ../../ansible/inventories/packtclusters/ \
  -e "worker_iam_role_arn=$(terraform output worker_iam_role_arn)" \
  ../../ansible/cluster.yaml

PLAY [deploy k8s add-ons] *****

TASK [deploy aws auth configmap] *****
changed: [localhost] => (item=[{'apiVersion': 'v1', 'kind': 'ConfigMap', 'metadata': {'name': 'aws-auth', 'namespace': 'kube-system'}, 'data': {'mapUsers': '\n- userarn: "arn:aws:iam:917616049678:user/packtclusters-admin"\n username: "packtclusters.admin"\n groups:\n   - system:masters\n', 'mapRoles': '\n- rolearn: "arn:aws:iam:636535661334:role/packtclusters-default-workers"\n username: "system:node:{{EC2PrivateDNSName}}"\n groups:\n   - system:bootstrappers\n   - system:nodes\n\n\n- rolearn: "arn:aws:iam:917616049678:role/admin-role"\n username: "admin:{{SessionName}}"\n groups:\n   - system:masters\n'}}])

TASK [create cluster namespaces] *****
changed: [localhost] => (item=[{'apiVersion': 'v1', 'kind': 'Namespace', 'metadata': {'name': 'packtsclusters-namespace', 'labels': {'name': 'packtsclusters-namespace'}, 'annotations': {'owner': 'packtclusters-admin'}}])

PLAY RECAP *****
localhost : ok=2 changed=2 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

```

```

(ansible-k8s-workspace) packtclusters % kubectl get namespaces

```

NAME	STATUS	AGE
default	Active	26m
kube-node-lease	Active	26m
kube-public	Active	26m
kube-system	Active	26m
packtsclusters-namespace	Active	11s

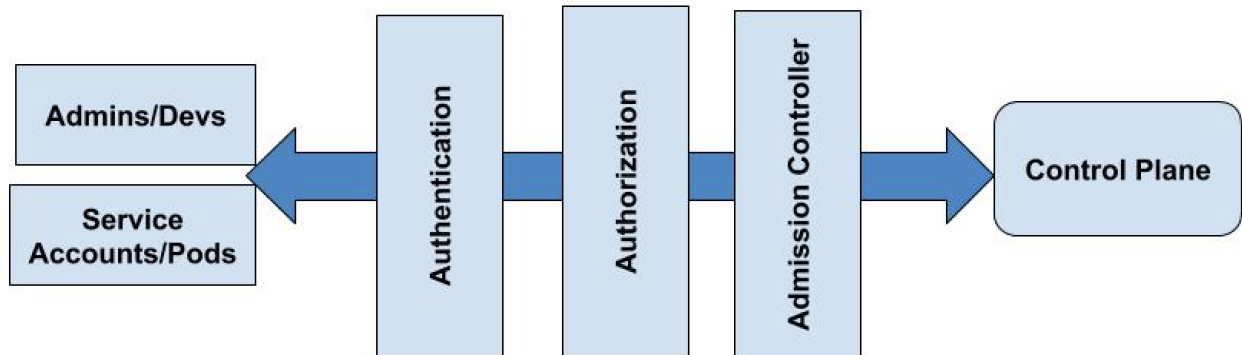
## Chapter 5: Configuring and Enhancing Kubernetes Networking Services

```
PLAY RECAP *****
localhost      : ok=7   changed=5   unreachable=0   failed=0   skipped=0   rescued=0   ignored=0
```

NAMESPACE	NAME	READY	STATUS	RESTARTS	AGE
ingress-nginx	ingress-nginx-admission-create-7z44v	0/1	Completed	0	51s
ingress-nginx	ingress-nginx-admission-patch-wg7dh	0/1	Completed	1	51s
ingress-nginx	ingress-nginx-controller-5cc4589cc8-77tvx	1/1	Running	0	61s
kube-system	aws-node-gcv2s	1/1	Running	0	6m10s
kube-system	aws-node-gs2fh	1/1	Running	0	6m9s
kube-system	aws-node-rjmtl	0/1	Running	0	42s
kube-system	coredns-84b69cff6f-hb2r6	1/1	Running	0	68s
kube-system	coredns-84b69cff6f-p2f52	1/1	Running	0	65s
kube-system	external-dns-558bc6f9bb-f9xp7	1/1	Running	0	65s
kube-system	external-dns-558bc6f9bb-ms7lf	1/1	Running	0	65s
kube-system	kube-proxy-76qwn	1/1	Running	0	59s
kube-system	kube-proxy-j2mx6	1/1	Running	0	52s
kube-system	kube-proxy-p6gl4	1/1	Running	0	45s



# Chapter 6: Securing Kubernetes Effectively

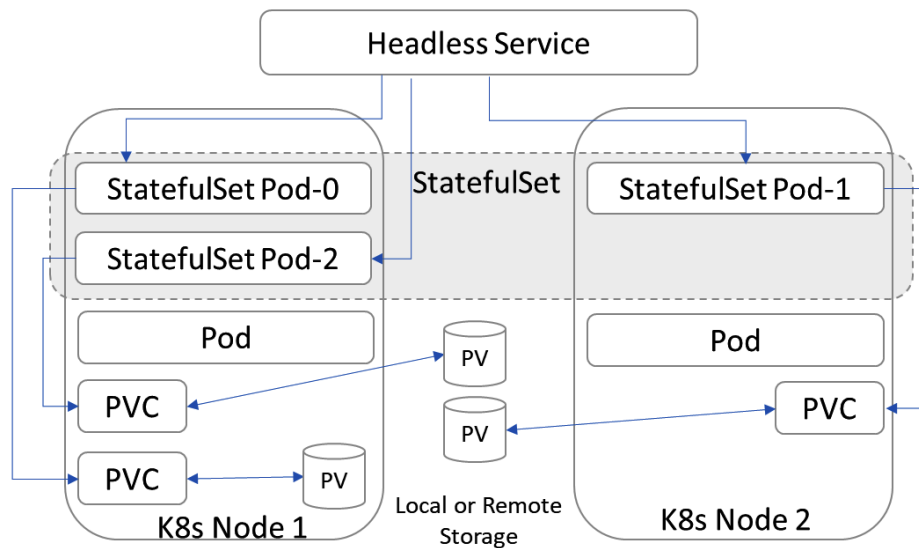
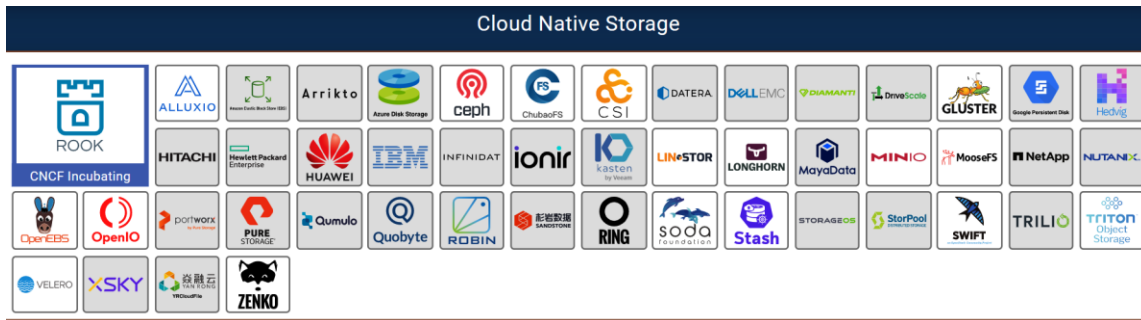


```

PLAY RECAP *****
localhost : ok=10  changed=6  unreachable=0  failed=0  skipped=0  rescued=0  ignored=0
  
```

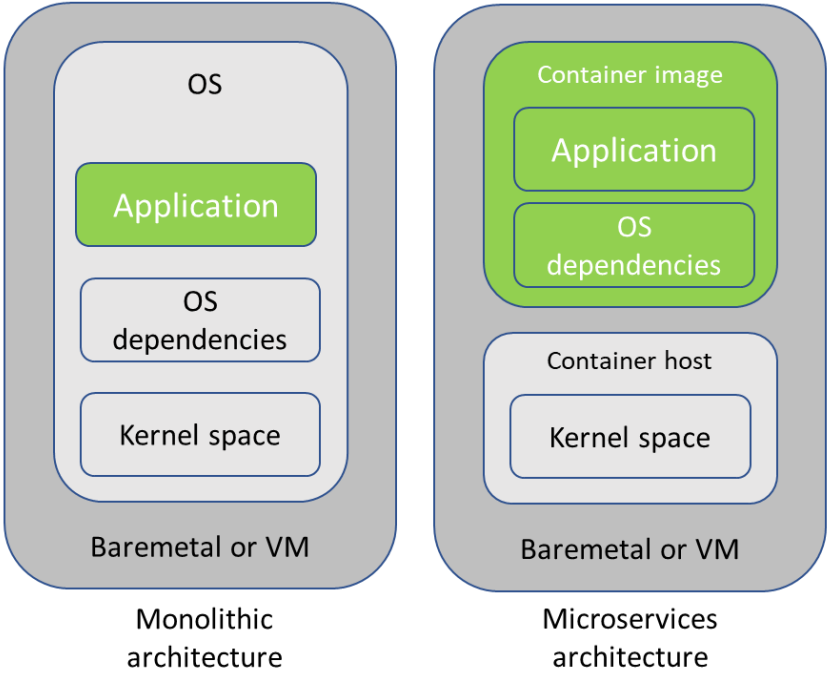
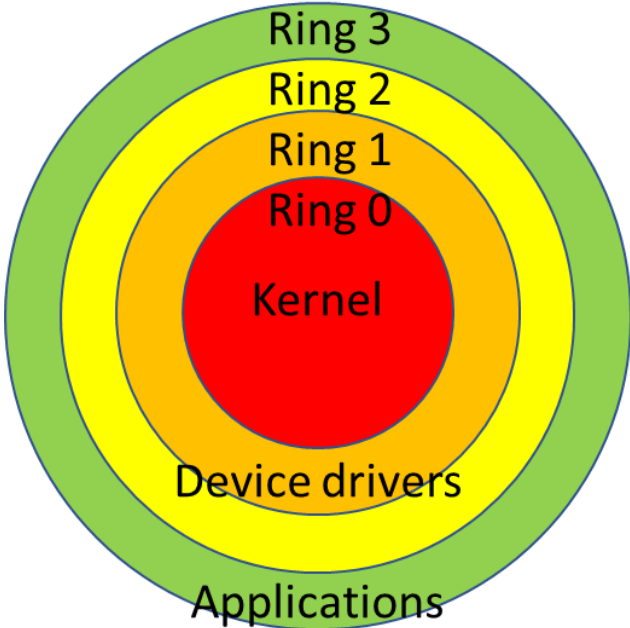
NAMESPACE	NAME	READY	STATUS	RESTARTS	AGE
ingress-nginx	ingress-nginx-admission-create-c4sk2	0/1	Completed	0	2m29s
ingress-nginx	ingress-nginx-admission-patch-d7ps7	0/1	Completed	0	2m28s
ingress-nginx	ingress-nginx-controller-866488c6d4-x5545	1/1	Running	0	2m39s
kube-system	aws-node-75kq7	1/1	Running	0	15m
kube-system	aws-node-rb9rp	1/1	Running	0	15m
kube-system	aws-node-vpzvh	1/1	Running	0	15m
kube-system	coredns-76dc8ddb47-mm9dd	1/1	Running	0	88m
kube-system	coredns-76dc8ddb47-whfmb	1/1	Running	0	12m
kube-system	external-dns-786699d876-r24fs	1/1	Running	0	2m57s
kube-system	external-dns-786699d876-r5clm	1/1	Running	0	2m57s
kube-system	kube-proxy-g9ngd	1/1	Running	0	15m
kube-system	kube-proxy-lnssz	1/1	Running	0	15m
kube-system	kube-proxy-rhtnk	1/1	Running	0	15m
kube-system	kube2iam-88mwj	1/1	Running	0	2m3s
kube-system	kube2iam-pzxkd	1/1	Running	0	2m3s
kube-system	kube2iam-rmb6c	1/1	Running	0	2m3s
kube-system	sealed-secrets-controller-699854fbd9-zvhv8	1/1	Running	0	20s

# Chapter 7: Managing Storage and Stateful Applications



NAME	READY	STATUS	RESTARTS	AGE
openebs-admission-server-59cb5d6f64-jtkpd	1/1	Running	0	96s
openebs-apiserver-76549b589b-mvxjw	1/1	Running	0	96s
openebs-localpv-provisioner-75d886744d-mb6g8	1/1	Running	0	96s
openebs-ndm-6ns5l	1/1	Running	0	96s
openebs-ndm-787fh	1/1	Running	0	96s
openebs-ndm-f6txb	1/1	Running	0	96s
openebs-ndm-operator-75fccb9c fb-l8kb9	1/1	Running	0	96s
openebs-provisioner-6d987f8b79-xw8b9	1/1	Running	0	96s
openebs-snapshot-operator-68fdb8d49d-8zjq5	2/2	Running	0	96s

# Chapter 8: Deploying Seamless and Reliable Applications



```

2020-12-20T15:53:30.380-0800 INFO Need to update DB
2020-12-20T15:53:30.380-0800 INFO Downloading DB...
19.55 MiB / 19.55 MiB [-----]
2020-12-20T15:53:34.412-0800 INFO Detecting Alpine vulnerabilities.
2020-12-20T15:53:34.413-0800 INFO Trivy skips scanning programming

alpine:3.12 (alpine 3.12.3)
=====
Total: 0 (UNKNOWN: 0, LOW: 0, MEDIUM: 0, HIGH: 0, CRITICAL: 0)

```

```

2020-12-20T16:00:20.720-0800 INFO Detecting Ubuntu vulnerabilities...
2020-12-20T16:00:20.722-0800 INFO Trivy skips scanning programming language libraries because no supported file was detected

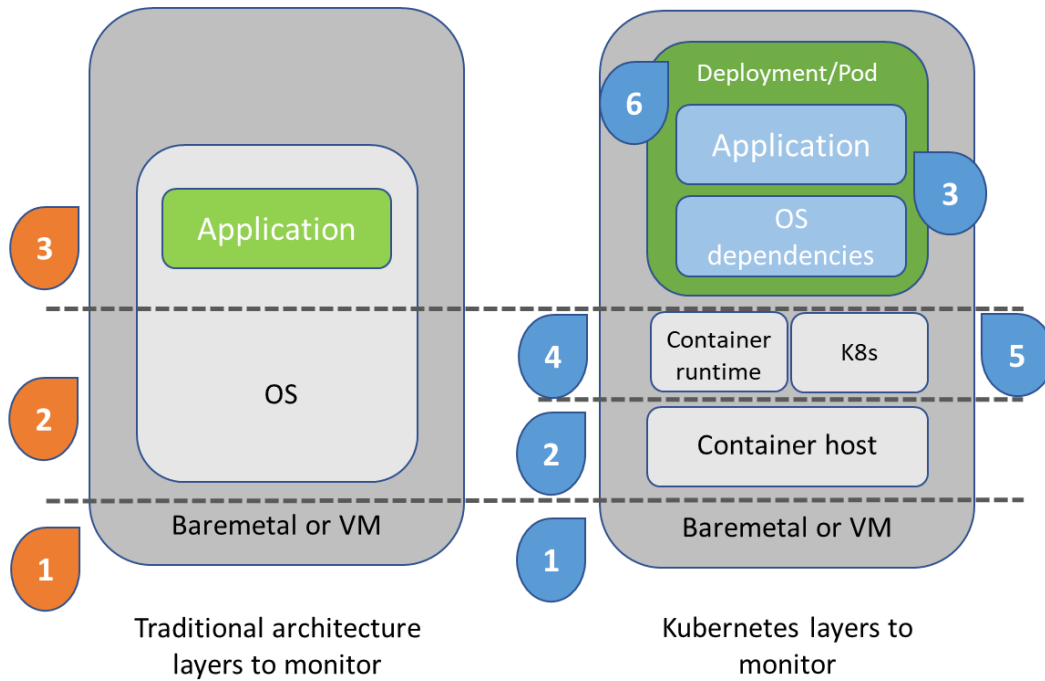
mongo:4.4 (ubuntu 18.04)
=====
Total: 93 (UNKNOWN: 0, LOW: 63, MEDIUM: 28, HIGH: 2, CRITICAL: 0)

+-----+-----+-----+-----+-----+
| LIBRARY TITLE | VULNERABILITY ID | SEVERITY | URL | INSTALLED VERSION | FIXED VERSION |
+-----+-----+-----+-----+-----+
| apt | CVE-2020-27350 | MEDIUM | avd.aquasec.com/nvd/cve-2020-27350 | 1.6.12ubuntu0.1 | 1.6.12ubuntu0.2 |
| ad several integer | | | | | |
| lows and underflows while | | | | | |
| ng .deb packages, aka... | | | | | |
+-----+-----+-----+-----+-----+

```

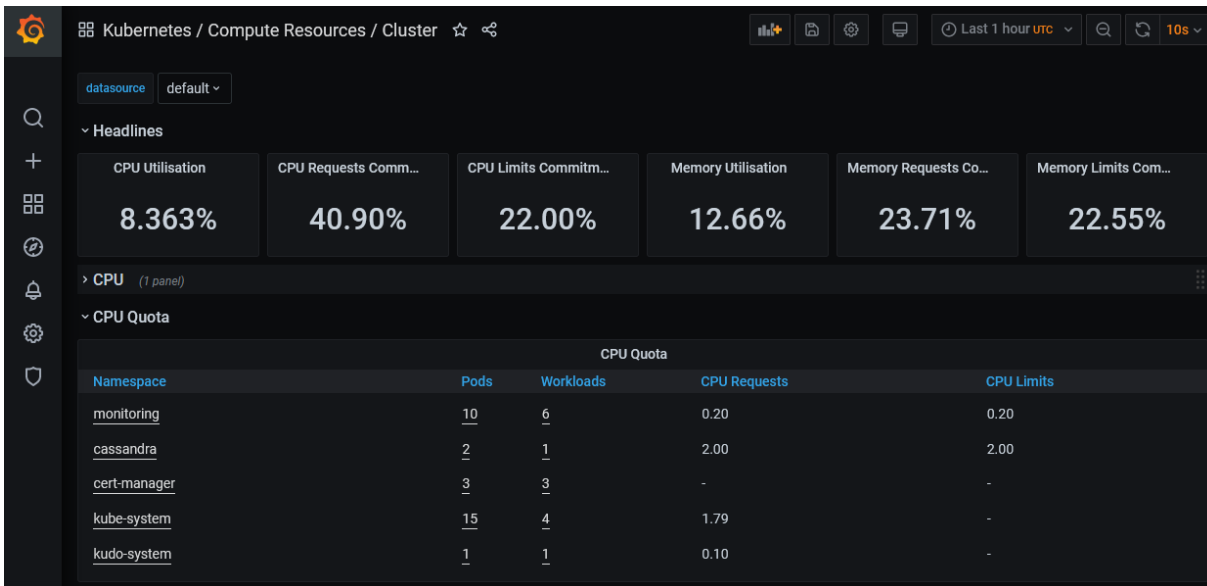
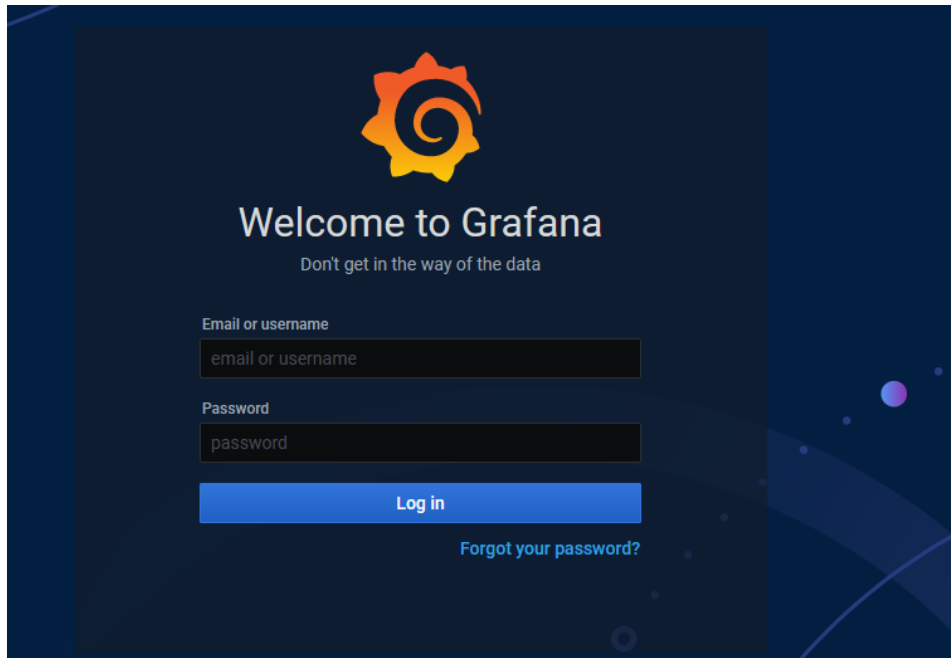
NAME	REFERENCE	TARGETS	MINPODS	MAXPODS	REPLICAS	AGE
nginx-autoscale	Deployment/nginx-hpa	0%/50%	1	5	0	15s

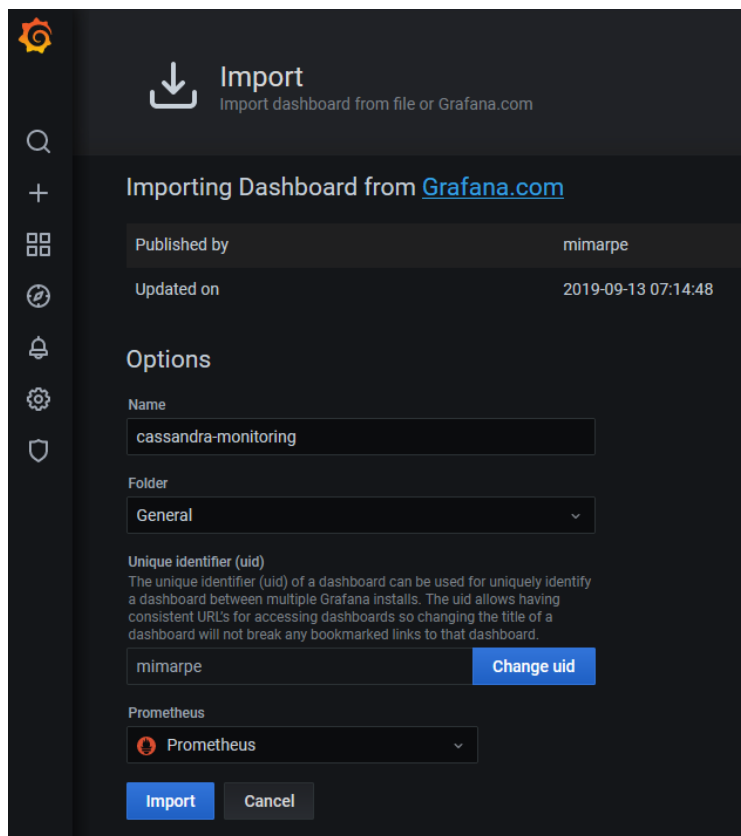
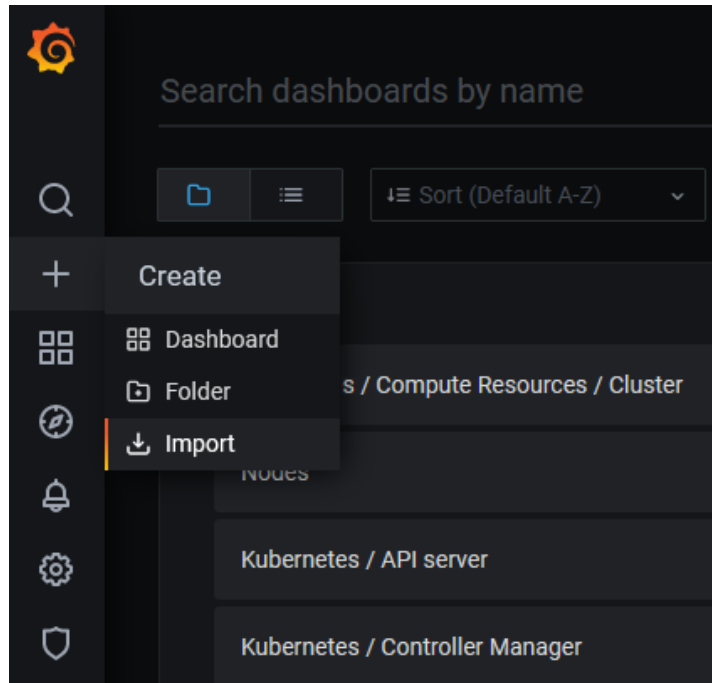
# Chapter 9: Monitoring, Logging, and Observability



NAME	READY	STATUS	RESTARTS	AGE
alertmanager-prometheus-kube-prometheus-alertmanager-0	2/2	Running	0	66s
prometheus-grafana-59bfb6b6bf-tflwn	2/2	Running	0	71s
prometheus-kube-prometheus-operator-58778957c9-8699x	1/1	Running	0	71s
prometheus-kube-state-metrics-c65b87574-hh98m	1/1	Running	0	71s
prometheus-prometheus-kube-prometheus-prometheus-0	2/2	Running	1	66s
prometheus-prometheus-node-exporter-2jvlh	1/1	Running	0	71s
prometheus-prometheus-node-exporter-6k4hb	1/1	Running	0	71s
prometheus-prometheus-node-exporter-8ww6b	1/1	Running	0	71s
prometheus-prometheus-node-exporter-d46lr	1/1	Running	0	71s
prometheus-prometheus-node-exporter-nvt5m	1/1	Running	0	71s

NAME	PORT(S)	AGE	TYPE	CLUSTER-IP	EXTERNAL-IP
alertmanager-operated	9093/TCP, 9094/TCP, 9094/UDP	18h	ClusterIP	None	<none>
prometheus-grafana	80:31322/TCP	18h	LoadBalancer	100.71.40.196	a724ff8566efb4c63b8f69f9b9b2cf-2054523943.us-east-1.elb.amazonaws.com
prometheus-kube-prometheus-alertmanager	9093/TCP	18h	ClusterIP	100.65.57.162	<none>
prometheus-kube-prometheus-operator	443/TCP	18h	ClusterIP	100.66.40.29	<none>
prometheus-kube-prometheus-prometheus	9090:30318/TCP	18h	LoadBalancer	100.68.100.42	a78fe3811a4ee4dea8c333e5deb06ef9-1220794032.us-east-1.elb.amazonaws.com
prometheus-kube-state-metrics	8080/TCP	18h	ClusterIP	100.68.57.63	<none>
prometheus-operated	9090/TCP	18h	ClusterIP	None	<none>
prometheus-prometheus-node-exporter	9100/TCP	18h	ClusterIP	100.67.63.189	<none>





```

pod/elastic-operator-0 1/1 Running 0 5m14s
customresourcedefinition.apiextensions.k8s.io/apmservers.apm.k8s.elastic.co 2021-01-06T09:10:50Z
customresourcedefinition.apiextensions.k8s.io/beats.beat.k8s.elastic.co 2021-01-06T09:10:51Z
customresourcedefinition.apiextensions.k8s.io/elasticsearches.elasticsearch.k8s.elastic.co 2021-01-06T09:10:51Z
customresourcedefinition.apiextensions.k8s.io/enterprisesearches.enterprisesearch.k8s.elastic.co 2021-01-06T09:10:51Z
customresourcedefinition.apiextensions.k8s.io/kibanas.kibana.k8s.elastic.co 2021-01-06T09:10:51Z

```

NAME	HEALTH	NODES	VERSION	PHASE	AGE
elastic	green	3	7.10.1	Ready	8m8s

NAME	READY	STATUS	RESTARTS	AGE
elastic-es-default-0	1/1	Running	0	17m
elastic-es-default-1	1/1	Running	0	17m
elastic-es-default-2	1/1	Running	0	17m

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
elastic-es-default	ClusterIP	None	<none>	9200/TCP	4h10m
elastic-es-http	ClusterIP	100.64.42.161	<none>	9200/TCP	4h10m
elastic-es-transport	ClusterIP	None	<none>	9300/TCP	4h10m

```

{
  "name" : "elastic-es-default-2",
  "cluster_name" : "elastic",
  "cluster_uuid" : "RwaujlTRQwK-MizxCxJ7gA",
  "version" : {
    "number" : "7.10.1",
    "build_flavor" : "default",
    "build_type" : "docker",
    "build_hash" : "1c34507e66d7db1211f66f3513706fdf548736aa",
    "build_date" : "2020-12-05T01:00:33.671820Z",
    "build_snapshot" : false,
    "lucene_version" : "8.7.0",
    "minimum_wire_compatibility_version" : "6.8.0",
    "minimum_index_compatibility_version" : "6.0.0-beta1"
  },
  "tagline" : "You Know, for Search"
}

```



NAME	HEALTH	NODES	VERSION	AGE
kibana	green	3	7.10.1	3m53s


NAME	READY	STATUS	RESTARTS	AGE
kibana-kb-68596c8d86-cttzm	1/1	Running	0	5m57s
kibana-kb-68596c8d86-hcqpm	1/1	Running	0	5m57s
kibana-kb-68596c8d86-rdl4n	1/1	Running	0	5m57s


NAME	READY	STATUS	RESTARTS	AGE
elastic-es-default-0	1/1	Running	0	7h
elastic-es-default-1	1/1	Running	0	7h
elastic-es-default-2	1/1	Running	0	7h
fluent-bit-42bhv	1/1	Running	0	7m48s
fluent-bit-6hh52	1/1	Running	0	7m48s
fluent-bit-bfph6	1/1	Running	0	7m48s
fluent-bit-xqcgf	1/1	Running	0	7m48s
kibana-kb-57d99cd6d9-k8js7	1/1	Running	0	110m
kibana-kb-57d99cd6d9-n6kfc	1/1	Running	0	110m
kibana-kb-57d99cd6d9-ntpzt	1/1	Running	0	110m





## Getting started with Kibana


Kibana empowers you to visualize your data, your way. Start with one question, and see where the answer leads you.

 **Dashboard**  
Analyze data in dashboards.


 **Discover**  
Search and find insights.

 **Canvas**  
Design pixel-perfect presentations.

 **Maps**  
Plot geographic data.

 **Machine Learning**  
Model, predict, and detect.



 **Add your data**

# Create index pattern

An index pattern can match a single source, for example, `filebeat-4-3-22` , or **multiple** data sources, `filebeat-*` .


[Read documentation](#) 

## Step 1 of 2: Define an index pattern

Index pattern name


Next step >

Use an asterisk (\*) to match multiple indices. Spaces and the characters `\, /, ?, ", <, >, |` are not allowed.

 Include system and hidden indices

✓ Your index pattern matches 1 source.

<b>kubernetes_cluster-2021.01.07</b>	Index
--------------------------------------	-------

Rows per page: 10 

# Chapter 10: Operating and Maintaining Efficient Kubernetes Clusters

NAME	STATUS	ROLES	AGE	VERSION
ip-10-40-102-5.ec2.internal	Ready	<none>	11m	v1.15.12-eks-31566f
ip-10-40-74-21.ec2.internal	Ready	<none>	11m	v1.15.12-eks-31566f

```
Plan: 0 to add, 1 to change, 0 to destroy.
```

```
-----  
Note: You didn't specify an "-out" parameter to save this plan, so Terraform  
can't guarantee that exactly these actions will be performed if  
"terraform apply" is subsequently run.
```

The screenshot shows the Amazon EKS Clusters console. On the left, there is a navigation menu with 'Amazon ECS' and 'Amazon EKS' sections. Under 'Amazon EKS', 'Clusters' is selected. The main content area shows 'Clusters (1) Info' with a search bar and a table of clusters. The table has columns for 'Cluster name', 'Kubernetes version', and 'Status'. One cluster is listed: 'packtclusters-prod1' with version '1.15' and status 'Updating'.

```
Plan: 4 to add, 0 to change, 0 to destroy.
```

```
Do you want to perform these actions?  
Terraform will perform the actions described above.  
Only 'yes' will be accepted to approve.
```

```
Enter a value: yes
```

```
aws_dynamodb_table.clusters_vpc_dynamodb_tf_state_lock: Creating...  
aws_dynamodb_table.clusters_dynamodb_tf_state_lock: Creating...  
aws_s3_bucket.clusters_tf_state_s3_bucket: Creating...  
aws_s3_bucket.clusters_vpc_tf_state_s3_bucket: Creating...  
aws_dynamodb_table.clusters_dynamodb_tf_state_lock: Creation complete after 6s [id=packtclusters-terraform-state-lock-dynamodb]  
aws_s3_bucket.clusters_vpc_tf_state_s3_bucket: Creation complete after 7s [id=packtclusters-vpc-terraform-state]  
aws_s3_bucket.clusters_tf_state_s3_bucket: Creation complete after 7s [id=packtclusters-terraform-state]  
aws_dynamodb_table.clusters_vpc_dynamodb_tf_state_lock: Creation complete after 10s [id=packtclusters-vpc-terraform-state-lock-dynamodb]
```

```
Apply complete! Resources: 4 added, 0 changed, 0 destroyed.
```

Kubernetes Version	1.18	1.17	1.16	1.15
Amazon VPC CNI plug-in	1.7.5	1.7.5	1.7.5	1.7.5
DNS (CoreDNS)	1.7.0	1.6.6	1.6.6	1.6.6
KubeProxy	1.18.9	1.17.12	1.16.15	1.15.12

NAME	READY	STATUS	RESTARTS	AGE
coredns-7cf87cdb56-29pfg	1/1	Running	0	3h58m
coredns-7cf87cdb56-ll2t7	1/1	Running	0	3h58m

```
Plan: 0 to add, 1 to change, 0 to destroy.
-----
Note: You didn't specify an "-out" parameter to save this plan, so Terraform
can't guarantee that exactly these actions will be performed if
"terraform apply" is subsequently run.
```

```
Do you want to perform these actions in workspace "prod1"?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

module.packtcluster.module.workers.aws_autoscaling_group.workers: Modifying...
module.packtcluster.module.workers.aws_autoscaling_group.workers: Modifications
m]

Apply complete! Resources: 0 added, 1 changed, 0 destroyed.
```

NAME	STATUS	ROLES	AGE	VERSION
ip-10-40-102-5.ec2.internal	Ready	<none>	5h7m	v1.15.12-eks-31566f
ip-10-40-74-21.ec2.internal	Ready	<none>	5h7m	v1.15.12-eks-31566f
ip-10-40-87-72.ec2.internal	Ready	<none>	6m9s	v1.16.15-eks-ad4801

NAME	STATUS	ROLES	AGE	VERSION
ip-10-40-66-90.ec2.internal	Ready	<none>	4m	v1.16.15-eks-ad4801
ip-10-40-87-72.ec2.internal	Ready	<none>	29m	v1.16.15-eks-ad4801
ip-10-40-96-218.ec2.internal	Ready	<none>	106s	v1.16.15-eks-ad4801

```
VolumeSnapshotLocation/default: created
Deployment/velero: attempting to create resource
Deployment/velero: created
DaemonSet/restic: attempting to create resource
DaemonSet/restic: created
Velero is installed! 🐛 Use 'kubectl logs deployment/velero -n velero' to view the status.
```

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
velero	1/1	1	1	3m23s

NAME	READY	STATUS	RESTARTS	AGE
pod/minio-569464db84-b6rst	1/1	Running	0	7m5s
pod/minio-setup-m2jg9	0/1	Completed	2	7m4s

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP
service/miniodemo	LoadBalancer	172.20.243.26	a4dbf6bfd29214b4791215b34d5e2457-135578941.us-east-1
.elb.amazonaws.com	9000:31864/TCP	7m4s	

NAME	ACCESS MODES	STORAGECLASS	AGE	STATUS	VOLUME	CAPACITY	A
persistentvolumeclaim/minio-pv-claim		gp2	7m5s	Bound	pvc-6bf98751-feca-4b6f-9a47-9d5970a13105	10Gi	R
w0							

NAME	READY	STATUS	RESTARTS	AGE
pod/minio-569464db84-b6rst	1/1	Running	0	7m5s
pod/minio-setup-m2jg9	0/1	Completed	2	7m4s

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP
service/miniodemo	LoadBalancer	172.20.243.26	a4dbf6bfd29214b4791215b34d5e2457-135578941.us-east-1
.elb.amazonaws.com	9000:31864/TCP	7m4s	

NAME	ACCESS MODES	STORAGECLASS	AGE	STATUS	VOLUME	CAPACITY	A
persistentvolumeclaim/minio-pv-claim		gp2	7m5s	Bound	pvc-6bf98751-feca-4b6f-9a47-9d5970a13105	10Gi	R
w0							

```
Plugin: systemd-logs
Status: passed
Total: 3
Passed: 3
Failed: 0
Skipped: 0
```

NAME	READY	STATUS	RESTARTS	AGE
cost-analyzer-checks-1610671200-2zwqw	0/1	Completed	0	100s
kubecost-cost-analyzer-f5bc9bd6-s2kkk	3/3	Running	0	4m14s
kubecost-grafana-6df5cc66b6-8n592	3/3	Running	0	4m14s
kubecost-kube-state-metrics-57d4dfc748-sgvzw	1/1	Running	0	4m14s
kubecost-prometheus-alertmanager-7cdf76d5-vmtpv	2/2	Running	0	4m14s
kubecost-prometheus-node-exporter-2xn6z	1/1	Running	0	4m14s
kubecost-prometheus-node-exporter-hqf2b	1/1	Running	0	4m14s
kubecost-prometheus-node-exporter-q66s6	1/1	Running	0	4m14s
kubecost-prometheus-server-6f79df498c-8jhsK	2/2	Running	0	4m14s

### Available Clusters

## AWS Cluster #1

3 nodes in us-east-1

# \$97.91/mo

>

+ Add new cluster

Overview / AWS Cluster #1
UPGRADE ↻

- 🏠 Overview
- 📊 Cost Allocation
- 📦 Assets
- 💰 Savings
- 🚨 Health
- 📄 Reports
- 🔔 Notifications

2 Monthly savings of \$19.74 identified LEARN MORE >

Monthly cost

# \$100.07

Cost Efficiency

# 6.0%

**Monthly cluster costs**

Monthly run rate expenses based on resource prices

Total cost ▾ CLUSTER METRICS >

**Resource Efficiency**

Based on currently provisioned resources and last 7d usage

■ Idle  
■ System  
■ Apps  
■ Other

[VIEW ASSETS >](#)



Namespace	Monthly Cost	Efficiency
<a href="#">velero</a>	\$3.14	4
<a href="#">kubecost</a>	\$1.31	22
<a href="#">kube-system</a>	\$0.80	10
<a href="#">default</a>	\$0.49	6
<a href="#">kudo-system</a>	\$0.15	7
<a href="#">minio-demo</a>	\$0.12	100

[NAMESPACE ALLOCATION >](#)



[Overview](#)

[Cost Allocation](#)

[Assets](#)

[Savings](#)

[Health](#)

[Reports](#)

[Notifications](#)

Savings / AWS Cluster #1

\$2915.76

Estimated Savings <sup>1</sup>

[Refresh](#)

Manage underutilized nodes	\$2340.37	<a href="#">&gt;</a>
Make reserved instance commitments	\$459.71	<a href="#">&gt;</a>
Manage unclaimed volumes	\$0.00	<a href="#">&gt;</a>
Potential abandoned workloads identified	\$0.00	<a href="#">&gt;</a>
Pods with over-provisioned requests	\$0.00	<a href="#">&gt;</a>
Local disks with low utilization found	\$0.00	<a href="#">&gt;</a>
Cluster nodes can be right-sized	\$0.00	<a href="#">&gt;</a>





