

ArgoCD ApplicationSet Controller

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Designed and implemented a multi-cluster Kubernetes setup by provisioning Amazon EKS clusters in both Mumbai and US regions

The screenshot displays the Amazon Elastic Kubernetes Service (EKS) console for the 'mumbai-cluster' in the Asia Pacific (Mumbai) region. The interface includes a sidebar with navigation options like Dashboard, Clusters, Settings, and Amazon EKS Anywhere. The main content area shows the cluster's status as 'Active' and provides a summary of its health and configuration. A warning banner at the top indicates that the current Kubernetes version (1.32) will reach the end of standard support on March 23, 2026. The cluster details section lists the API server endpoint, OpenID Connect provider URL, and the cluster ARN.

Cluster info

Cluster health	Upgrade insights	Node health issues	Capability issues
0	5	0	0

Details

API server endpoint	OpenID Connect provider URL	Created
https://71E1C3A4774230A924C9869C5A5F82EE.g7.ap-south-1.eks.amazonaws.com	https://oidc.eks.ap-south-1.amazonaws.com/id/71E1C3A4774230A924C9869C5A5F82EE	5 hours ago

The screenshot displays the Amazon Elastic Kubernetes Service (EKS) console for the 'us-cluster' in the United States (N. Virginia) region. The interface is similar to the Mumbai cluster view, showing the cluster's status as 'Active' and a summary of its health and configuration. A warning banner at the top indicates that the current Kubernetes version (1.32) will reach the end of standard support on March 23, 2026. The cluster details section lists the API server endpoint, OpenID Connect provider URL, and the cluster ARN.

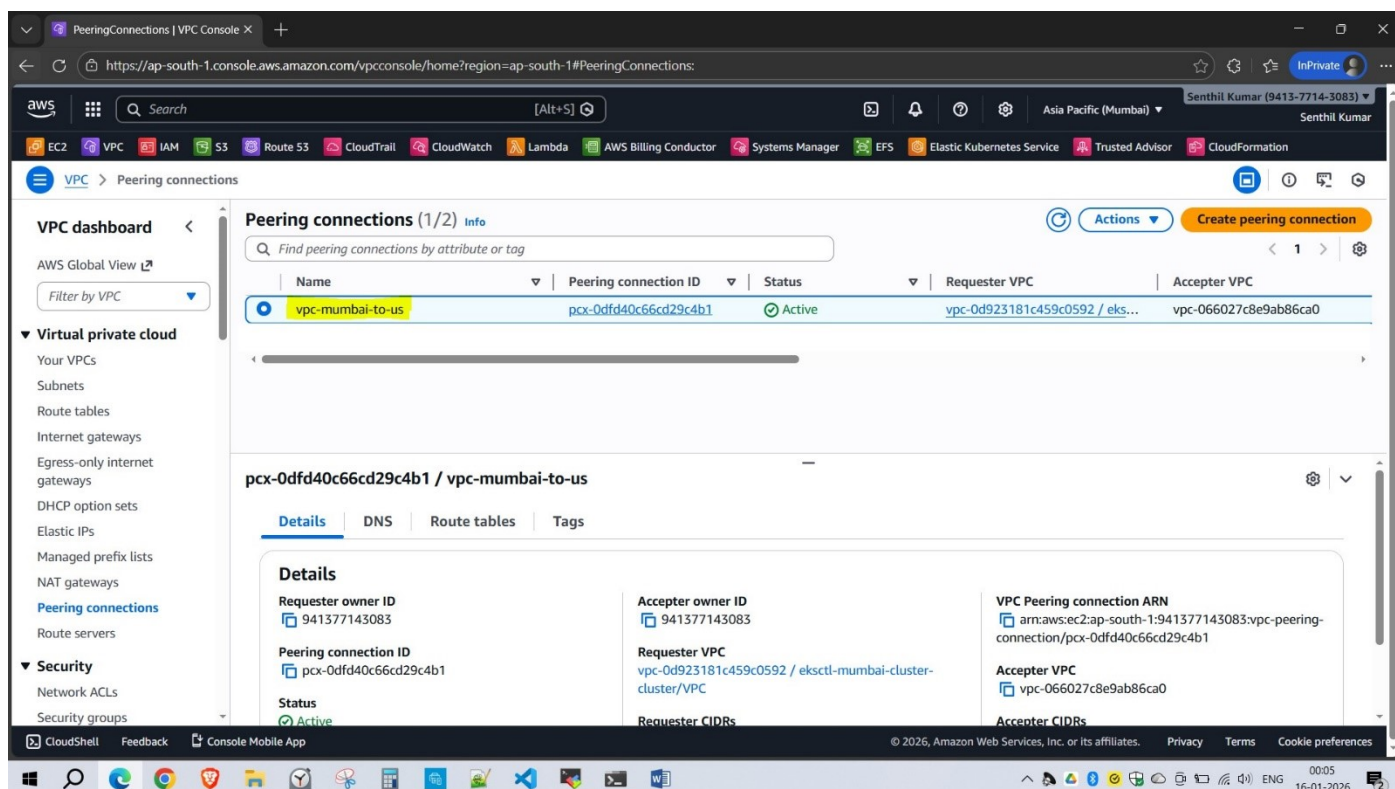
Cluster info

Cluster health	Upgrade insights	Node health issues	Capability issues
0	3	0	0

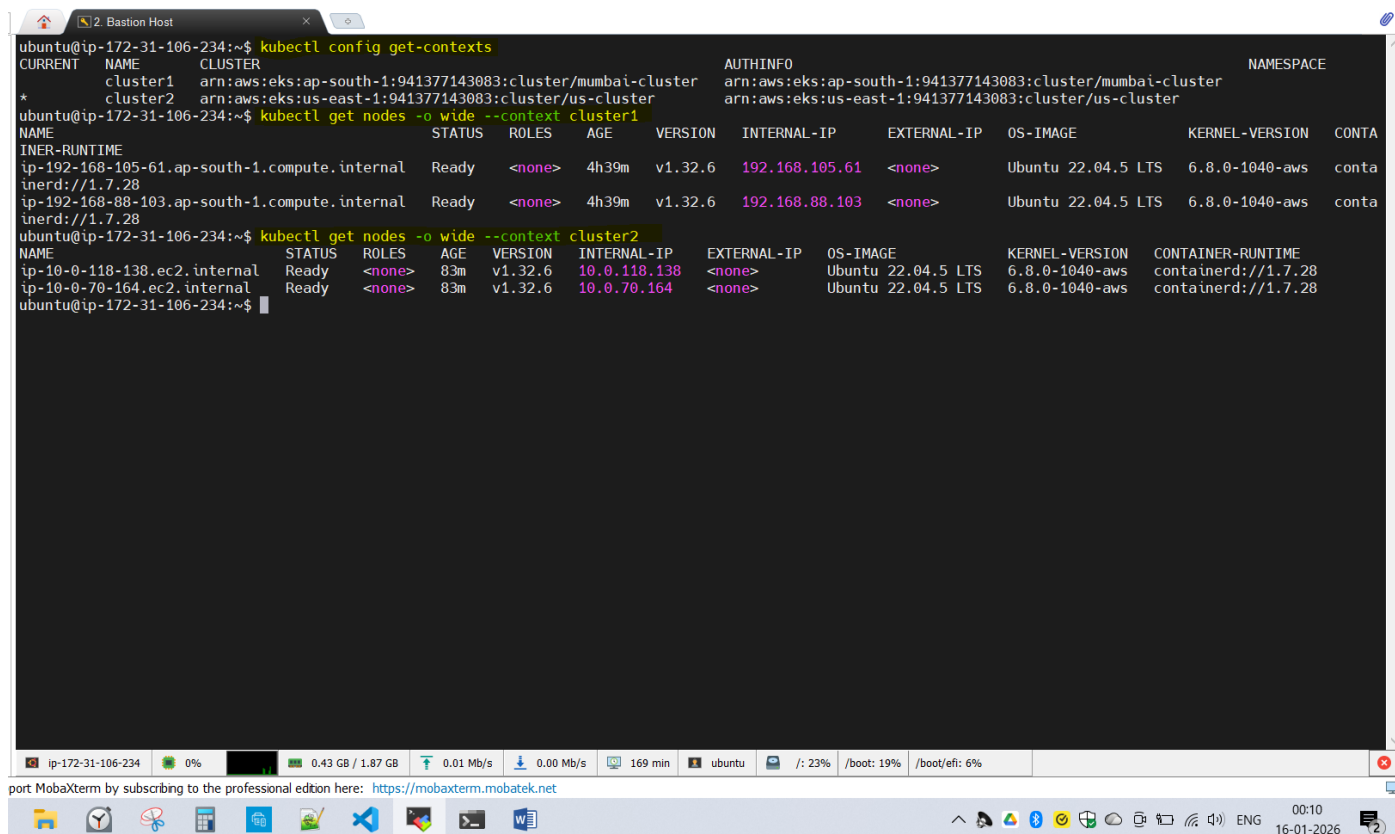
Details

API server endpoint	OpenID Connect provider URL	Created
https://683E2FFAC9FAD3E68E95D5C5EAE6F35C.g7.us-east-1.eks.amazonaws.com	https://oidc.eks.us-east-1.amazonaws.com/id/683E2FFAC9FAD3E68E95D5C5EAE6F35C	2 hours ago

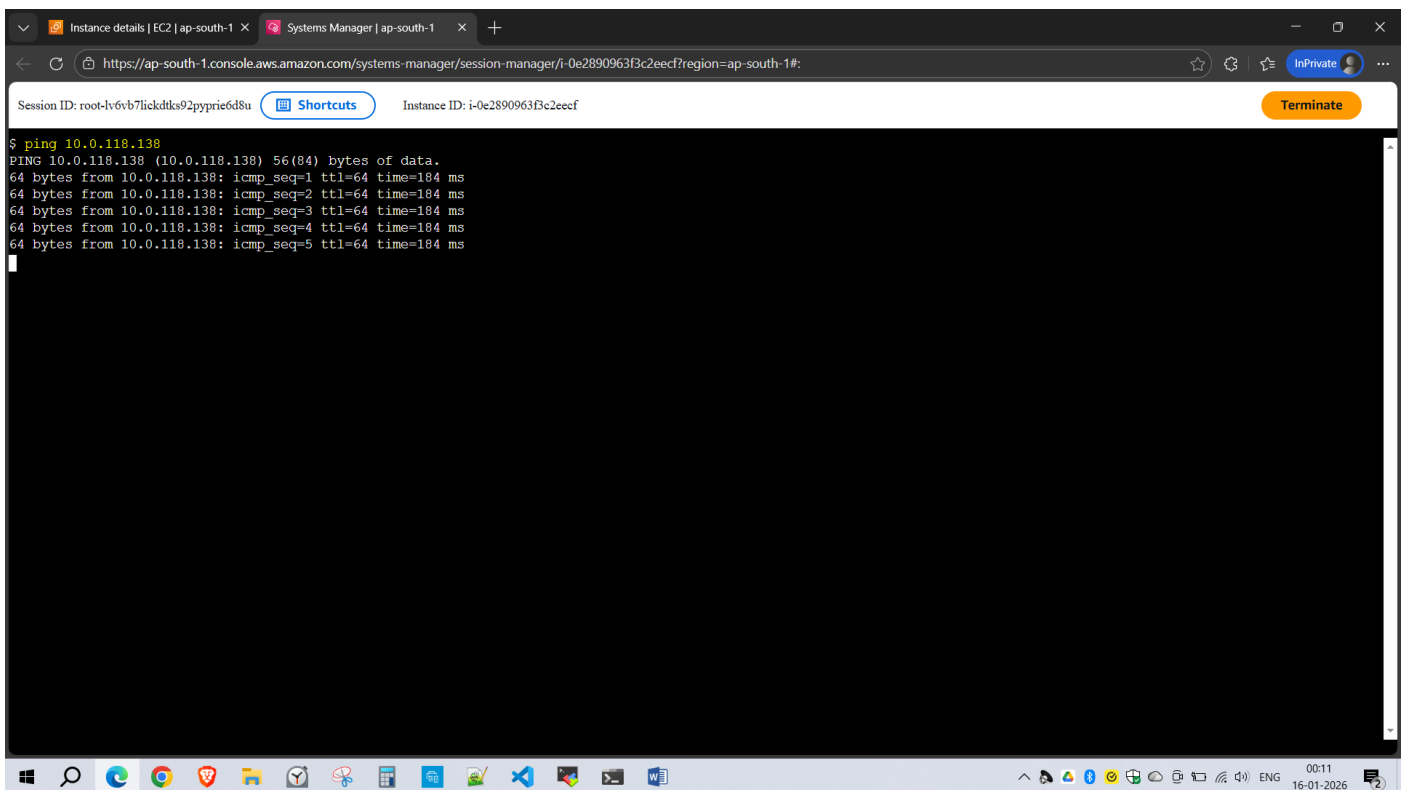
Established VPC peering between two EKS clusters to enable secure inter-cluster communication



SK Fetched node information from both EKS clusters through a secure bastion host



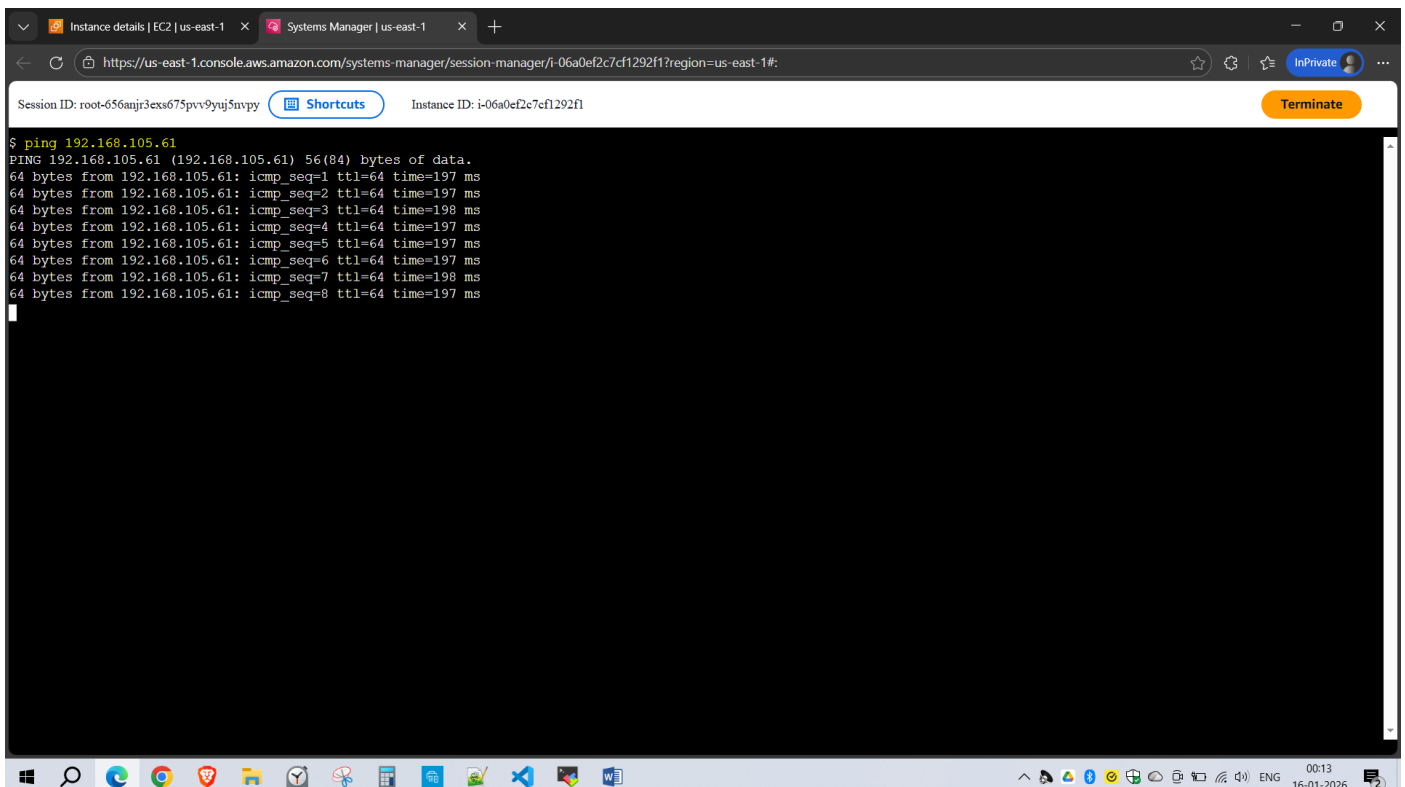
Validated inter-cluster communication by performing successful ping tests from the Mumbai cluster to US cluster via VPC peering



The screenshot shows the AWS Systems Manager console for an EC2 instance in the ap-south-1 region. The terminal window displays the output of a ping command to 10.0.118.138, which is successful. The console interface includes a 'Shortcuts' button and a 'Terminate' button. The browser address bar shows the URL: https://ap-south-1.console.aws.amazon.com/systems-manager/session-manager/i-0e2890963f3c2eef?region=ap-south-1#.

```
$ ping 10.0.118.138
PING 10.0.118.138 (10.0.118.138) 56(84) bytes of data:
64 bytes from 10.0.118.138: icmp_seq=1 ttl=64 time=184 ms
64 bytes from 10.0.118.138: icmp_seq=2 ttl=64 time=184 ms
64 bytes from 10.0.118.138: icmp_seq=3 ttl=64 time=184 ms
64 bytes from 10.0.118.138: icmp_seq=4 ttl=64 time=184 ms
64 bytes from 10.0.118.138: icmp_seq=5 ttl=64 time=184 ms
```

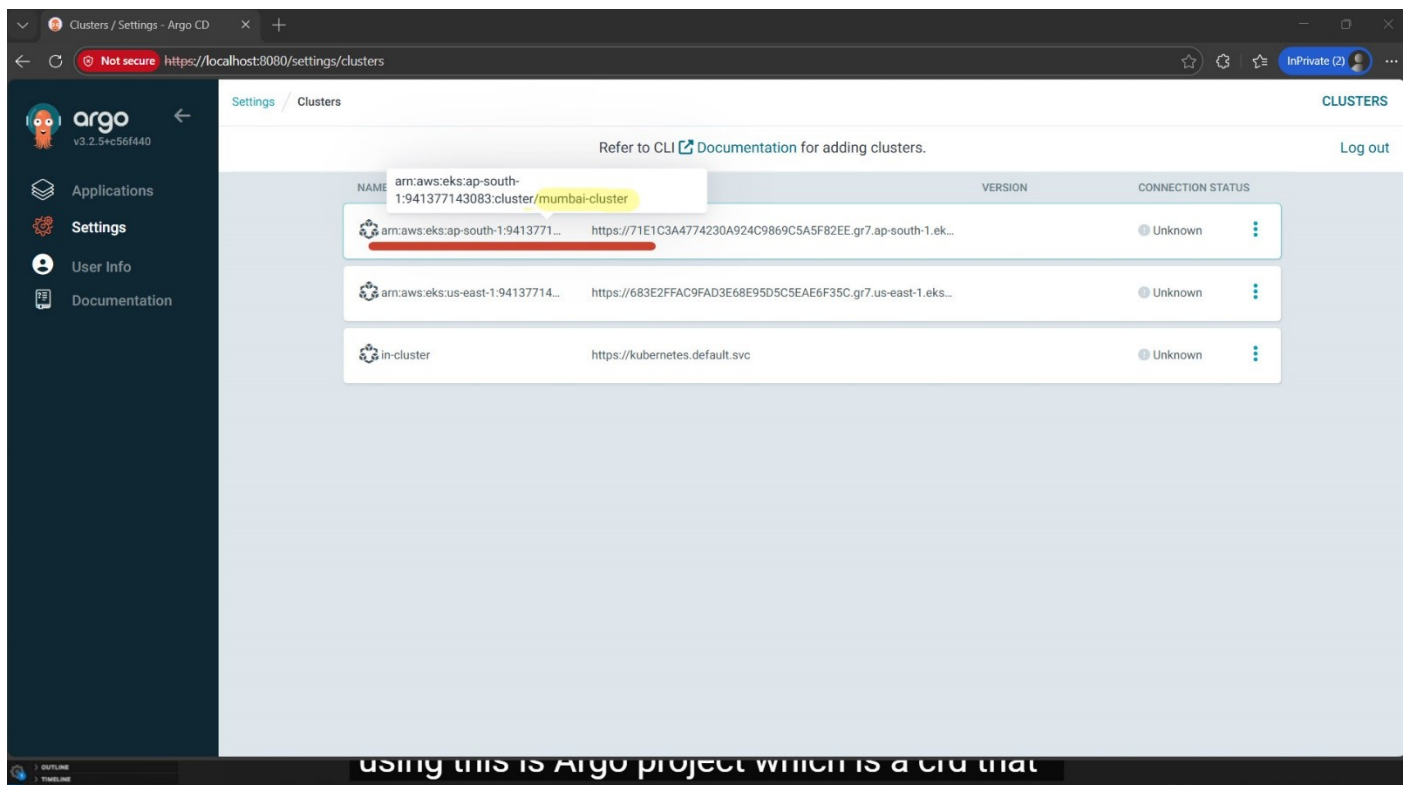
Performed reverse connectivity tests by pinging Mumbai cluster from US cluster to validate bidirectional communication over VPC peering



The screenshot shows the AWS Systems Manager console for an EC2 instance in the us-east-1 region. The terminal window displays the output of a ping command to 192.168.105.61, which is successful. The console interface includes a 'Shortcuts' button and a 'Terminate' button. The browser address bar shows the URL: https://us-east-1.console.aws.amazon.com/systems-manager/session-manager/i-06a0ef2c7cf1292f1?region=us-east-1#.

```
$ ping 192.168.105.61
PING 192.168.105.61 (192.168.105.61) 56(84) bytes of data:
64 bytes from 192.168.105.61: icmp_seq=1 ttl=64 time=197 ms
64 bytes from 192.168.105.61: icmp_seq=2 ttl=64 time=197 ms
64 bytes from 192.168.105.61: icmp_seq=3 ttl=64 time=198 ms
64 bytes from 192.168.105.61: icmp_seq=4 ttl=64 time=197 ms
64 bytes from 192.168.105.61: icmp_seq=5 ttl=64 time=197 ms
64 bytes from 192.168.105.61: icmp_seq=6 ttl=64 time=197 ms
64 bytes from 192.168.105.61: icmp_seq=7 ttl=64 time=198 ms
64 bytes from 192.168.105.61: icmp_seq=8 ttl=64 time=197 ms
```

Added and configured both EKS clusters in ArgoCD to enable multi-cluster application deployment and management

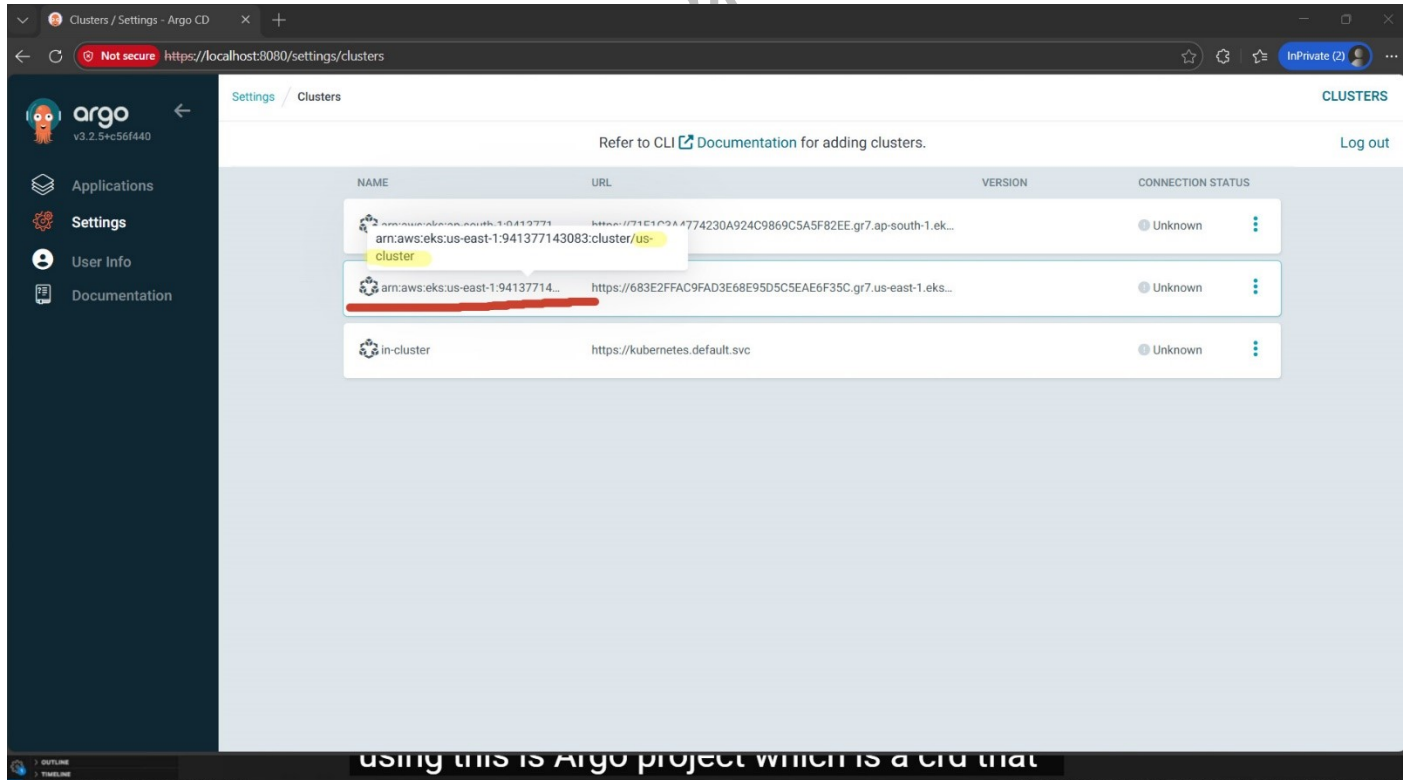


The screenshot shows the ArgoCD web interface at the 'Clusters' page. The left sidebar contains the Argo logo and navigation links for Applications, Settings, User Info, and Documentation. The main content area displays a table of clusters with columns for NAME, URL, VERSION, and CONNECTION STATUS. A tooltip is visible over the first cluster's name.

NAME	URL	VERSION	CONNECTION STATUS
arn:aws:eks:ap-south-1:941377143083:cluster/mumbai-cluster	https://71E1C3A4774230A924C9869C5A5F82EE.gr7.ap-south-1.eks...		Unknown
arn:aws:eks:us-east-1:94137714...	https://683E2FFAC9FAD3E68E95D5C5EAE6F35C.gr7.us-east-1.eks...		Unknown
in-cluster	https://kubernetes.default.svc		Unknown

using this is Argo project which is a cnd that

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This screenshot is similar to the one above, showing the ArgoCD Clusters page. A tooltip is visible over the second cluster's name.

NAME	URL	VERSION	CONNECTION STATUS
arn:aws:eks:us-east-1:941377143083:cluster/us-cluster	https://71E1C3A4774230A924C9869C5A5F82EE.gr7.ap-south-1.eks...		Unknown
arn:aws:eks:us-east-1:94137714...	https://683E2FFAC9FAD3E68E95D5C5EAE6F35C.gr7.us-east-1.eks...		Unknown
in-cluster	https://kubernetes.default.svc		Unknown

using this is Argo project which is a cnd that

Executed application deployments to two EKS clusters using a centralized control (main) cluster

The screenshot shows the Argo CD web interface. The left sidebar contains navigation links for Applications, Settings, User Info, and Documentation. Below these are application filters for Favorites Only, Sync Status (Unknown, Synced, OutOfSync), and Health Status (Progressing, Suspended, Healthy, Degraded, Missing). The main area displays a list of applications. Three applications are visible:

- main-app**: Project: default, Status: Healthy Synced, Repository: https://github.com/semever24/argocd-..., Target R...: master, Path: apps, Destination...: in-cluster, Namesp...: argocd, Created ...: 01/16/2026 02:36:03 (7 minutes ago), Last Sync: 01/16/2026 02:36:04 (7 minutes ago).
- mumbai-sock-shop**: Project: default, Status: Healthy Synced, Repository: https://github.com/semever24/argocd-..., Target R...: master, Path: sock-shop, Destination...: arn:aws:eks:ap-south-1:941377143083:..., Namesp...: default, Created ...: 01/16/2026 02:36:04 (7 minutes ago), Last Sync: 01/16/2026 02:36:08 (7 minutes ago).
- us-sock-shop**: Project: default, Status: Healthy Synced, Repository: https://github.com/semever24/argocd-..., Target R...: master, Path: sock-shop, Destination...: arn:aws:eks:us-east-1:941377143083:cl..., Namesp...: default, Created ...: 01/16/2026 02:36:04 (7 minutes ago), Last Sync: 01/16/2026 02:36:13 (7 minutes ago).

Each application card has buttons for SYNC, REFRESH, and DELETE. The top right of the main area shows 'Sort: name' and 'Items per page: 10'.

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The screenshot shows the Argo CD web interface for the 'main-app' details. The left sidebar is the same as the previous screenshot. The main area displays the application details for 'main-app'.

APP HEALTH: Healthy

SYNC STATUS: Synced to master (8f690fd)

LAST SYNC: Sync OK to 8f690fd

Auto sync is enabled. Author: Senthil Kumar Rajan <semever@hotmail.com> - Comment: Added new files

Succeeded a minute ago (Fri Jan 16 2026 02:36:04 GMT+0530) Author: Senthil Kumar Rajan <semever@hotmail.com> - Comment: Added new files

The bottom section shows a resource diagram with the following components:

- main-app** (application)
- main-app** (application)
- sock-shop** (applicationset)
- mumbai-sock-shop** (application)
- us-sock-shop** (application)

Arrows indicate dependencies between these resources. The diagram is zoomed in at 100%.

Verified live health and sync status of applications deployed on Mumbai cluster

The screenshot displays the Argo CD web interface for the 'mumbai-sock-shop' application. The left sidebar shows the 'argo' logo and navigation links for Applications, Settings, User Info, and Documentation. The main panel shows the application's health and sync status. The 'APP HEALTH' is 'Healthy' (green heart). The 'SYNC STATUS' is 'Synced to master (8f690fd)' (green checkmark). The 'LAST SYNC' was successful 7 minutes ago (Fri Jan 16 2026 02:36:08 GMT+0530) with the comment 'Added new files'. The application is a 'mumbai-sock-shop' service. The 'APPLICATION DETAILS TREE' shows the following components: user-db (svc), carts (deploy), carts-db (deploy), catalogue (deploy), catalogue-db (deploy), front-end (deploy), and orders (deploy). Each component has a corresponding resource (rs) and a pod (pod) with a green heart icon indicating health. The sync status for each component is 'Synced' (green checkmark) and the last sync time is '7 minutes'.

Verified live health and sync status of applications deployed on US cluster

The screenshot displays the Argo CD web interface for the 'us-sock-shop' application. The left sidebar shows the 'argo' logo and navigation links for Applications, Settings, User Info, and Documentation. The main panel shows the application's health and sync status. The 'APP HEALTH' is 'Healthy' (green heart). The 'SYNC STATUS' is 'Synced to master (8f690fd)' (green checkmark). The 'LAST SYNC' was successful 14 minutes ago (Fri Jan 16 2026 02:36:13 GMT+0530) with the comment 'Added new files'. The application is a 'us-sock-shop' service. The 'APPLICATION DETAILS TREE' shows the following components: payment (deploy), queue-master (deploy), rabbitmq (deploy), session-db (deploy), shipping (deploy), and user (deploy). Each component has a corresponding resource (rs) and a pod (pod) with a green heart icon indicating health. The sync status for each component is 'Synced' (green checkmark) and the last sync time is '14 minutes'.


```
ubuntu@ip-172-31-106-234:~$ kubectl config get-contexts
CURRENT  NAME                                CLUSTER                                AUTHINFO                                NAMESPACE
*        cluster1                            arn:aws:eks:ap-south-1:941377143083:cluster/mumbai-cluster  arn:aws:eks:ap-south-1:941377143083:cluster/mumbai-cluster
cluster2  arn:aws:eks:us-east-1:941377143083:cluster/us-cluster        arn:aws:eks:us-east-1:941377143083:cluster/us-cluster
```

Ensured all application resources were correctly deployed and managed in Mumbai cluster

```
ubuntu@ip-172-31-106-234:~$ kubectl config use-context cluster1
Switched to context "cluster1".
ubuntu@ip-172-31-106-234:~$ kubectl get pods
NAME                                READY    STATUS    RESTARTS   AGE
carts-6d4c64b486-tj4dt             1/1      Running   0           9m40s
carts-db-6b68658c5c-vsnr5          1/1      Running   0           9m40s
catalogue-cb49cf7-vhd6p            1/1      Running   0           9m40s
catalogue-db-76986f6766-q4lm5      1/1      Running   0           9m40s
front-end-758976979f-7xczn         1/1      Running   0           9m40s
orders-5f4649c895-j842z            1/1      Running   0           9m39s
orders-db-6dbd876695-c878f         1/1      Running   0           9m38s
payment-69c4b47bbc-mzh79           1/1      Running   0           9m40s
queue-master-7bc6c66fb7-nt2vs       1/1      Running   0           9m40s
rabbitmq-66748fcbdc-6zxxk7         2/2      Running   0           9m40s
session-db-5dc457f7-t8fxb          1/1      Running   0           9m40s
shipping-bcf5b787-f5bhx            1/1      Running   0           9m39s
user-875dbf8d-9szgx               1/1      Running   0           9m39s
user-db-586b466b65-bjrxl           1/1      Running   0           9m39s
ubuntu@ip-172-31-106-234:~$ kubectl get svc
NAME                                TYPE        CLUSTER-IP    EXTERNAL-IP    PORT(S)    AGE
carts                             ClusterIP   10.100.17.170  <none>         80/TCP     9m52s
carts-db                          ClusterIP   10.100.101.142 <none>         27017/TCP  9m51s
catalogue                         ClusterIP   10.100.173.208 <none>         80/TCP     9m51s
catalogue-db                      ClusterIP   10.100.126.198 <none>         3306/TCP   9m51s
front-end                         ClusterIP   10.100.72.4    <none>         80/TCP     9m51s
kubernetes                       ClusterIP   10.100.0.1     <none>         443/TCP    7h26m
orders                           ClusterIP   10.100.22.79   <none>         80/TCP     9m51s
orders-db                        ClusterIP   10.100.180.195 <none>         27017/TCP  9m51s
payment                          ClusterIP   10.100.120.19  <none>         80/TCP     9m51s
queue-master                     ClusterIP   10.100.80.183  <none>         80/TCP     9m51s
rabbitmq                         ClusterIP   10.100.168.26  <none>         5672/TCP,9090/TCP 9m51s
session-db                      ClusterIP   10.100.255.213 <none>         6379/TCP   9m51s
shipping                         ClusterIP   10.100.15.196  <none>         80/TCP     9m51s
user                             ClusterIP   10.100.61.51   <none>         80/TCP     9m51s
user-db                         ClusterIP   10.100.45.168  <none>         27017/TCP  9m51s
ubuntu@ip-172-31-106-234:~$
```

ip-172-31-106-234 0% 0.42 GB / 1.87 GB 0.01 Mb/s 0.00 Mb/s 5 hours ubuntu /: 23% /boot: 19% /boot/efi: 6%

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Ensured all application resources were correctly deployed and managed in US cluster

```
ubuntu@ip-172-31-106-234:~$ kubectl config use-context cluster2
Switched to context "cluster2".
ubuntu@ip-172-31-106-234:~$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
carts-6d4c64b486-2vc2n             1/1     Running   0           11m
carts-db-6b68658c5c-vc5cb          1/1     Running   0           11m
catalogue-cb49cf7-x5bh4            1/1     Running   0           11m
catalogue-db-76986f6766-56jkr      1/1     Running   0           11m
front-end-758976979f-zrpzm        1/1     Running   0           11m
orders-5f4649c895-mzjg9           1/1     Running   0           11m
orders-db-6dbd876695-jq2xr         1/1     Running   0           11m
payment-69c4b47bbc-ncp9n          1/1     Running   0           11m
queue-master-7bc6c66fb7-9s9k5     1/1     Running   0           11m
rabbitmq-66748fcbdc-q6dpv         2/2     Running   0           11m
session-db-5dcd457f7-7dnrx        1/1     Running   0           11m
shipping-bcfd5b787-mm4nw          1/1     Running   0           11m
user-875dbf8d-szxfl              1/1     Running   0           11m
user-db-586b466b65-j69t6         1/1     Running   0           11m
ubuntu@ip-172-31-106-234:~$ kubectl get svc
NAME      TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
carts     ClusterIP   172.20.243.98 <none>        80/TCP          12m
carts-db  ClusterIP   172.20.172.56 <none>        27017/TCP       12m
catalogue ClusterIP   172.20.61.218 <none>        80/TCP          12m
catalogue-db ClusterIP 172.20.19.200 <none>        3306/TCP       12m
front-end ClusterIP   172.20.197.42 <none>        80/TCP          12m
kubernetes ClusterIP   172.20.0.1    <none>        443/TCP         4h11m
orders    ClusterIP   172.20.104.201 <none>        80/TCP          12m
orders-db ClusterIP   172.20.169.240 <none>        27017/TCP      12m
payment   ClusterIP   172.20.244.54 <none>        80/TCP          12m
queue-master ClusterIP 172.20.230.141 <none>        80/TCP          12m
rabbitmq  ClusterIP   172.20.198.26 <none>        5672/TCP,9090/TCP 12m
session-db ClusterIP   172.20.69.115 <none>        6379/TCP       12m
shipping  ClusterIP   172.20.201.59 <none>        80/TCP          12m
user      ClusterIP   172.20.67.170 <none>        80/TCP          12m
user-db   ClusterIP   172.20.10.50  <none>        27017/TCP      12m
ubuntu@ip-172-31-106-234:~$
```

ip-172-31-106-234 0% 0.42 GB / 1.87 GB 0.01 Mb/s 0.00 Mb/s 5 hours ubuntu /: 23% /boot: 19% /boot/efi: 6%

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