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Branch - CBA Batch - 71

CS Practical 9

Scenario : To restrict network access to an application deployed on Kubernetes, you can use Network Policies. A NetworkPolicy resource defines how groups of pods are allowed to communicate with each other and with other network endpoints. You can configure network policies to control both ingress and egress traffic, limiting access to your application only to the necessary services or pods.

Tasks :

- Review any default network policies applied by Calico or Kubernetes that might affect traffic in your cluster.
- Add new network policies to meet the security requirements outlined above.
- After testing the policies, clean up any temporary or redundant policies that are no longer needed.

Steps and Screenshots :

Name - Yash Lakhtariya

Enrollment number - 21162101012

Branch - CBA Batch - 71

CS Practical 9

1. Login to IBM Cloud CLI / Shell and configure kubernetes and export datastore type env variable with value kubernetes

The screenshot shows a terminal window with a purple header bar. The terminal prompt is 'ysl ~ 09:30'. The user has run the command `ibmcloud ks cluster config --cluster cr3cpfc0m882o64nbq0`. The output indicates that the configuration was successful, and a context was added for the cluster. The user then runs `kubectl config current-context`, which shows the context is now set to 'mycluster-dali0-b5c.4x16-group3/cr3cpfc0m882o64nbq0'. Finally, the user exports the environment variable `DATASTORE_TYPE=kubernetes`.

```
ibmcloud ks cluster config --cluster cr3cpfc0m882o64nbq0
OK
The configuration for cr3cpfc0m882o64nbq0 was downloaded successfully.

Added context for cr3cpfc0m882o64nbq0 to the current kubeconfig file.
You can now execute 'kubectl' commands against your cluster. For example, run 'kubectl get nodes'.

kubectl config current-context
mycluster-dali0-b5c.4x16-group3/cr3cpfc0m882o64nbq0
export DATASTORE_TYPE=kubernetes

```

Name - Yash Lakhtariya

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Branch - CBA Batch - 71

CS Practical 9

2. Configure k8s with admin access to network part

The screenshot shows a terminal window with a pink and orange gradient background. The terminal is running on a system with a battery level of 3%, 7.93GB RAM, 54°C temperature, and 51% disk usage. The time is 09:36 AM. The terminal window has a title bar with the date and time. The terminal itself has a header with the user 'ysl' and the current timestamp '09:30'. The command history includes:

```
ibmcloud ks cluster config --cluster cr3cpfcs0m882o64nbq0
OK
The configuration for cr3cpfcs0m882o64nbq0 was downloaded successfully.

Added context for cr3cpfcs0m882o64nbq0 to the current kubeconfig file.
You can now execute 'kubectl' commands against your cluster. For example, run 'kubectl get nodes'.

kubectl config current-context
mycluster-dal10-b3c.4x16-group3/cr3cpfcs0m882o64nbq0
export DATASTORE_TYPE=kubernetes
ibmcloud ks cluster config --cluster cr3cpfcs0m882o64nbq0 --admin --network
OK
The configuration for cr3cpfcs0m882o64nbq0 was downloaded successfully.

Network Config:
/home/ysl/.bluemix/plugins/container-service/clusters/mycluster-dal10-b3c.4x16-group3-cr3cpfcs0m882o64nbq0-admin/calicoctl.cfg

Added context for cr3cpfcs0m882o64nbq0 to the current kubeconfig file.
You can now execute 'kubectl' commands against your cluster. For example, run 'kubectl get nodes'.
```

The bottom of the terminal shows a dock with various application icons, including a browser, file manager, and system tools. The terminal window has a rounded border and a light gray background.

Name - Yash Lakhtariya
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Branch - CBA Batch - 71
CS Practical 9

3. If in IBM shell, copy the calico config to /etc directory to configure calicectl

The screenshot shows a terminal window titled "IBM Cloud Shell" with the URL <https://cloud.ibm.com/shell>. The terminal output is as follows:

```
target      Set or View the targeted region, account or resource group
tp         Manage Transit Gateway service
tts        Manage crypto units in the IBM Cloud
update     Update CLI to the latest version
version    Print the version
watson    Manage Watson Assistant v1.
help, h   Show help

Enter `ibmcloud help [command]` for more information about a command.

ENVIRONMENT VARIABLES:
IBMCLOUD_COLOR=false          Do not colorize output
IBMCLOUD_VERSION_CHECK=false   Do not check latest version for update
IBMCLOUD_HTTP_TIMEOUT=5        A time limit for HTTP requests
IBMCLOUD_API_KEY=api_key_value API Key used for login
IBMCLOUD_VPC_URL=url_value    The custom server URL to use when obtaining an instance identity token and IAM token as a VPC VSI compute resource. This value will replace the default server endpoint of the VPC VSI in
IBMCLOUD_CR_VPC_TOKEN=token   Compute resource token used for login. Can either be a token string or a path to a @file.
IBMCLOUD_CR_TOKEN=token       The name, ID, or CRN of the linked trusted IAM profile to be used when obtaining the IAM access token. If authenticating as a VPC VSI compute resource, only specifying a trusted profile
CRN or ID is supported.
IBMCLOUD_TRACE=true          Print API request diagnostics to stdout
IBMCLOUD_TRACE=path/to/trace.log Append API request diagnostics to a log file
IBMCLOUD_HOME=path/to/dir    Path to config directory

GLOBAL OPTIONS:
--version, -v                  Print the version
--help, -h                      Show help

yashlakhtariya21@cloudshell:~$ ibmcloud ks cluster config --cluster cr3cpfc0m882o64nbq0 --admin --network
OK
The configuration for cr3cpfc0m882o64nbq0 was downloaded successfully.

Network Config:
/tmp/ic-/1/.bluemix/plugins/container-service/clusters/mycluster-dal10-b3c.4x16-group3-cr3cpfc0m882o64nbq0-admin/calicectl.cfg

Added context for cr3cpfc0m882o64nbq0 to the current kubeconfig file.
You can now execute 'kubectl' commands against your cluster. For example, run 'kubectl get nodes'.
yashlakhtariya21@cloudshell:~$ kubectl config current-context
mycluster-dal10-b3c.4x16-group3-cr3cpfc0m882o64nbq0/admin
yashlakhtariya21@cloudshell:~$ export DATASTORE_TYPE=kubernetes
yashlakhtariya21@cloudshell:~$ yashlakhtariya21@cloudshell:~$ yashlakhtariya21@cloudshell:~$ sudo mv /tmp/ic-/1/.bluemix/plugins/container-service/clusters/mycluster-dal10-b3c.4x16-group3-cr3cpfc0m882o64nbq0-admin/calicectl.cfg /etc/calico
-bash: mv: command not found
yashlakhtariya21@cloudshell:~$ cp /tmp/ic-/1/.bluemix/plugins/container-service/clusters/mycluster-dal10-b3c.4x16-group3-cr3cpfc0m882o64nbq0-admin/calicectl.cfg /etc/calico
yashlakhtariya21@cloudshell:~$ yashlakhtariya21@cloudshell:~$
```

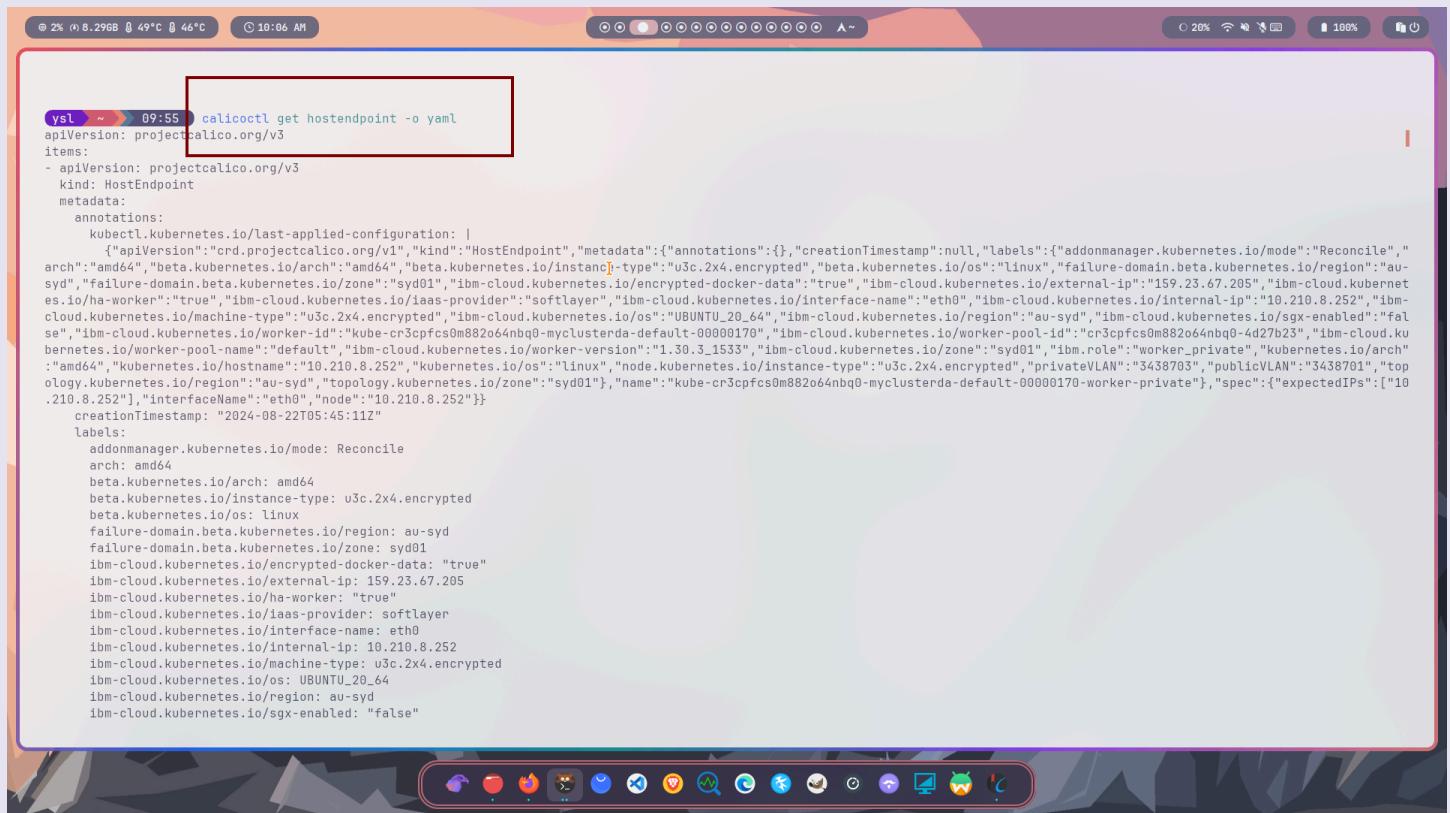
Name - Yash Lakhtariya

Enrollment number - 21162101012

Branch - CBA Batch - 71

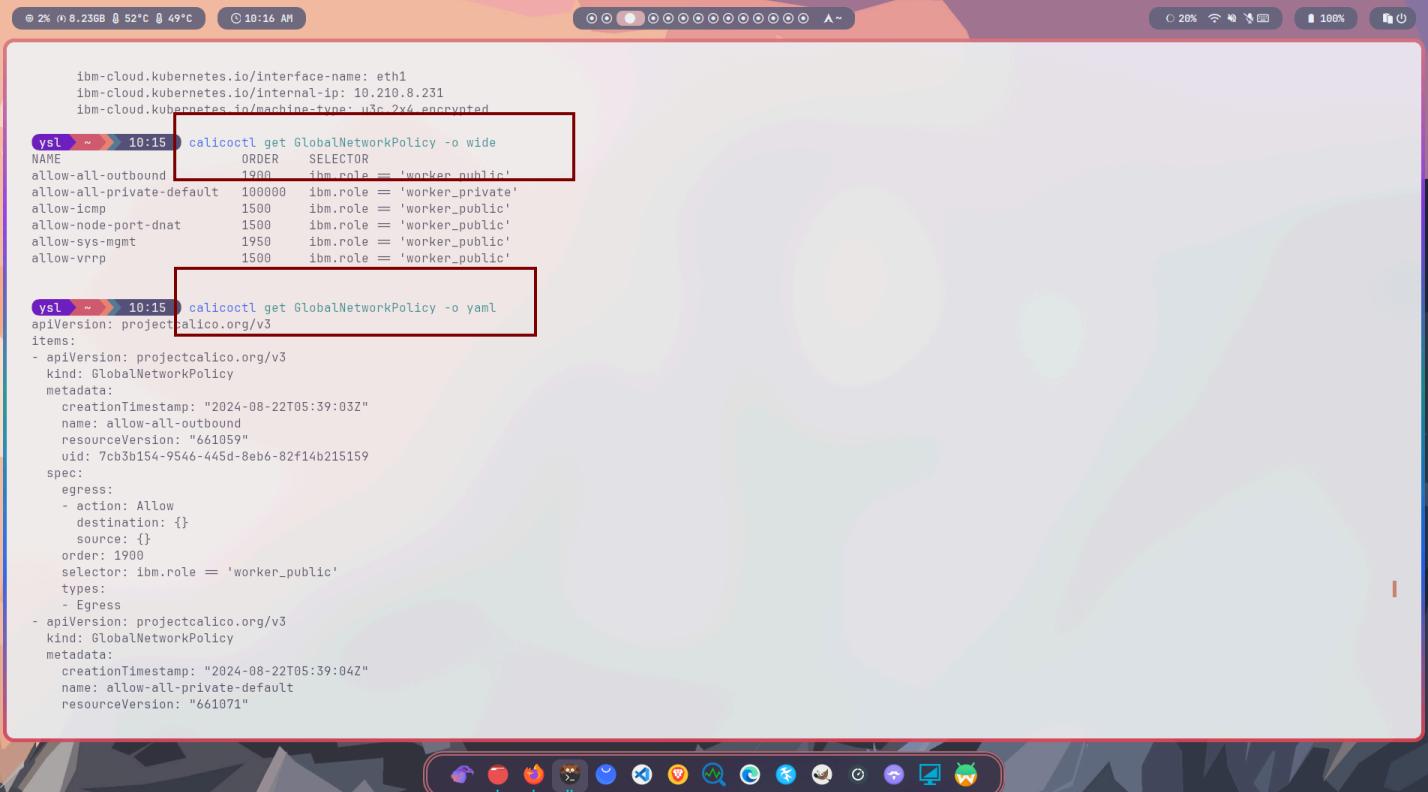
CS Practical 9

4. Try getting hostendpoints, Global Network Policies and other Network Policies using calicoctl



```
ysl ~ 09:55 calicoctl get hostendpoint -o yaml
apiVersion: projectcalico.org/v3
items:
- apiVersion: projectcalico.org/v3
  kind: HostEndpoint
  metadata:
    annotations:
      kubectl.kubernetes.io/last-applied-configuration: |
        {"apiVersion":"crd.projectcalico.org/v1","kind":"HostEndpoint","metadata":{"annotations":{},"creationTimestamp":null,"labels":{"addonmanager.kubernetes.io/mode":"Reconcile","arch":"amd64","beta.kubernetes.io/arch":"amd64","beta.kubernetes.io/instance-type":"u3c.2x4.encrypted","beta.kubernetes.io/os":"linux","failure-domain.beta.kubernetes.io/region":"au-syd","failure-domain.beta.kubernetes.io/zone":"syd01","ibm-cloud.kubernetes.io/encrypted-docker-data":"true","ibm-cloud.kubernetes.io/external-ip":"159.23.67.205","ibm-cloud.kubernetes.io/ha-worker":"true","ibm-cloud.kubernetes.io/ias-provider":"softlayer","ibm-cloud.kubernetes.io/interface-name":"eth0","ibm-cloud.kubernetes.io/internal-ip":"10.210.8.252","ibm-cloud.kubernetes.io/machine-type":"u3c.2x4.encrypted","ibm-cloud.kubernetes.io/os":"UBUNTU_20_64","ibm-cloud.kubernetes.io/region":"au-syd","ibm-cloud.kubernetes.io/sgx-enabled":"false","ibm-cloud.kubernetes.io/worker-id":"kube-cr3cpfc0m882064nbq0-myclusterda-default-00000170","ibm-cloud.kubernetes.io/worker-pool-id":"cr3cpfc0m882064nbq0-4d27b23","ibm-cloud.kubernetes.io/worker-pool-name":"default","ibm-cloud.kubernetes.io/worker-version":"1.30.3_1533","ibm-cloud.kubernetes.io/zone":"syd01","ibm.role":"worker_private","kubernetes.io/arch":"amd64","kubernetes.io/hostname":"10.210.8.252","kubernetes.io/os":"linux","node.kubernetes.io/instance-type":"u3c.2x4.encrypted","privateVLAN":"3438703","publicVLAN":"3438701","topology.kubernetes.io/region":"au-syd","topology.kubernetes.io/zone":"syd01"},"name":"kube-cr3cpfc0m882064nbq0-myclusterda-default-00000170-worker-private"},"spec":{"expectedIPs":["10.210.8.252"]},"interfaceName":"eth0","node":"10.210.8.252"}}
    creationTimestamp: "2024-08-22T05:45:11Z"
  labels:
    addonmanager.kubernetes.io/mode: Reconcile
  arch: amd64
  beta.kubernetes.io/arch: amd64
  beta.kubernetes.io/instance-type: u3c.2x4.encrypted
  beta.kubernetes.io/os: linux
  failure-domain.beta.kubernetes.io/region: au-syd
  failure-domain.beta.kubernetes.io/zone: syd01
  ibm-cloud.kubernetes.io/encrypted-docker-data: "true"
  ibm-cloud.kubernetes.io/external-ip: 159.23.67.205
  ibm-cloud.kubernetes.io/ha-worker: "true"
  ibm-cloud.kubernetes.io/interface-name: eth0
  ibm-cloud.kubernetes.io/internal-ip: 10.210.8.252
  ibm-cloud.kubernetes.io/machine-type: u3c.2x4.encrypted
  ibm-cloud.kubernetes.io/os: UBUNTU_20_64
  ibm-cloud.kubernetes.io/region: au-syd
  ibm-cloud.kubernetes.io/sgx-enabled: "false"
```

Name - Yash Lakhtariya
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Branch - CBA Batch - 71
CS Practical 9



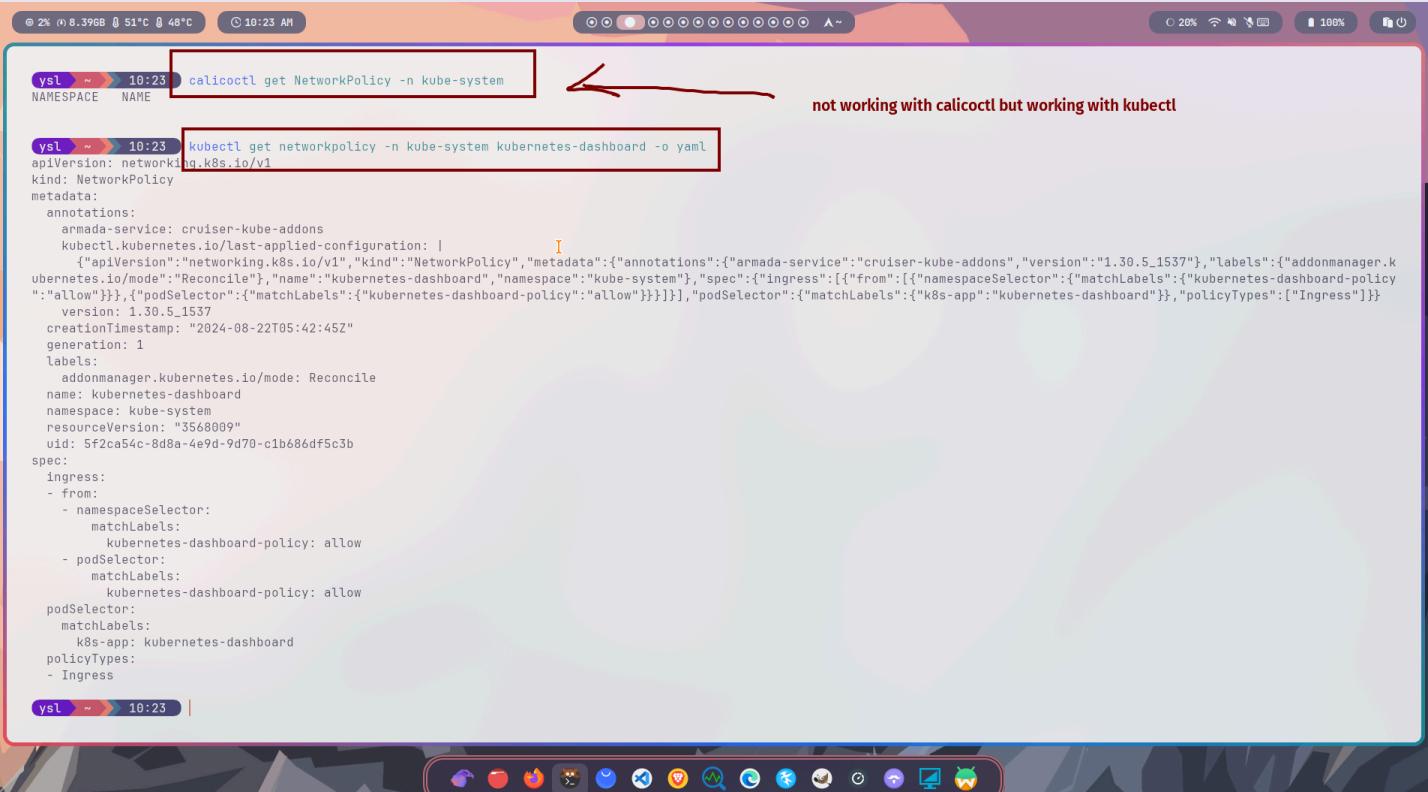
```

ibm-cloud.kubernetes.io/interface-name: eth1
ibm-cloud.kubernetes.io/internal-ip: 10.210.8.231
ibm-cloud.kubernetes.io/machine-type: u3c-2x4 encrypted

ydl ~ 10:15 calicoctl get GlobalNetworkPolicy -o wide
NAME ORDER SELECTOR
allow-all-outbound 1900 ibm.role == 'worker_public'
allow-all-private-default 100000 ibm.role == 'worker_private'
allow-icmp 1500 ibm.role == 'worker_public'
allow-node-port-dnat 1500 ibm.role == 'worker_public'
allow-sys-mgmt 1950 ibm.role == 'worker_public'
allow-vrrp 1500 ibm.role == 'worker_public'

ydl ~ 10:15 calicoctl get GlobalNetworkPolicy -o yaml
apiVersion: projectcalico.org/v3
items:
- apiVersion: projectcalico.org/v3
  kind: GlobalNetworkPolicy
  metadata:
    creationTimestamp: "2024-08-22T05:39:03Z"
    name: allow-all-outbound
    resourceVersion: "661059"
    uid: 7cb3b154-9546-445d-8eb6-82f14b215159
  spec:
    egress:
      - action: Allow
        destination: {}
        source: {}
        order: 1900
        selector: ibm.role == 'worker_public'
        types:
          - Egress
- apiVersion: projectcalico.org/v3
  kind: GlobalNetworkPolicy
  metadata:
    creationTimestamp: "2024-08-22T05:39:04Z"
    name: allow-all-private-default
    resourceVersion: "661071"

```



not working with calicoctl but working with kubectl

```

ydl ~ 10:23 calicoctl get NetworkPolicy -n kube-system
NAMESPACE NAME

ydl ~ 10:23 kubectl get networkpolicy -n kube-system kubernetes-dashboard -o yaml
apiVersion: networking.k8s.io/v1
kind: NetworkPolicy
metadata:
  annotations:
    armada-service: cruiser-kube-addons
    kubectl.kubernetes.io/last-applied-configuration: | I
      {"apiVersion":"networking.k8s.io/v1","kind":"NetworkPolicy","metadata":{"annotations":{"armada-service":"cruiser-kube-addons","version":"1.30.5_1537"}, "labels":{"addonmanager.kubernetes.io mode": "Reconcile"}, "name":"kubernetes-dashboard", "namespace": "kube-system"}, "spec":{"ingress":[{"from":[{"namespaceSelector":{"matchLabels":{"kubernetes-dashboard-policy": "allow"} }]}], "podSelector":{"matchLabels":{"k8s-app": "kubernetes-dashboard"}}, "policyTypes":["Ingress"]}}
    version: 1.30.5_1537
  creationTimestamp: "2024-08-22T05:42:45Z"
  generation: 1
  labels:
    addonmanager.kubernetes.io mode: Reconcile
    name: kubernetes-dashboard
    namespace: kube-system
    resourceVersion: "3568009"
    uid: 5f2ca54c-8d8a-4e9d-9d70-c1b686df5c3b
spec:
  ingress:
    - from:
      - namespaceSelector:
          matchLabels:
            kubernetes-dashboard-policy: allow
      - podSelector:
          matchLabels:
            kubernetes-dashboard-policy: allow
    podSelector:
      matchLabels:
        k8s-app: kubernetes-dashboard
    policyTypes:
    - Ingress

```

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Enrollment number - 21162101012

Branch - CBA Batch - 71

CS Practical 9

5. Create namespace in k8s cluster and create and expose any pod like nginx

The screenshot shows a terminal window with a purple title bar containing system status icons. The main area displays the following command history:

```
yel ~ 10:37 kubectl create ns yashlani-jagya
namespace/yashlani-jagya created
yel ~ 10:37 kubectl create deployment --namespace yashlani-jagya nginx --image=nginx
deployment.apps/nginx created
yel ~ 10:38 kubectl expose --namespace yashlani-jagya deployment nginx --port=80
service/nginx exposed
yel ~ 10:39
```

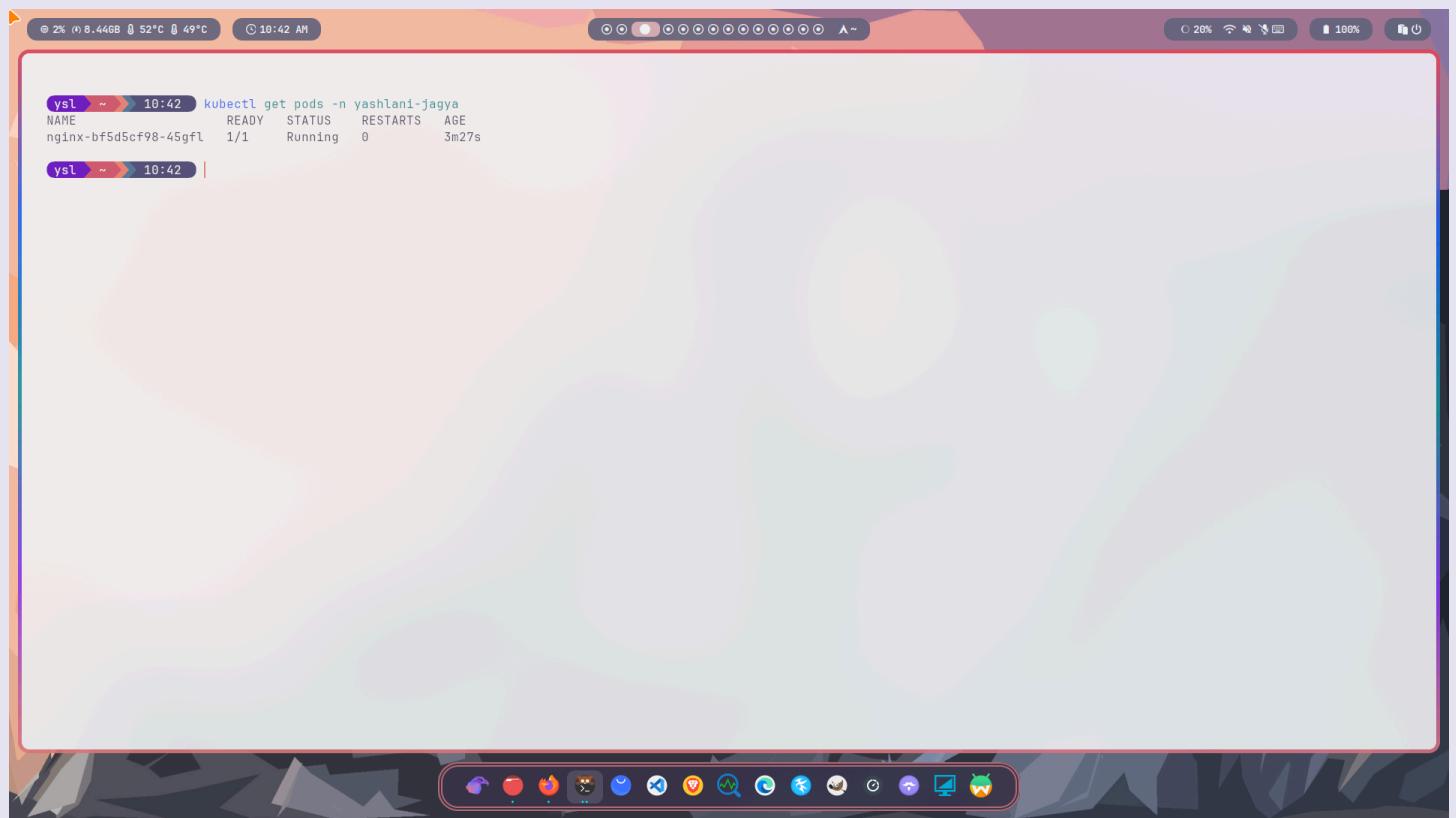
A red rectangular box highlights the first three commands: creating the namespace, creating the deployment, and exposing the service.

Name - Yash Lakhtariya

Enrollment number - 21162101012

Branch - CBA Batch - 71

CS Practical 9



A screenshot of a Linux desktop environment showing a terminal window. The terminal window has a light blue background and a dark blue header bar. The header bar displays system status icons and the current time (10:42 AM). The terminal window itself shows the command 'kubectl get pods -n yashlani-jagya' followed by its output:

```
ysl ~ 10:42 kubectl get pods -n yashlani-jagya
NAME      READY   STATUS    RESTARTS   AGE
nginx-bf5d5cf98-45gfl  1/1     Running   0          3m27s
```

The terminal window is positioned above a dock containing various application icons, including a browser, file manager, terminal, and system tray icons.

Name - Yash Lakhtariya

Enrollment number - 21162101012

Branch - CBA Batch - 71

CS Practical 9

6. Run pod container and check the egress and ingress traffic

The screenshot shows two terminal windows side-by-side on a Linux desktop environment.

Left Terminal:

```
ysl ~ 10:42 kubectl get pods -n yashlani-jagya
NAME          READY   STATUS    RESTARTS   AGE
nginx-bf5d5cf98-45gfl  1/1     Running   0          3m27s
ysl ~ 10:44
```

Right Terminal:

```
ysl ~ 10:44 kubectl run -n yashlani-jagya access --rm -ti --image busybox /bin/sh
If you don't see a command prompt, try pressing enter.
/ # ls
bin  dev  etc  home  lib  lib64  proc  root  sys  tmp  usr  var
/ # wget --timeout=5 nginx -O -
Connecting to nginx (172.21.132.111:80)
writing to stdout
<!DOCTYPE html>
<html>
<head>
<title>Welcome to nginx!</title>
<style>
html { color-scheme: light dark; }
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>
-
written to stdout
/ #
```

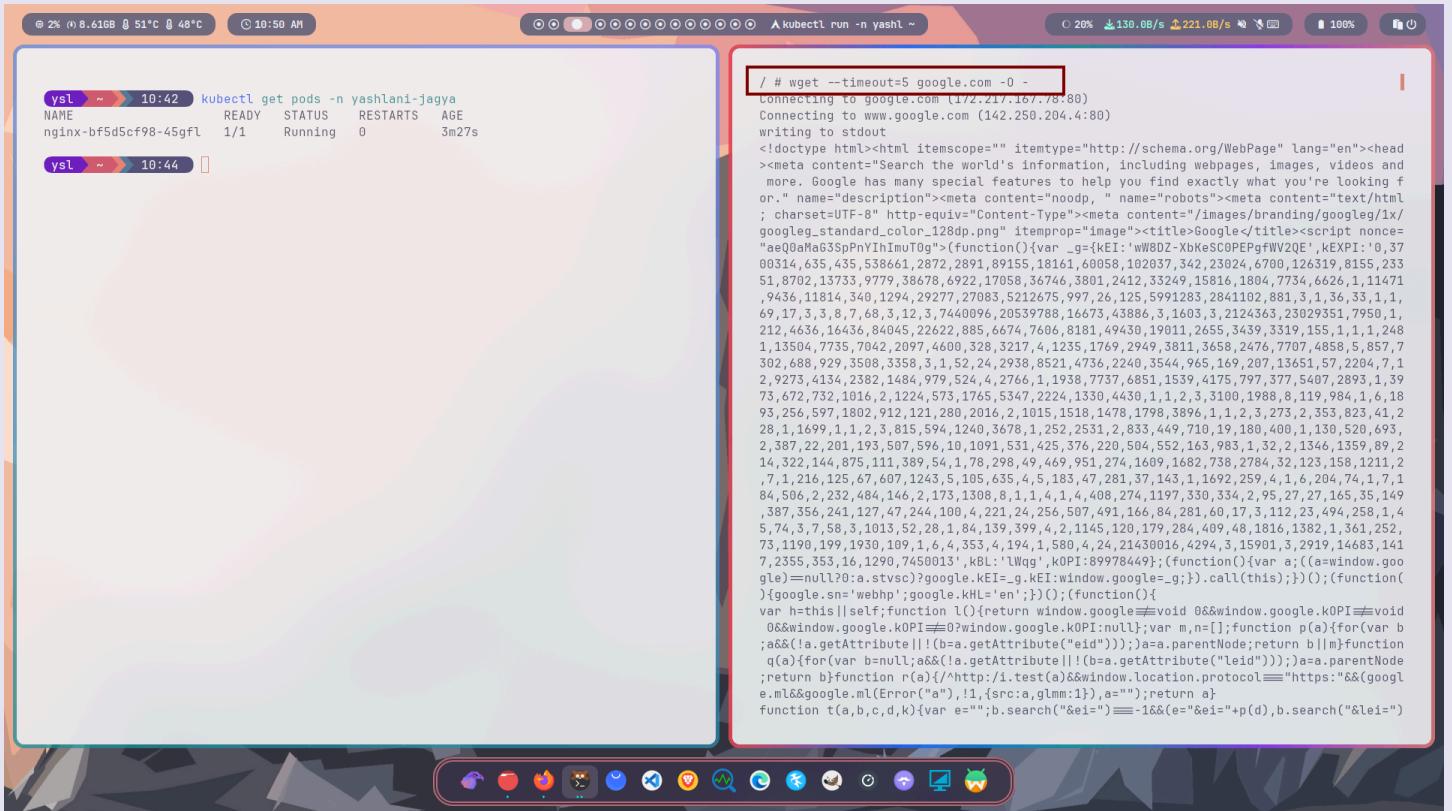
The desktop interface includes a dock with various application icons at the bottom.

Name - Yash Lakhtariya

Enrollment number - 21162101012

Branch - CBA Batch - 71

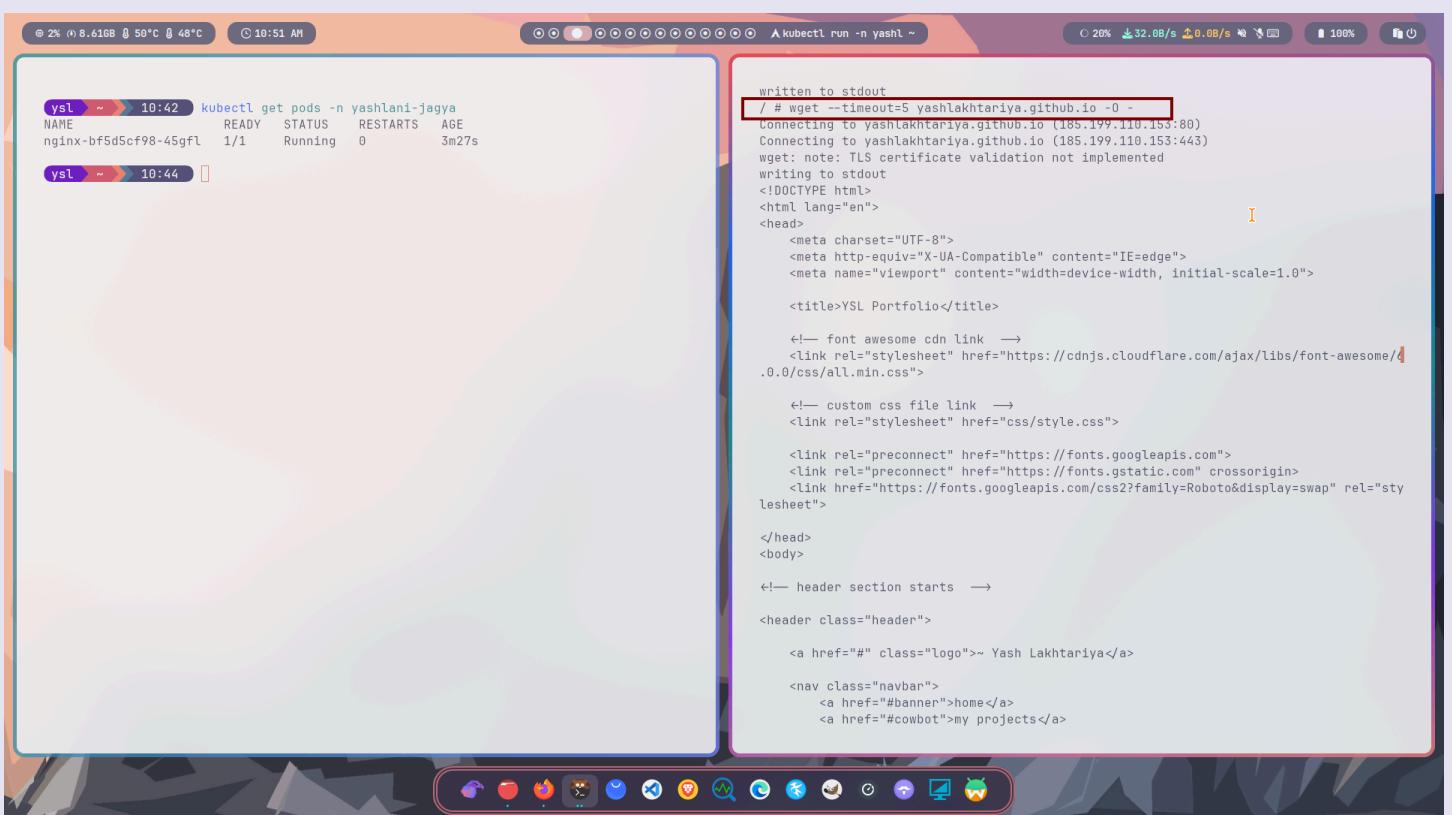
CS Practical 9



```
 2% (0) 8.61GB 51°C 48°C 10:50 AM A kubectl run -n yashlani-jagya
ydl ~ 10:42 kubectl get pods -n yashlani-jagya
NAME READY STATUS RESTARTS AGE
nginx-bf5d5cf98-45gfl 1/1 Running 0 3m27s

ydl ~ 10:44
```

```
/ # wget --timeout=5 google.com -O
Connecting to www.google.com (142.205.204.4:80)
writing to stdout
<!doctype html><html itemscope="" itemtype="http://schema.org/WebPage" lang="en"><head>
<meta content="Search the world's information, including webpages, images, videos and more. Google has many special features to help you find exactly what you're looking for." name="description"><meta content="noindex, " name="robots"><meta content="text/html; charset=UTF-8" http-equiv="Content-Type"><meta content="/images/branding/googlelog/1x/google_standard_color_128dp.png" itemprop="image"><title>Google</title><script nonce="ae00MaG3SpNvIhImu0g">(function(){var _g={kEI:'wWB0Z-xbKeSC0PpfFW20E',kEXPI:'0.3700314,635,435,538661,2872,2891,89155,18161,60058,102037,342,23024,6700,126319,8155,23351,8702,13733,9779,38678,6922,17058,36746,3801,2412,33249,15816,1804,7734,6626,1,11471,9436,11814,340,1294,29277,27083,5212675,997,26,125,5991283,2841102,881,3,1,36,53,1,1,69,17,3,8,7,68,3,12,3,7440096,20539788,16673,438863,3,1603,3,2124363,23029351,7950,1,212,4636,16436,84045,22622,885,6674,7606,8181,49430,19011,2655,3439,3319,155,1,1,1,2481,13504,7735,7042,2097,4600,328,3217,4,1235,1769,2949,3811,3658,2476,7707,4858,5,857,7302,688,929,3508,3358,3,1,52,24,2938,8521,4736,2240,3544,965,169,207,13651,57,2204,7,1,29273,4134,2382,1484,979,524,4,2766,1,1938,7737,6851,1539,4175,797,377,5407,2893,1,3973,672,1016,2,1224,573,1765,5347,2224,1330,4430,1,1,2,3,3100,1988,8,119,984,1,6,1893,256,597,1802,912,121,280,2016,2,1015,1518,1478,1798,3896,1,1,2,3,273,2,353,823,41,28,1,1699,1,1,2,3,815,594,1240,3678,1,252,2531,2,833,449,710,19,180,400,1,130,520,693,2,387,22,201,193,507,596,10,1091,531,425,376,220,504,552,163,983,1,32,2,1346,1359,89,214,322,144,875,111,389,54,1,78,298,49,469,951,274,1609,1682,738,2784,32,123,158,1211,2,7,1,216,125,67,607,1243,5,105,635,4,5,183,47,281,37,143,1,1692,259,4,1,6,204,74,1,7,184,506,2,232,484,146,2,173,1308,8,1,1,4,1,4,408,274,1197,330,334,2,95,27,27,165,35,149,387,356,241,127,47,244,100,4,221,24,256,507,491,166,84,281,60,17,3,112,23,494,258,1,4574,3,7,58,3,1013,52,28,1,84,139,399,4,2,1145,120,179,284,409,48,1816,1382,1,361,252,73,1190,199,1930,109,1,6,4,353,4,194,1,580,4,24,2143016,4294,3,15901,3,2919,14683,1417,2355,353,16,1290,7450013',kBL:'!Wqg';kOI:'89978449';(function(){var a;((a>window.google)||null?0:a.stvc)?google.kEI=_g,kEI>window.google=_g;():call(this);})();(function(){google.sn='webhp';google.kHL='en';})();(function(){var h=this||self;function l(){return window.google==void 0&&window.google.KOI==void 0&&window.google.kOI==void 0&&window.google.KOI:null;}var m=[];function p(a){for(var b;a&&(!a.getAttribute||!(b=a.getAttribute("eid")));a=a.parentNode;return b||m)function q(a){for(var b=null;a&&(!a.getAttribute||!(b=a.getAttribute("leid")));a=a.parentNode;return b||m)function r(a){for(var b=null;a&&(!a.getAttribute||!(b=a.getAttribute("leid")));a=a.parentNode;return b||m)function s(a){for(var b=null;a&&(!a.getAttribute||!(b=a.getAttribute("leid")));a=a.parentNode;return b||m)function t(a,b,c,d,k){var e="";b.search("&ei")==-1&&(e="&ei="+p(d),b.search("&lei=")
```



```
 2% (0) 8.61GB 50°C 48°C 10:51 AM A kubectl run -n yashlani-jagya
ydl ~ 10:42 kubectl get pods -n yashlani-jagya
NAME READY STATUS RESTARTS AGE
nginx-bf5d5cf98-45gfl 1/1 Running 0 3m27s

ydl ~ 10:44
```

```
written to stdout
/ # wget --timeout=5 yashlakhtariya.github.io -O
Connecting to yashlakhtariya.github.io (185.199.110.153:80)
Connecting to yashlakhtariya.github.io (185.199.110.153:443)
wget: note: TLS certificate validation not implemented
writing to stdout
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>YSL Portfolio</title>
<!-- font awesome cdn link -->
<link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.0.0/css/all.min.css">
<!-- custom css file link -->
<link rel="stylesheet" href="css/style.css">
<link rel="preconnect" href="https://fonts.googleapis.com">
<link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>
<link href="https://fonts.googleapis.com/css2?family=Roboto&display=swap" rel="stylesheet">
</head>
<body>
<!-- header section starts -->
<header class="header">
<a href="#" class="logo">~ Yash Lakhtariya</a>
<nav class="navbar">
<a href="#banner">home</a>
<a href="#cowbot">my projects</a>
```

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Branch - CBA Batch - 71

CS Practical 9

The screenshot shows a Linux desktop environment with a pink and orange theme. At the top, there's a system tray with battery level (3%), signal strength (8.62GB), temperature (49°C), and volume (46%). The date and time (10:57 AM) are also shown. Below the tray, there are two terminal windows and a file viewer.

Terminal 1:

```
ysl ~ 10:42 kubectl get pods -n yashlani-jagya
NAME          READY   STATUS    RESTARTS   AGE
nginx-bf5d5cf98-45gfl  1/1     Running   0          3m27s
```

Terminal 2:

```
ysl ~ 10:44
```

File Viewer:

sometimes o/p isn't redirected to stdout then use textfile instead

```
<div class="inputBox">
  <input type="number" placeholder="Number">
</div>
<pre>/ # wget --timeout=5 fast.com -O ahiyalakho
Connecting to fast.com [104.68.6.240:80]
Connecting to fast.com [104.68.6.240:43]
wget: note: TLS certificate validation not implemented
saving to 'ahiyalakho'
ahiyalakho           100% |*****| 25888  0:00:00 ETA
'ahiyalakho' saved
/ #
/ # cat ahiyalakho
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
<!-- htmllint id-class-style="dash" -->
<!-- htmllint attr-name-style="dash" -->
<html>
  <head profile="http://www.w3.org/2005/10/profile">
    <meta http-equiv="content-type" content="text/html; charset=UTF-8">
    <meta charset="UTF-8">
    <meta name="description" content="How fast is your download speed? In seconds, FAST.com's simple Internet speed test will estimate your ISP speed.">
    <link href="https://fast.com" rel="canonical">
```

The file viewer displays the HTML content of the fast.com page, which includes meta tags and links to various language versions of the site.

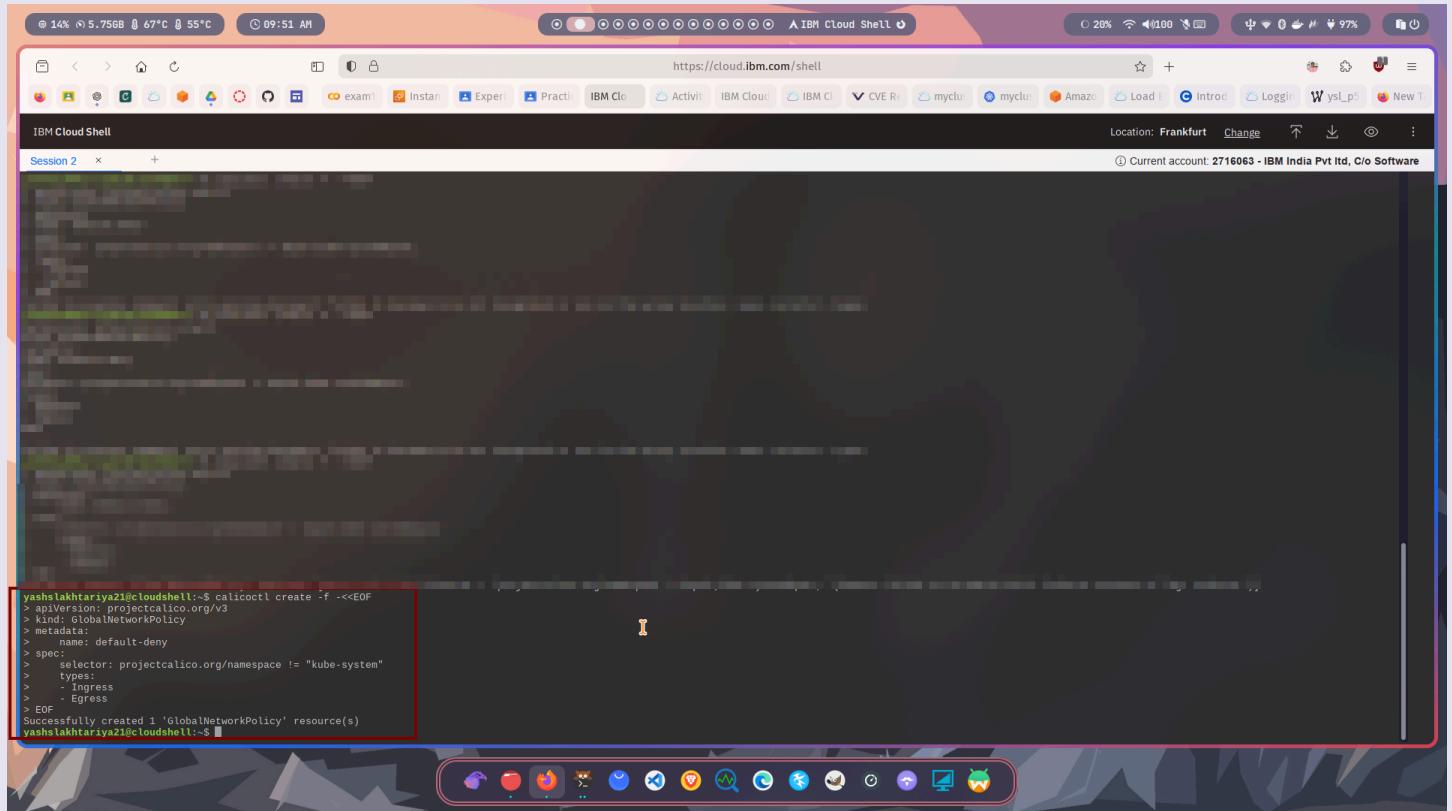
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CS Practical 9

7. Now create global network policy to deny all traffic



The screenshot shows a browser window for the IBM Cloud Shell at <https://cloud.ibm.com/shell>. The session is titled "Session 2". The terminal output is displayed in a dark-themed interface. A red box highlights the command and its output:

```
yashlakhtariya21@cloudshell:~$ calicoctl create -f -<<EOF
> apiVersion: projectcalico.org/v3
> kind: GlobalNetworkPolicy
> metadata:
>   name: default-deny
> spec:
>   selector: projectcalico.org/namespace != "kube-system"
>   types:
>     - Ingress
>     - Egress
> EOF
Successfully created 1 'GlobalNetworkPolicy' resource(s)
yashlakhtariya21@cloudshell:~$
```

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CS Practical 9

A screenshot of a Linux desktop environment showing a terminal window. The terminal has a light gray background and a dark blue border. It displays the following command and its output:

```
/ # wget --timeout=2 google.com
wget: bad address 'google.com'
/ #
```

The terminal window is positioned over a blurred background of a desktop screen with various icons and a colorful gradient. At the top of the image, there is a horizontal bar with various system status icons and battery levels (14%, 6GB RAM, 65°C, 51°C). The bottom of the image shows a dock with several application icons.

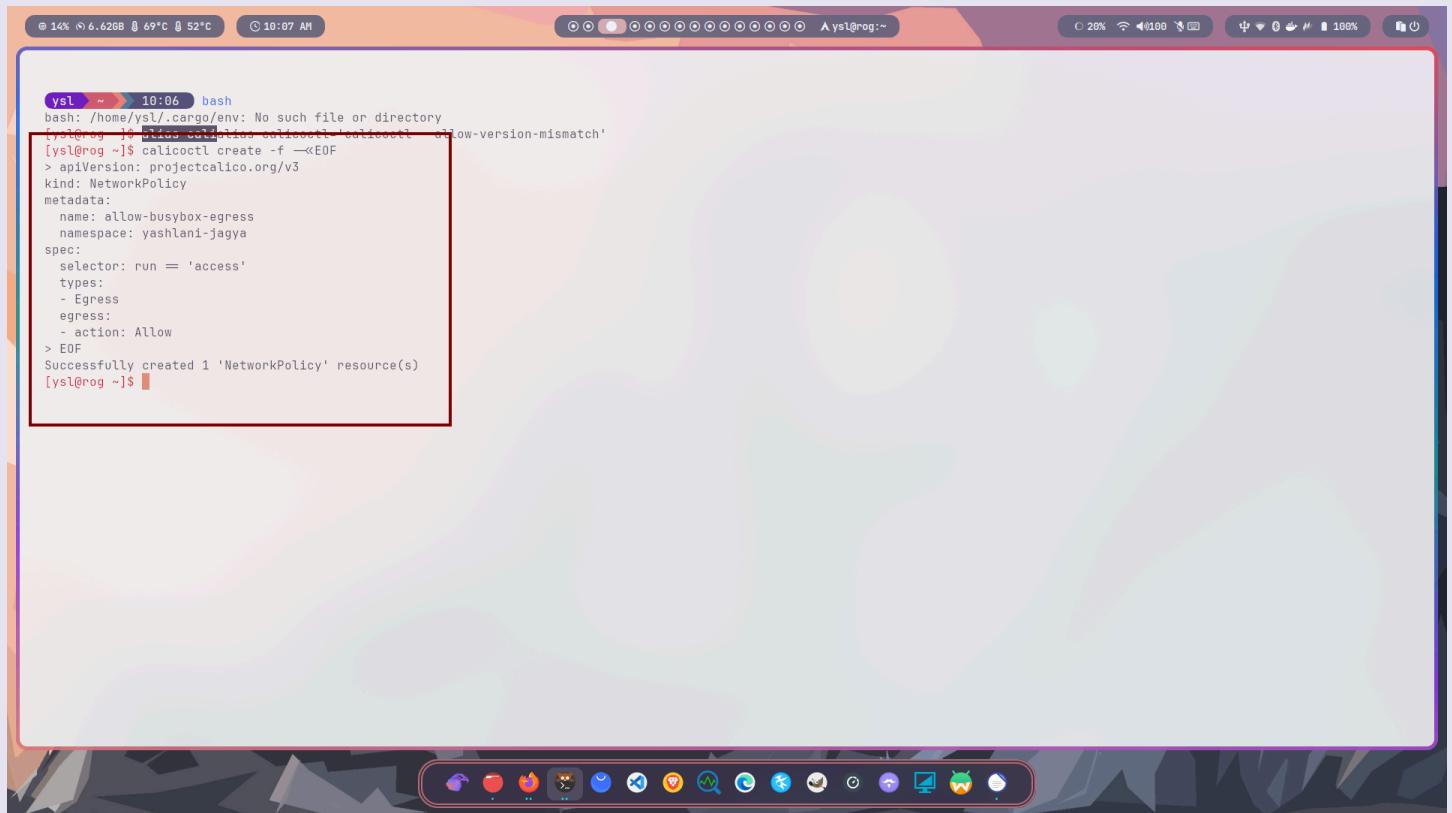
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8. Now create a policy to allow our pod's egress traffic



The screenshot shows a terminal window on a Linux desktop environment. The terminal window has a red border and displays the following command and its output:

```
ysl ~ 10:06 bash
bash: /home/ysl/.cargo/env: No such file or directory
[ysl@rog ~]$ kubectl config use-context calicoctl 'allow-version-mismatch'
[ysl@rog ~]$ calicocctl create -f --EOF
> apiVersion: projectcalico.org/v3
kind: NetworkPolicy
metadata:
  name: allow-busybox-egress
  namespace: yashlani-jagya
spec:
  selector: run == 'access'
  types:
  - Egress
  egress:
  - action: Allow
> EOF
Successfully created 1 'NetworkPolicy' resource(s)
[ysl@rog ~]$
```

The terminal window is part of a desktop interface with a dock at the bottom containing various application icons.

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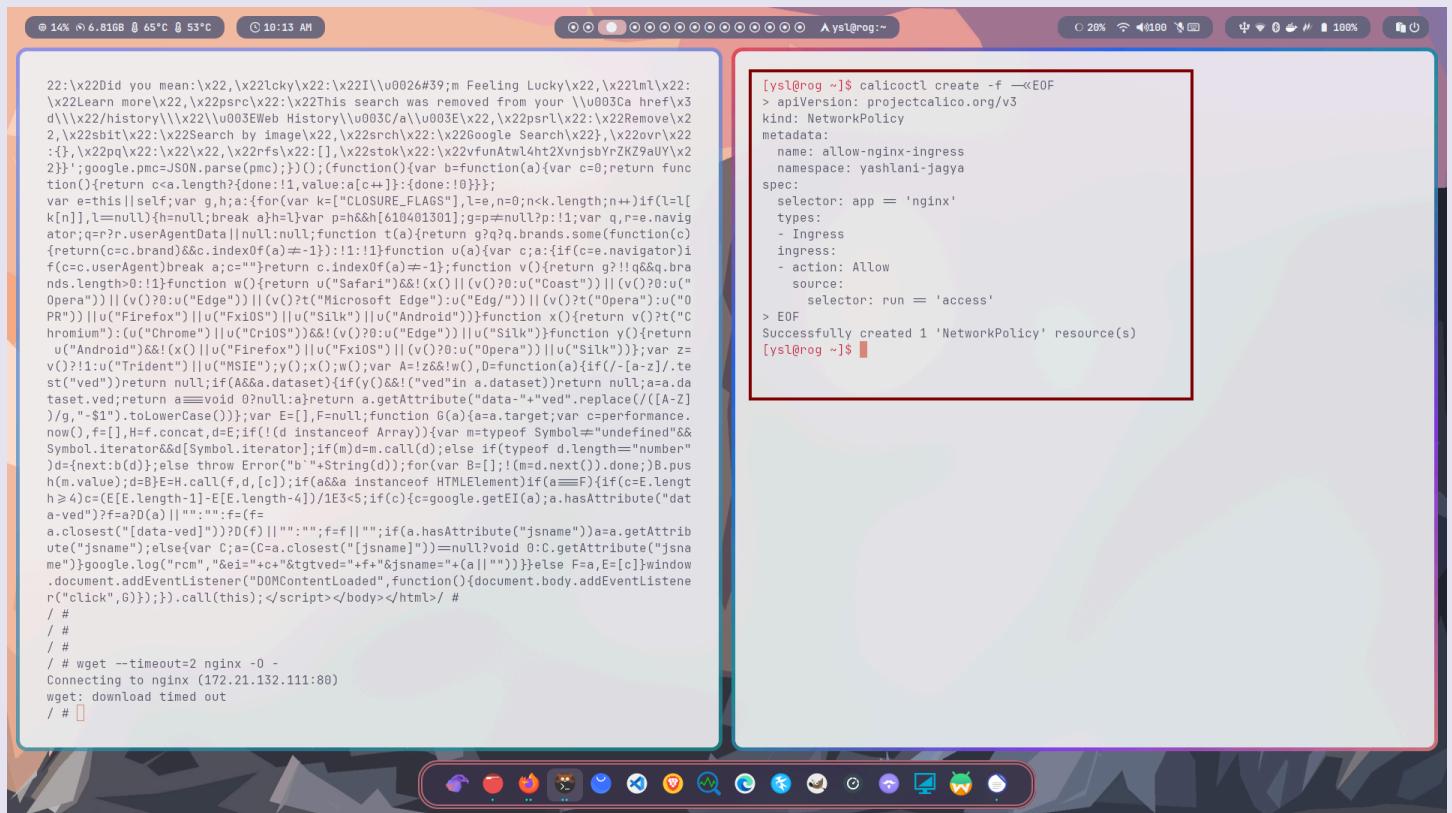
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9. Ingress traffic is still blocked so create a new policy to allow communication between these pods



```
22:\x20Did you mean:\x22,\x22lucky\x22:\x22I\x20\x006#39;m Feeling Lucky\x22,\x22ml\x22:\x22Learn more\x22,\x22psrc\x22:\x22This search was removed from your \u003ca href\x3d\\"\\"x22/history\\x22\\u003E\\x22 History\\u003C/a\\u003E\\x22,\x22psr\\x22:\\x22Remove\\x22,\x22bit\\x22:\\x22Search by image\\x22,\x22srch\\x22:\\x22Google Search\\x22,\x22zovr\\x22:{},\x22pd\\x22:\\x22x22,\x22rfs\\x22:[],\x22stok\\x22:\\x22funAtwL4htXvnjsbYrZK29aUY\\x22}';google.pmc=JSON.parse(pmcs)}();function(){var b=function(a){var c=0;return function(){return ca.length?{done:!1,value:a[c++]}:{done:0}}};var e=this||self;var g,h;a:{for(var k=[\"CLOSURE_FLAGS\"],l=e,n=0;n<k.length;n++)if(l==[k[n]],l==null){h=null;break}a=j;var p=h&h[610401301];g=p==null?p:[1;var q,r=e.navigator;q=r.userAgentData||null:null;function t(a){return g?q.q.brands.some(function(c){return(csc.brand)&&c.indexOf(a)==-1}):11!1}function u(a){var c;a;if(c==e.navigator)if(cc.userAgent)break a=c;"";return c.indexOf(a)==-1};function v(){return g?!q&&q.brands.length>0!1}function w(){return u("Safari")&&!x()||(v())?0:u("Coast")||(v())?0:u("Opera"))||(v())?0:u("Edge"))||(v())?t("Microsoft Edge"):(v())?t("Edg")||(v())?t("Opera"):(v())?0:u("PR")||(v())?0:u("Fx10S")||(v())?0:u("Silk"))||u("Android"));function x(){return v()?t("Cromium"):((v())?0:u("Chrome"))||(v())?0:u("Edge"))||u("Silk"));function y(){return u("Android")&&(x()||u("Firefox"))||(v())?0:u("Opera"))||u("Silk");var z=v()?11:u("Trident")||u("MSIE");y();x();var A=z&&!w();D=function(a){if(/-/|[-a-z].test("ved"))return null;if(A&&a.dataset){if(y()&&!(ved"in a.dataset))return null;A=a.dataset.ved;return A==void 0?null:a}return a.getAttribute("data-\"ved".replace(/[a-zA-Z]/g,"-$1").toLowerCase()));var E=[],F=null;function G(a){a=a.target;var cs=performance.now(),f=[],H=f.concat,d=if(!d instanceof Array){var m=typeof Symbol=="undefined"&&Symbol.iterator&&d(Symbol.iterator);if(m)d=m.call(d);else if(typeof d.length=="number")d={next:bd(d)};else throw Error("b "+String(d));}for(var B=[];!m=d.next().done);B.push(m.value);d=B;E=H.call(f,d,[c]);if(a&&a instanceof HTMLElement)if(a==F){if(cc=E.length>4)c=(E.length-1)-E[4].length/4/1E3<5;if(c){c=google.getEI(a);a.hasAttribute("data-ved")?fa=0:(a)||"";f=f+";=f=a.closest("[data-ved]");D(f)||"";f=f||"";if(a.getAttribute("jsname"))a.getAttribute("jsname");else var C;a=(C=a.closest("[jsname"]))==null?vid:0:C.getAttribute("jsname");google.log("rcm","&is="+c+"&gtved="+f+"&jsname='"+a+"')};else Fa,E=[c];window.document.addEventListener("DOMContentLoaded",function(){document.body.addEventListener("click",G)}).call(this);</script></body></html> # # # # wget --timeout=2 nginx -o - Connecting to nginx (172.21.132.111:80) wget: download timed out # #
```

```
[yasl@rog ~]$ calicoctl create -f --EOF
> apiVersion: projectcalico.org/v3
kind: NetworkPolicy
metadata:
  name: allow-nginx-ingress
  namespace: yashlani-jagya
spec:
  selector: app = 'nginx'
  types:
  - Ingress
  ingress:
  - action: Allow
    source:
      selector: run = 'access'
> EOF
Successfully created 1 'NetworkPolicy' resource(s)
[yasl@rog ~]$
```

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Branch - CBA Batch - 71
CS Practical 9

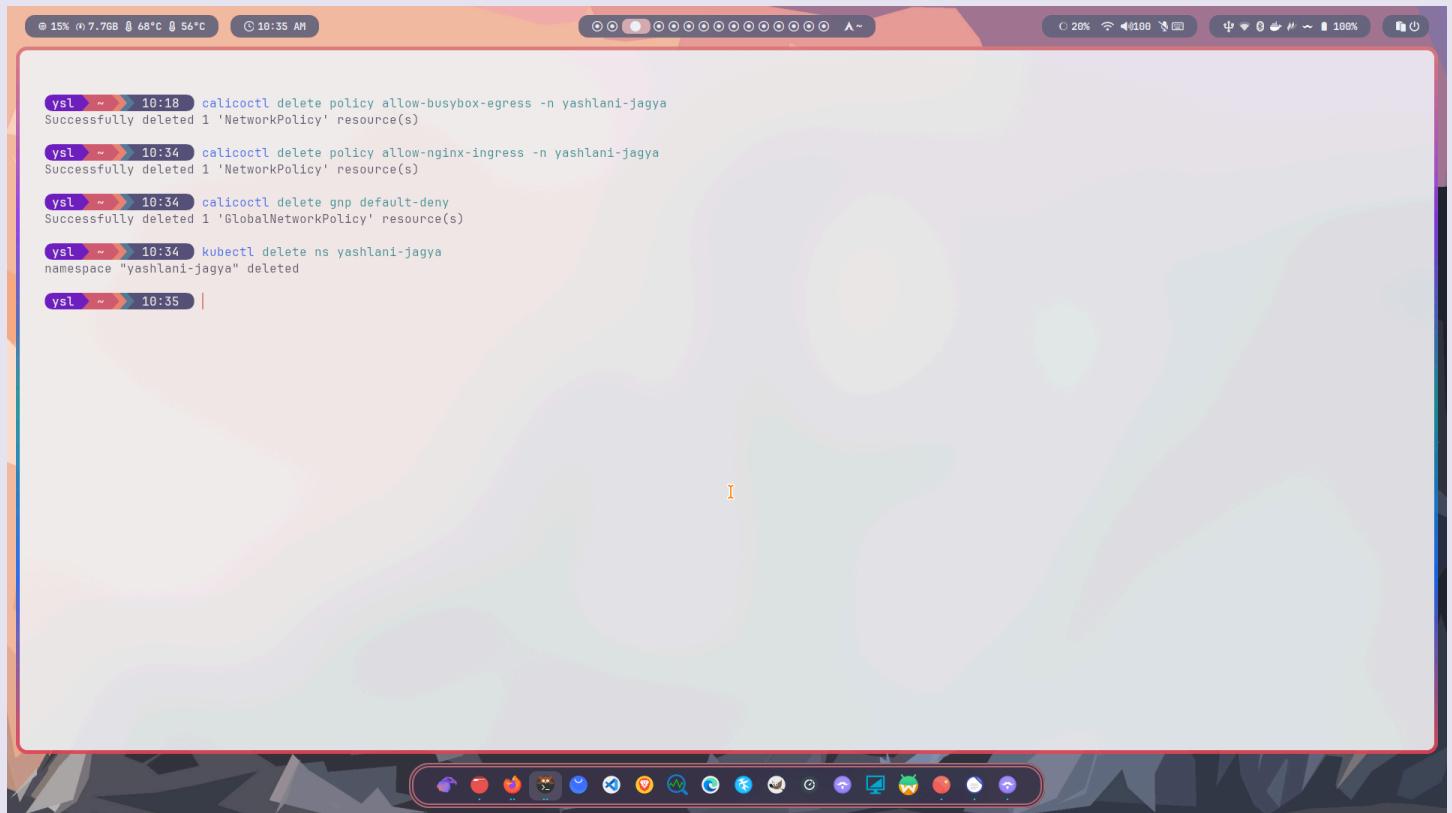
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10. Now delete everything created in this practical



The screenshot shows a Linux terminal window with a pinkish-purple background. The terminal is running on a system with a battery level of 15%, 7.7GB RAM, 68°C CPU temperature, and 56°C GPU temperature. The system is connected to a 100% charged power source. The terminal window has a title bar with the date and time (10:35 AM) and a status bar at the bottom showing various system icons.

```
ysl ~ 10:18 calicctl delete policy allow-busybox-egress -n yashlani-jagya
Successfully deleted 1 'NetworkPolicy' resource(s)

ysl ~ 10:34 calicctl delete policy allow-nginx-ingress -n yashlani-jagya
Successfully deleted 1 'NetworkPolicy' resource(s)

ysl ~ 10:34 calicctl delete gnp default-deny
Successfully deleted 1 'GlobalNetworkPolicy' resource(s)

ysl ~ 10:34 kubectl delete ns yashlani-jagya
namespace "yashlani-jagya" deleted

ysl ~ 10:35 |
```