Day 5

Post Test Link

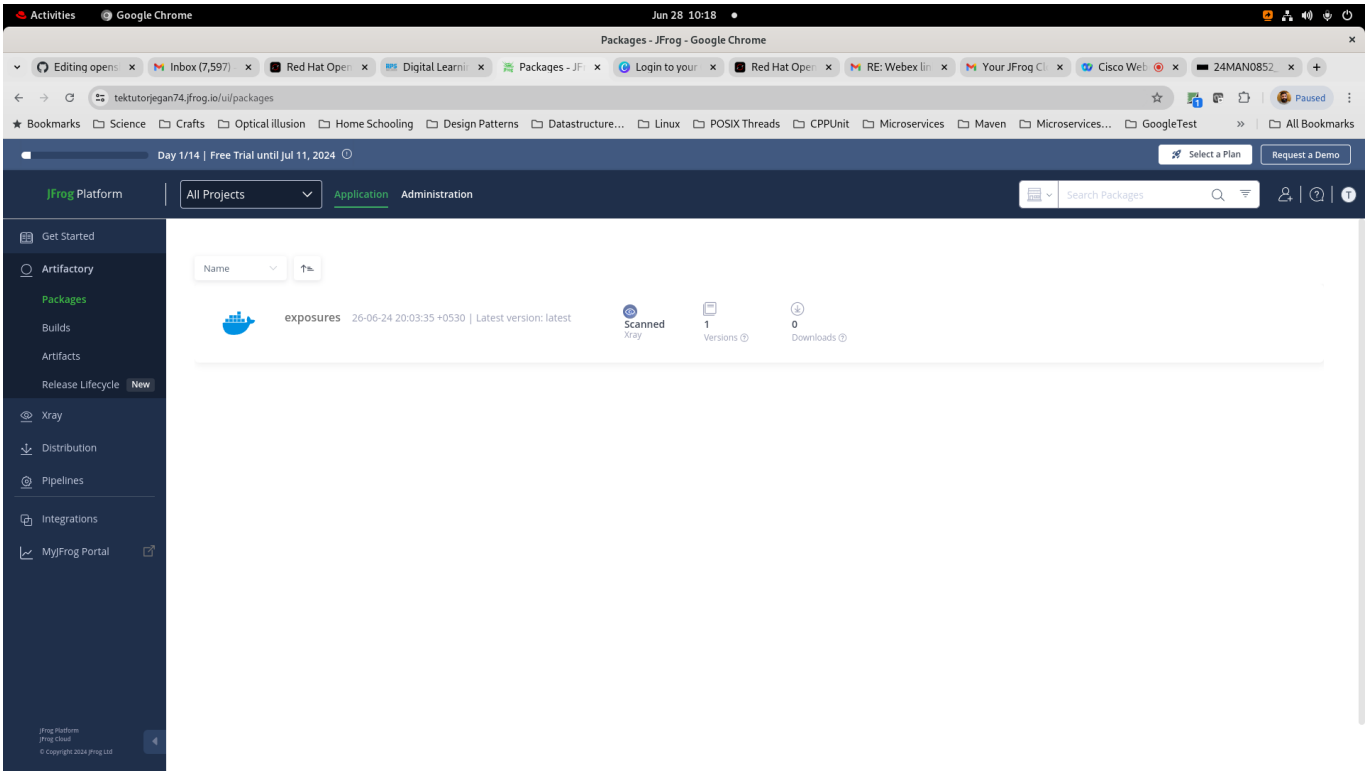
```
https://rpsconsulting116.examly.io/contest/public?U2FsdGVkX1%20lj2JvRF3%20bex%2Fua1NkTg4RWPsa3kSjTgsunMnwnzHAvmgEYl90cBn7Oz9grc0QNwV933IJwQubQ=%3D
```

Feedback link

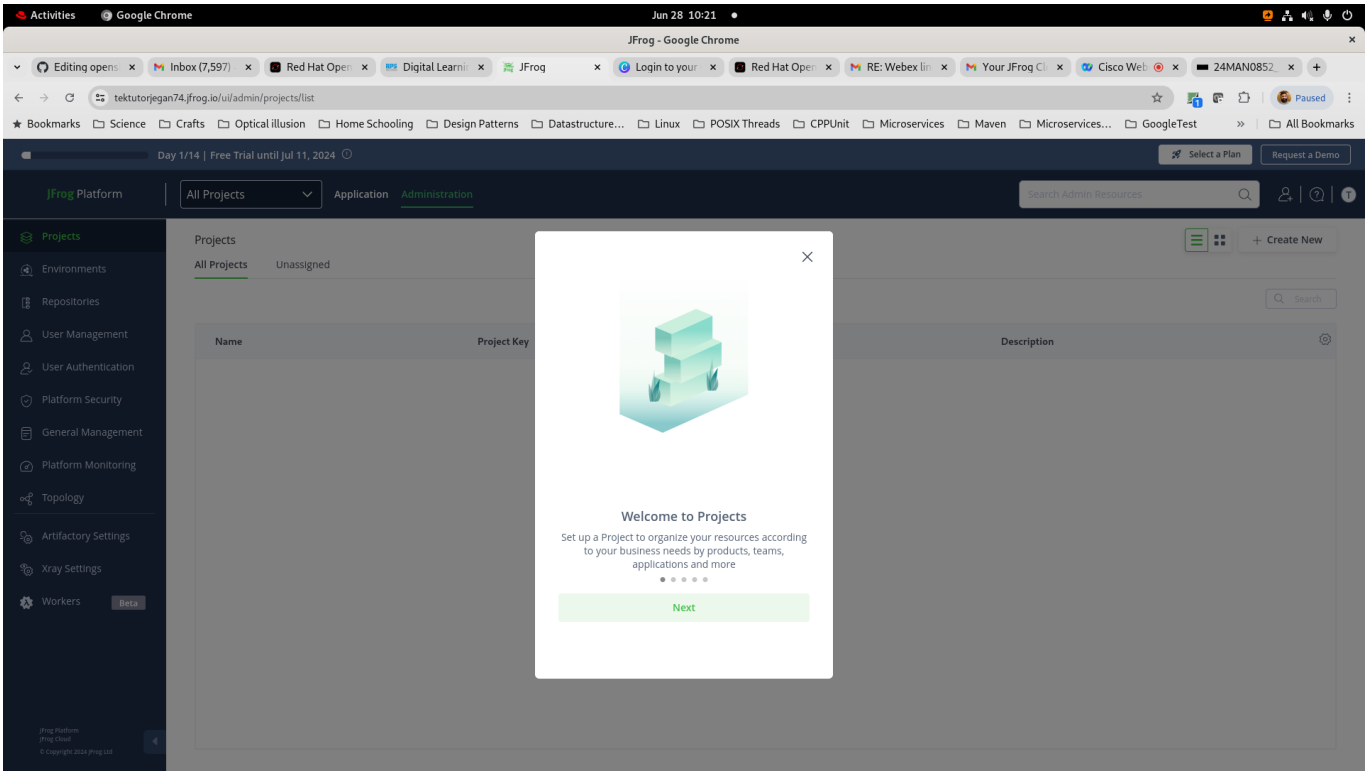
```
https://survey.zohopublic.com/zs/M50Mel
```

Creating a Docker Registry in your JFrog Artifactory Cloud environment

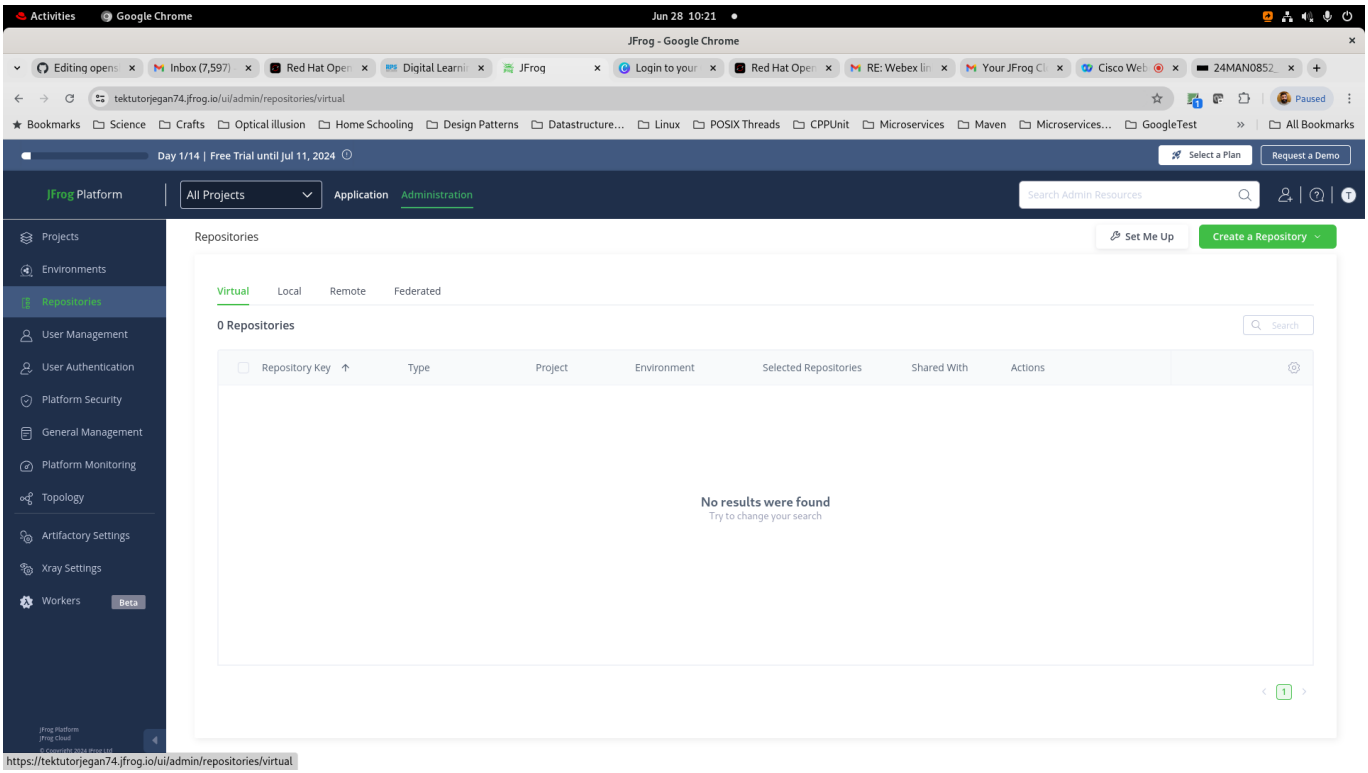
Login to your JFrog Artifactory Cloud account



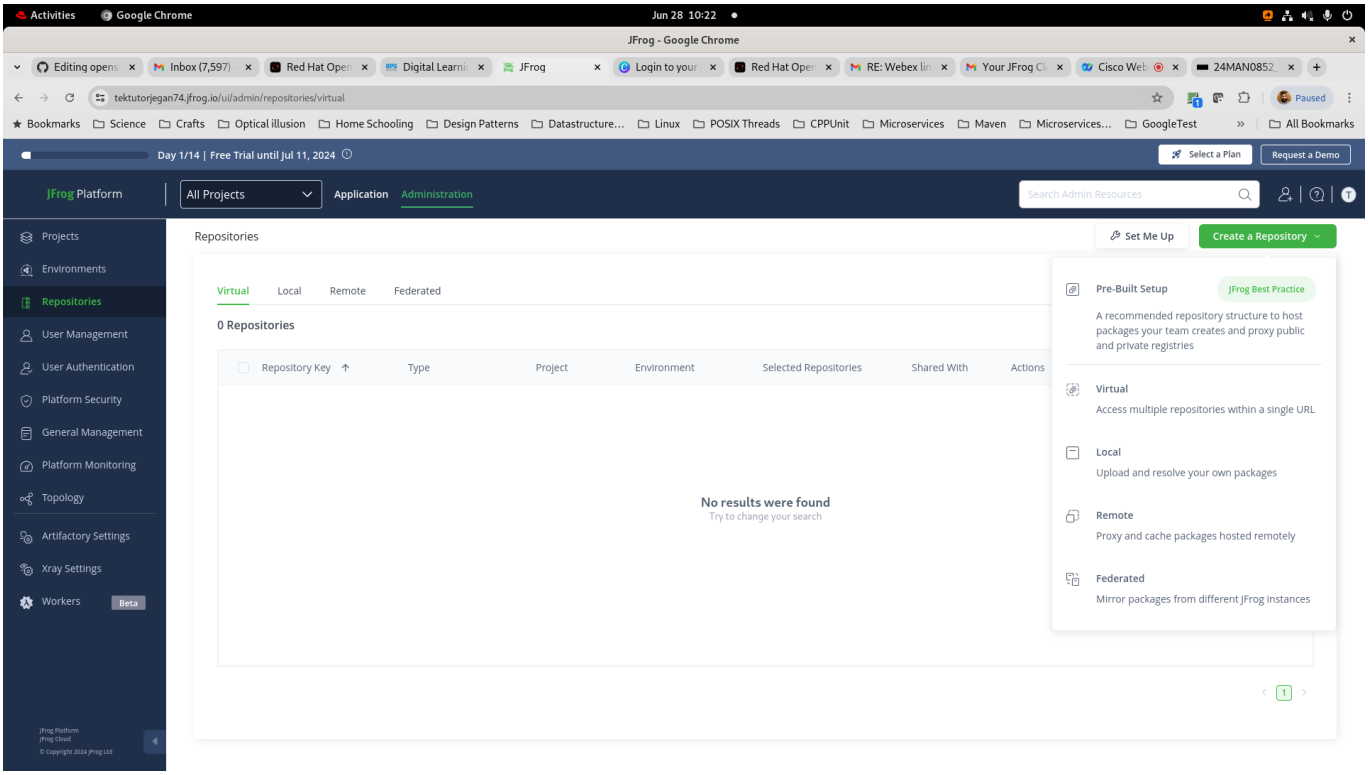
Switch to Administration Tab



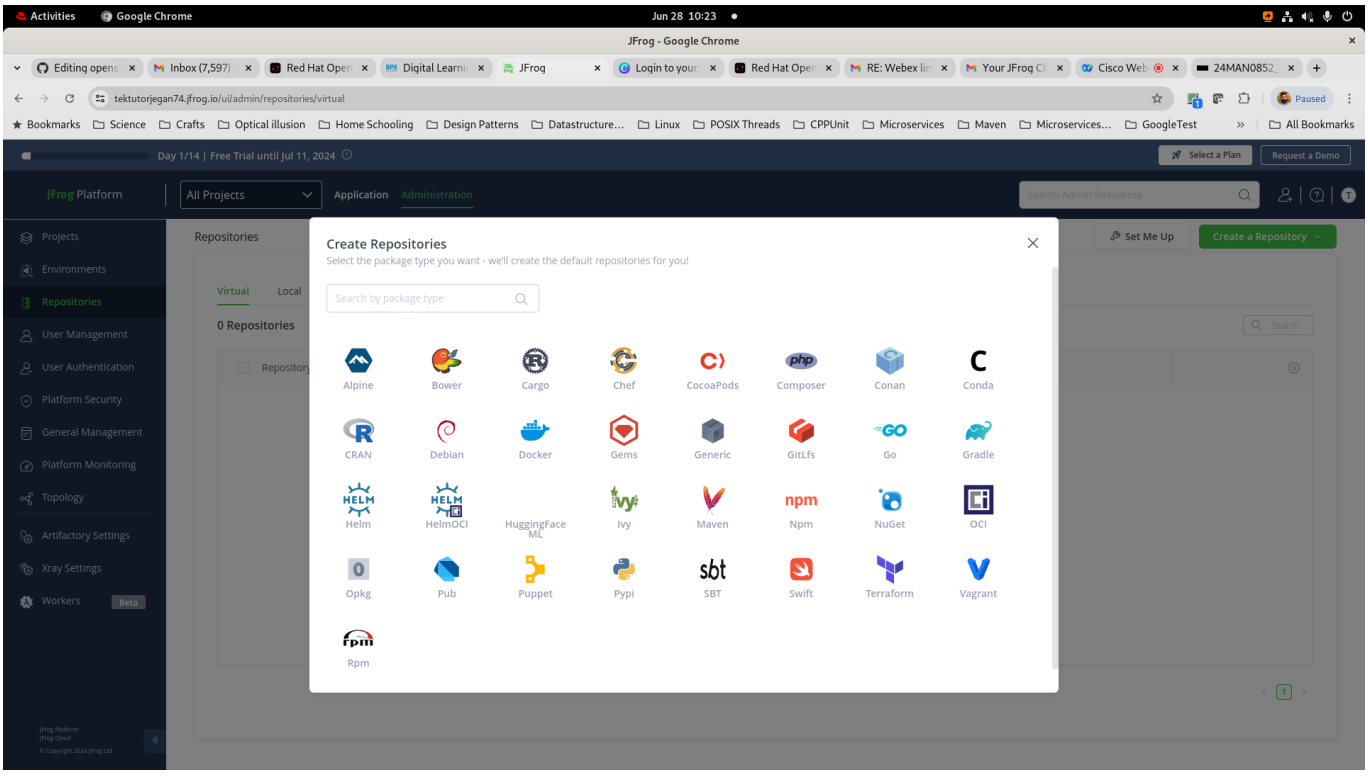
Click on Repositories on the left side menu



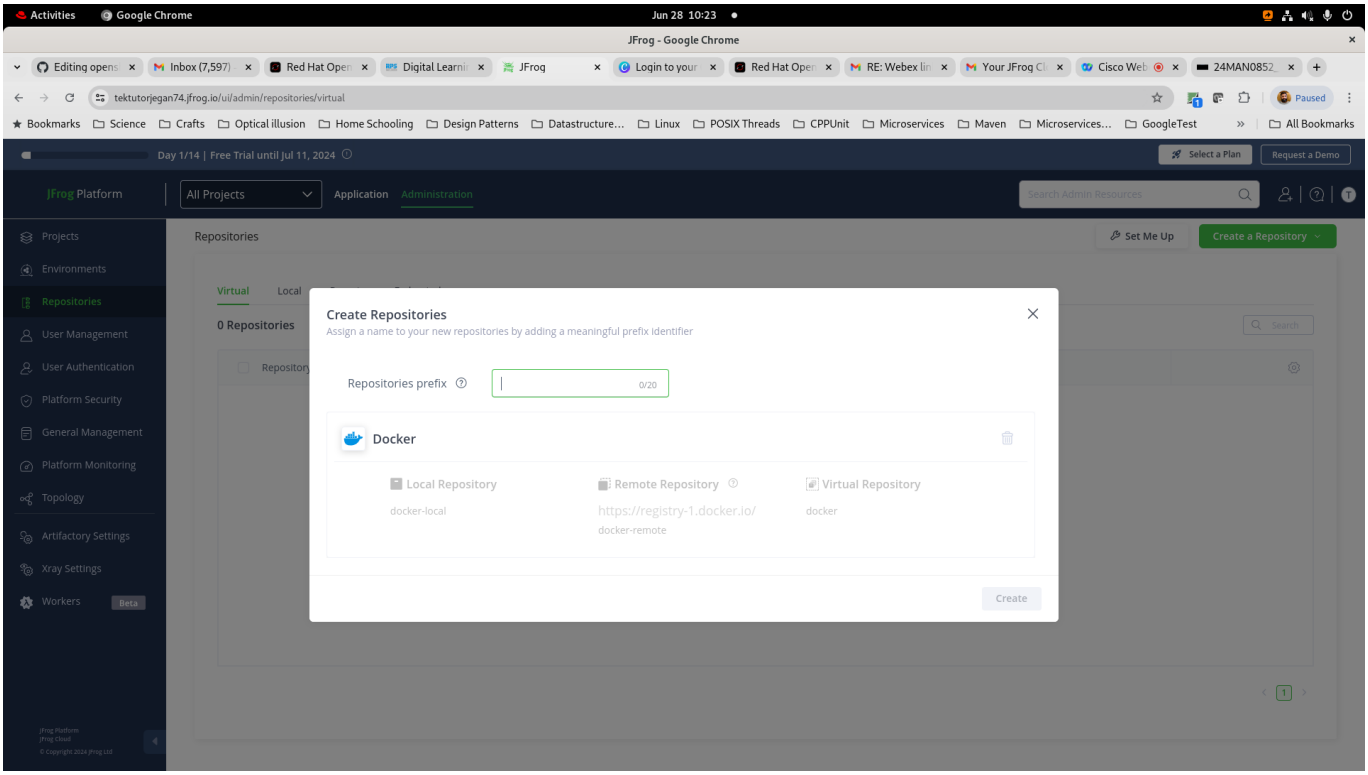
Click on Create Repository menu on the top right corner



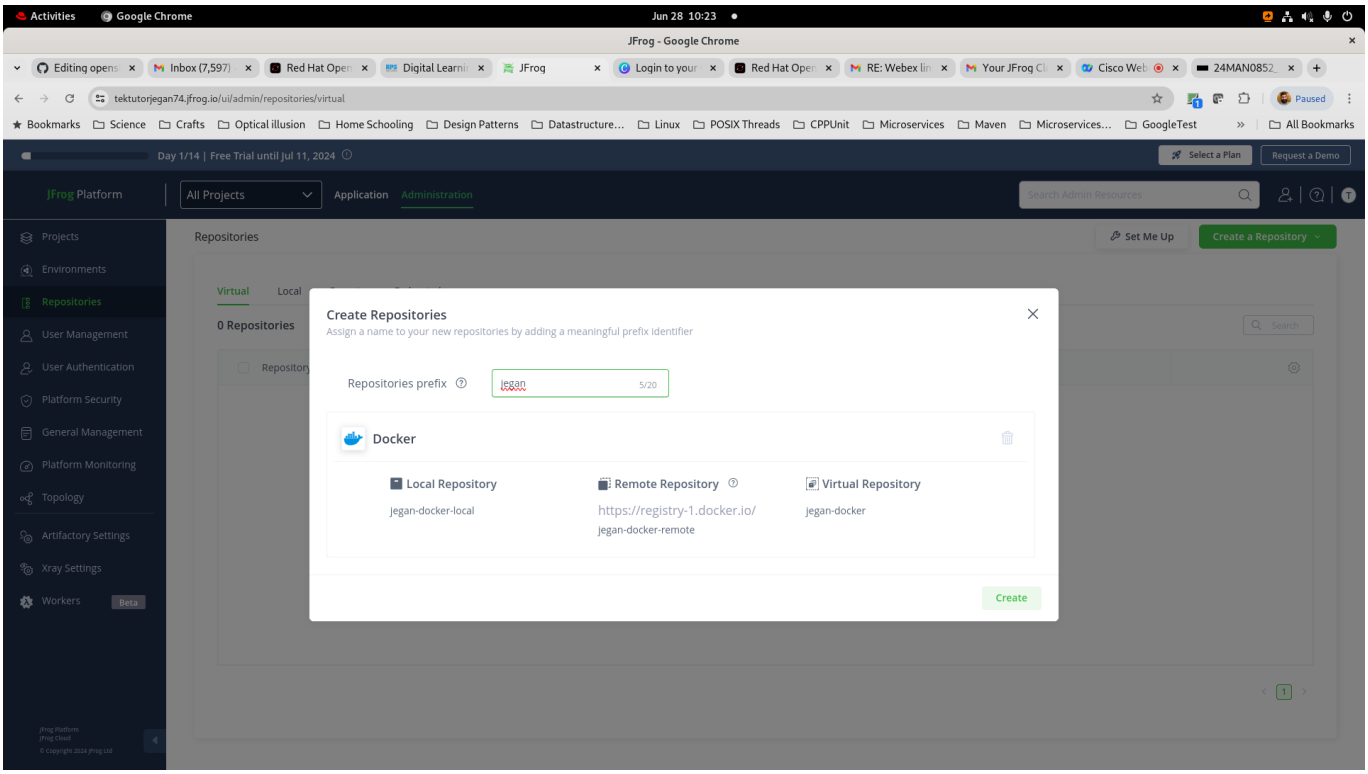
Click on Pre-built Setup



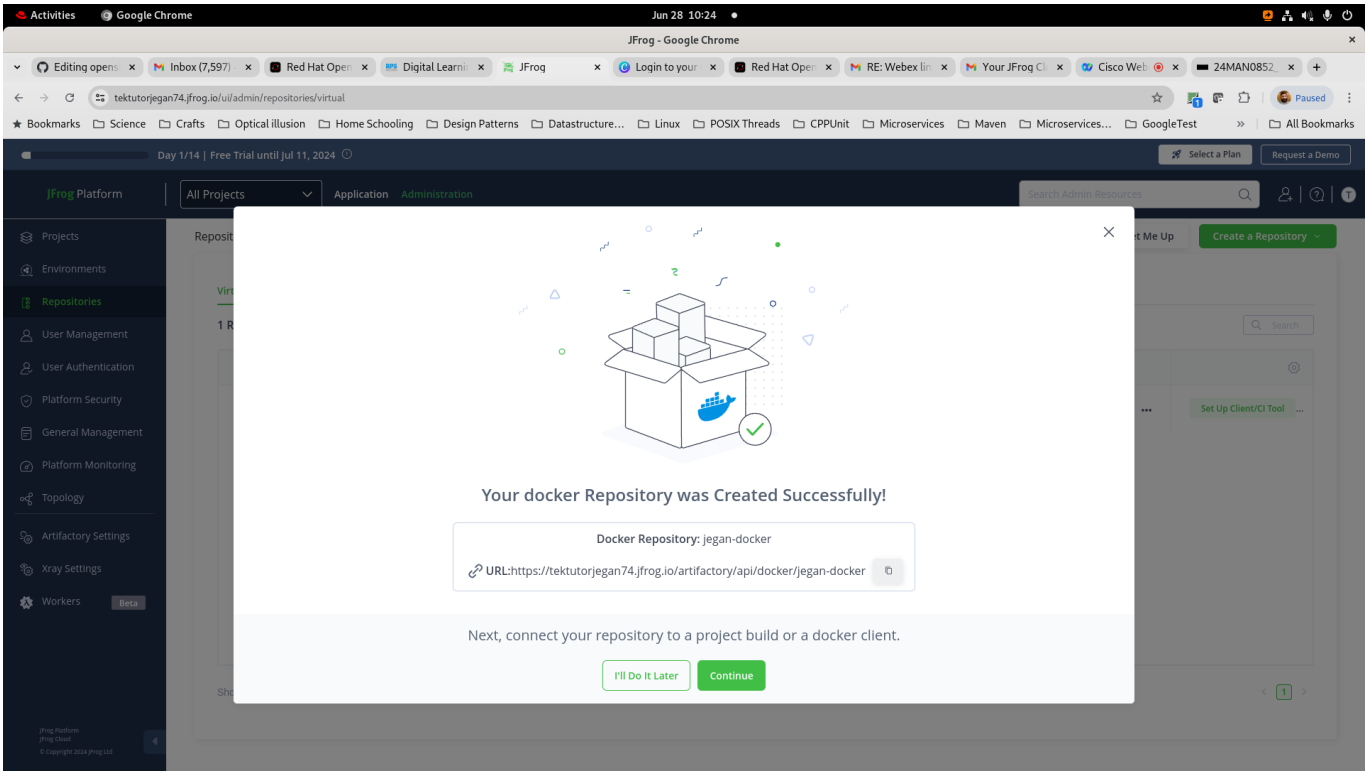
Select Docker



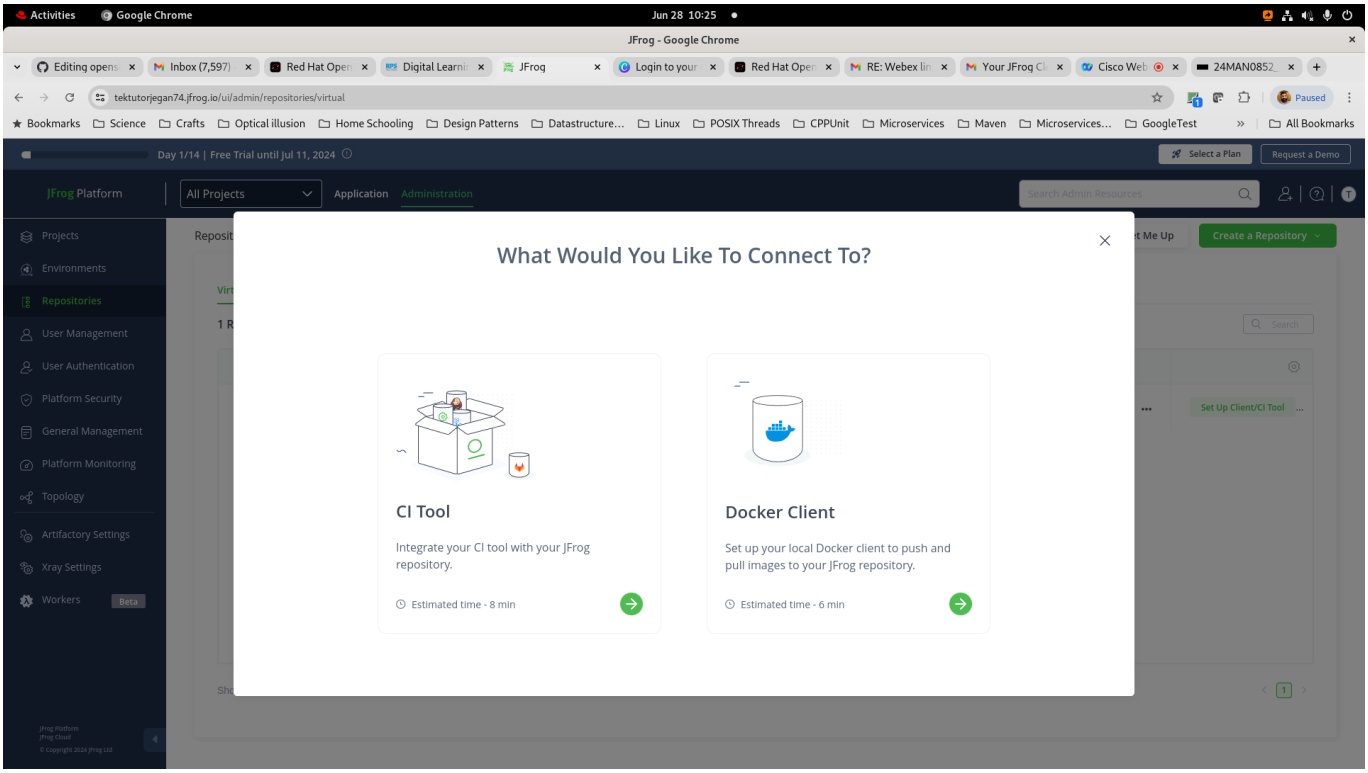
Type your name and click on create button



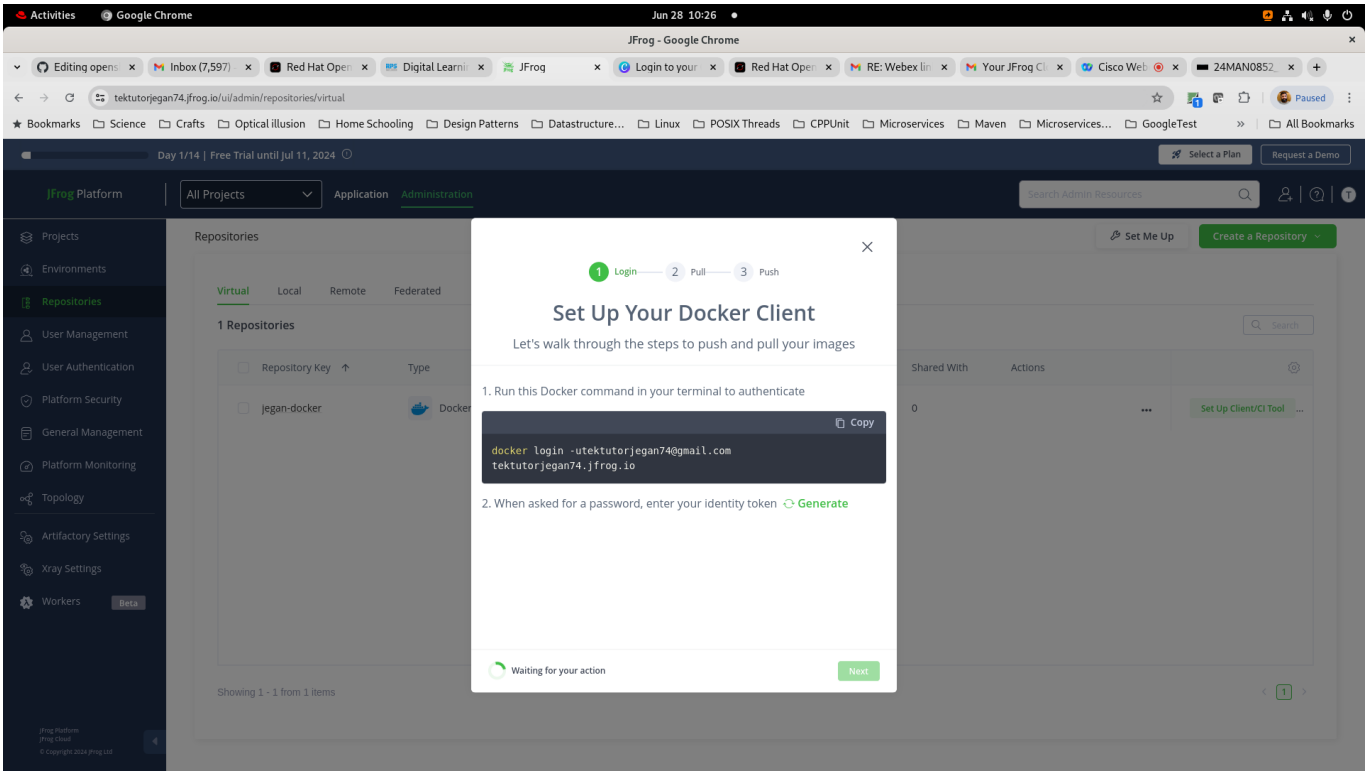
Click Continue button when you see a screen as shown in the screenshot below



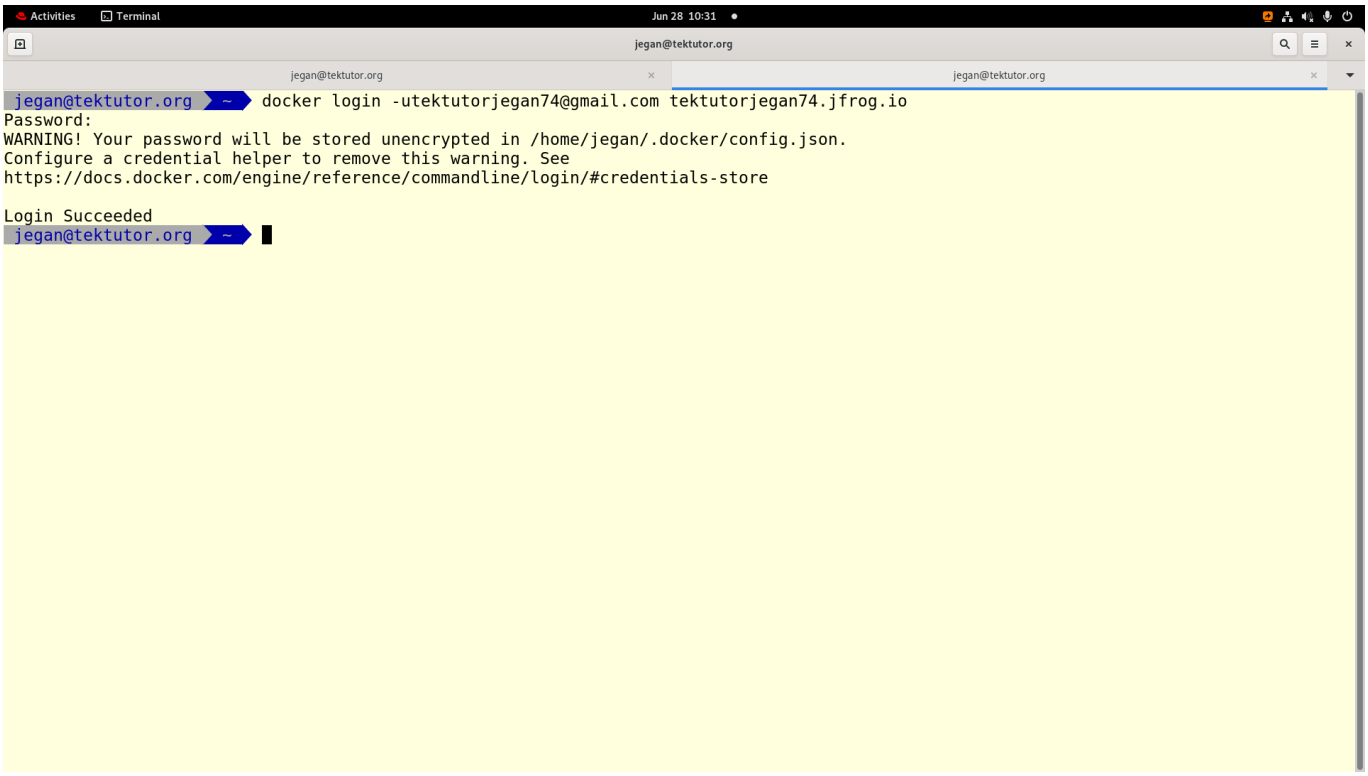
Need to click on "Docker Client" Green arrow

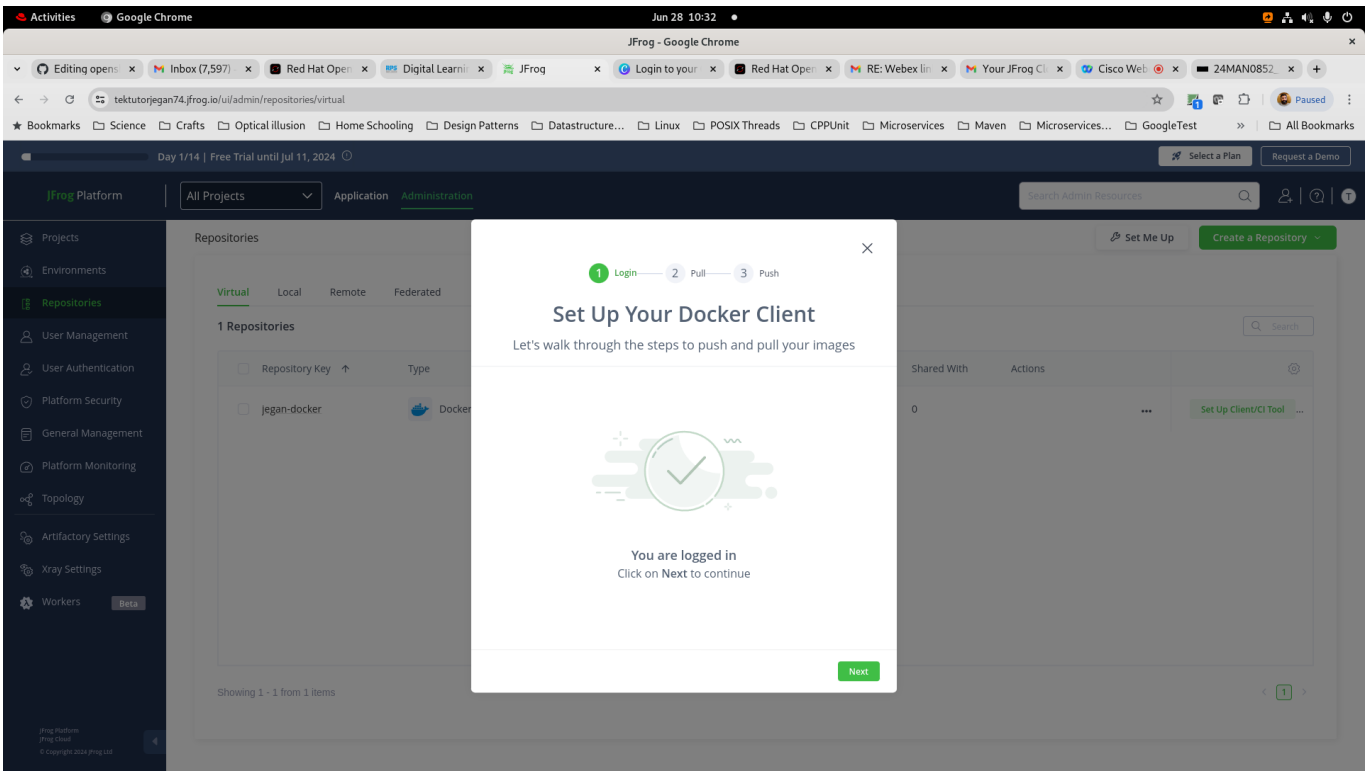


Copy the instructions shown below in some text file and save it for your reference, click on Generate

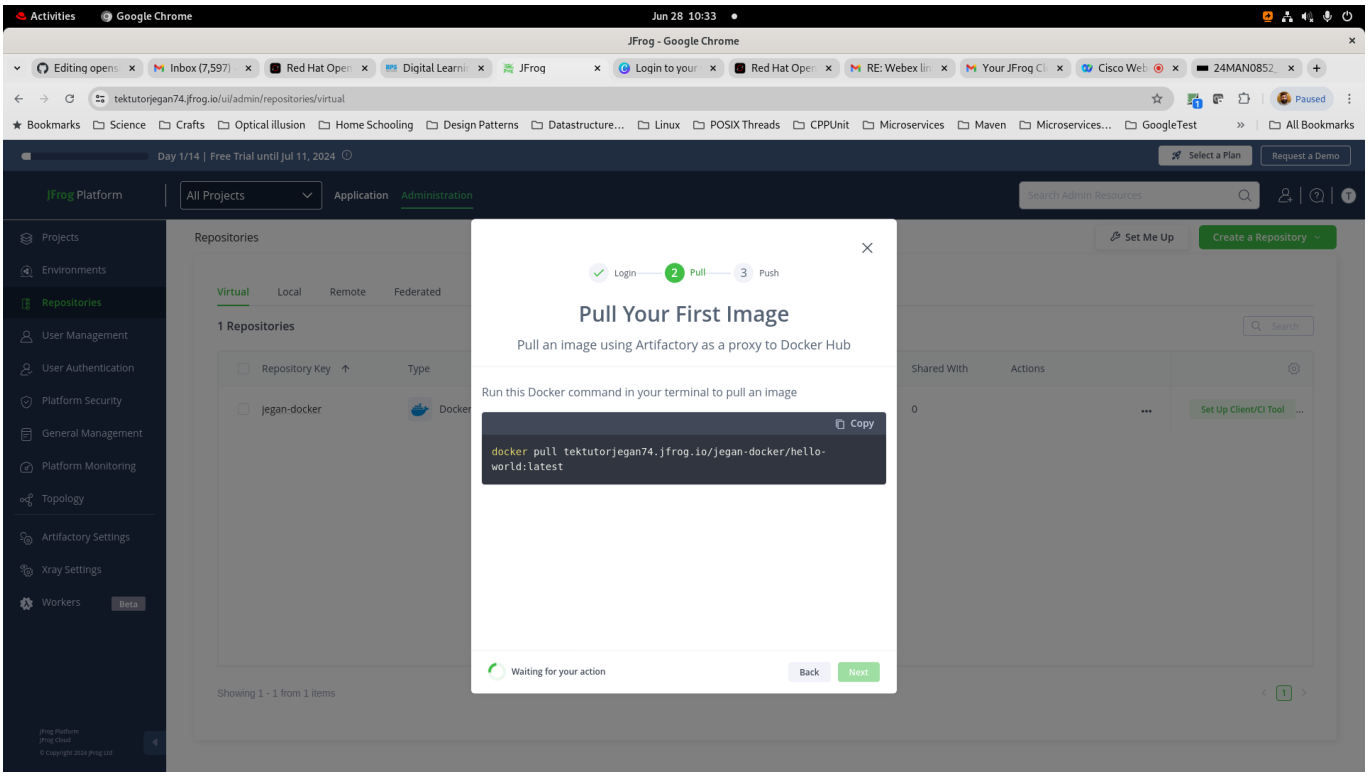


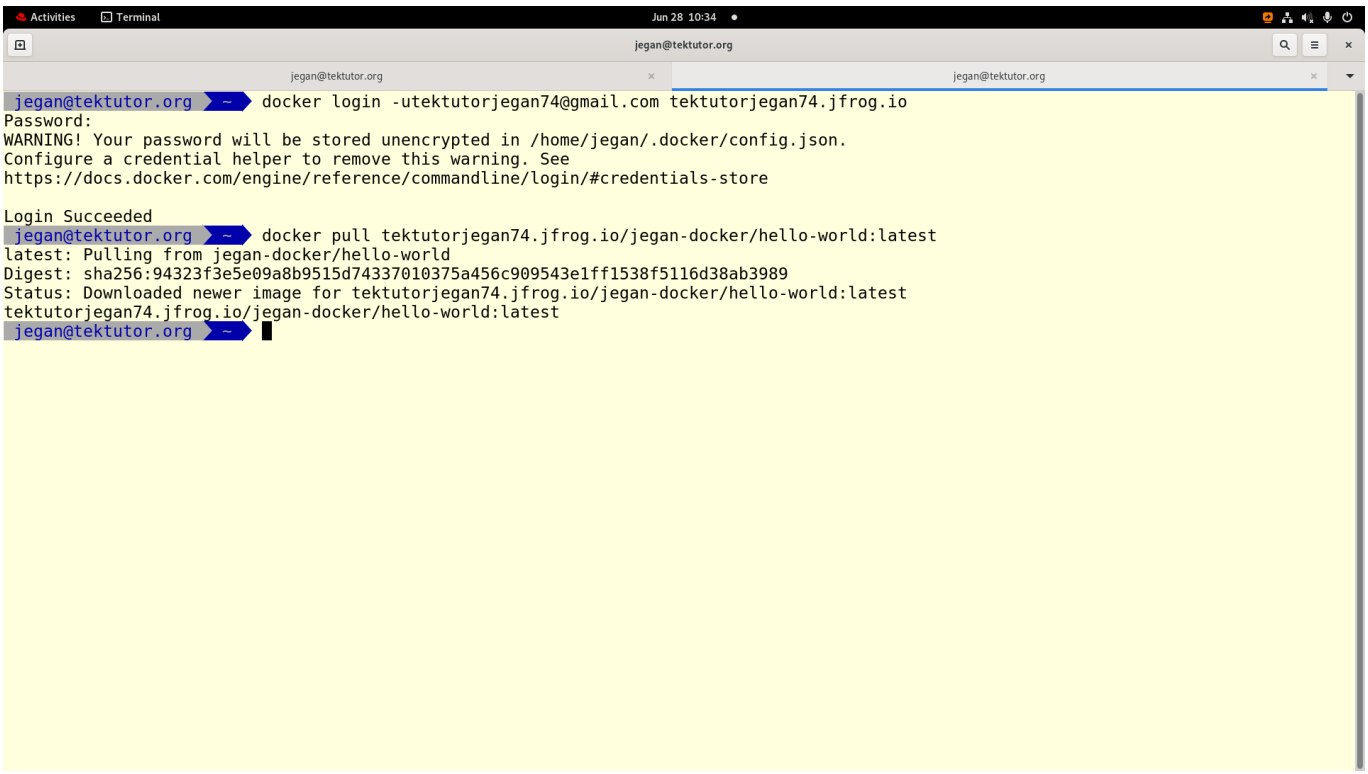
Copy the token and save it in the same text file where you saved the previous instructions. Now, we need to execute the docker login instructions shown in the screen on your linux terminal using the token as the password

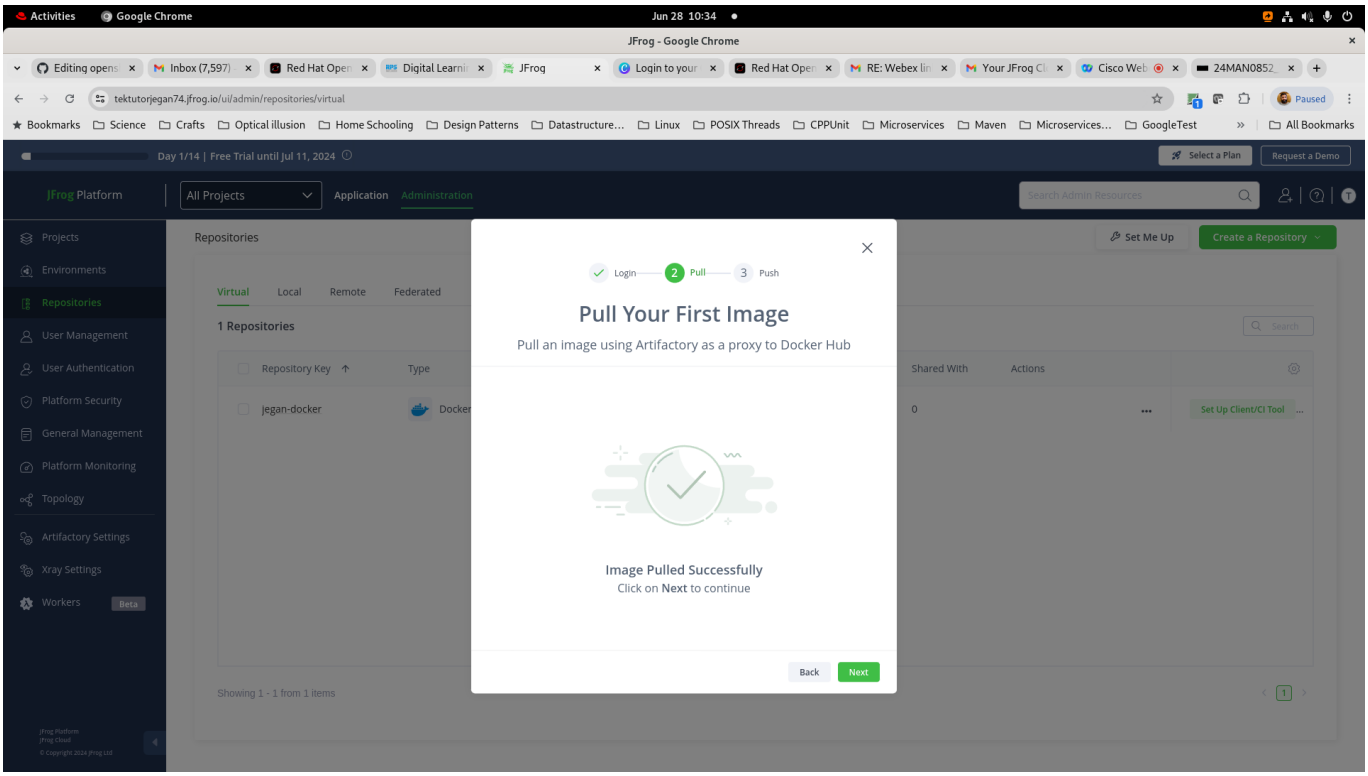




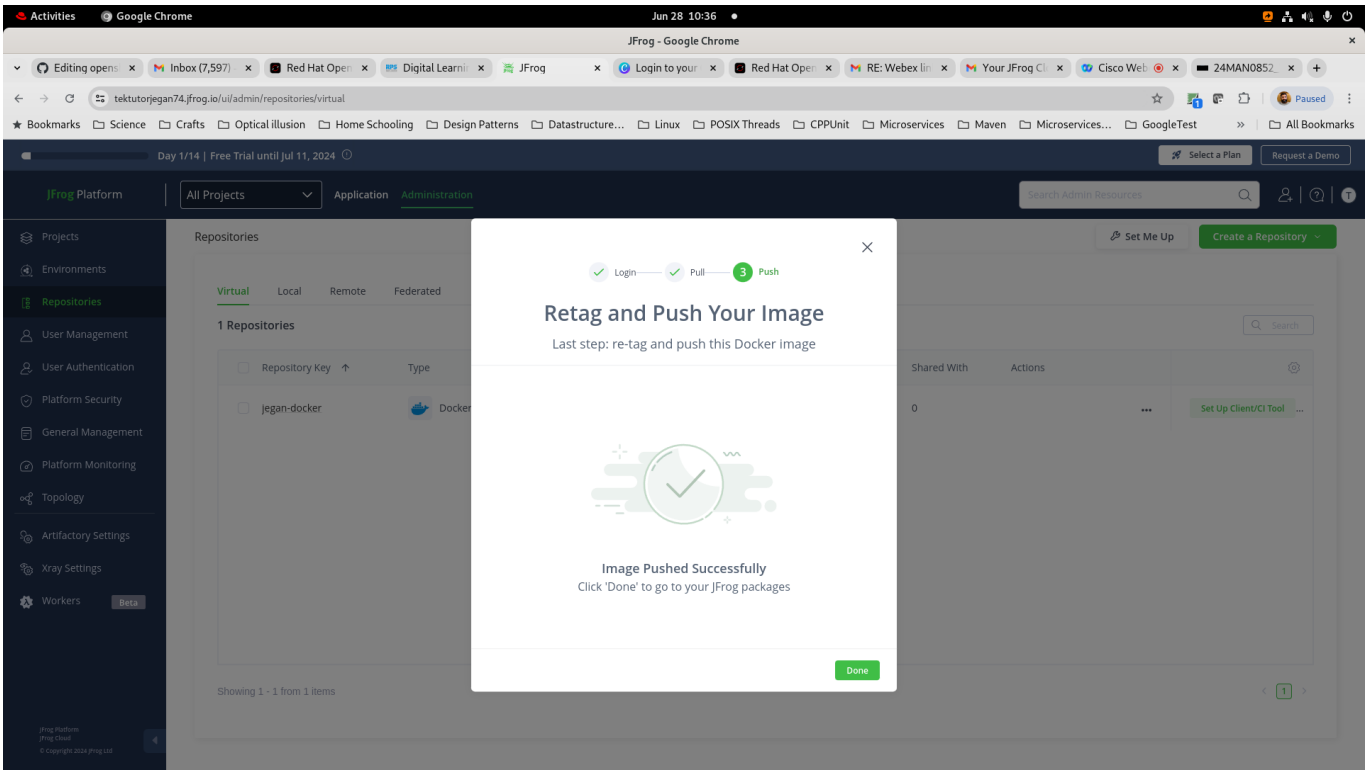
Click on Next button, copy the instruction shown below save it in text file and execute the instruction on your linux terminal


Activities
Google Chrome
Jun 28 10:33
JFrog - Google Chrome
tektutorjegan74.jfrog.io/ui/admin/repositories/virtual
Day 1/14 | Free Trial until Jul 11, 2024
Select a Plan
Request a Demo
JFrog Platform
All Projects
Application
Administration
Search Admin Resources
Projects
Environments
Repositories
User Management
User Authentication
Platform Security
General Management
Platform Monitoring
Topology
Artifactory Settings
Xray Settings
Workers
Beta
Repositories
Set Me Up
Create a Repository
Virtual
Local
Remote
Federated
1 Repositories
Repository Key
Type
Shared With
Actions
jegan-docker
Set Up Client/CI Tool
Showing 1 - 1 from 1 items
Login
2 Pull
3 Push
Pull Your First Image
Pull an image using Artifactory as a proxy to Docker Hub
Run this Docker command in your terminal to pull an image
Copy
docker pull tektutorjegan74.jfrog.io/jegan-docker/hello-world:latest
Waiting for your action
Back
Next

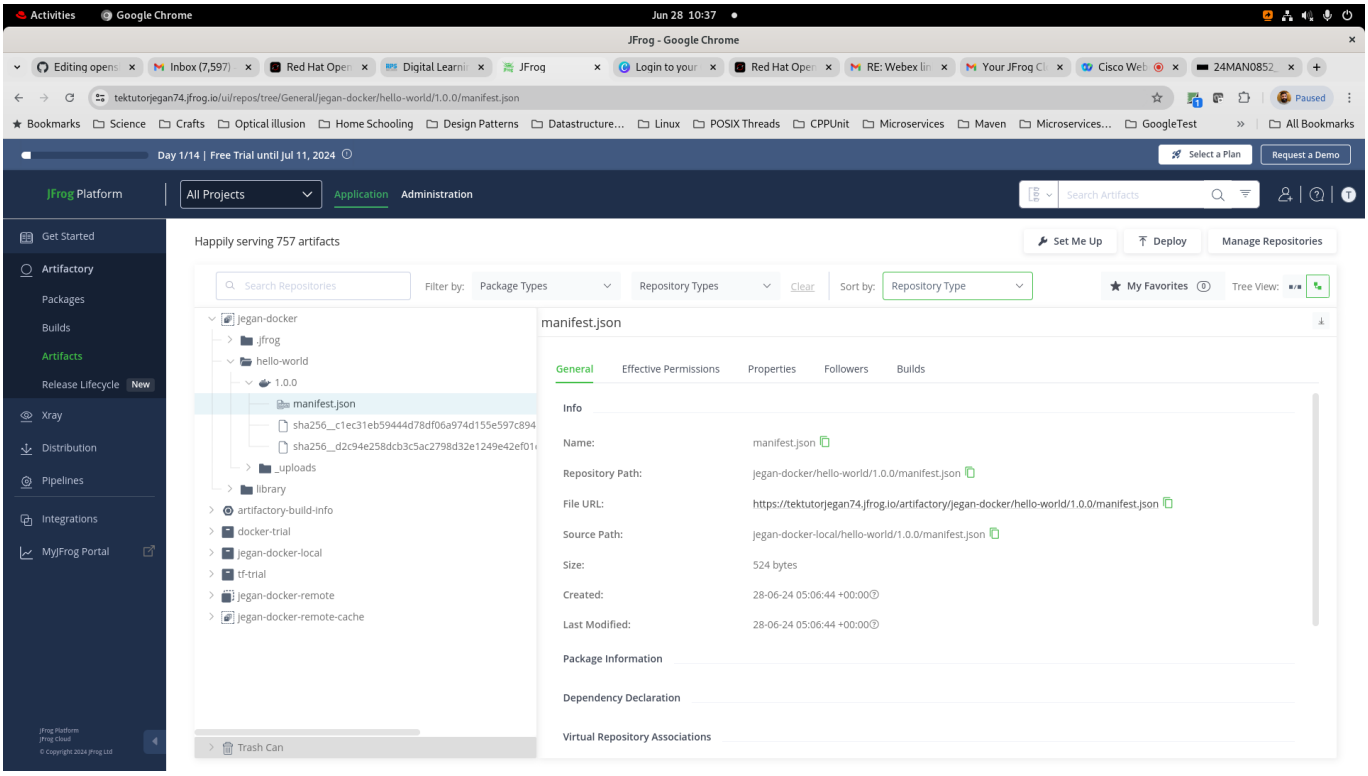

Activities
Terminal
Jun 28 10:34
jegan@tektutor.org
jegan@tektutor.org
jegan@tektutor.org
jegan@tektutor.org ~ docker login -utektutorjegan74@gmail.com tektutorjegan74.jfrog.io
Password:
WARNING! Your password will be stored unencrypted in /home/jegan/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store
Login Succeeded
jegan@tektutor.org ~ docker pull tektutorjegan74.jfrog.io/jegan-docker/hello-world:latest
latest: Pulling from jegan-docker/hello-world
Digest: sha256:94323f3e5e09a8b9515d74337010375a456c909543e1ff1538f5116d38ab3989
Status: Downloaded newer image for tektutorjegan74.jfrog.io/jegan-docker/hello-world:latest
tektutorjegan74.jfrog.io/jegan-docker/hello-world:latest
jegan@tektutor.org ~



Click on Next button,copy the instruction in the text file and execute the pull and tag followed by push command



Click on Done and you will see the below page. You will notice

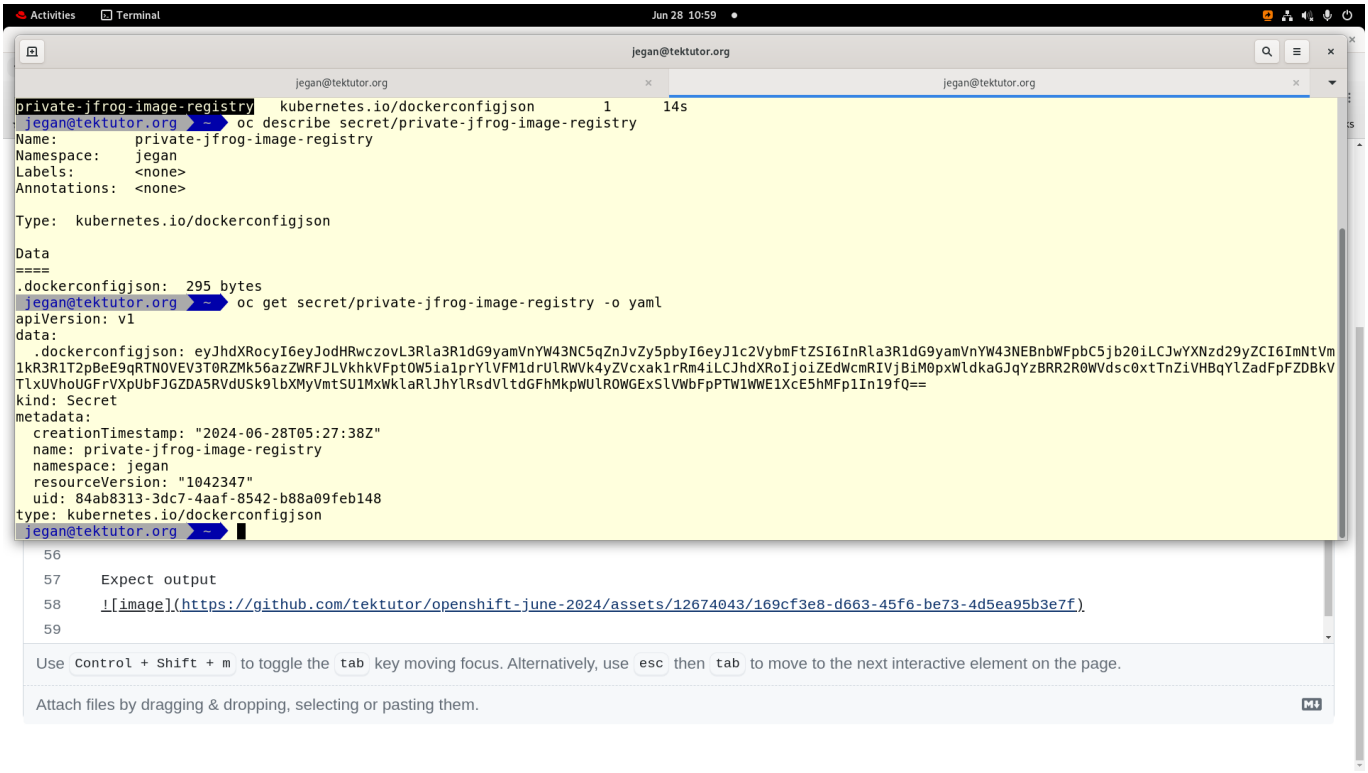


Lab - Build custom image with our application binary and push the image to JFrog Artifactory Docker Registry

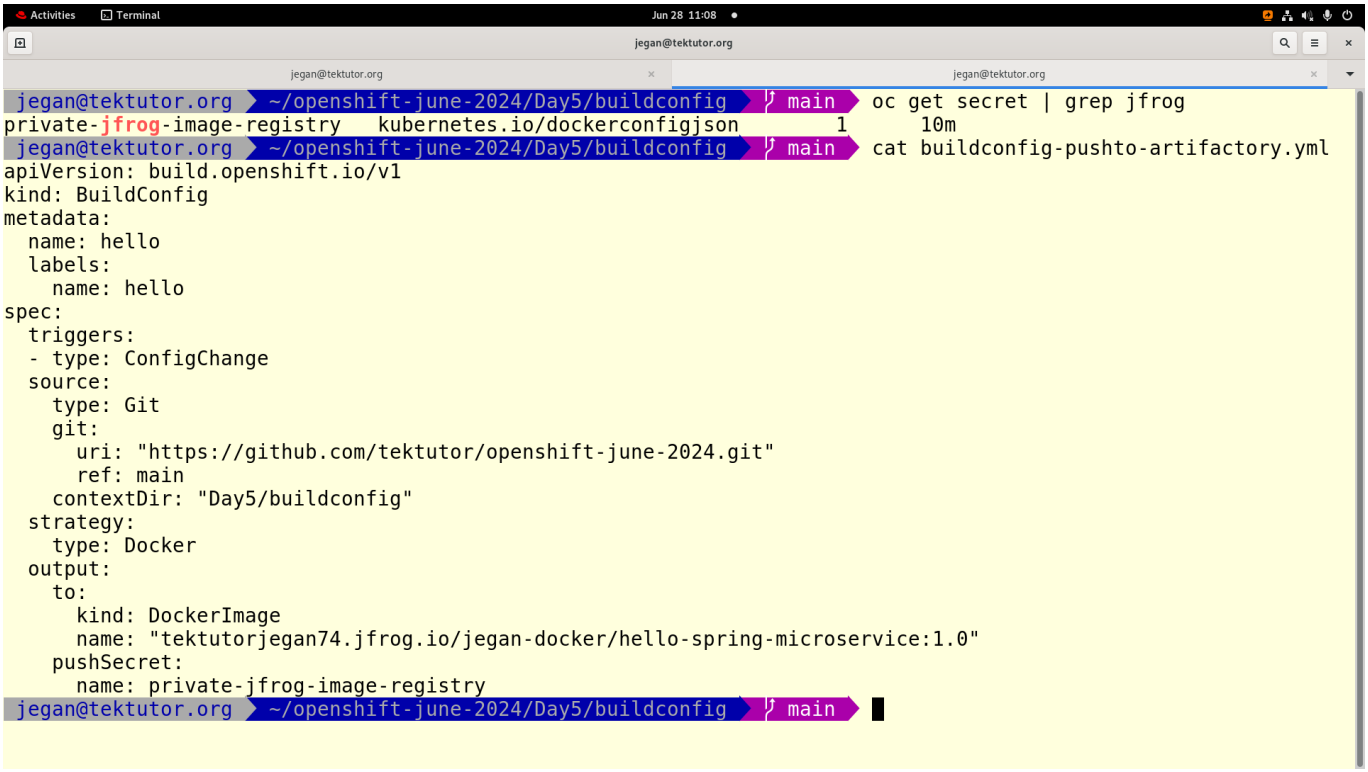
Openshift need to login to JFrog Artifactry server in order to push the custom docker images, hence let's create a secret to store the JFrog Login Credentials in Openshift

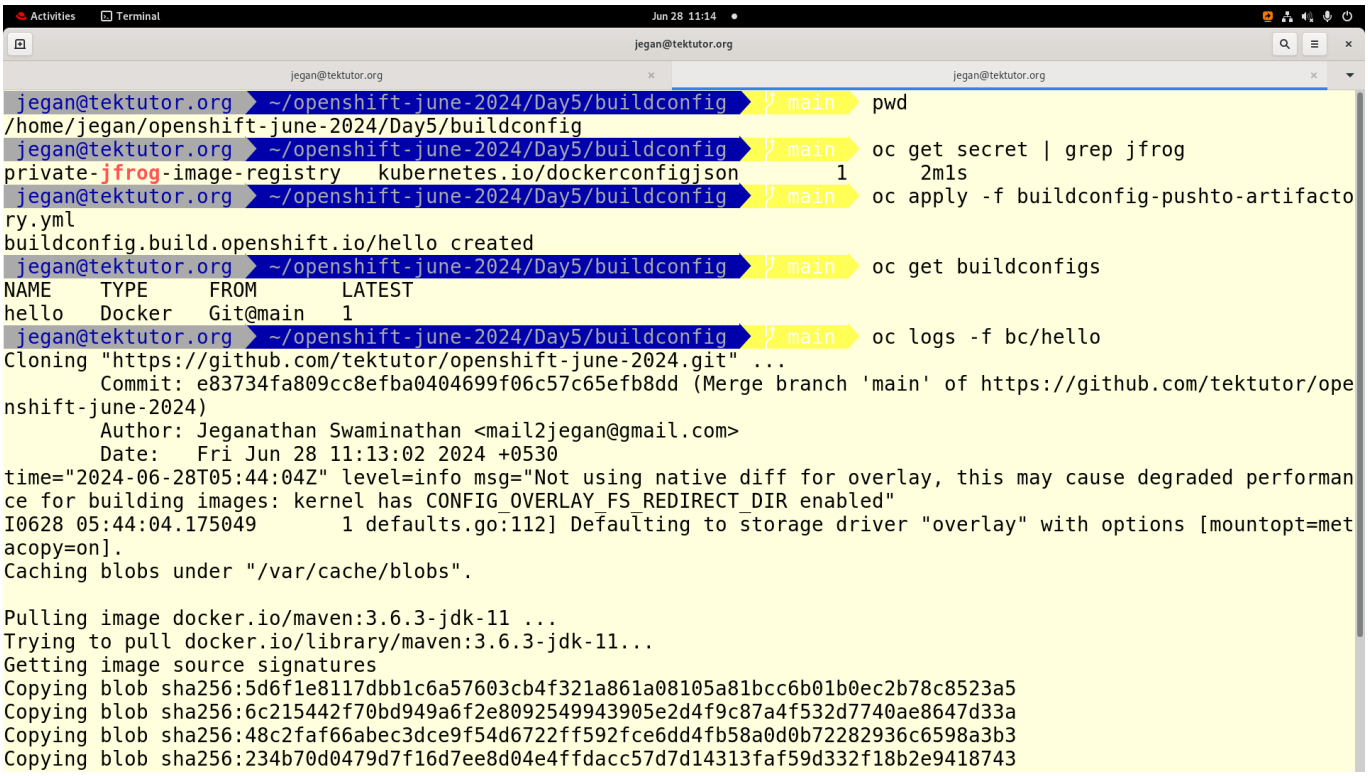
```
oc create secret docker-registry private-jfrog-image-registry --docker-
server=https://<your-jfrog-id>.jfrog.io --docker-username=<your-jfrog-
registered-email> --docker-password=<your-jfrog-token>
secret/private-jfrog-image-registry created
```

Expected output

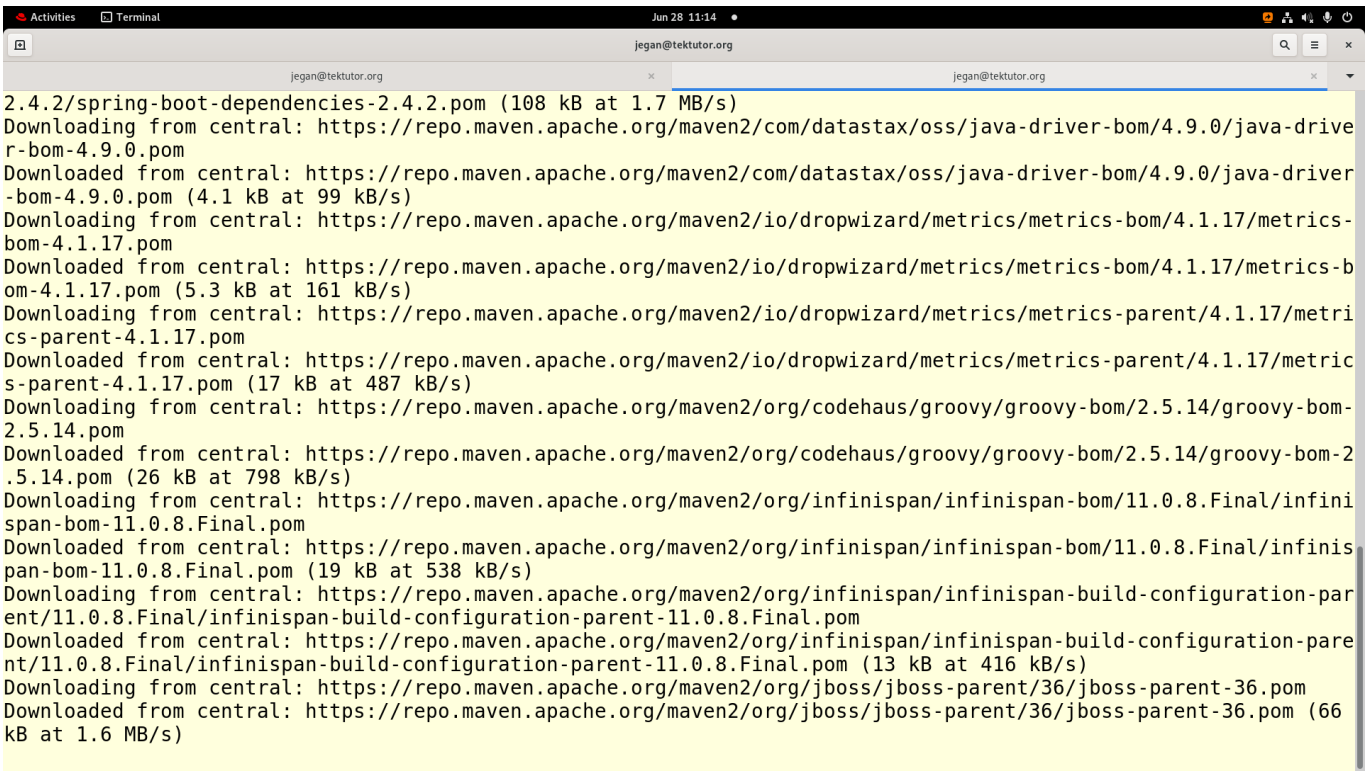


We need to create a buildconfig along with the jfrog credentials in the form of pushsecret as shown below

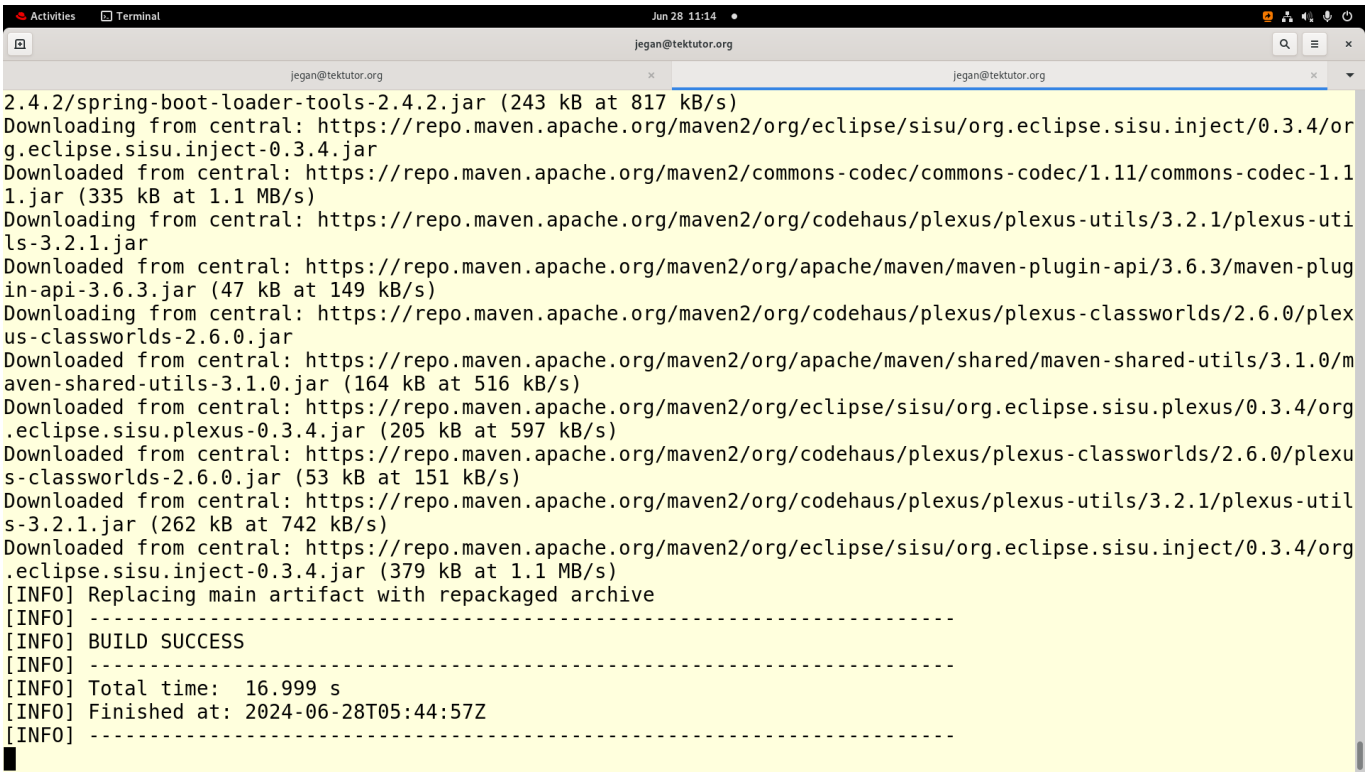


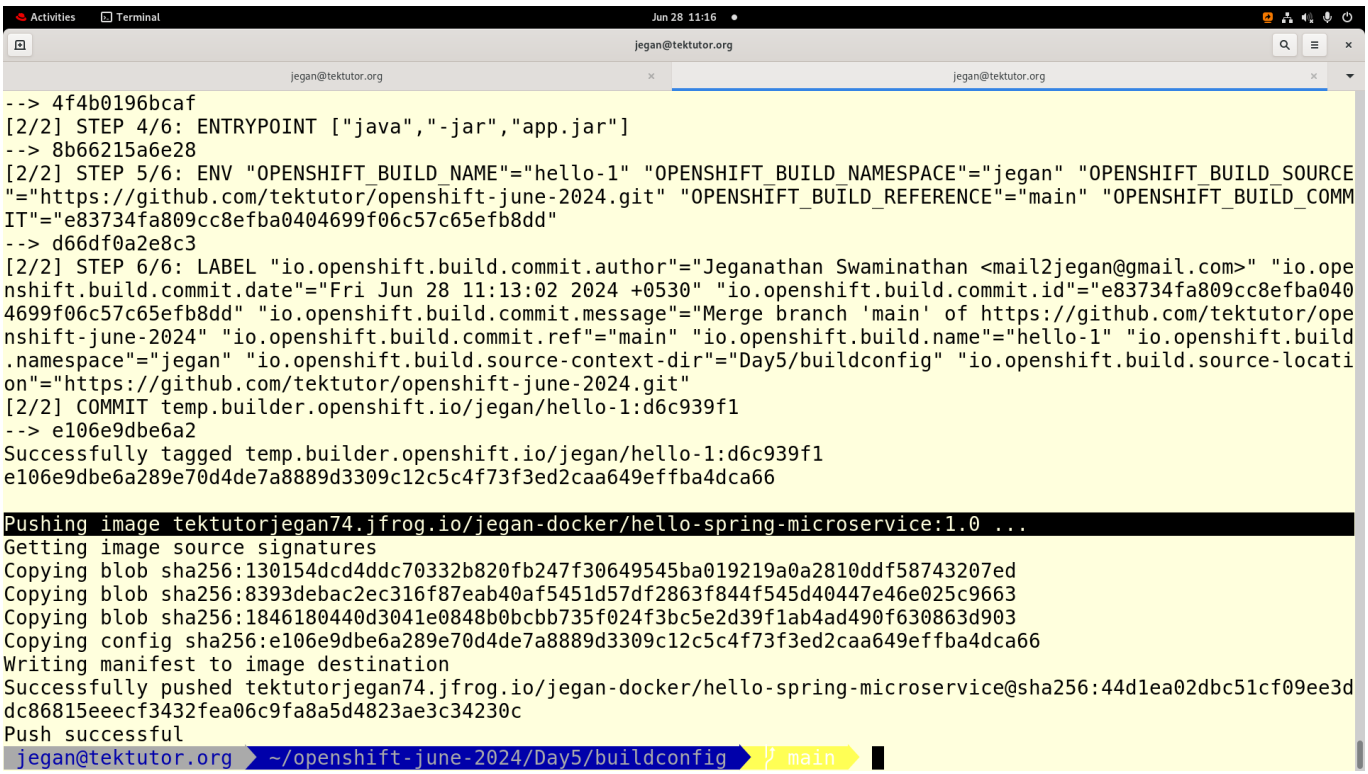


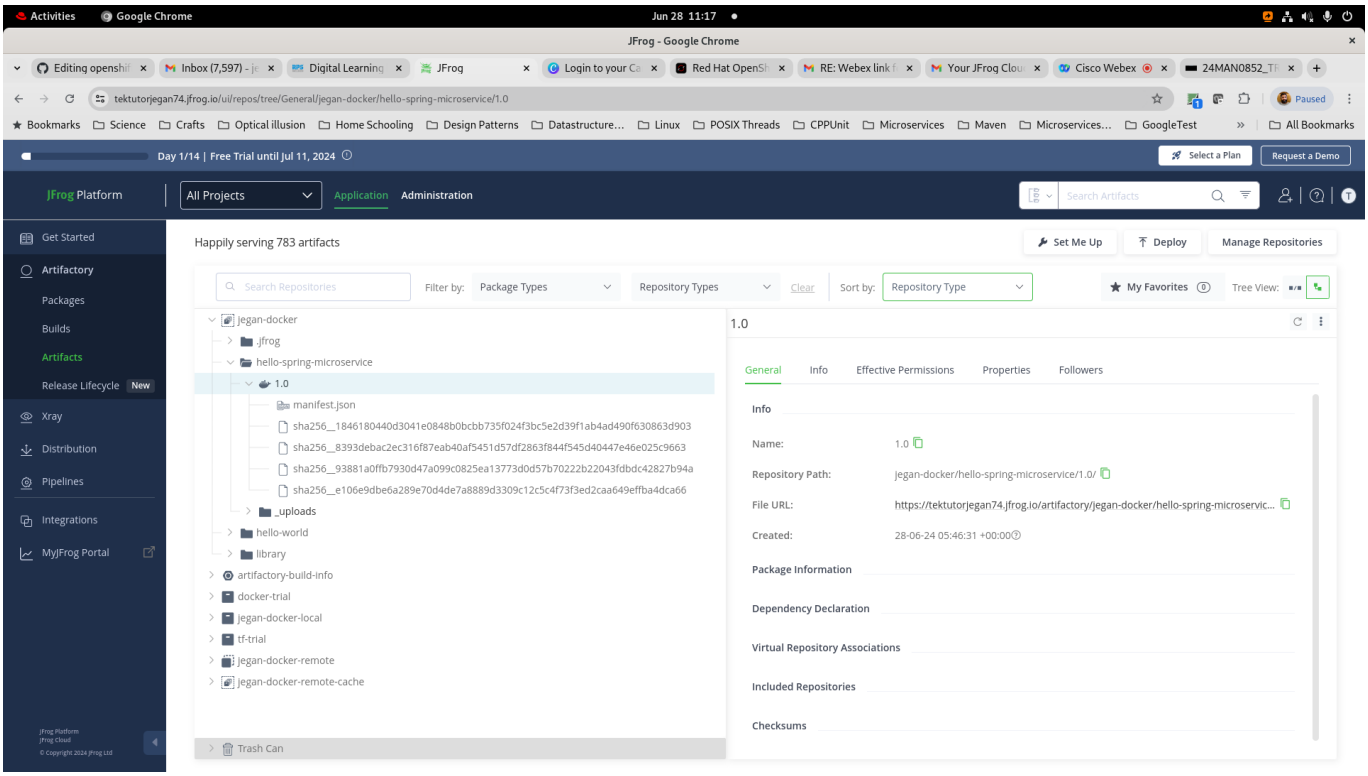
```
 jegan@tektutor.org  ~/openshift-june-2024/Day5/buildconfig  main  pwd
/home/jegan/openshift-june-2024/Day5/buildconfig
 jegan@tektutor.org  ~/openshift-june-2024/Day5/buildconfig  main  oc get secret | grep jfrog
private-jfrog-image-registry   kubernetes.io/dockerconfigjson        1      2m1s
 jegan@tektutor.org  ~/openshift-june-2024/Day5/buildconfig  main  oc apply -f buildconfig-pushto-artifacto
ry.yml
buildconfig.build.openshift.io/hello created
 jegan@tektutor.org  ~/openshift-june-2024/Day5/buildconfig  main  oc get buildconfigs
NAME    TYPE     FROM       LATEST
hello   Docker   Git@main   1
 jegan@tektutor.org  ~/openshift-june-2024/Day5/buildconfig  main  oc logs -f bc/hello
Cloning "https://github.com/tektutor/openshift-june-2024.git" ...
        Commit: e83734fa809cc8efba0404699f06c57c65efb8dd (Merge branch 'main' of https://github.com/tektutor/ope
nshift-june-2024)
        Author: Jeganathan Swaminathan <mail2jegan@gmail.com>
        Date:   Fri Jun 28 11:13:02 2024 +0530
time="2024-06-28T05:44:04Z" level=info msg="Not using native diff for overlay, this may cause degraded performan
ce for building images: kernel has CONFIG_OVERLAY_FS_REDIRECT_DIR enabled"
I0628 05:44:04.175049       1 defaults.go:112] Defaulting to storage driver "overlay" with options [mountopt=met
acopy=on].
Caching blobs under "/var/cache/blobs".

Pulling image docker.io/maven:3.6.3-jdk-11 ...
Trying to pull docker.io/library/maven:3.6.3-jdk-11...
Getting image source signatures
Copying blob sha256:5d6f1e8117dbb1c6a57603cb4f321a861a08105a81bcc6b01b0ec2b78c8523a5
Copying blob sha256:6c215442f70bd949a6f2e80925499439O5e2d4f9c87a4f532d7740ae8647d33a
Copying blob sha256:48c2faf66abec3dce9f54d6722ff592fce6dd4fb58a0d0b72282936c6598a3b3
Copying blob sha256:234b70d0479d7f16d7ee8d04e4ffdacc57d7d14313faf59d332f18b2e9418743
```



```
2.4.2/spring-boot-dependencies-2.4.2.pom (108 kB at 1.7 MB/s)
Downloading from central: https://repo.maven.apache.org/maven2/com/datastax/oss/java-driver-bom/4.9.0/java-drive
r-bom-4.9.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/com/datastax/oss/java-driver-bom/4.9.0/java-driver
-bom-4.9.0.pom (4.1 kB at 99 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/io/dropwizard/metrics/metrics-bom/4.1.17/metrics-
bom-4.1.17.pom
Downloaded from central: https://repo.maven.apache.org/maven2/io/dropwizard/metrics/metrics-bom/4.1.17/metrics-b
om-4.1.17.pom (5.3 kB at 161 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/io/dropwizard/metrics/metrics-parent/4.1.17/metri
cs-parent-4.1.17.pom
Downloaded from central: https://repo.maven.apache.org/maven2/io/dropwizard/metrics/metrics-parent/4.1.17/metric
s-parent-4.1.17.pom (17 kB at 487 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/codehaus/groovy/groovy-bom/2.5.14/groovy-bom-
2.5.14.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/groovy/groovy-bom/2.5.14/groovy-bom-2
.5.14.pom (26 kB at 798 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/infinispan/infinispan-bom/11.0.8.Final/infini
span-bom-11.0.8.Final.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/infinispan/infinispan-bom/11.0.8.Final/infinis
pan-bom-11.0.8.Final.pom (19 kB at 538 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/infinispan/infinispan-build-configuration-par
ent/11.0.8.Final/infinispan-build-configuration-parent-11.0.8.Final.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/infinispan/infinispan-build-configuration-pare
nt/11.0.8.Final/infinispan-build-configuration-parent-11.0.8.Final.pom (13 kB at 416 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/jboss/jboss-parent/36/jboss-parent-36.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/jboss/jboss-parent/36/jboss-parent-36.pom (66
kB at 1.6 MB/s)
```


Activities
Terminal
Jun 28 11:14
jegan@tektutor.org
jegan@tektutor.org
jegan@tektutor.org
2.4.2/spring-boot-loader-tools-2.4.2.jar (243 kB at 817 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/eclipse/sisu/org.eclipse.sisu.inject/0.3.4/org.eclipse.sisu.inject-0.3.4.jar
Downloaded from central: https://repo.maven.apache.org/maven2/commons-codec/commons-codec/1.11/commons-codec-1.11.jar (335 kB at 1.1 MB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.2.1/plexus-utils-3.2.1.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-plugin-api/3.6.3/maven-plugin-api-3.6.3.jar (47 kB at 149 kB/s)
Downloading from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-classworlds/2.6.0/plexus-classworlds-2.6.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/shared/maven-shared-utils/3.1.0/maven-shared-utils-3.1.0.jar (164 kB at 516 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/eclipse/sisu/org.eclipse.sisu.plexus/0.3.4/org.eclipse.sisu.plexus-0.3.4.jar (205 kB at 597 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-classworlds/2.6.0/plexus-classworlds-2.6.0.jar (53 kB at 151 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-utils/3.2.1/plexus-utils-3.2.1.jar (262 kB at 742 kB/s)
Downloaded from central: https://repo.maven.apache.org/maven2/org/eclipse/sisu/org.eclipse.sisu.inject/0.3.4/org.eclipse.sisu.inject-0.3.4.jar (379 kB at 1.1 MB/s)
[INFO] Replacing main artifact with repackaged archive
[INFO] --
[INFO] BUILD SUCCESS
[INFO] --
[INFO] Total time: 16.999 s
[INFO] Finished at: 2024-06-28T05:44:57Z
[INFO] --


Activities
Terminal
Jun 28 11:16
jegan@tektutor.org
jegan@tektutor.org
jegan@tektutor.org
--> 4f4b0196bcaf
[2/2] STEP 4/6: ENTRYPOINT ["java","-jar","app.jar"]
--> 8b66215a6e28
[2/2] STEP 5/6: ENV "OPENSHIFT_BUILD_NAME"="hello-1" "OPENSHIFT_BUILD_NAMESPACE"="jegan" "OPENSHIFT_BUILD_SOURCE"="https://github.com/tektutor/openshift-june-2024.git" "OPENSHIFT_BUILD_REFERENCE"="main" "OPENSHIFT_BUILD_COMMIT"="e83734fa809cc8efba0404699f06c57c65efb8dd"
--> d66df0a2e8c3
[2/2] STEP 6/6: LABEL "io.openshift.build.commit.author"="Jeganathan Swaminathan <mail2jegan@gmail.com>" "io.openshift.build.commit.date"="Fri Jun 28 11:13:02 2024 +0530" "io.openshift.build.commit.id"="e83734fa809cc8efba0404699f06c57c65efb8dd" "io.openshift.build.commit.message"="Merge branch 'main' of https://github.com/tektutor/openshift-june-2024" "io.openshift.build.commit.ref"="main" "io.openshift.build.name"="hello-1" "io.openshift.build.namespace"="jegan" "io.openshift.build.source-context-dir"="Day5/buildconfig" "io.openshift.build.source-location"="https://github.com/tektutor/openshift-june-2024.git"
[2/2] COMMIT temp.builder.openshift.io/jegan/hello-1:d6c939f1
--> e106e9dbe6a2
Successfully tagged temp.builder.openshift.io/jegan/hello-1:d6c939f1
e106e9dbe6a289e70d4de7a8889d3309c12c5c4f73f3ed2caa649effba4dca66
Pushing image tektutorjegan74.jfrog.io/jegan-docker/hello-spring-microservice:1.0 ...
Getting image source signatures
Copying blob sha256:130154dcd4ddc70332b820fb247f30649545ba019219a0a2810ddf58743207ed
Copying blob sha256:8393debac2ec316f87eab40af5451d57df2863f844f545d40447e46e025c9663
Copying blob sha256:1846180440d3041e0848b0bcbb735f024f3bc5e2d39f1ab4ad490f630863d903
Copying config sha256:e106e9dbe6a289e70d4de7a8889d3309c12c5c4f73f3ed2caa649effba4dca66
Writing manifest to image destination
Successfully pushed tektutorjegan74.jfrog.io/jegan-docker/hello-spring-microservice@sha256:44d1ea02dbc51cf09ee3ddc86815eeecf3432fea06c9fa8a5d4823ae3c34230c
Push successful
jegan@tektutor.org ~/openshift-june-2024/Day5/buildconfig main



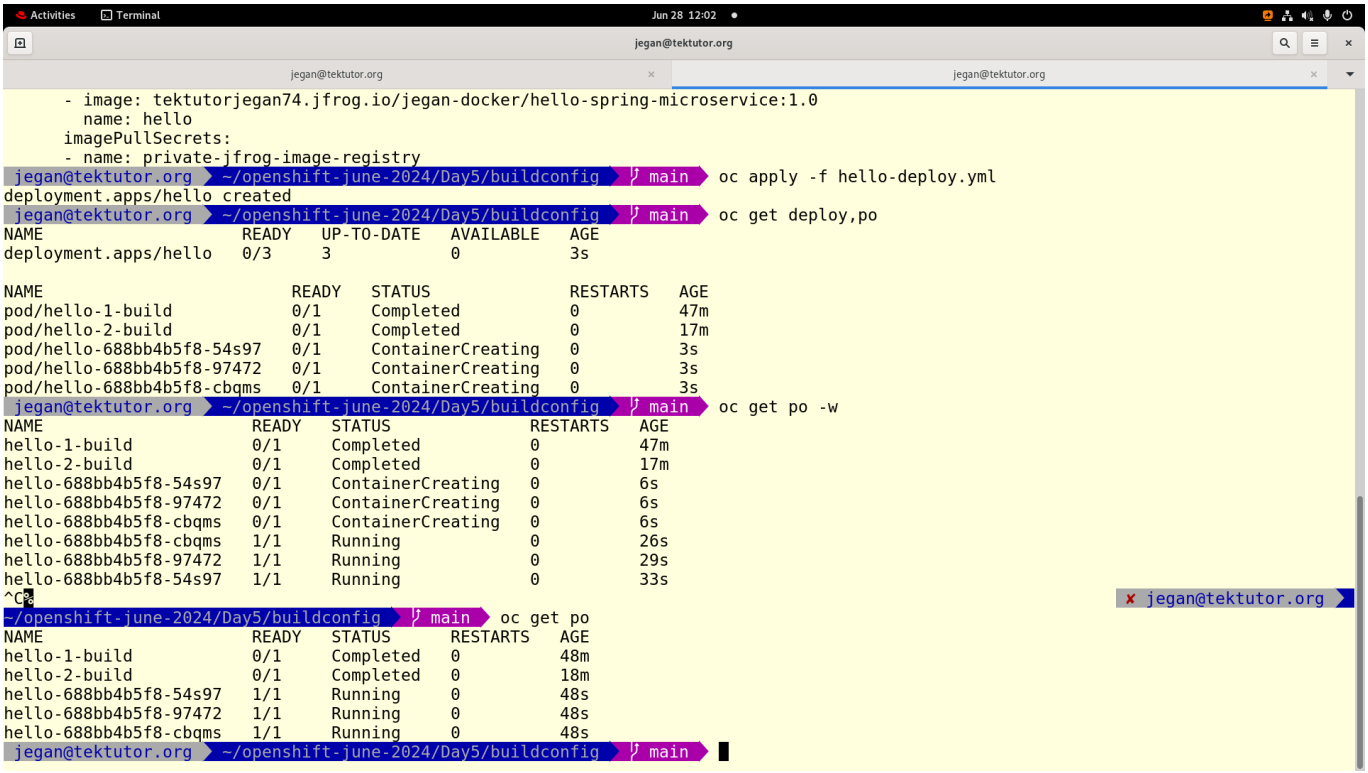
Lab - Deploying hello microservice using our custom docker image from Private JFrog Docker Registry

```
cd ~/openshift-june-2024
git pull
cd Day5/buildconfig
oc create deployment hello --image=tektutorjegan74.jfrog.io/jegan-
docker/hello-spring-microservice:1.0 --replicas=3 -o yaml --dry-run=client

oc create deployment hello --image=tektutorjegan74.jfrog.io/jegan-
docker/hello-spring-microservice:1.0 --replicas=3 -o yaml --dry-run=client
> hello-deploy.yml
```

Update the hello-deploy to use your private-jfrog-image-registry secret as JFrog Artifactory will allow only authorized users to download and use the image from it.

```
cd ~/openshift-june-2024
git pull
cd Day5/buildconfig
cat hello-deploy.yml
oc apply -f hello-deploy.yml
oc get deploy,po
oc get po -w
oc get po
```

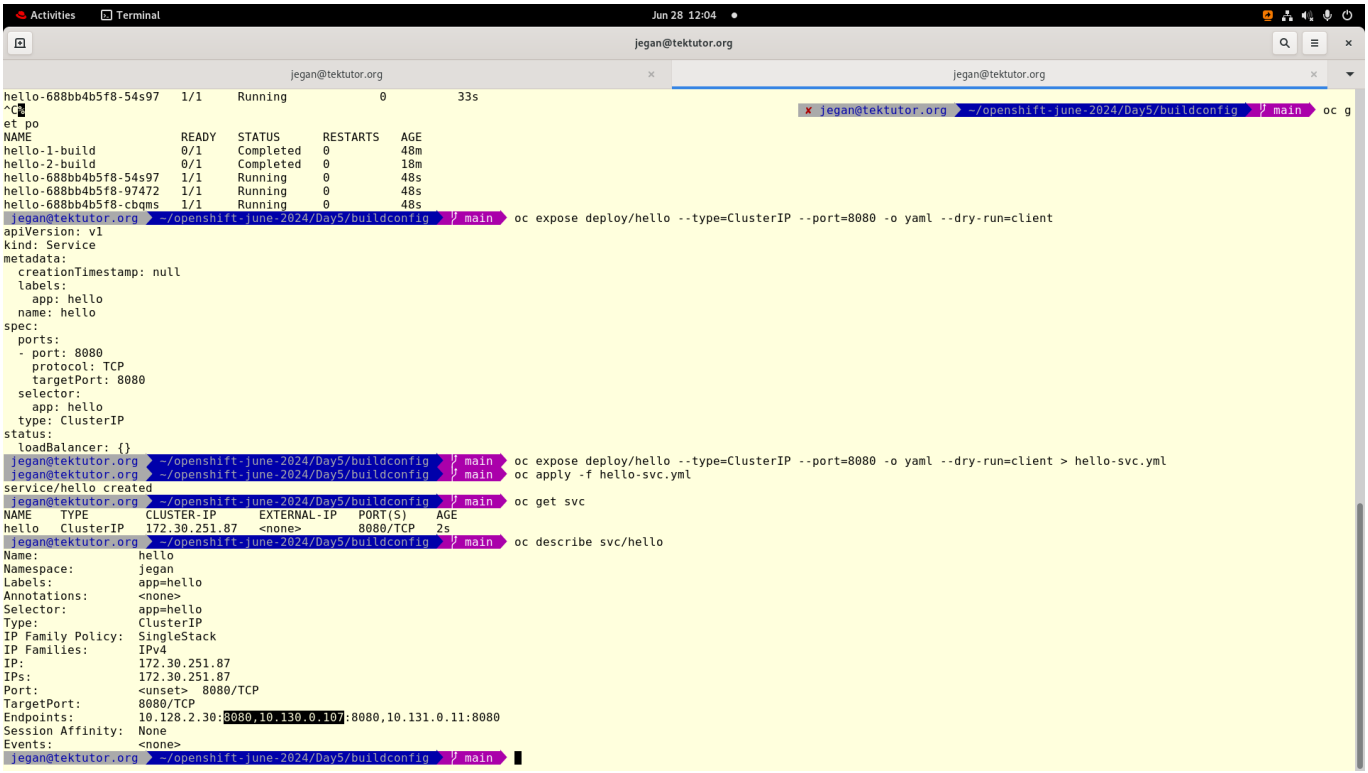
Expected output



Let's create an internal service for hello microservice

```
oc expose deploy/hello --type=ClusterIP --port=8080 -o yaml --dry-
run=client
oc expose deploy/hello --type=ClusterIP --port=8080 -o yaml --dry-
run=client > hello-svc.yml
oc apply -f hello-svc.yml
oc get svc
oc describe svc/hello
```

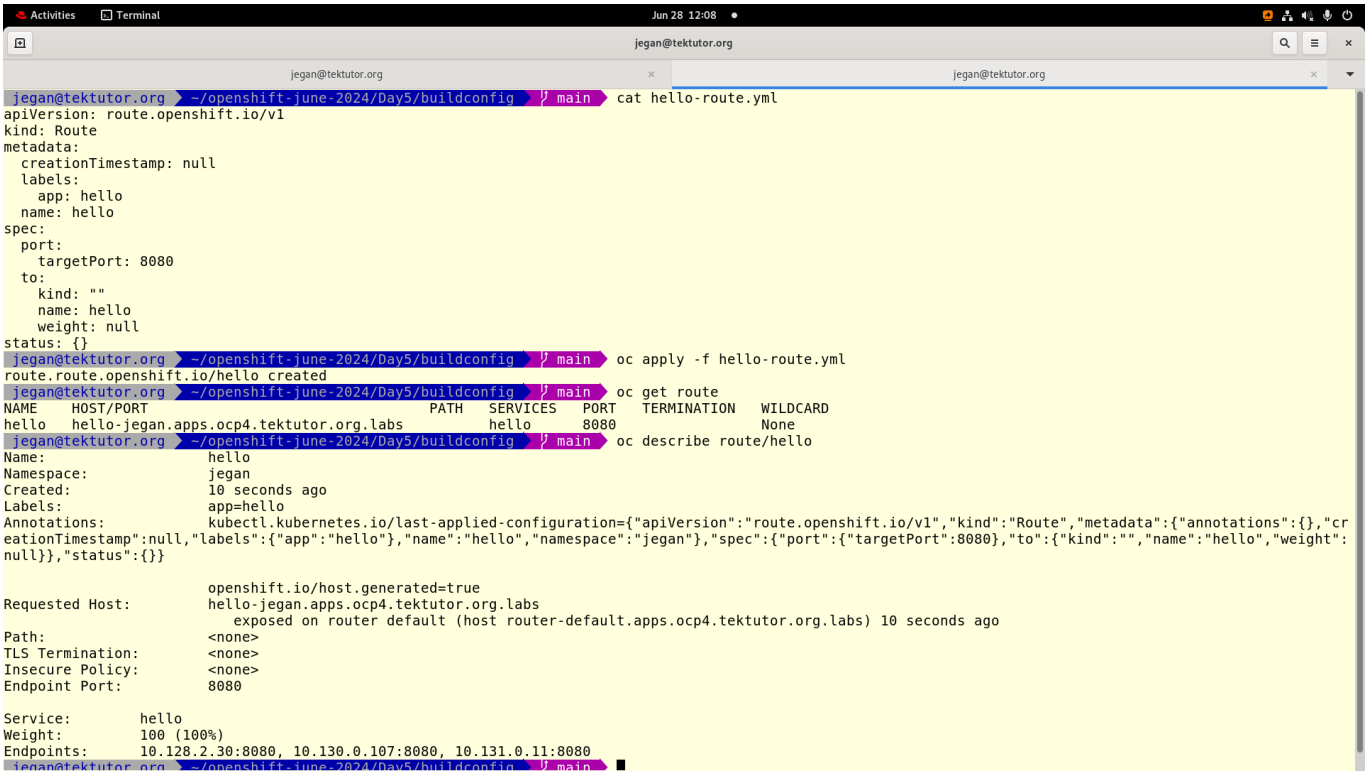
Expected output

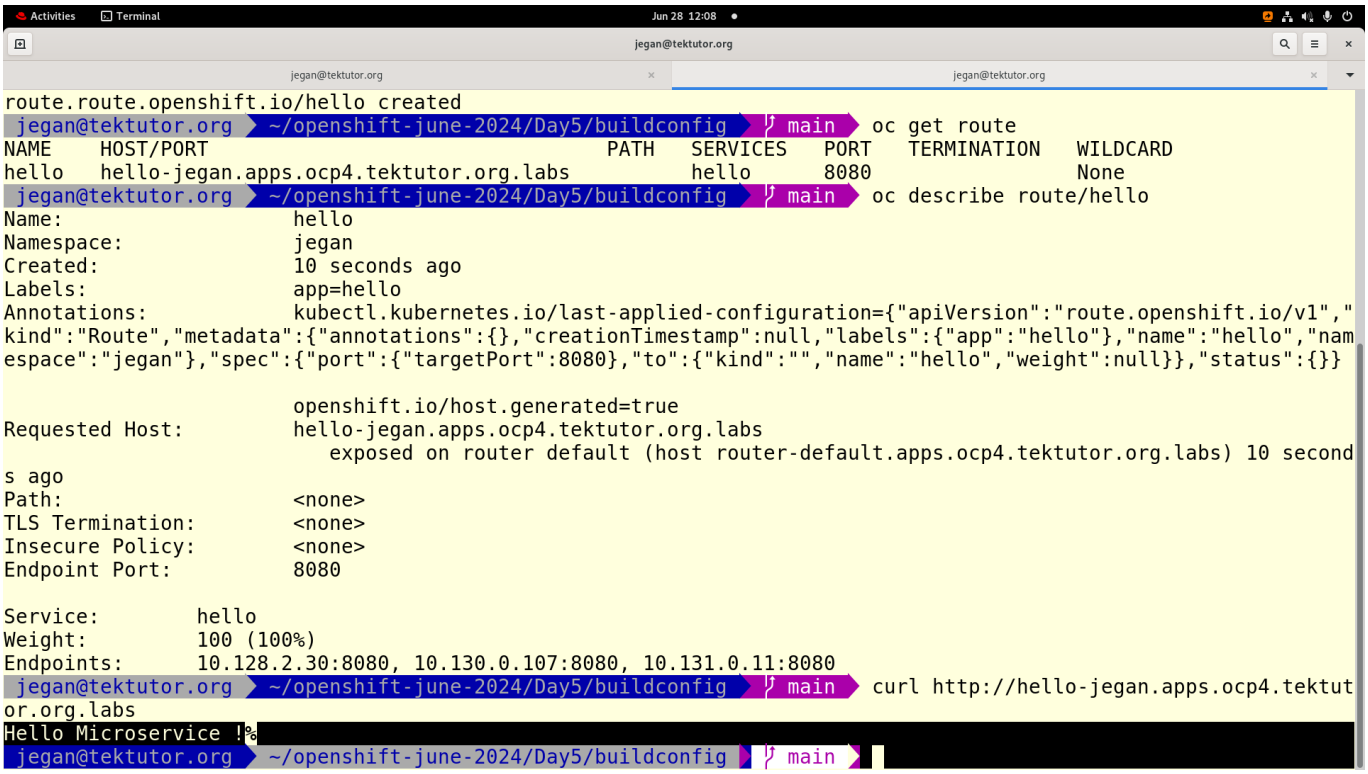


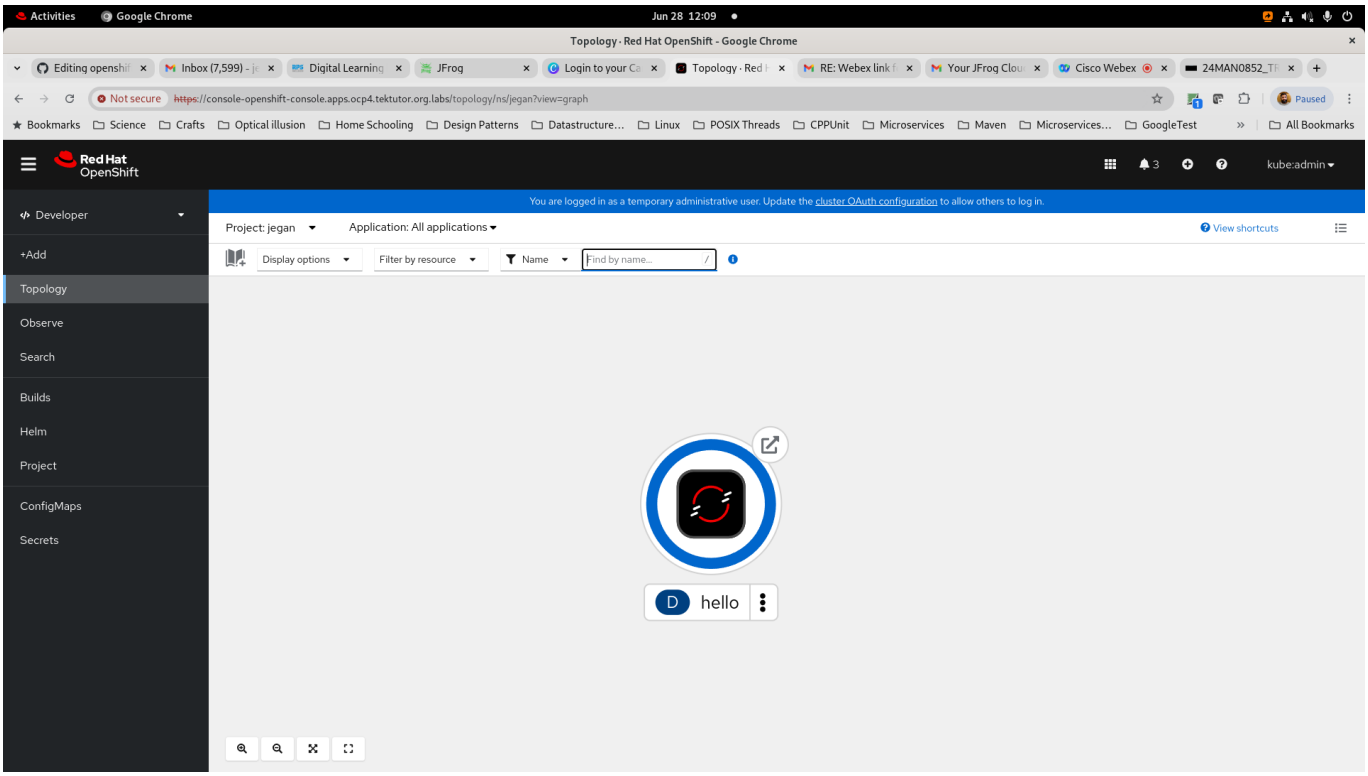
Let's create a route to access the hello microservice from outside the openshift cluster

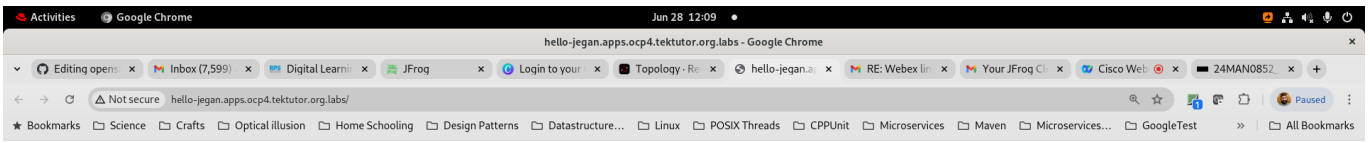
```
oc expose svc/hello -o yaml --dry-run=client
oc expose svc/hello -o yaml --dry-run=client > hello-route.yml

cat hello-route.yml

oc apply -f hello-route.yml
oc get route
oc describe route/hello
```

Expected output









Hello Microservice !

Lab - Rolling update - updating hello microservice to its v2.0

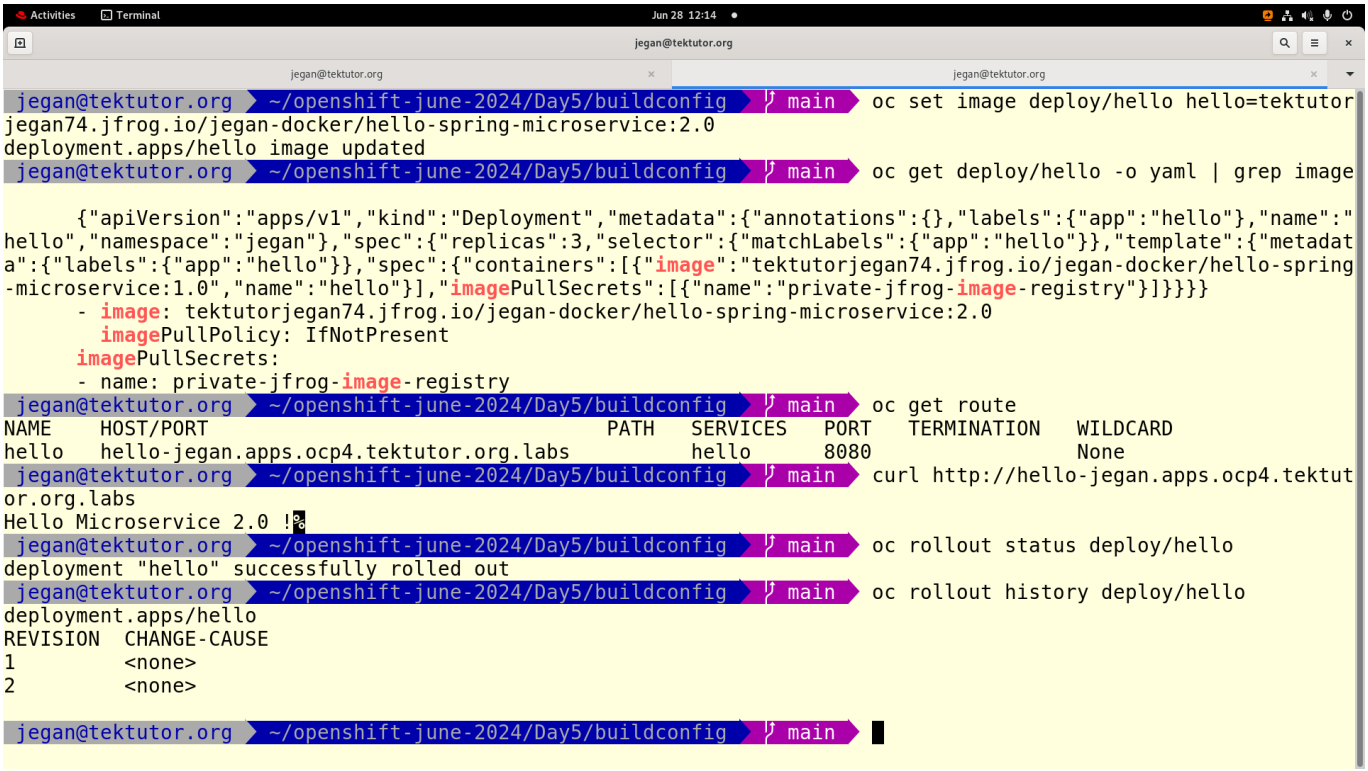
When the build config file is updated, we need to apply the changes in the openshift cluster

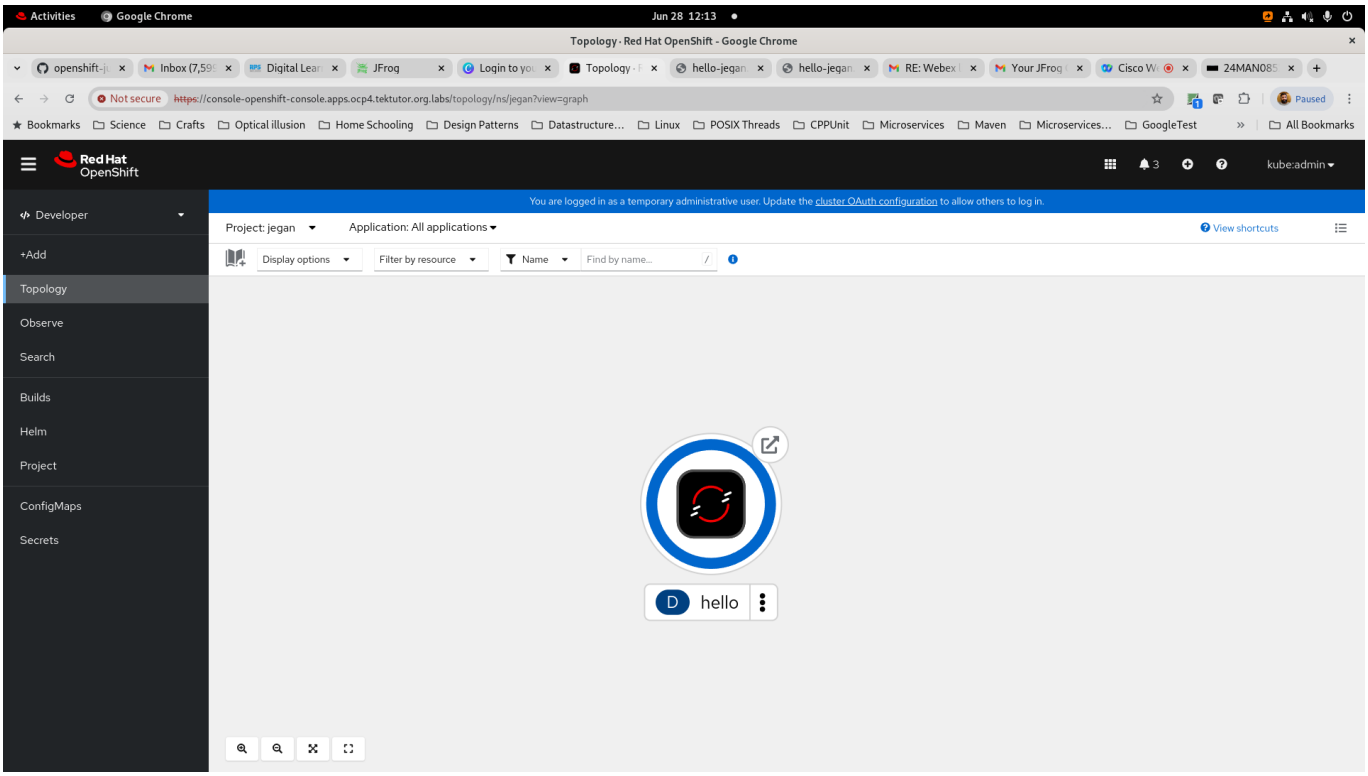
```
cd ~/openshift-june-2024
git pull
cd Day5/buildconfig
cat buildconfig-pushto-artifactory.yml
oc apply -f buildconfig-pushto-artifactory.yml
oc get buildconfigs
oc start-build bc/hello
```

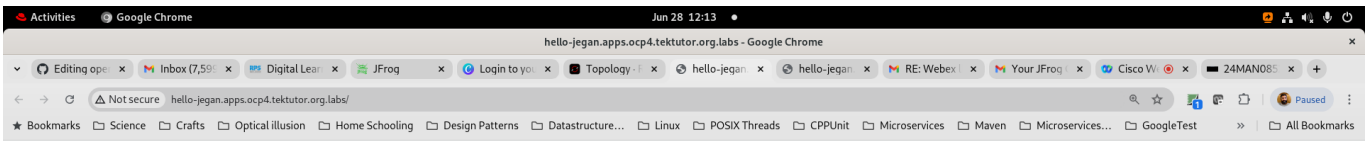
Once the new image v2.0 is pushed successfully to JFrog Artifactory, you can proceed as shown bellow

```
oc set image deploy/hello hello=tektutorjegan74.jfrog.io/jegan-
docker/hello-spring-microservice:2.0
oc get deploy/hello -o yaml | grep image
oc get route
curl http://hello-jegan.apps.ocp4.tektutor.org.labs
```

Expected output







Hello Microservice 2.0 !

Info - What is Continuous Integration?

```
- Jenkins - is a CI Build Server
- We can create a Jenkins Job - to monitor code commits done in
GitHub/BitBucket or any version control
- Whenever Jenkins detects code commit in the version control, it will
start the build
- As part of the CI Build, it will first clone the latest source code from
GitHub/BitBucket code repository
- Then it will start the application build (maven build, dotnet build)
- As part of the build, you also have to have some automated test cases
```

```
which runs part of the build
- If any test cases fails, the build will also fail
- If code is compiling and all test cases are executed successfully then
the build will succeed.
```

Info - What is Continuous Deployment?

```
- the dev team certified CI builds, will automatically deploy the
application binaries into QA environment for further automated testing
- if all the automated test cases added by QA team succeeds then the build
is good to go live in production
- it might require some manual approvals
```

Info - What is Continuous Delivery?

```
- the QA certified build will automatically be deployed into pre-prod
environment for the customer to check and approve to decide to make them
live in production
```

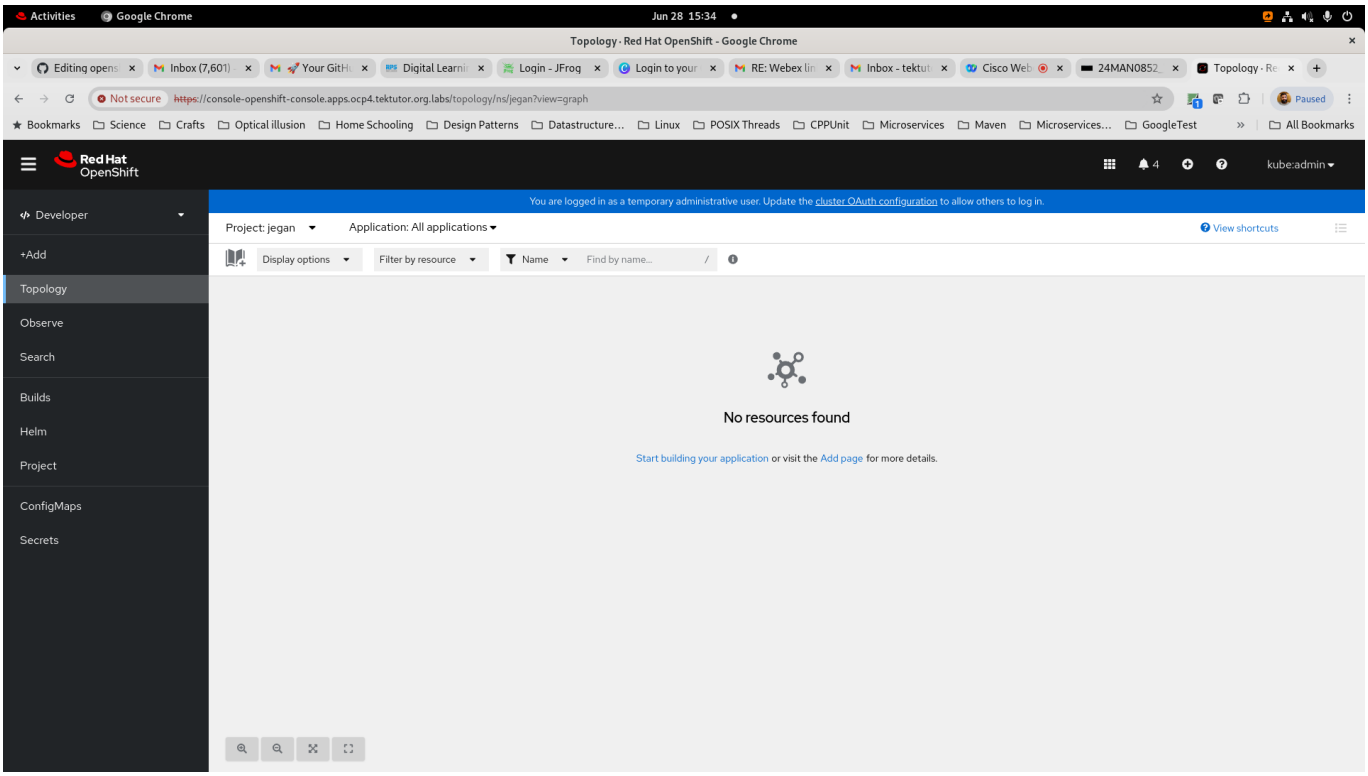
Info - What is a Jenkins CI/CD Job?

```
- could build application source and run automated test cases
- could build custom docker images
- could deploy application binaries to JFrog, Weblogic or JBoss
- could deploy application into Openshift
```

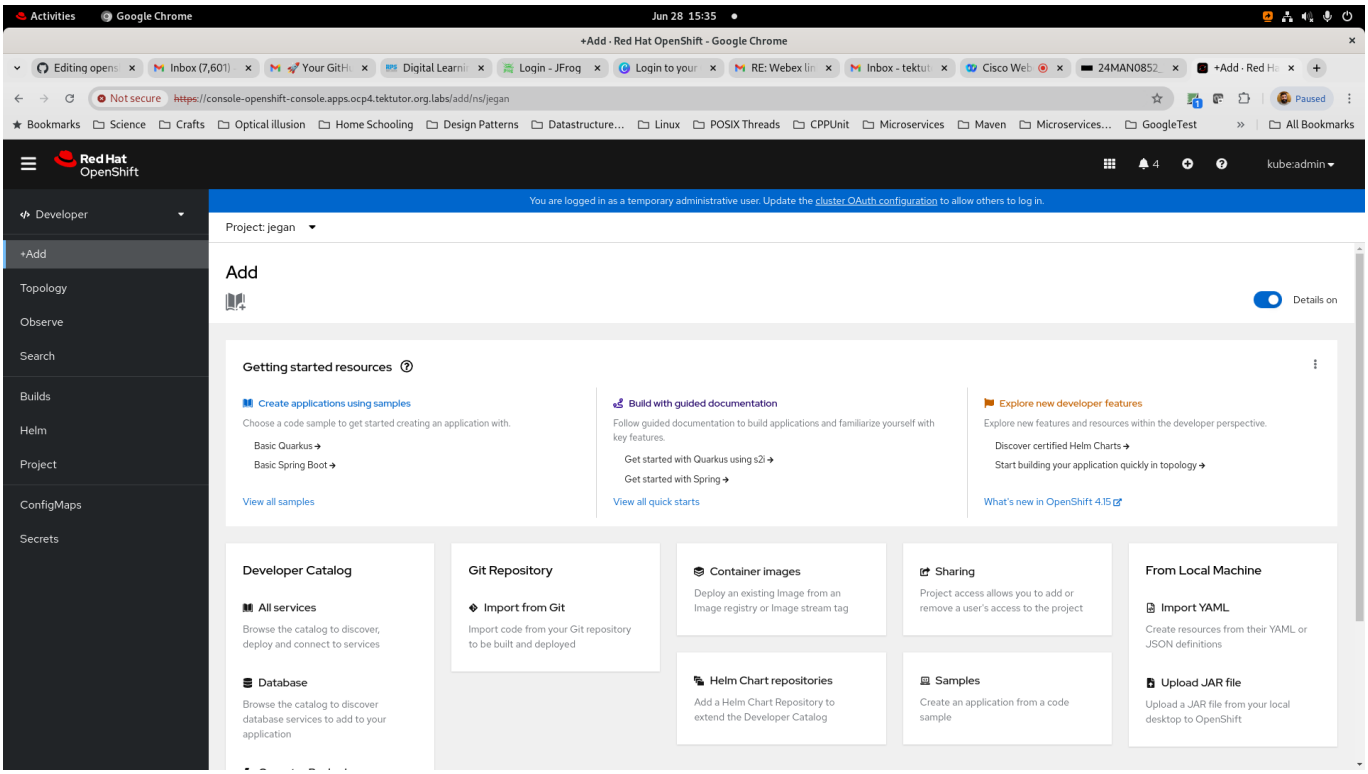
Info - What is Jenkins Pipeline?

```
- Pipelines involves many Jenkins Job that run one after the other in
sequence or in parallel
- Pipelines consists of many Stages
- Each Stage will have one Jenkins Job
- When the First Stage Job succeeds it will trigger next downstream jenkins
job in the pipeline
- If the second stage Job succeeds it will trigger the next downstream
jenkins job in the pipeline
- this goes on until all the jobs complete successfully
- if any one of the stage fails, it won't trigger the next downstream
jenkins job and the build will fail
```

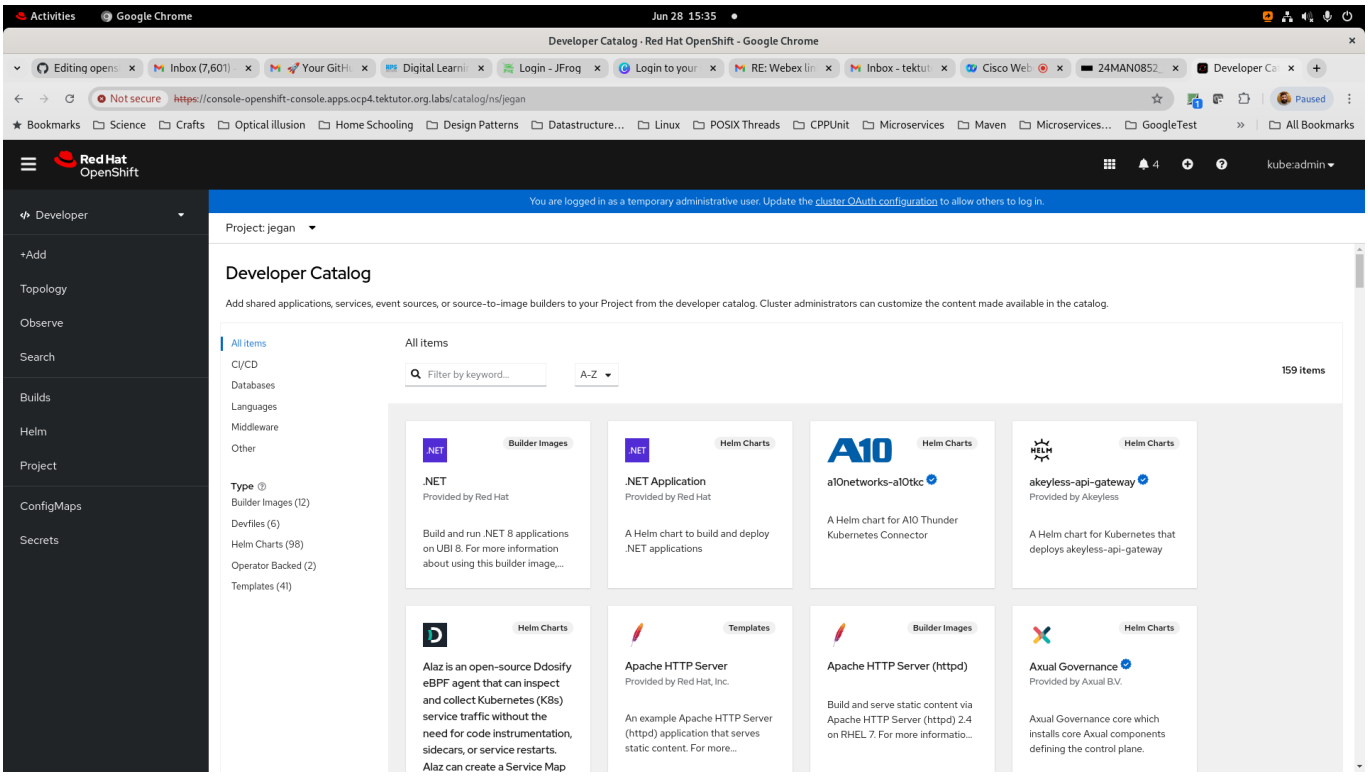
Lab - Deploying Jenkins in Openshift via Helm



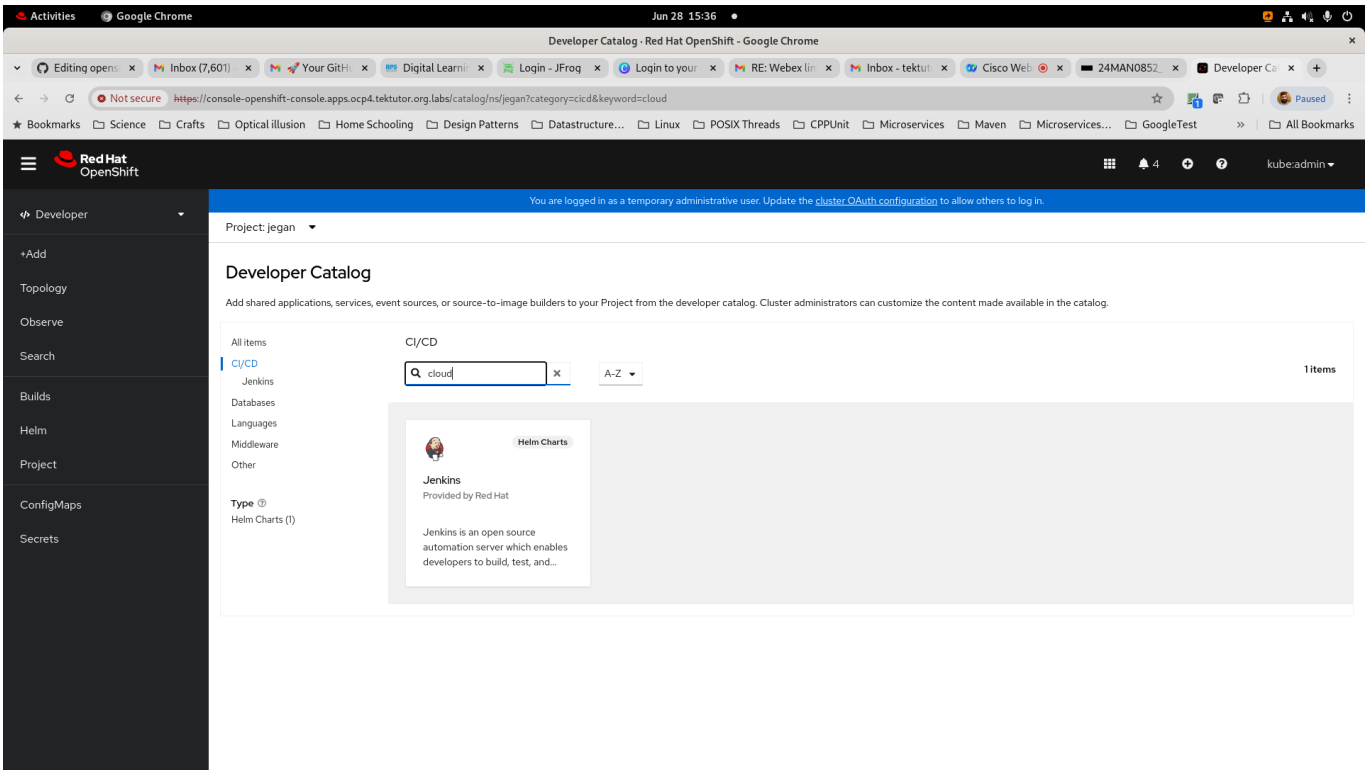
Click on Add



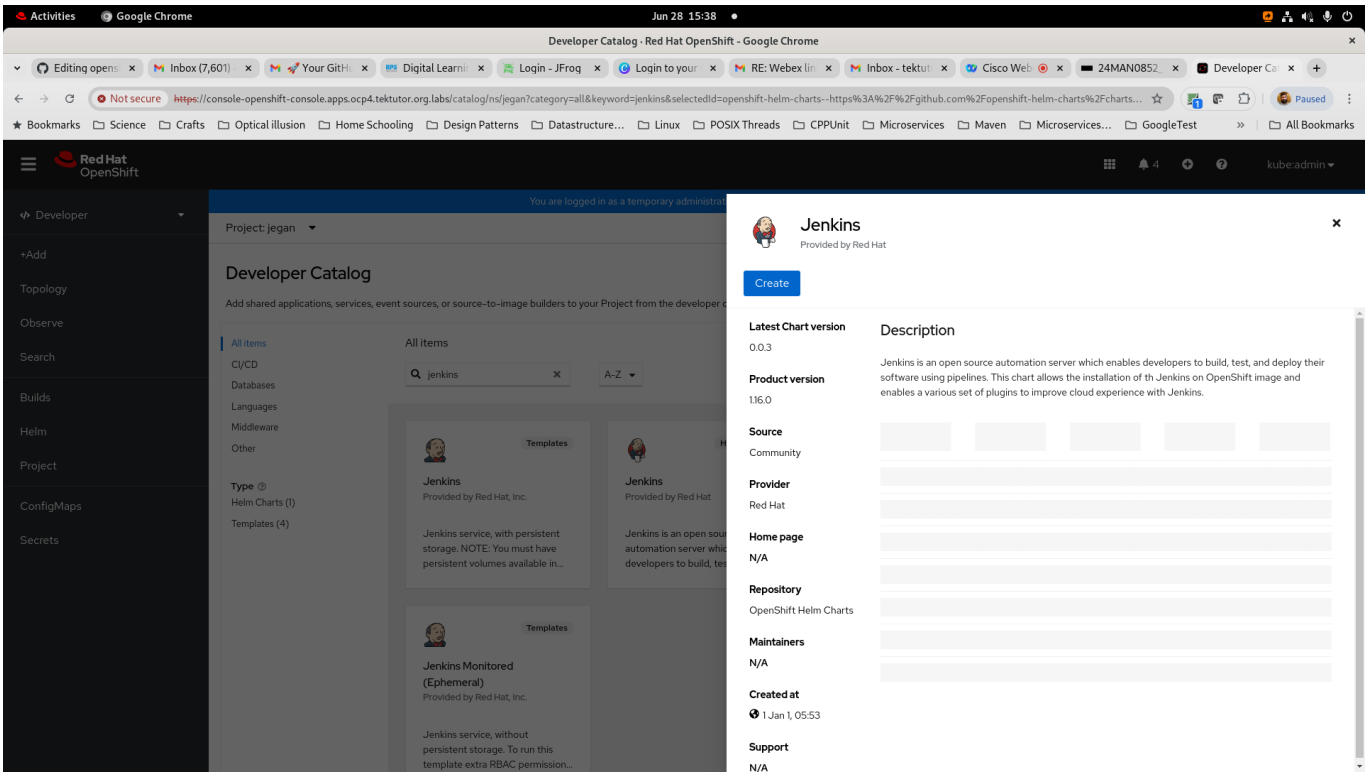
Click on Developer Catalog --> All Service



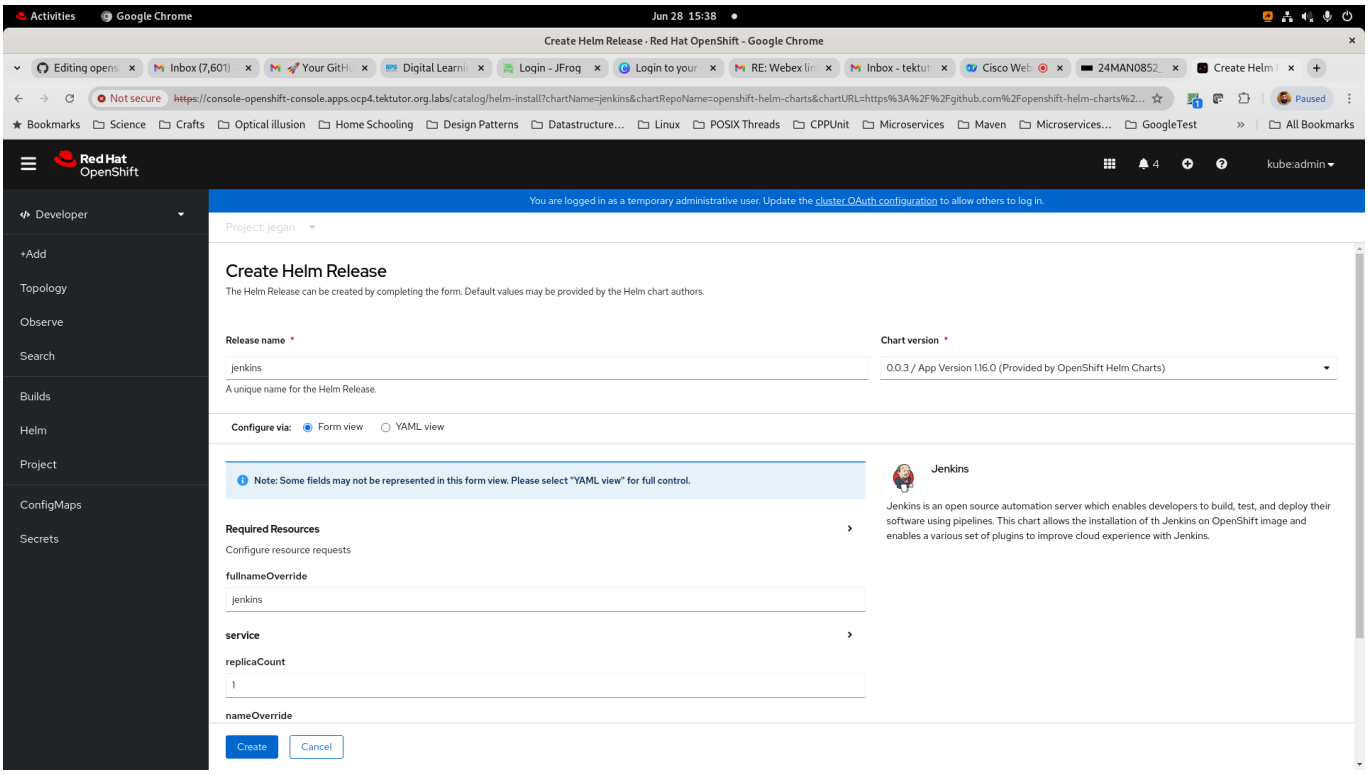
Search jenkins and select Jenkins Helm Charts

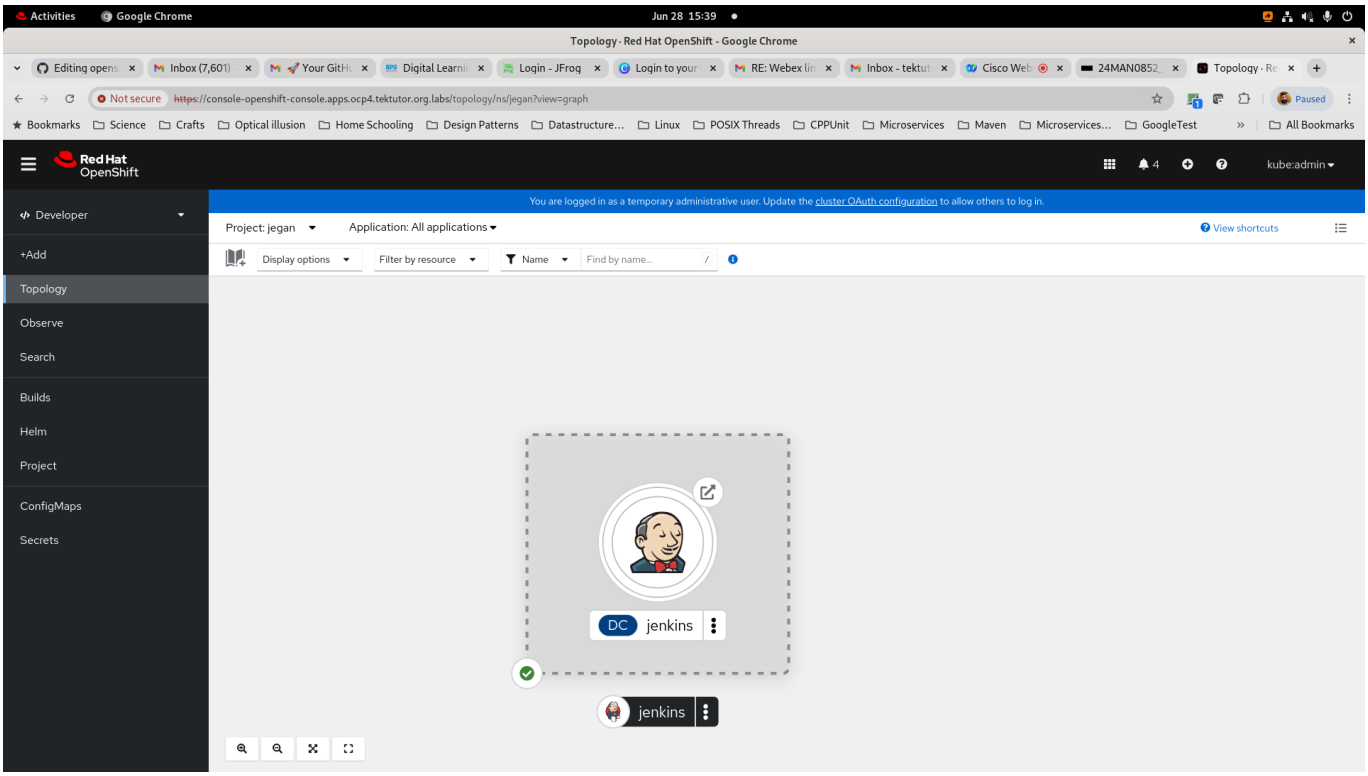


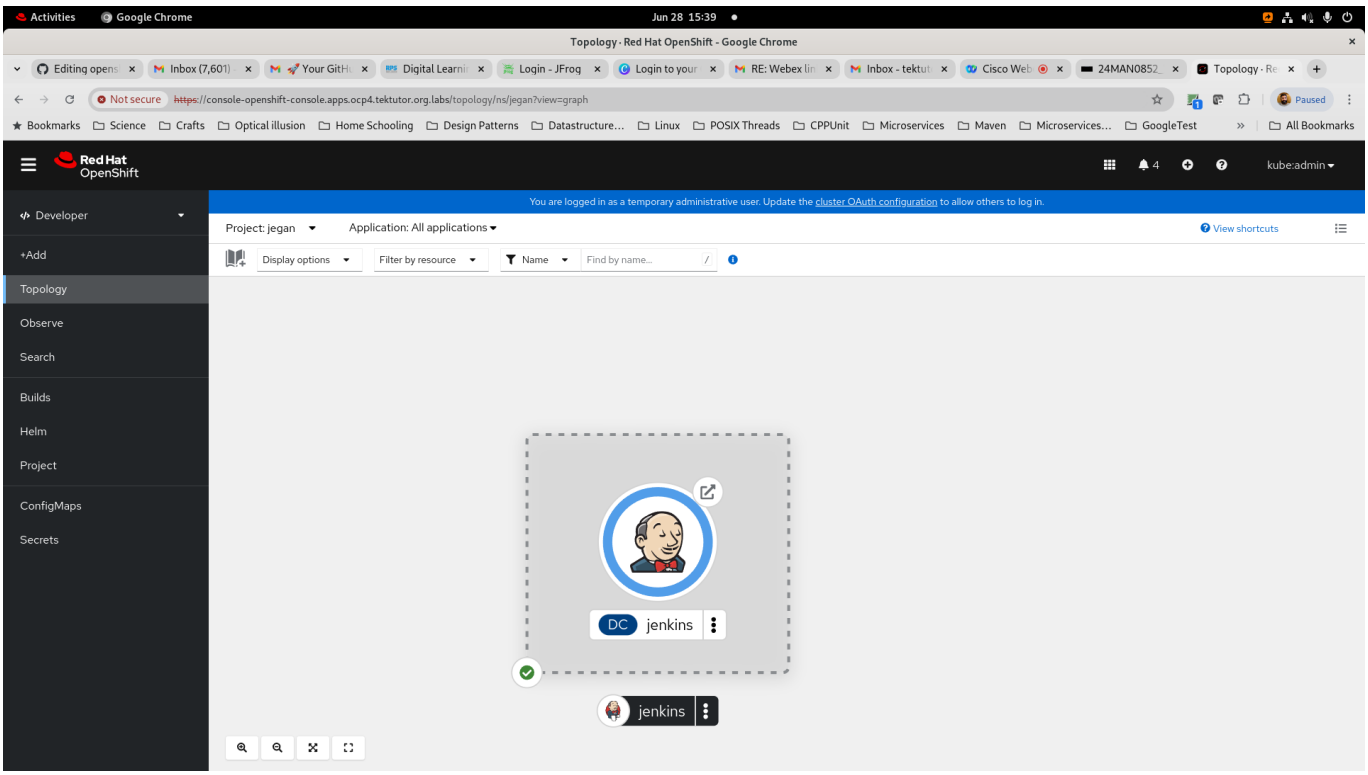
Click on Create when you see the below screen

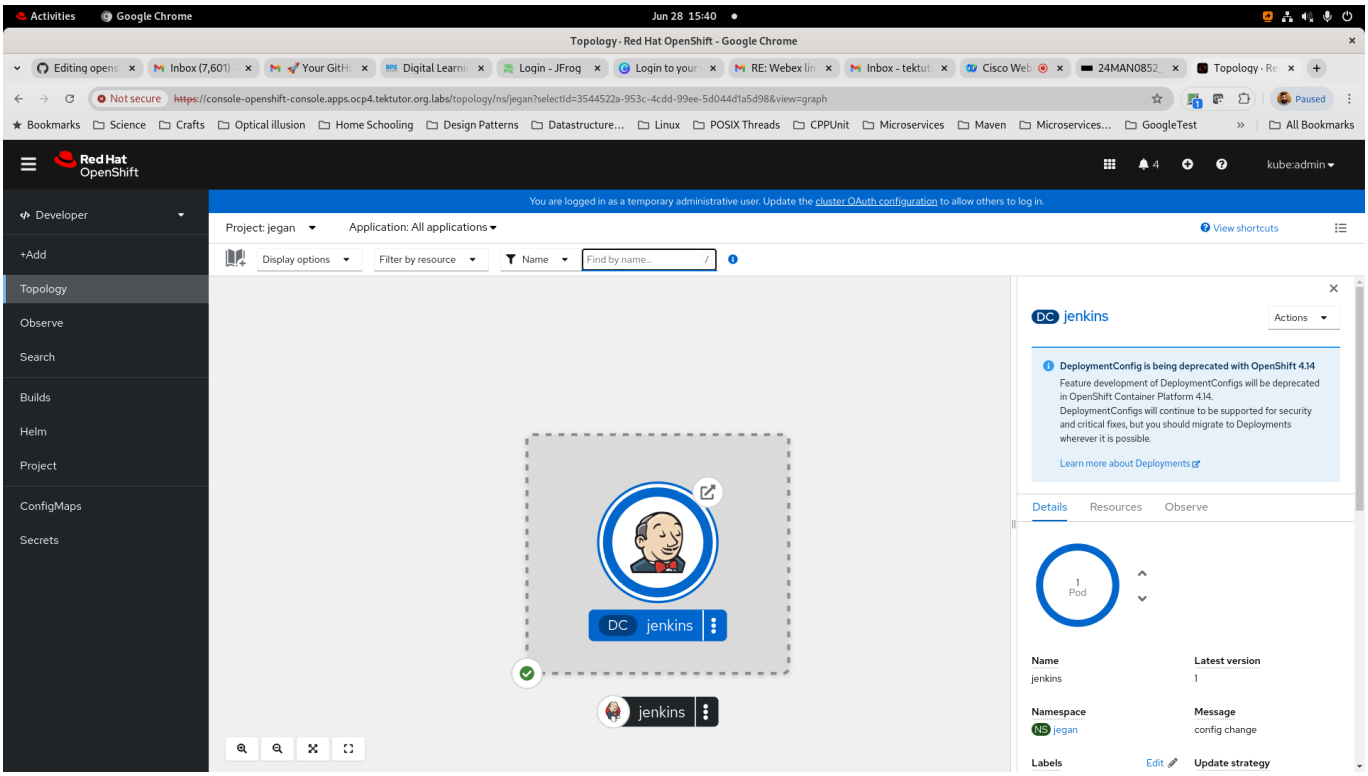


Accept the default values and click on Create button

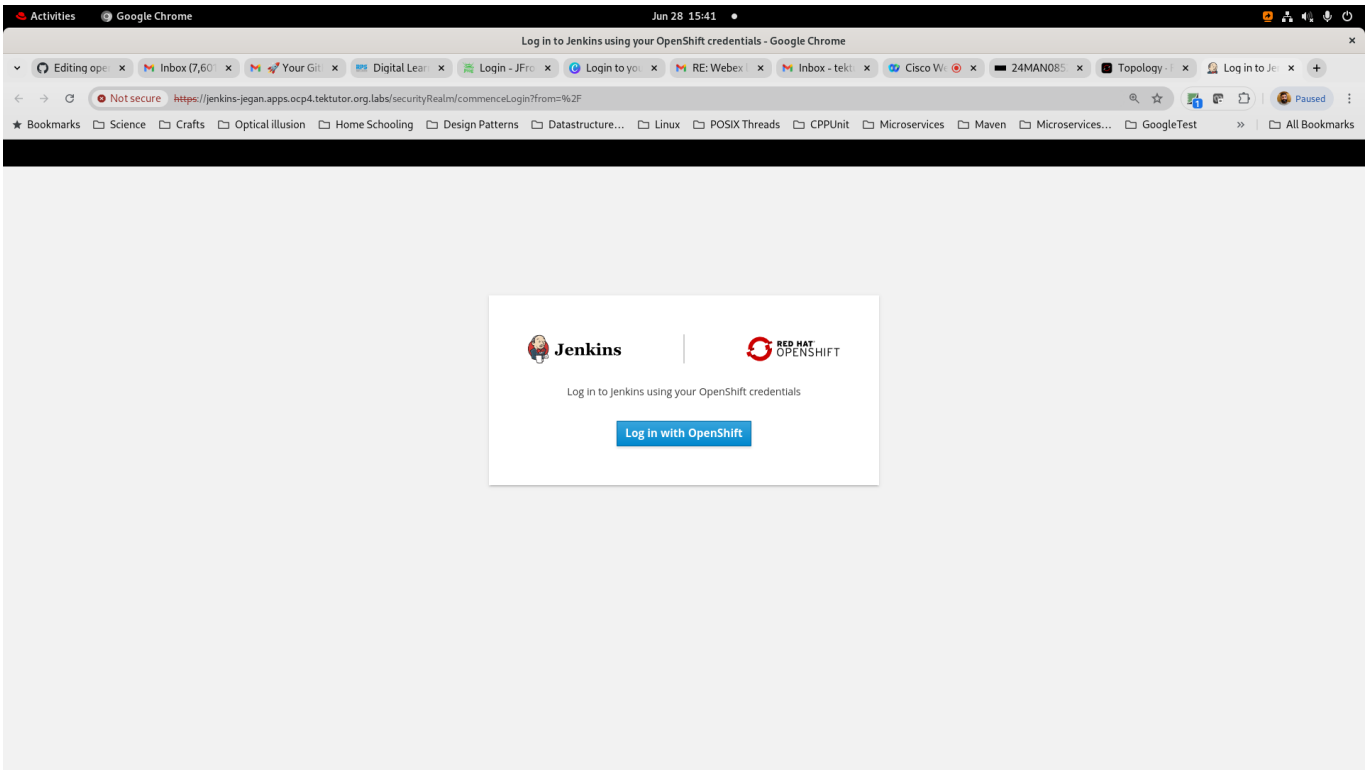



Activities
Google Chrome
Jun 28 15:39
Topology · Red Hat OpenShift - Google Chrome
Red Hat OpenShift
kube:admin
Developer
+Add
Topology
Observe
Search
Builds
Helm
Project
ConfigMaps
Secrets
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: jegan
Application: All applications
View shortcuts
Display options
Filter by resource
Name
Find by name...
DC jenkins
jenkins


Activities
Google Chrome
Jun 28 15:39
Topology · Red Hat OpenShift - Google Chrome
Red Hat OpenShift
kube:admin
Developer
+Add
Topology
Observe
Search
Builds
Helm
Project
ConfigMaps
Secrets
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: jegan
Application: All applications
View shortcuts
Display options
Filter by resource
Name
Find by name...
DC jenkins
jenkins



Click on "Login with Openshift"



What makes the Serveless architecture work in Openshift or Kubernetes

```
- You need to install OpenShift Serverless Operator
- The Serverless Operator installs knative serverless framework
```

Knative and Red Hat Servless

```
- Red Hat Serverless is based on Knative opensource project
- Knative provides a serverless application layer on top of
OpenShift/Kubernetes
- Knative consists of 3 building blocks
  - Build
  - Eventing
  - Serving
```

What does Serverless mean ?

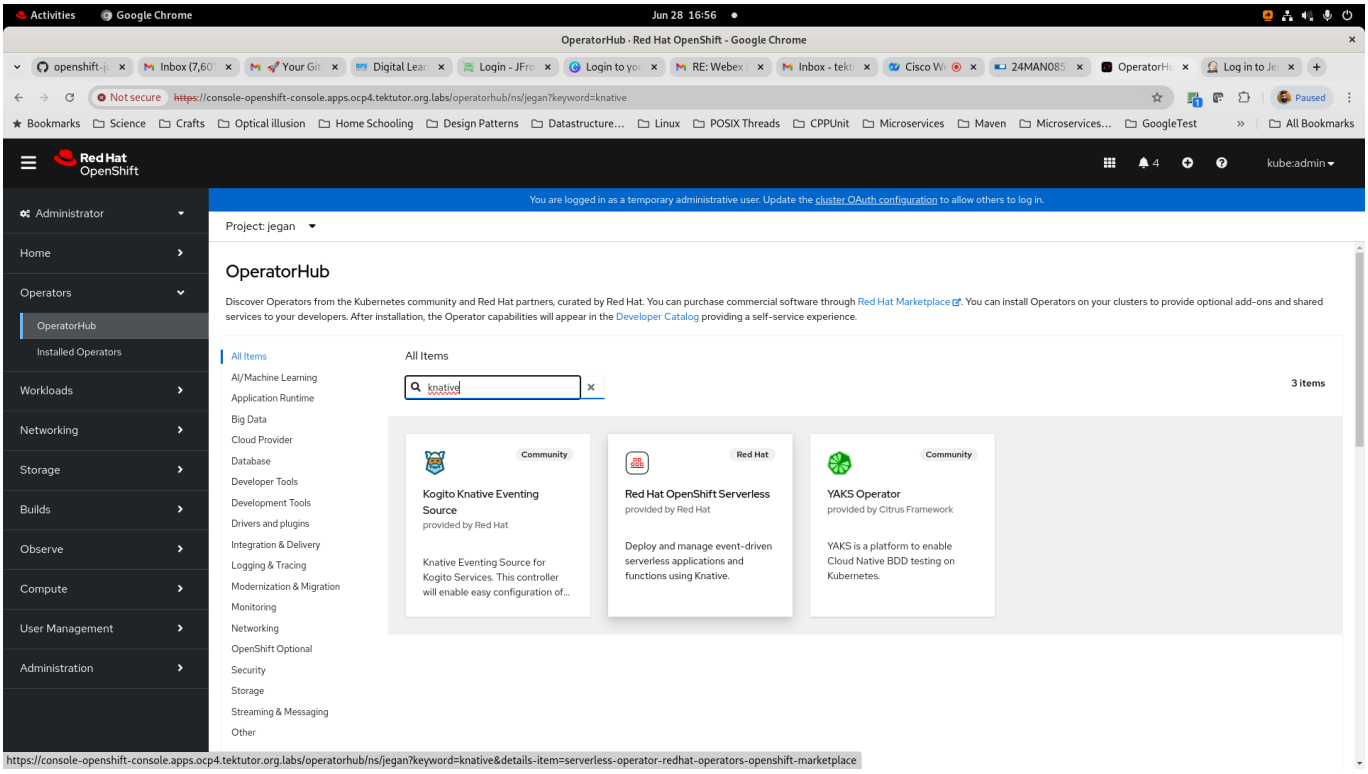
```
- serverless doesn not mean the absence of servers
- is an architecture model for running applications in an environment that
is abstracted away from developers
- developers can focus more on developing their application that where
their code runs
- an ideal serverless workload executes a single task
- a function that retrieves data from a database can be an execellent
serverless workload
- serverless model is the idea of the cold start
- when using serverless, there is a period between the request and creating
the pod environment.  This period is called cold start.
- Examples
  - openshift serverless workloads follow this workflow
    - a request comes in
    - a pod is spun up to service the request
    - the serves the request
    - the pod is destroy when there is no user traffic to handle
    - your service will be scaled down all the way upto 0 pod when there is
0 zero
  - Another example of a serverless workload can be an image processing
function
    - an event could be a photo upload. The uploaded photo triggers an
event to run an application to process the image
    - For example, the application may overtext text, create a banner, or
make thumbnail
    - Once the image is stored permanently, the application has served its
purpose and is no longer needed
```

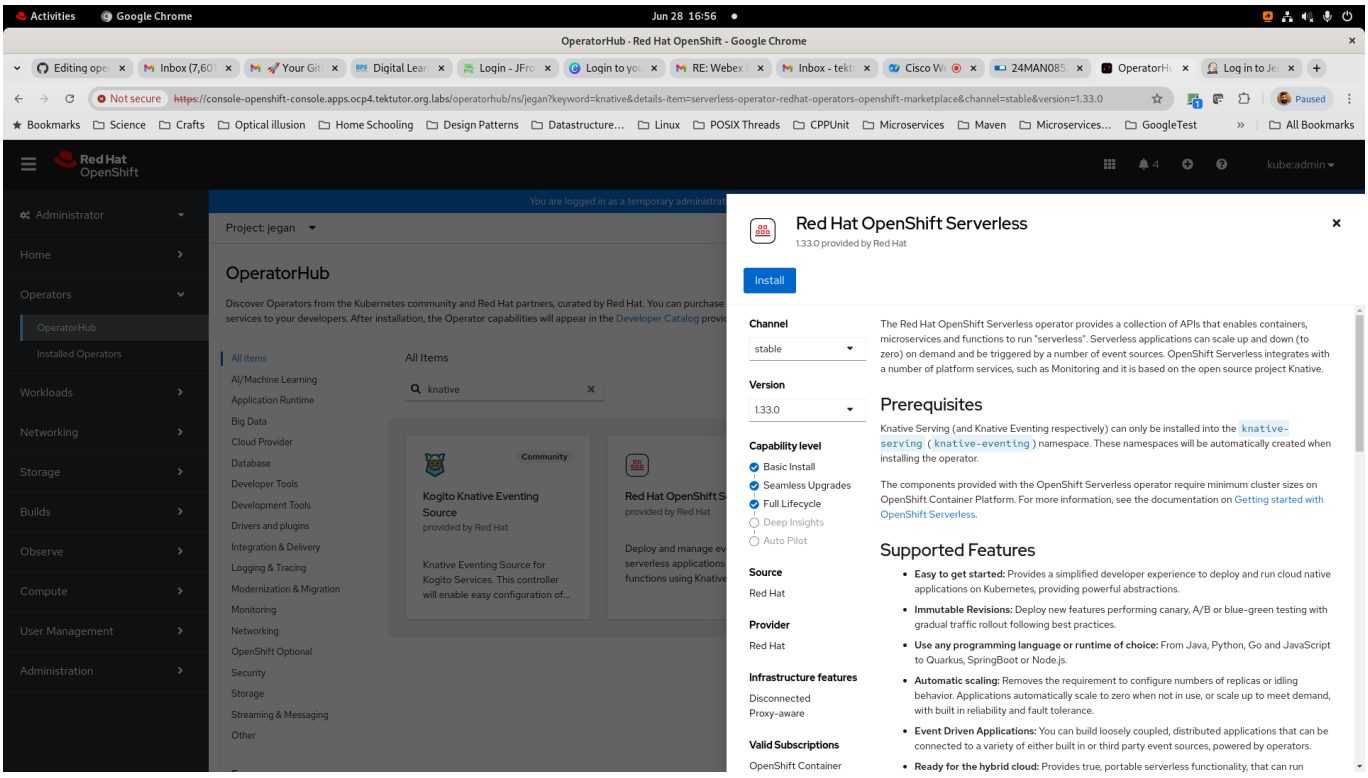
Serverless Features

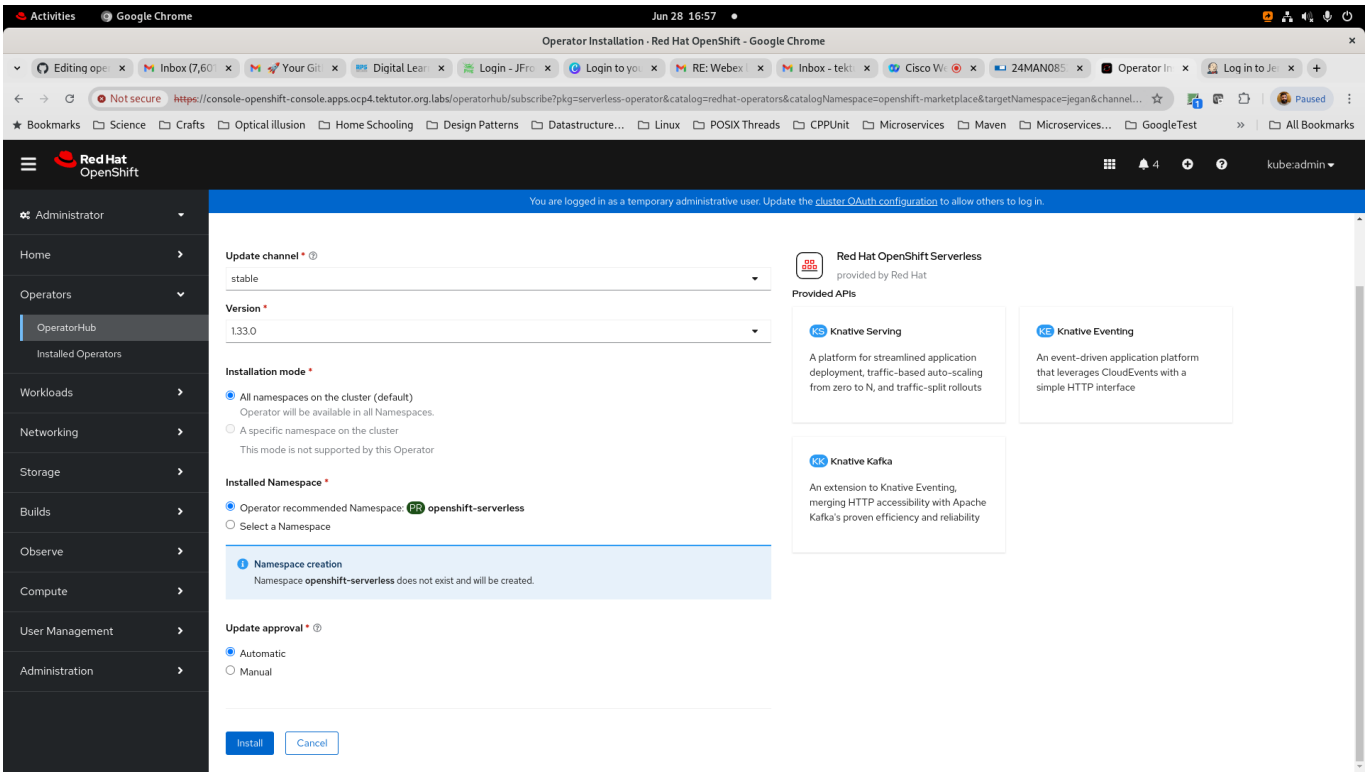
```
- Stateless Function
  - a function to query a database and return the data
  - a function to query weather report and return the data
- Event Driven
  - a serverless model relies on a trigger to execute the code
  - could be a request to an API or an event on a queue
- Auto Scales to zero
```

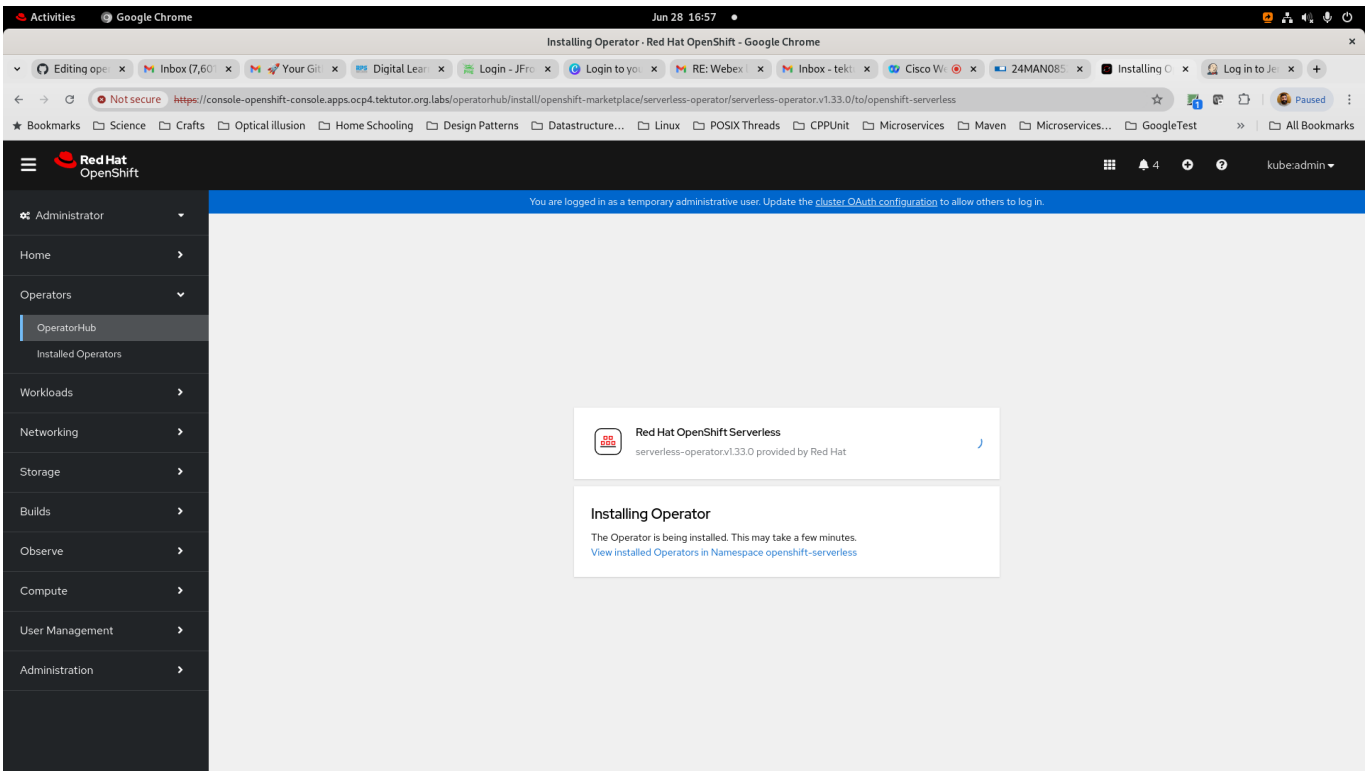
```
    - Being able to scale to zero means your code only runs when it needs to
  respond to an event
    - once the request is serverd, resources are release
```

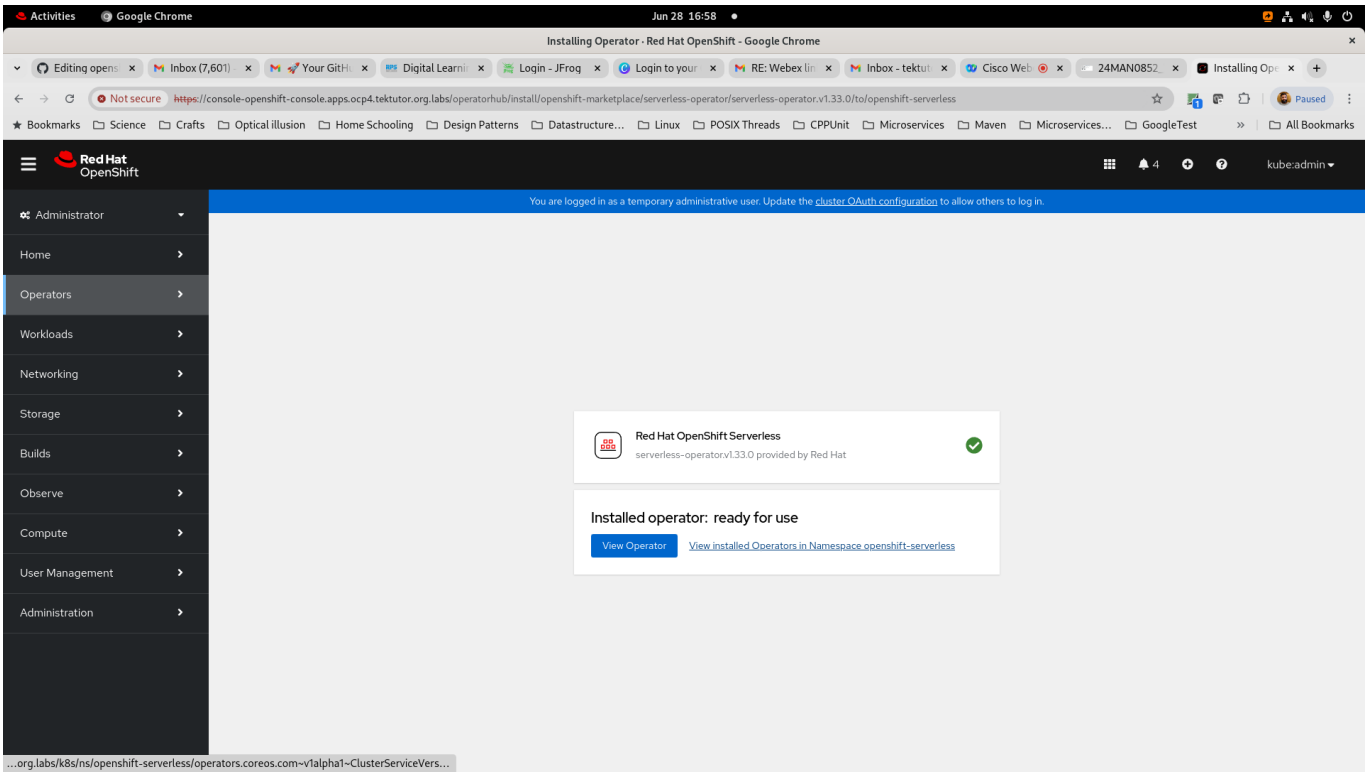
Lab - Installing Red Hat OpenShift Serverless Operator as Openshift Administrator

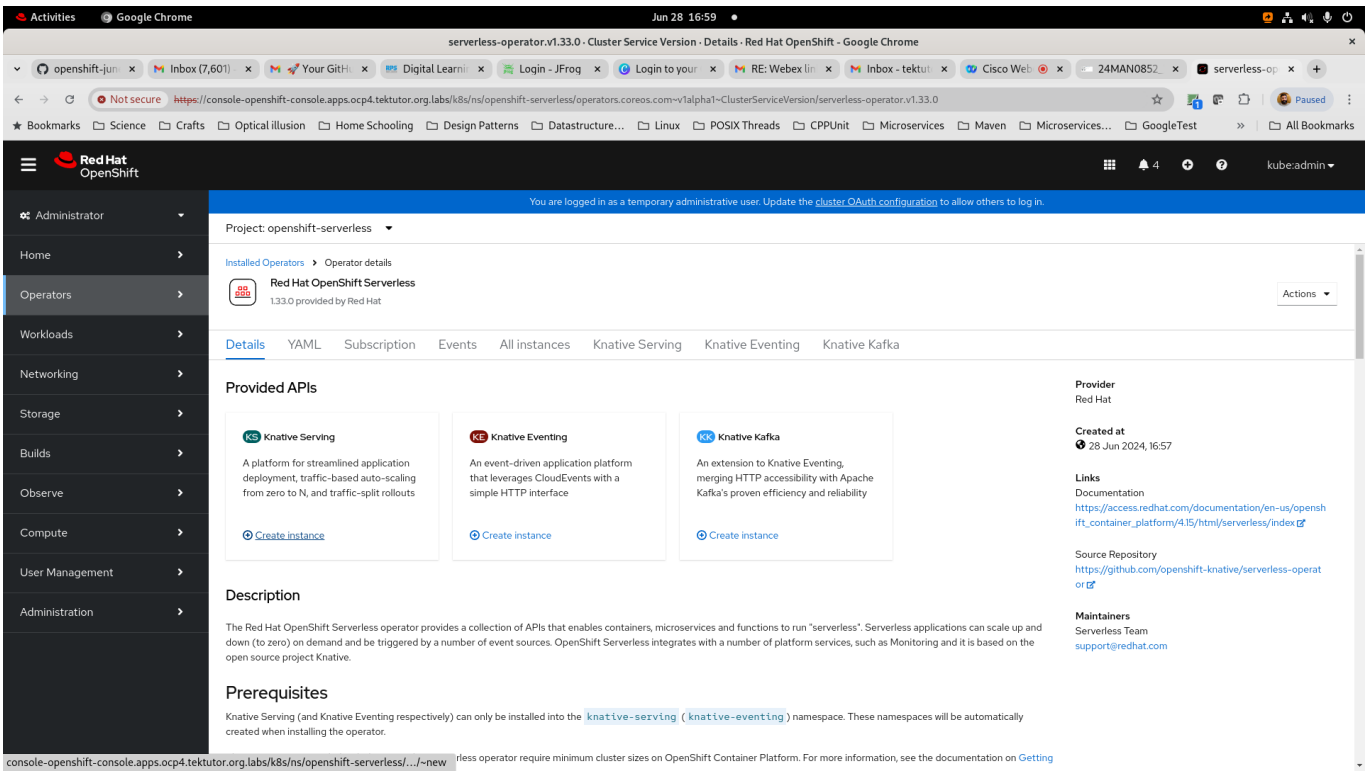


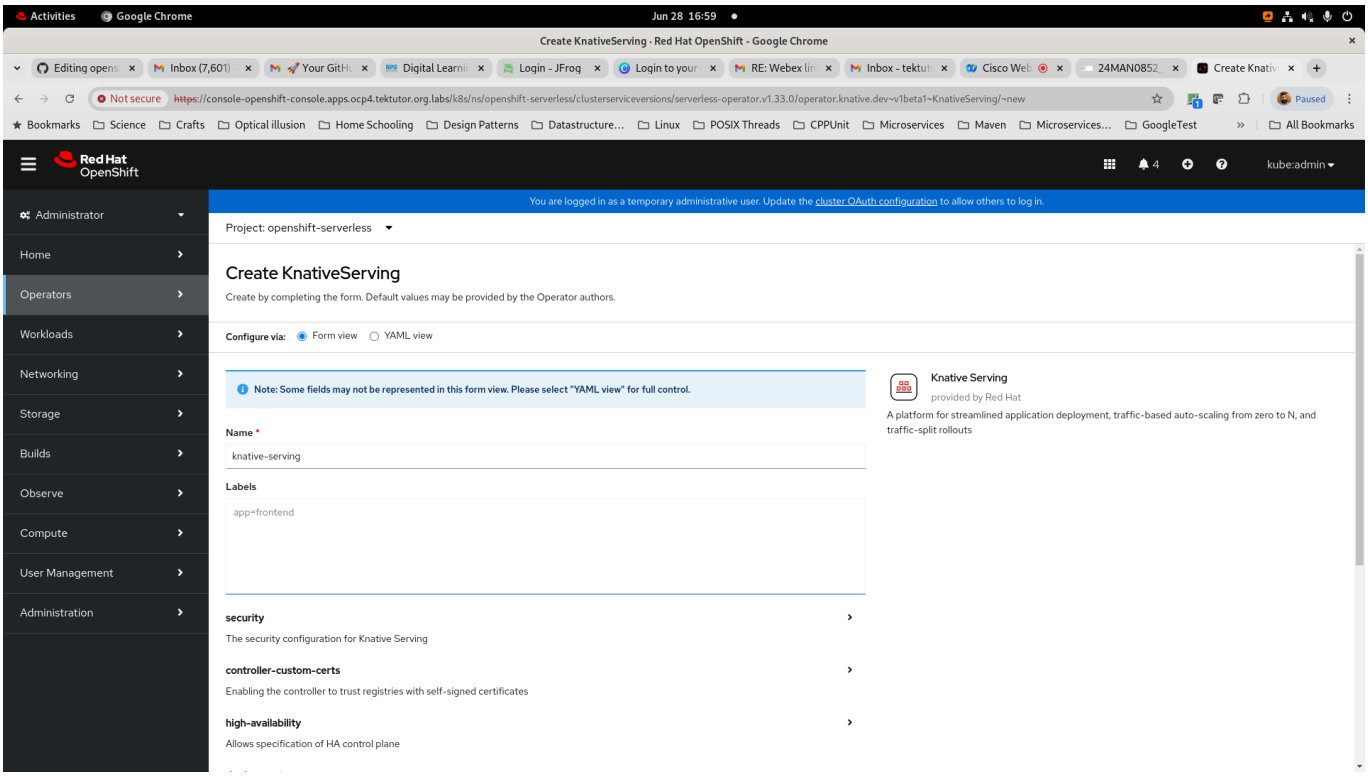


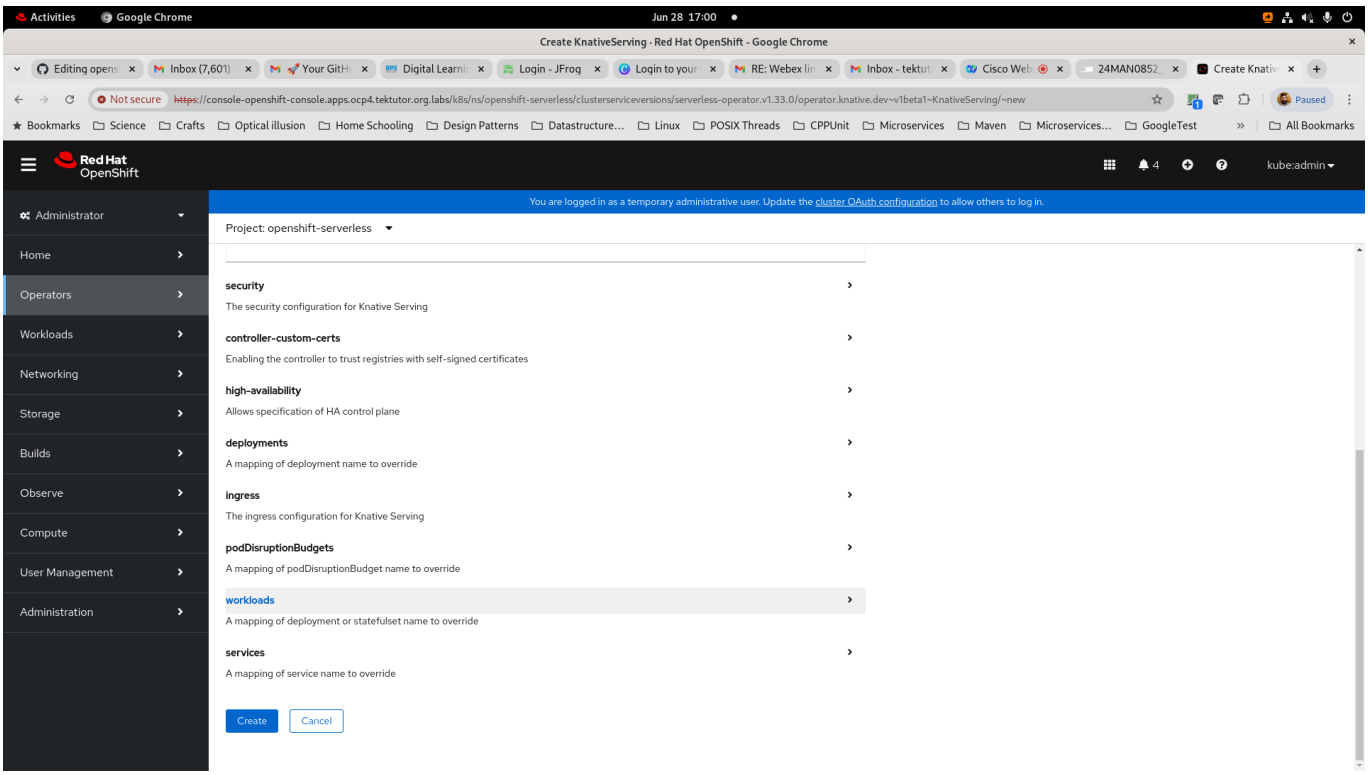

Activities
Google Chrome
Jun 28 16:57
Operator Installation - Red Hat OpenShift - Google Chrome
Red Hat OpenShift
kube:admin
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Administrator
Home
Operators
OperatorHub
Installed Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
Update channel *
stable
Version *
1.33.0
Installation mode *
All namespaces on the cluster (default)
Operator will be available in all Namespaces.
A specific namespace on the cluster
This mode is not supported by this Operator
Installed Namespace *
Operator recommended Namespace: openshift-serverless
Select a Namespace
Namespace creation
Namespace openshift-serverless does not exist and will be created.
Update approval *
Automatic
Manual
Install
Cancel
Red Hat OpenShift Serverless
provided by Red Hat
Provided APIs
Knative Serving
A platform for streamlined application deployment, traffic-based auto-scaling from zero to N, and traffic-split rollouts
Knative Eventing
An event-driven application platform that leverages CloudEvents with a simple HTTP interface
Knative Kafka
An extension to Knative Eventing, merging HTTP accessibility with Apache Kafka's proven efficiency and reliability

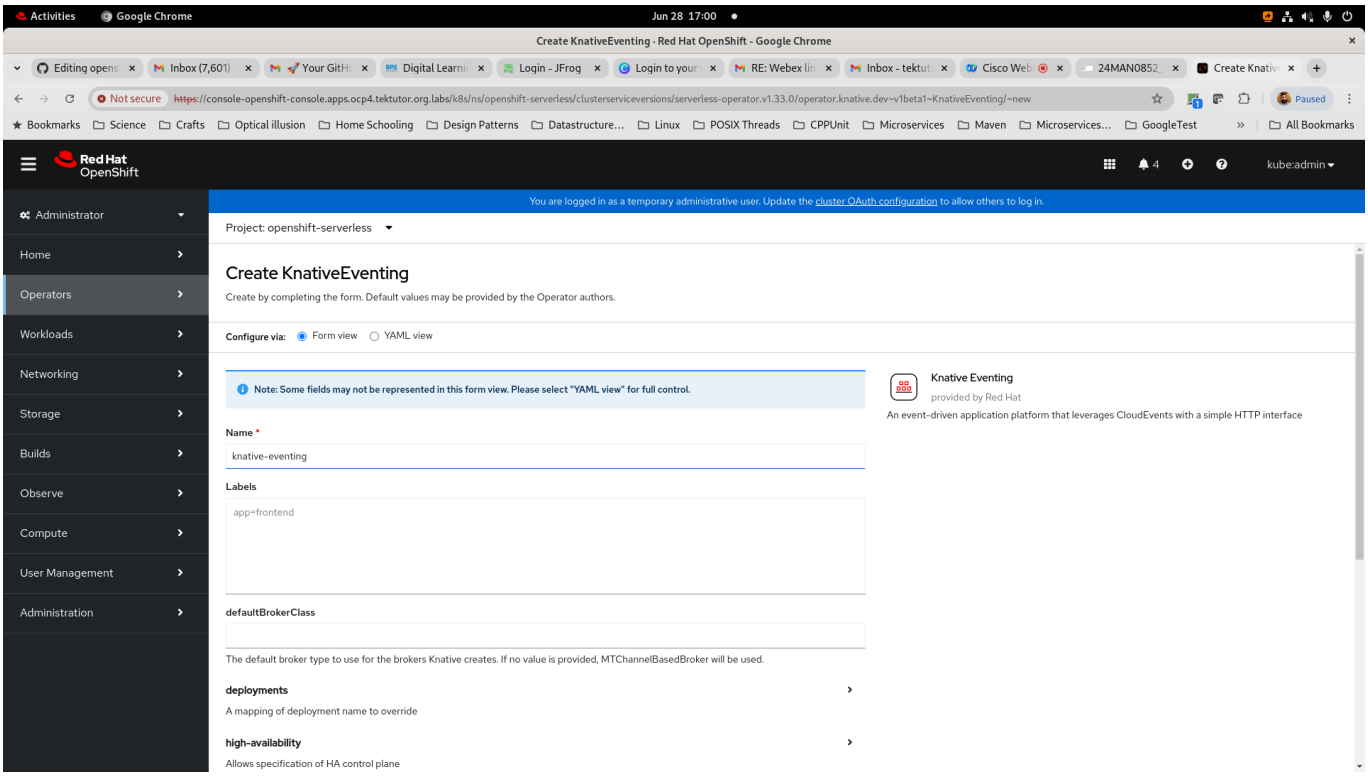

Activities
Google Chrome
Jun 28 16:57
Installing Operator - Red Hat OpenShift - Google Chrome
Red Hat OpenShift
kube:admin
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Administrator
Home
Operators
OperatorHub
Installed Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
Red Hat OpenShift Serverless
serverless-operator.v1.33.0 provided by Red Hat
Installing Operator
The Operator is being installed. This may take a few minutes.
View installed Operators in Namespace openshift-serverless

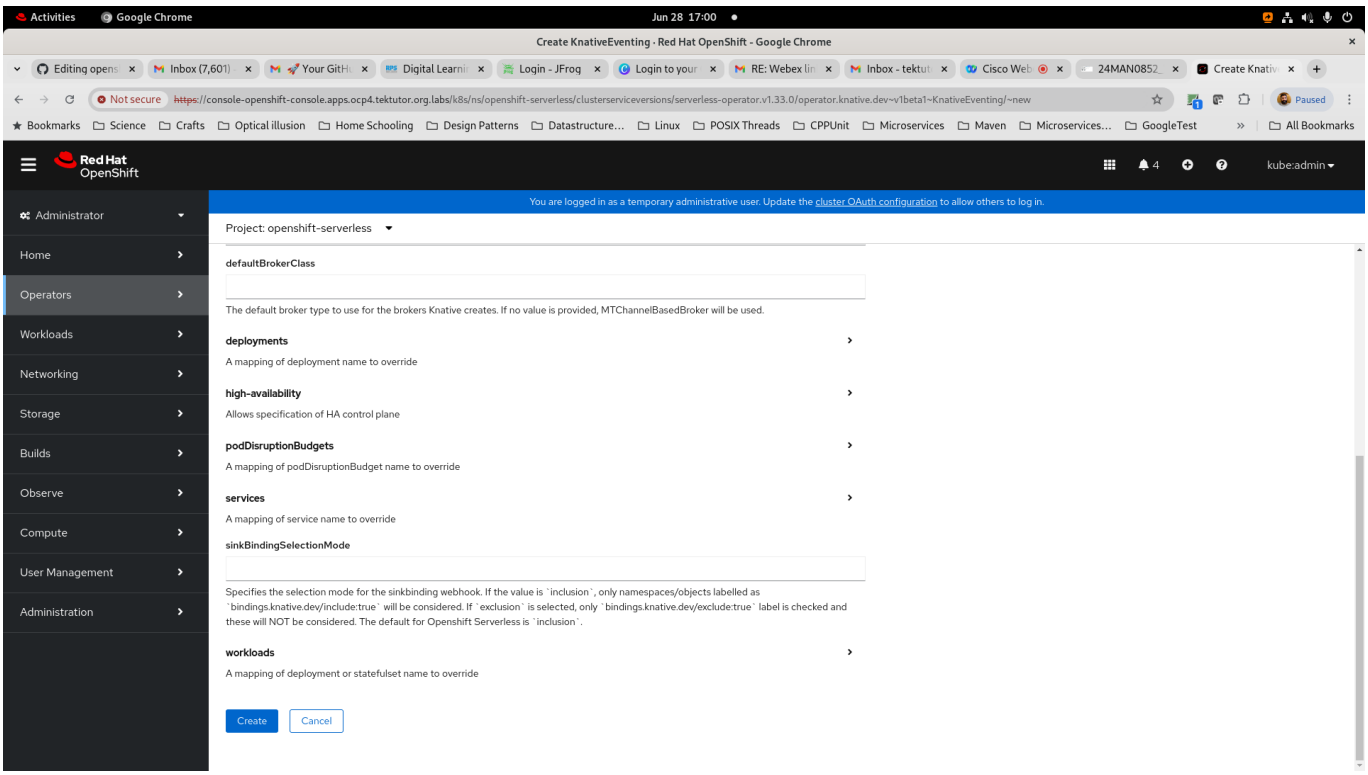

Activities
Google Chrome
Jun 28 16:58
Installing Operator · Red Hat OpenShift - Google Chrome
Red Hat OpenShift
kube:admin
Administrator
Home
Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Red Hat OpenShift Serverless
serverless-operator.v1.33.0 provided by Red Hat
Installed operator: ready for use
View Operator
View installed Operators in Namespace openshift-serverless

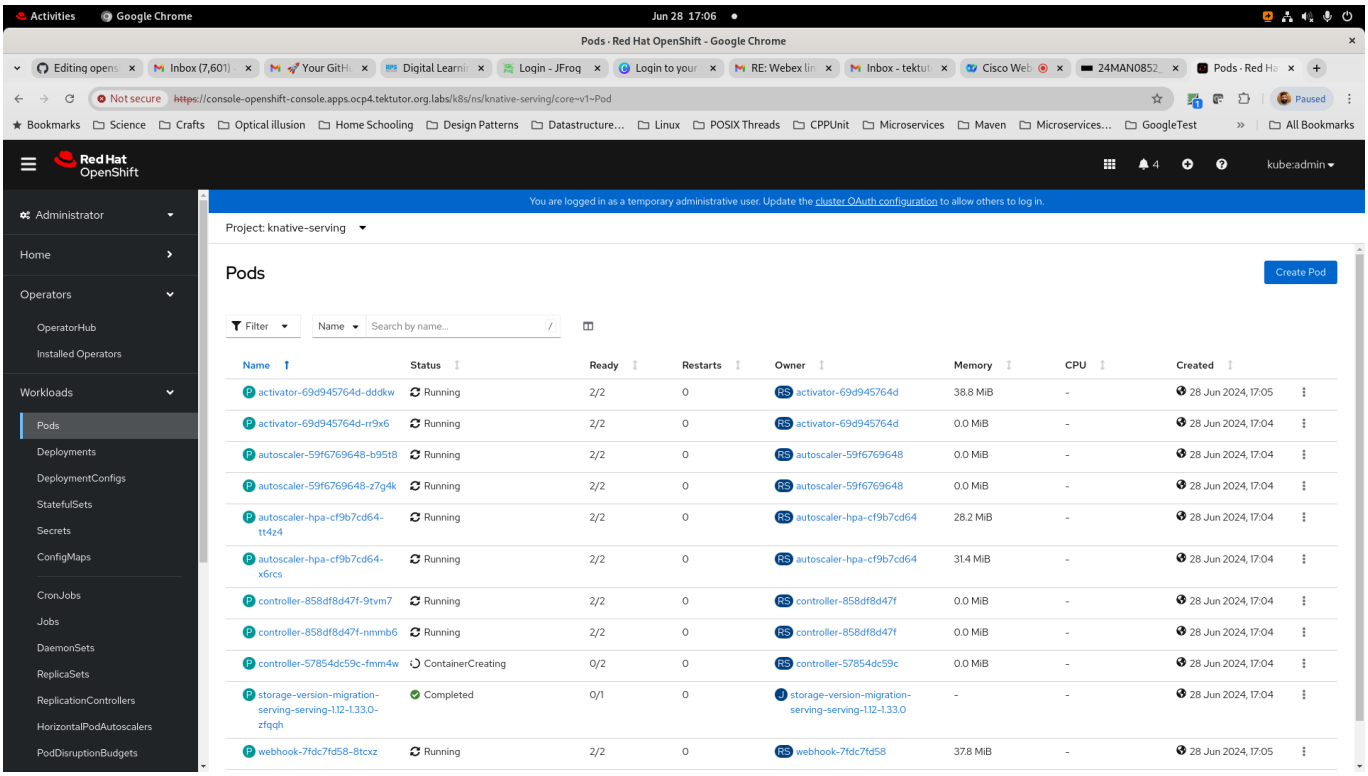

Activities
Google Chrome
Jun 28 16:59
serverless-operator.v1.33.0 · Cluster Service Version · Details · Red Hat OpenShift - Google Chrome
Red Hat OpenShift
kube:admin
Administrator
Home
Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: openshift-serverless
Installed Operators › Operator details
Red Hat OpenShift Serverless
1.33.0 provided by Red Hat
Actions
Details
YAML
Subscription
Events
All instances
Knative Serving
Knative Eventing
Knative Kafka
Provided APIs
Knative Serving
A platform for streamlined application deployment, traffic-based auto-scaling from zero to N, and traffic-split rollouts
Create instance
Knative Eventing
An event-driven application platform that leverages CloudEvents with a simple HTTP interface
Create instance
Knative Kafka
An extension to Knative Eventing, merging HTTP accessibility with Apache Kafka's proven efficiency and reliability
Create instance
Description
The Red Hat OpenShift Serverless operator provides a collection of APIs that enables containers, microservices and functions to run "serverless". Serverless applications can scale up and down (to zero) on demand and be triggered by a number of event sources. OpenShift Serverless integrates with a number of platform services, such as Monitoring and it is based on the open source project Knative.
Prerequisites
Knative Serving (and Knative Eventing respectively) can only be installed into the knative-serving (knative-eventing) namespace. These namespaces will be automatically created when installing the operator.
Provider
Red Hat
Created at
28 Jun 2024, 16:57
Links
Documentation
https://access.redhat.com/documentation/en-us/openshift_container_platform/4.15/html/serverless/index
Source Repository
https://github.com/openshift-knative/serverless-operator
Maintainers
Serverless Team
support@redhat.com

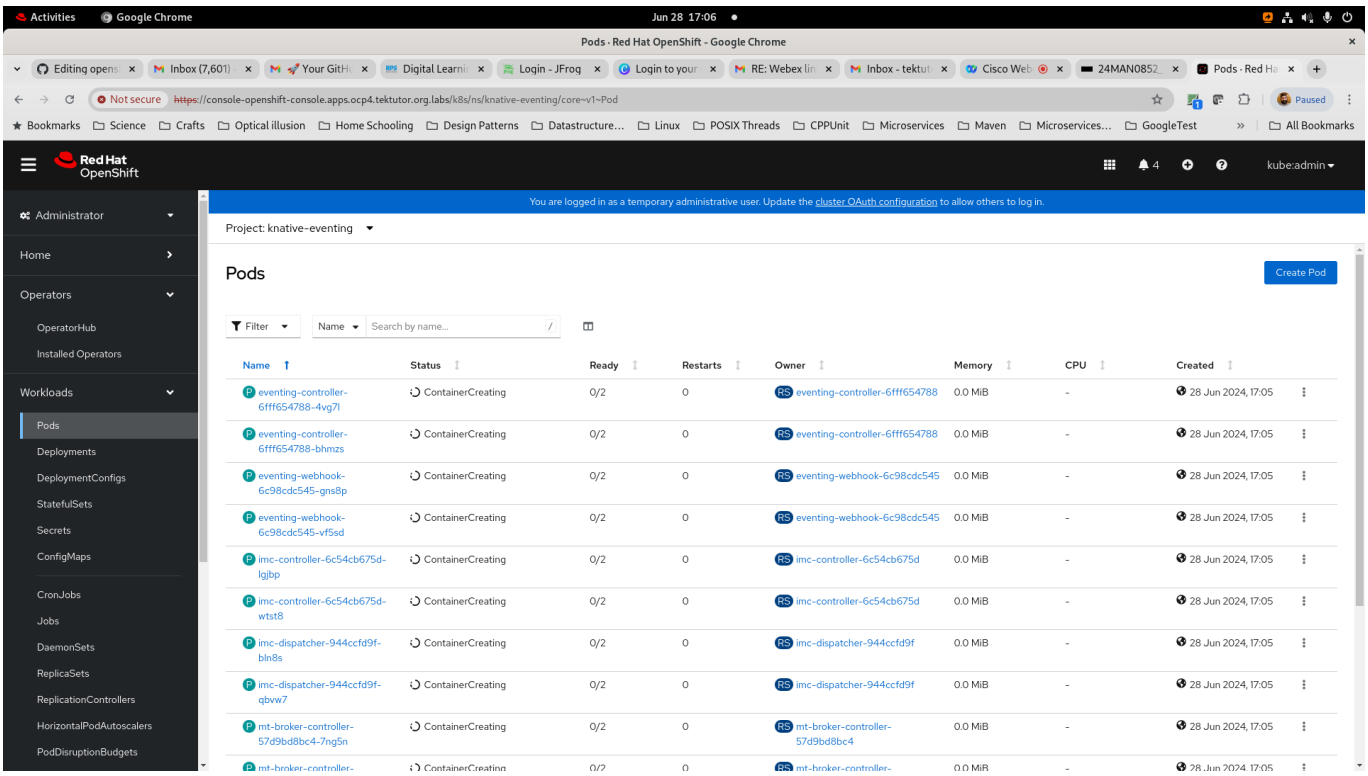

Activities
Google Chrome
Jun 28 16:59
Create KnativeServing · Red Hat OpenShift - Google Chrome
Red Hat OpenShift
kube:admin
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Administrator
Home
Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
Project: openshift-serverless
Create KnativeServing
Create by completing the form. Default values may be provided by the Operator authors.
Configure via: Form view YAML view
Note: Some fields may not be represented in this form view. Please select "YAML view" for full control.
Name *
knative-serving
Labels
app=frontend
security
The security configuration for Knative Serving
controller-custom-certs
Enabling the controller to trust registries with self-signed certificates
high-availability
Allows specification of HA control plane
Knative Serving
provided by Red Hat
A platform for streamlined application deployment, traffic-based auto-scaling from zero to N, and traffic-split rollouts

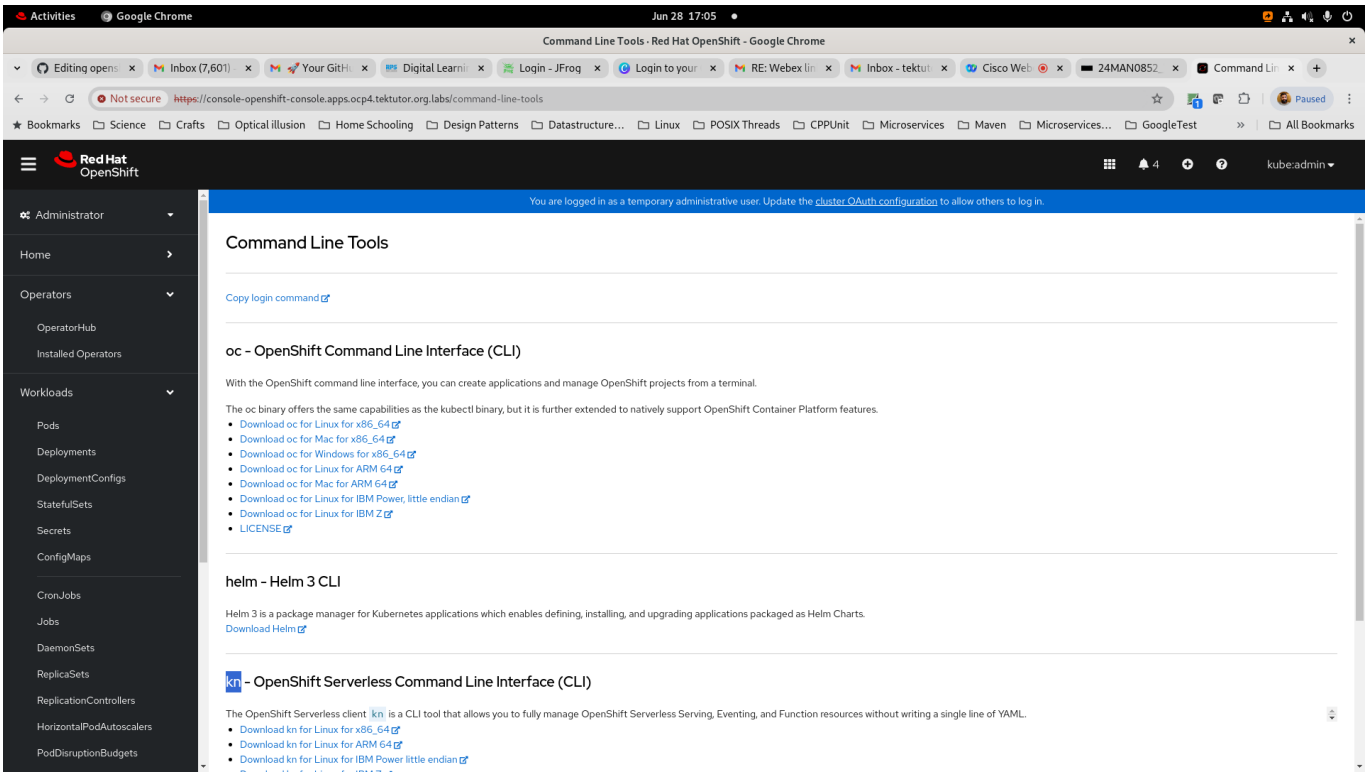

Activities
Google Chrome
Jun 28 17:00
Create KnativeServing · Red Hat OpenShift - Google Chrome
Red Hat OpenShift
kube:admin
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Administrator
Home
Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
Project: openshift-serverless
security
The security configuration for Knative Serving
controller-custom-certs
Enabling the controller to trust registries with self-signed certificates
high-availability
Allows specification of HA control plane
deployments
A mapping of deployment name to override
ingress
The ingress configuration for Knative Serving
podDisruptionBudgets
A mapping of podDisruptionBudget name to override
workloads
A mapping of deployment or statefulset name to override
services
A mapping of service name to override
Create
Cancel


Activities
Google Chrome
Jun 28 17:00
Create KnativeEventing · Red Hat OpenShift - Google Chrome
Not secure
https://console-openshift-console.apps.ocp4.tektutor.org.labs/k8s/ns/openshift-serverless/clusterserviceversions/serverless-operator.v1.33.0/operator.knative.dev~v1beta1~KnativeEventing/~new
Red Hat OpenShift
kube:admin
Administrator
Home
Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: openshift-serverless
Create KnativeEventing
Create by completing the form. Default values may be provided by the Operator authors.
Configure via: Form view YAML view
Note: Some fields may not be represented in this form view. Please select "YAML view" for full control.
Name *
knative-eventing
Labels
app=frontend
defaultBrokerClass
The default broker type to use for the brokers Knative creates. If no value is provided, MTChannelBasedBroker will be used.
deployments
A mapping of deployment name to override
high-availability
Allows specification of HA control plane
Knative Eventing
provided by Red Hat
An event-driven application platform that leverages CloudEvents with a simple HTTP interface


Activities
Google Chrome
Jun 28 17:00
Create KnativeEventing · Red Hat OpenShift - Google Chrome
Not secure
https://console-openshift-console.apps.ocp4.tektutor.org.labs/k8s/ns/openshift-serverless/clusterserviceversions/serverless-operator.v1.33.0/operator.knative.dev~v1beta1~KnativeEventing/~new
Red Hat OpenShift
kube:admin
Administrator
Home
Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: openshift-serverless
defaultBrokerClass
The default broker type to use for the brokers Knative creates. If no value is provided, MTChannelBasedBroker will be used.
deployments
A mapping of deployment name to override
high-availability
Allows specification of HA control plane
podDisruptionBudgets
A mapping of podDisruptionBudget name to override
services
A mapping of service name to override
sinkBindingSelectionMode
Specifies the selection mode for the sinkbinding webhook. If the value is `inclusion`, only namespaces/objects labelled as `bindings.knative.dev/include:true` will be considered. If `exclusion` is selected, only `bindings.knative.dev/exclude:true` label is checked and these will NOT be considered. The default for Openshift Serverless is `inclusion`.
workloads
A mapping of deployment or statefulset name to override
Create
Cancel


Activities
Google Chrome
Jun 28 17:06
Pods · Red Hat OpenShift - Google Chrome
Not secure https://console-openshift-console.apps.ocp4.tektutor.org.labs/k8s/ns/knative-serving/core~v1~Pod
Red Hat OpenShift
kube:admin
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: knative-serving
Administrator
Home
Operators
OperatorHub
Installed Operators
Workloads
Pods
Deployments
DeploymentConfigs
StatefulSets
Secrets
ConfigMaps
CronJobs
Jobs
DaemonSets
ReplicaSets
ReplicationControllers
HorizontalPodAutoscalers
PodDisruptionBudgets
Pods
Create Pod
Filter
Name
Search by name...
Name
Status
Ready
Restarts
Owner
Memory
CPU
Created
activator-69d945764d-dddkw Running 2/2 0 activator-69d945764d 38.8 MiB - 28 Jun 2024, 17:05
activator-69d945764d-rr9x6 Running 2/2 0 activator-69d945764d 0.0 MiB - 28 Jun 2024, 17:04
autoscaler-59f6769648-b95t8 Running 2/2 0 autoscaler-59f6769648 0.0 MiB - 28 Jun 2024, 17:04
autoscaler-59f6769648-z7g4k Running 2/2 0 autoscaler-59f6769648 0.0 MiB - 28 Jun 2024, 17:04
autoscaler-hpa-cf9b7cd64-tt4z4 Running 2/2 0 autoscaler-hpa-cf9b7cd64 28.2 MiB - 28 Jun 2024, 17:04
autoscaler-hpa-cf9b7cd64-x6rcs Running 2/2 0 autoscaler-hpa-cf9b7cd64 31.4 MiB - 28 Jun 2024, 17:04
controller-858df8d47f-9tvm7 Running 2/2 0 controller-858df8d47f 0.0 MiB - 28 Jun 2024, 17:04
controller-858df8d47f-nmmb6 Running 2/2 0 controller-858df8d47f 0.0 MiB - 28 Jun 2024, 17:04
controller-57854dc59c-fmm4w ContainerCreating 0/2 0 controller-57854dc59c 0.0 MiB - 28 Jun 2024, 17:04
storage-version-migration-serving-serving-1.12-1.33.0-zfqqh Completed 0/1 0 storage-version-migration-serving-serving-1.12-1.33.0 - - 28 Jun 2024, 17:04
webhook-7fdc7fd58-8tcxz Running 2/2 0 webhook-7fdc7fd58 37.8 MiB - 28 Jun 2024, 17:05


Activities
Google Chrome
Jun 28 17:06
Pods · Red Hat OpenShift - Google Chrome
Not secure https://console-openshift-console.apps.ocp4.tektutor.org.labs/k8s/ns/knative-eventing/core~v1~Pod
Red Hat OpenShift
kube:admin
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: knative-eventing
Administrator
Home
Operators
OperatorHub
Installed Operators
Workloads
Pods
Deployments
DeploymentConfigs
StatefulSets
Secrets
ConfigMaps
CronJobs
Jobs
DaemonSets
ReplicaSets
ReplicationControllers
HorizontalPodAutoscalers
PodDisruptionBudgets
Pods
Create Pod
Filter
Name
Search by name...
Name
Status
Ready
Restarts
Owner
Memory
CPU
Created
eventing-controller-6fff654788-4vg7l ContainerCreating 0/2 0 eventing-controller-6fff654788 0.0 MiB - 28 Jun 2024, 17:05
eventing-controller-6fff654788-bhmzs ContainerCreating 0/2 0 eventing-controller-6fff654788 0.0 MiB - 28 Jun 2024, 17:05
eventing-webhook-6c98cdc545-gns8p ContainerCreating 0/2 0 eventing-webhook-6c98cdc545 0.0 MiB - 28 Jun 2024, 17:05
eventing-webhook-6c98cdc545-vf5sd ContainerCreating 0/2 0 eventing-webhook-6c98cdc545 0.0 MiB - 28 Jun 2024, 17:05
imc-controller-6c54cb675d-lgjbp ContainerCreating 0/2 0 imc-controller-6c54cb675d 0.0 MiB - 28 Jun 2024, 17:05
imc-controller-6c54cb675d-wtst8 ContainerCreating 0/2 0 imc-controller-6c54cb675d 0.0 MiB - 28 Jun 2024, 17:05
imc-dispatcher-944ccfd9f-bln8s ContainerCreating 0/2 0 imc-dispatcher-944ccfd9f 0.0 MiB - 28 Jun 2024, 17:05
imc-dispatcher-944ccfd9f-qbvw7 ContainerCreating 0/2 0 imc-dispatcher-944ccfd9f 0.0 MiB - 28 Jun 2024, 17:05
mt-broker-controller-57d9bd8bc4-7ng5n ContainerCreating 0/2 0 mt-broker-controller-57d9bd8bc4 0.0 MiB - 28 Jun 2024, 17:05



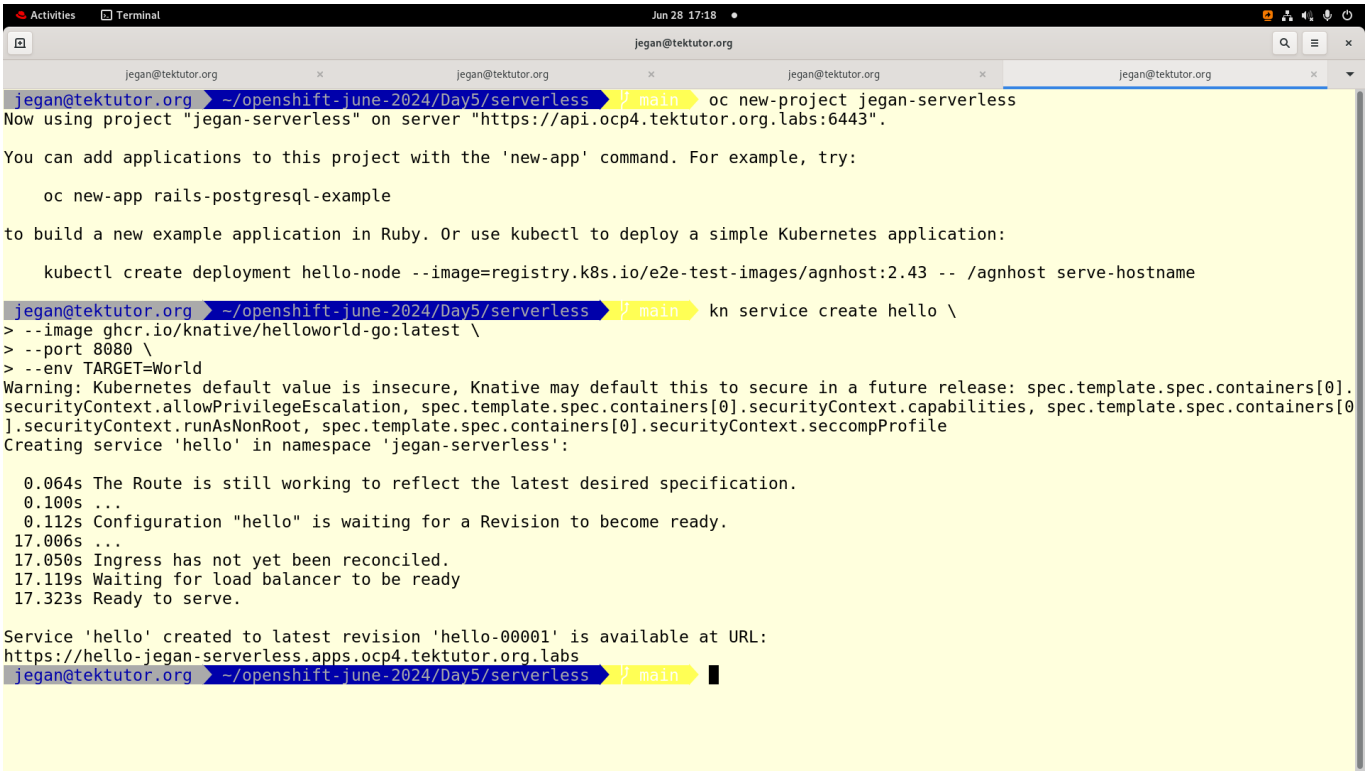
Lab - Deploying your first knative service

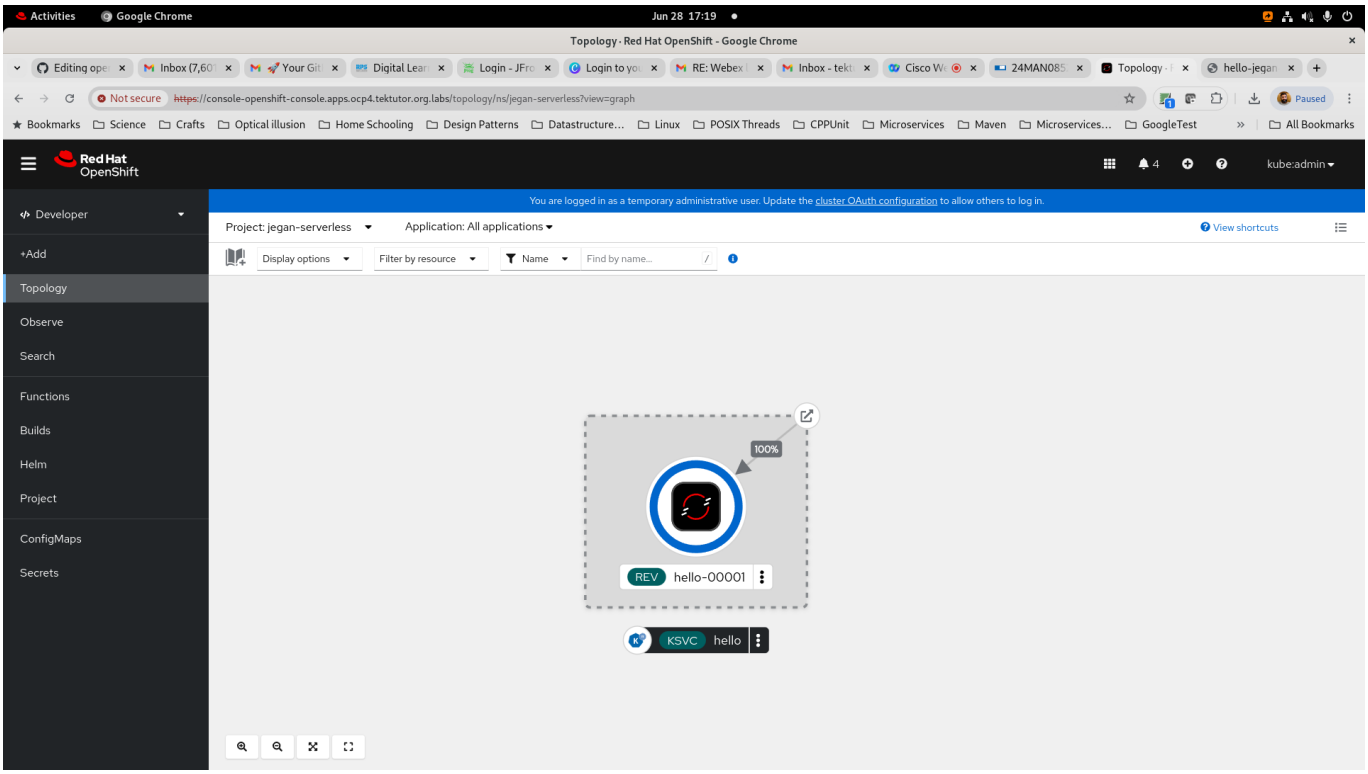
```
kn service create hello \
--image ghcr.io/knative/helloworld-go:latest \
--port 8080
--env TARGET=World
```

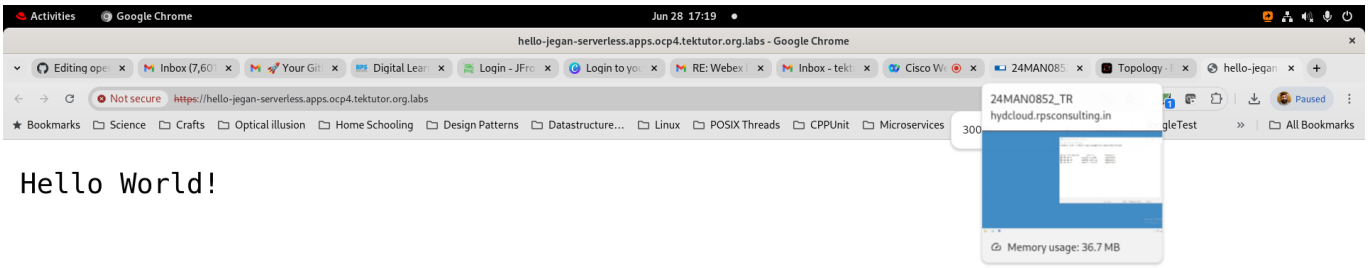
Accessing the knative application from command line

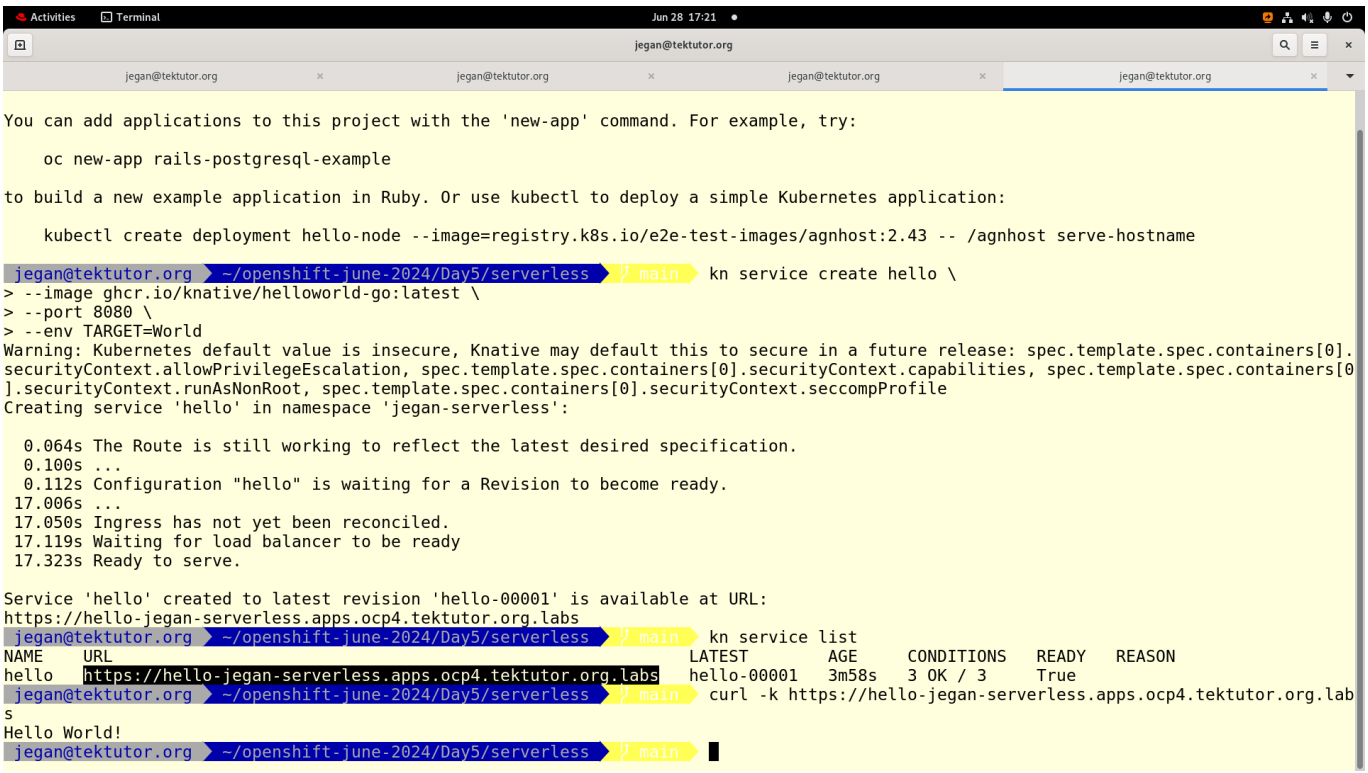
```
curl -k https://hello-jegan-serverless.apps.ocp4.tektutor.org.labs
```

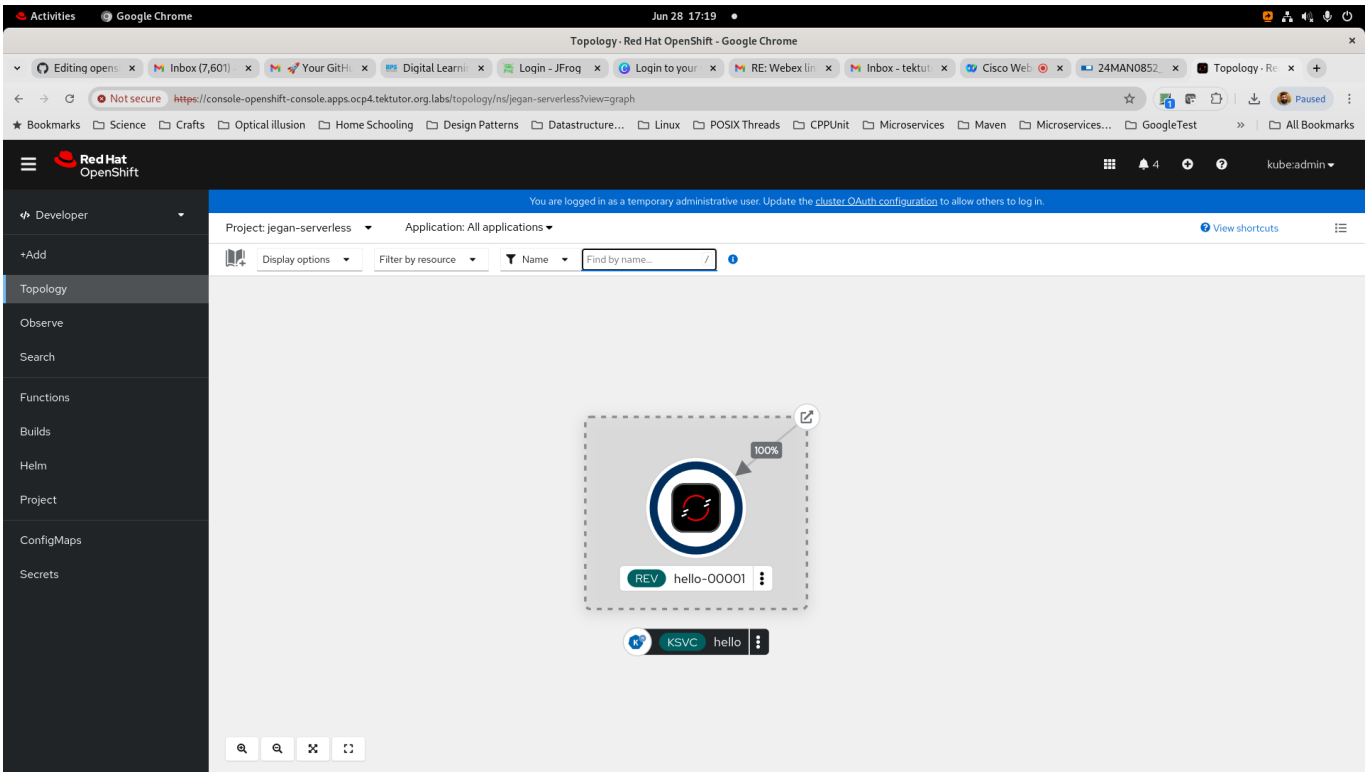
Expected output

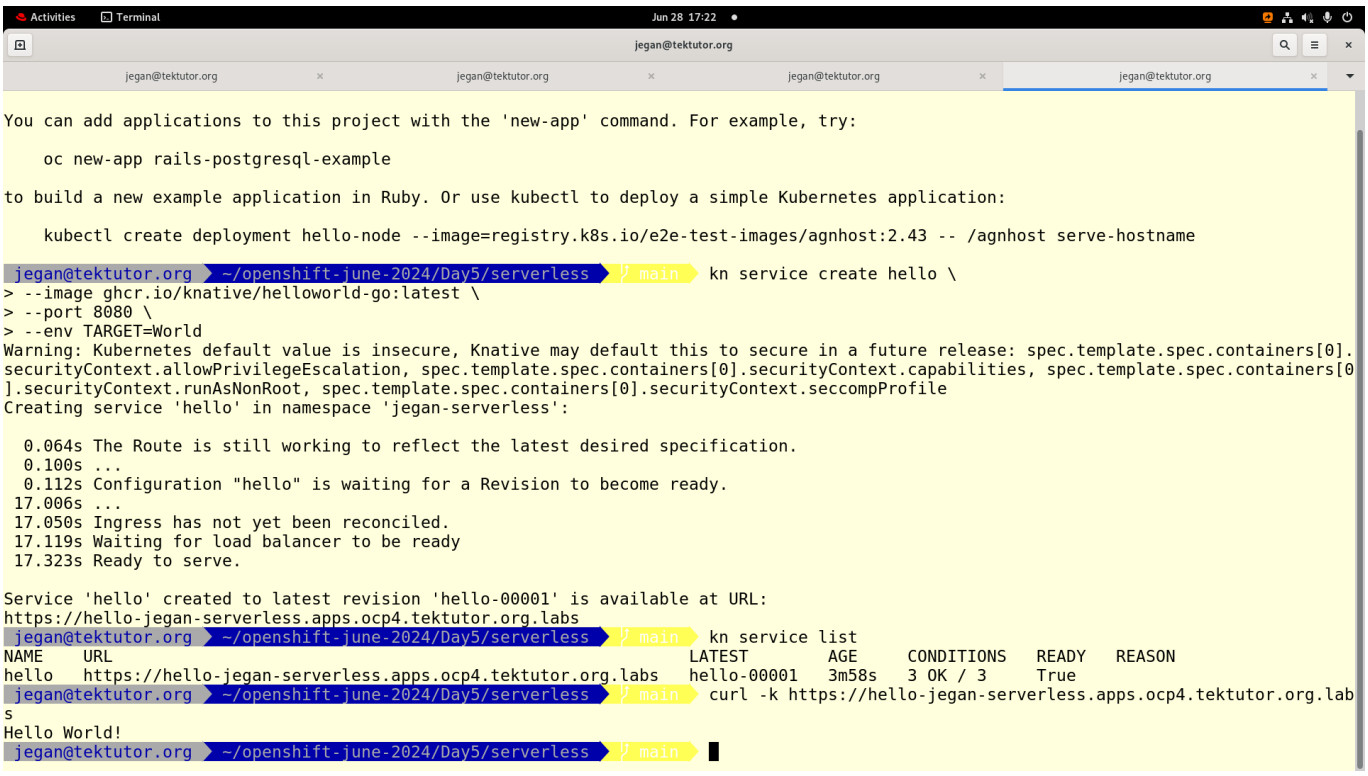





Activities
Google Chrome
Jun 28 17:19
hello-jegan-serverless.apps.ocp4.tektutor.org.labs - Google Chrome
Not secure
https://hello-jegan-serverless.apps.ocp4.tektutor.org.labs
Bookmarks
Science
Crafts
Optical illusion
Home Schooling
Design Patterns
Datastructure...
Linux
POSIX Threads
CPPUnit
Microservices
All Bookmarks
24MAN0852_TR
hydcloud.rpsconsulting.in
Memory usage: 36.7 MB
Hello World!


Activities
Terminal
Jun 28 17:21
jegan@tektutor.org
jegan@tektutor.org
jegan@tektutor.org
jegan@tektutor.org
jegan@tektutor.org
You can add applications to this project with the 'new-app' command. For example, try:
oc new-app rails-postgresql-example
to build a new example application in Ruby. Or use kubectl to deploy a simple Kubernetes application:
kubectl create deployment hello-node --image=registry.k8s.io/e2e-test-images/agnhost:2.43 -- /agnhost serve-hostname
jegan@tektutor.org ~/openshift-june-2024/Day5/serverless main kn service create hello \
> --image ghcr.io/knative/helloworld-go:latest \
> --port 8080 \
> --env TARGET=World
Warning: Kubernetes default value is insecure, Knative may default this to secure in a future release: spec.template.spec.containers[0].securityContext.allowPrivilegeEscalation, spec.template.spec.containers[0].securityContext.capabilities, spec.template.spec.containers[0].securityContext.runAsNonRoot, spec.template.spec.containers[0].securityContext.seccompProfile
Creating service 'hello' in namespace 'jegan-serverless':
0.064s The Route is still working to reflect the latest desired specification.
0.100s ...
0.112s Configuration "hello" is waiting for a Revision to become ready.
17.006s ...
17.050s Ingress has not yet been reconciled.
17.119s Waiting for load balancer to be ready
17.323s Ready to serve.
Service 'hello' created to latest revision 'hello-00001' is available at URL:
https://hello-jegan-serverless.apps.ocp4.tektutor.org.labs
jegan@tektutor.org ~/openshift-june-2024/Day5/serverless main kn service list
NAME URL LATEST AGE CONDITIONS READY REASON
hello https://hello-jegan-serverless.apps.ocp4.tektutor.org.labs hello-00001 3m58s 3 OK / 3 True
jegan@tektutor.org ~/openshift-june-2024/Day5/serverless main curl -k https://hello-jegan-serverless.apps.ocp4.tektutor.org.labs
Hello World!
jegan@tektutor.org ~/openshift-june-2024/Day5/serverless main





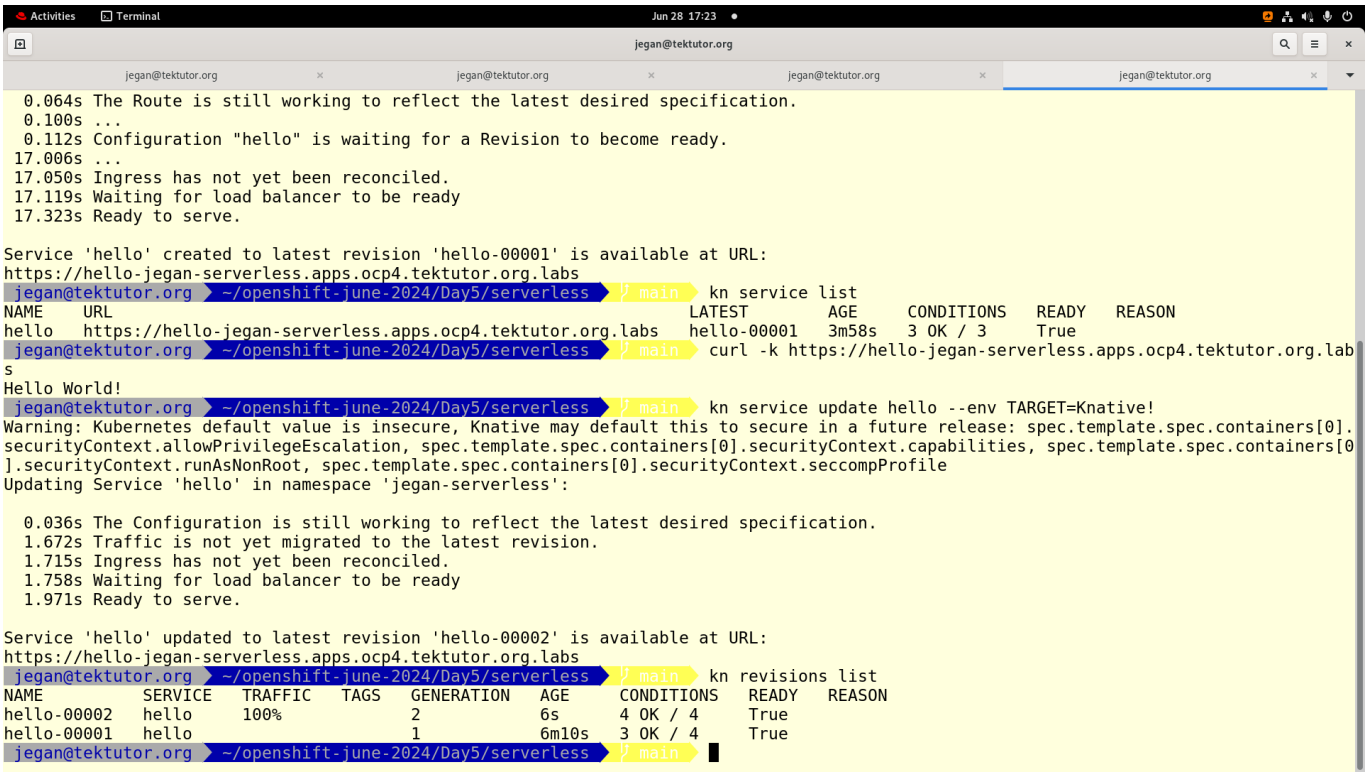
Update the service

```
kn service update hello --env TARGET=Knative!
kn revisions list
```

Accessing the knative application from command line

```
curl -k https://hello-jegan-serverless.apps.ocp4.tektutor.org.labs
```

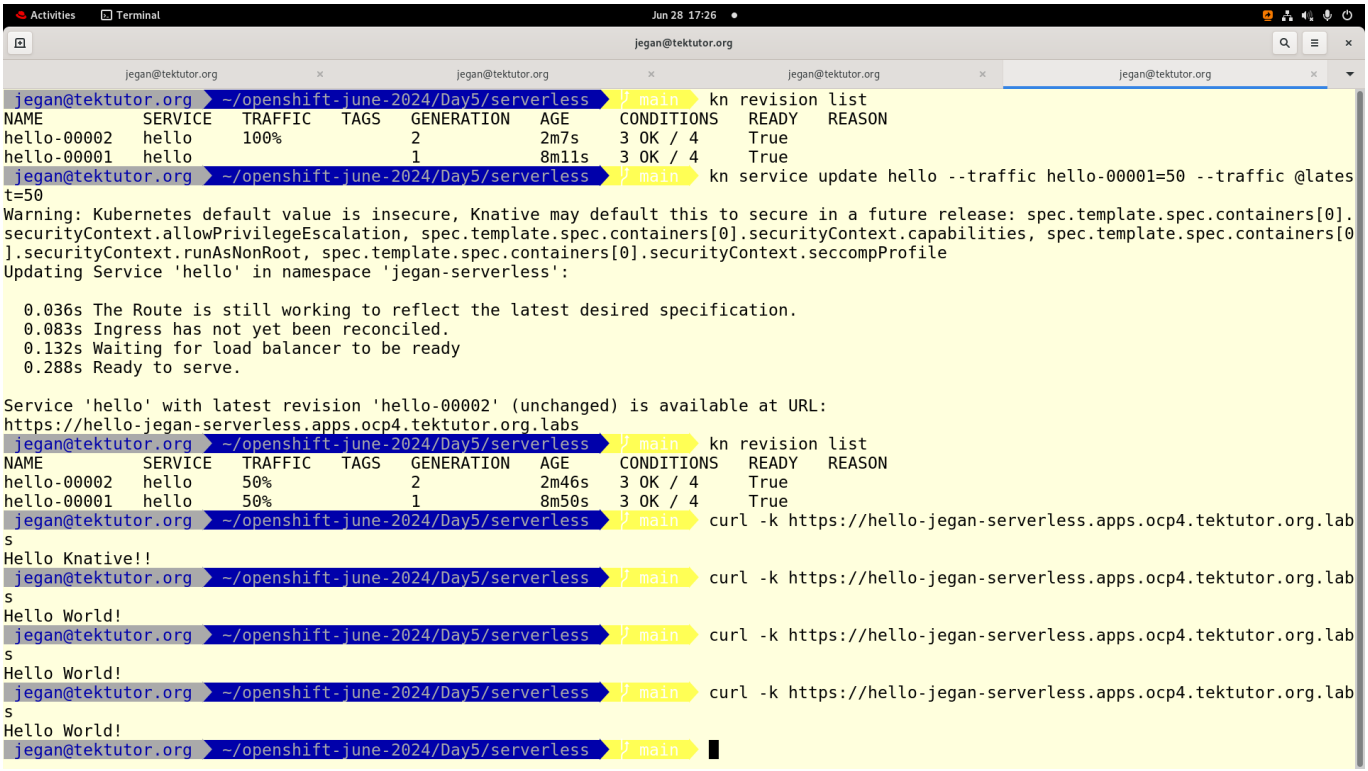
Expected output



Splitting the traffic between two revisions

```
kn service update hello --traffic hello-00001=50 --traffic @latest=50
kn revisions list
```

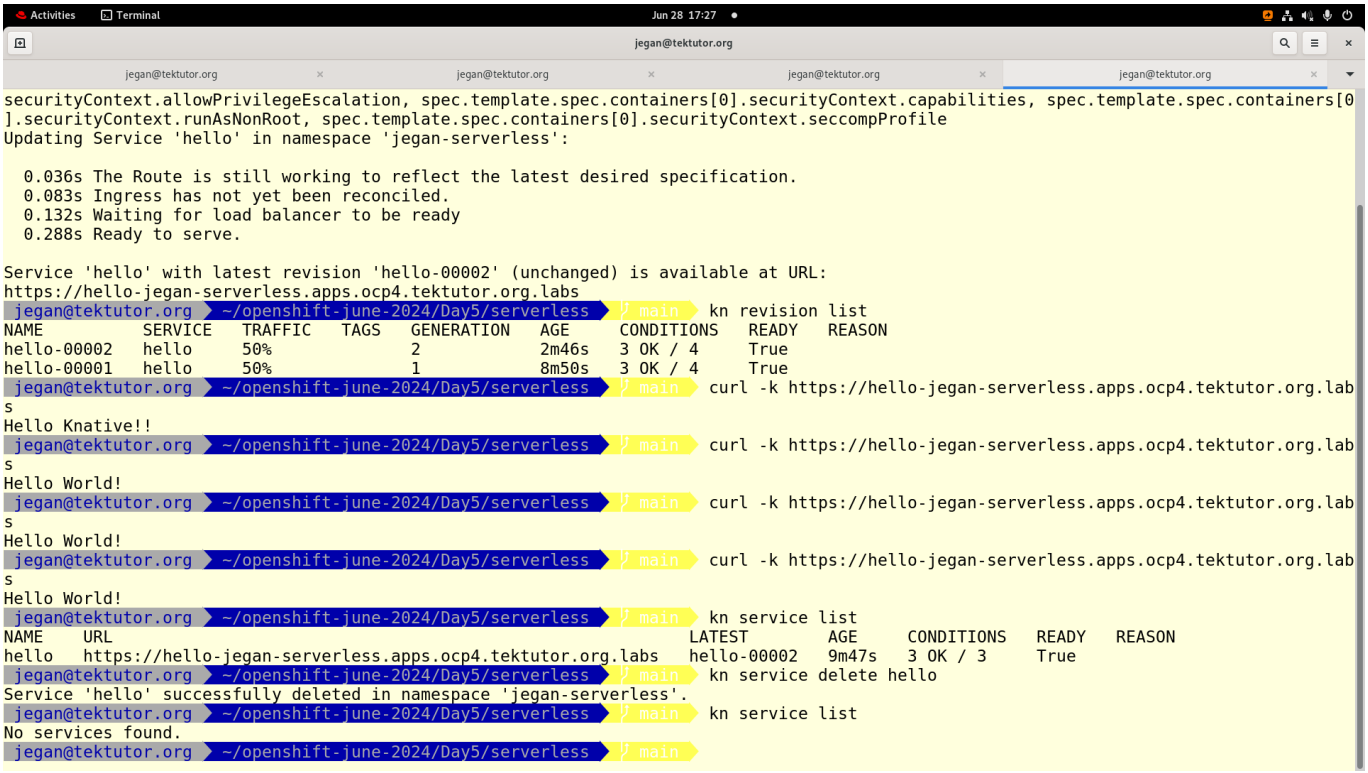
Expected output



Delete the knative service

```
kn service list
kn service delete hello
kn service list
```

Expected output

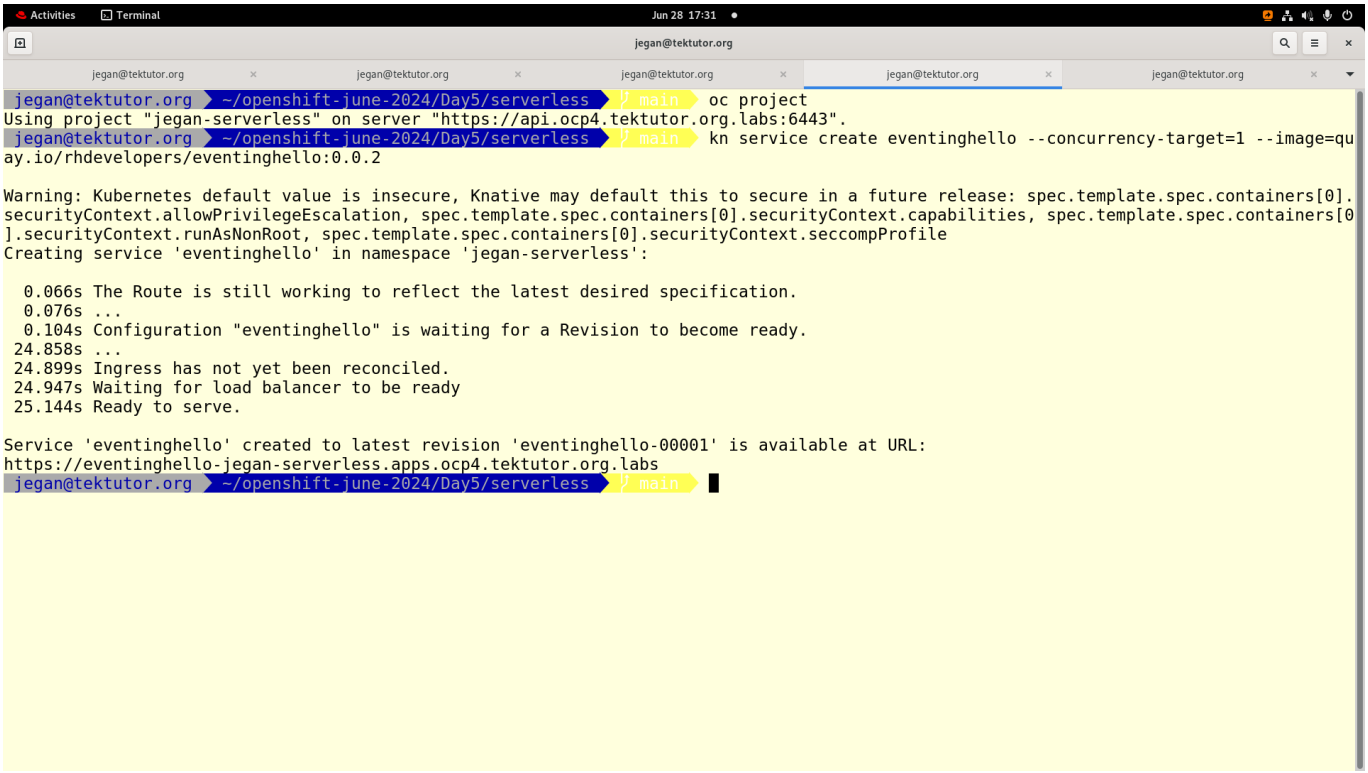


Lab - Knative eventing

Let's deploy a sink service

```
oc project jegan-serverless
kn service create eventinghello --concurrency-target=1 --
image=quay.io/rhdevelopers/eventinghello:0.0.2
```

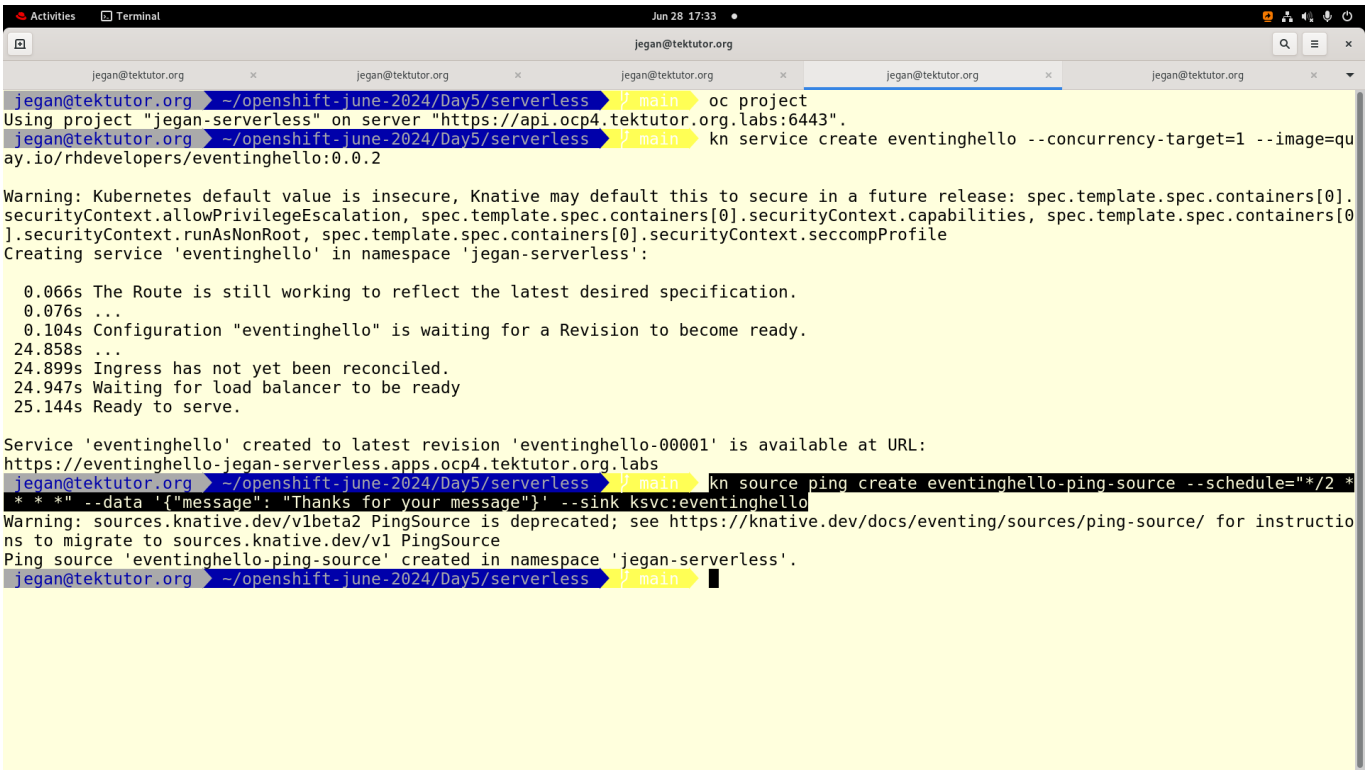
Expected output

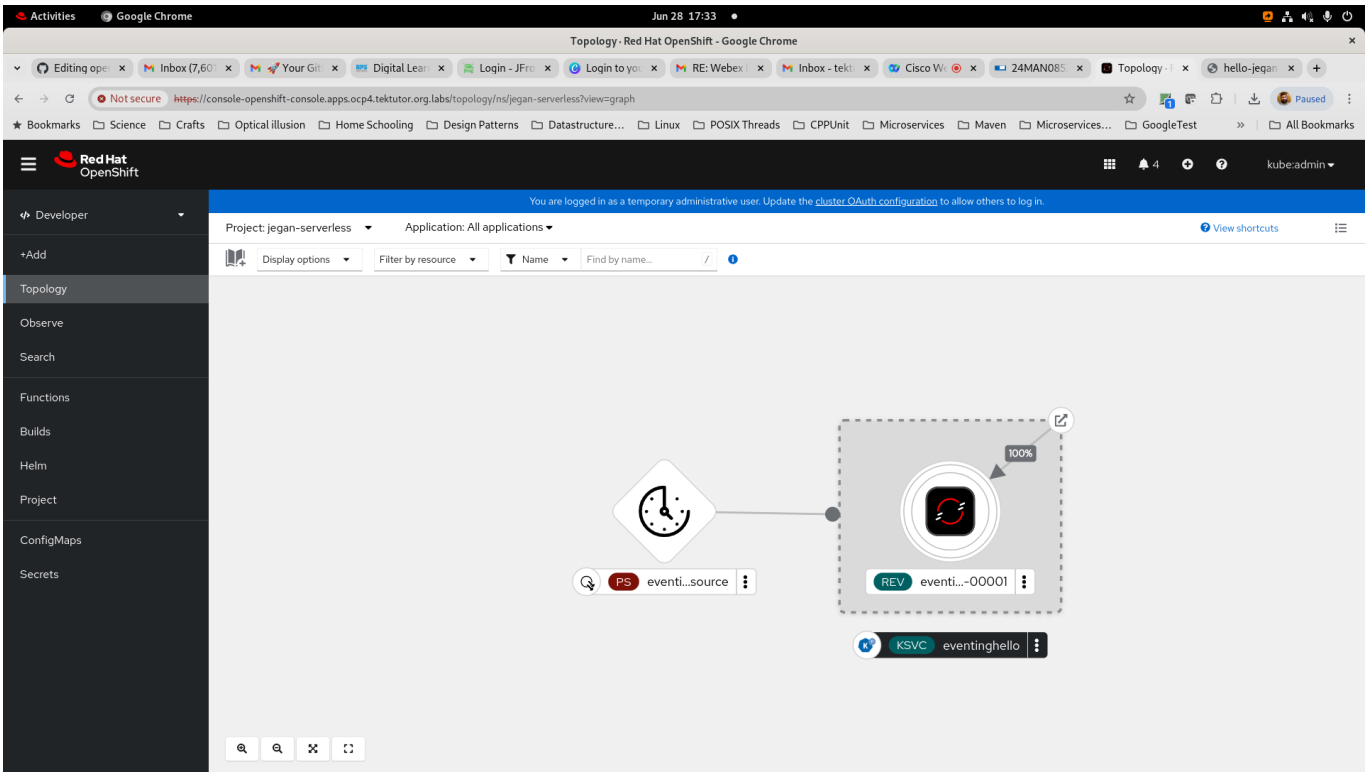


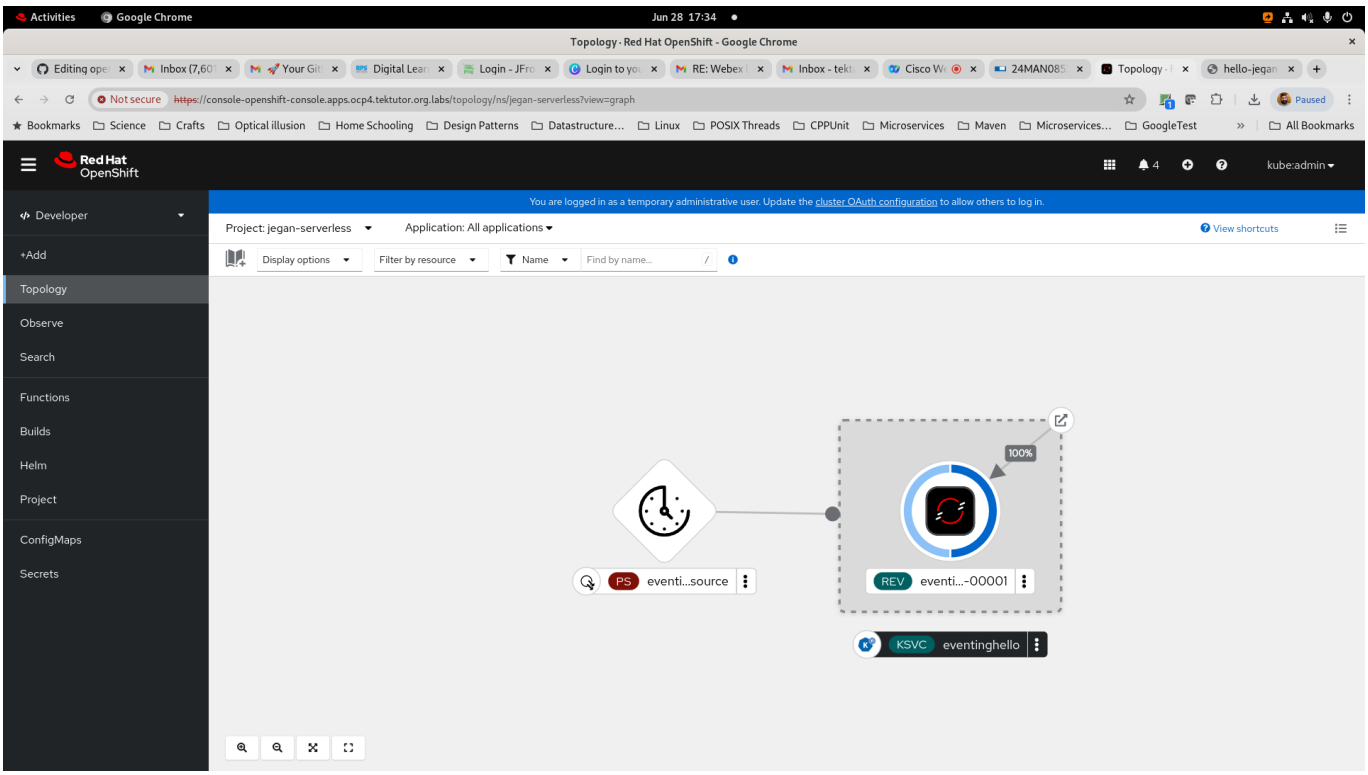
Let's create an event source application

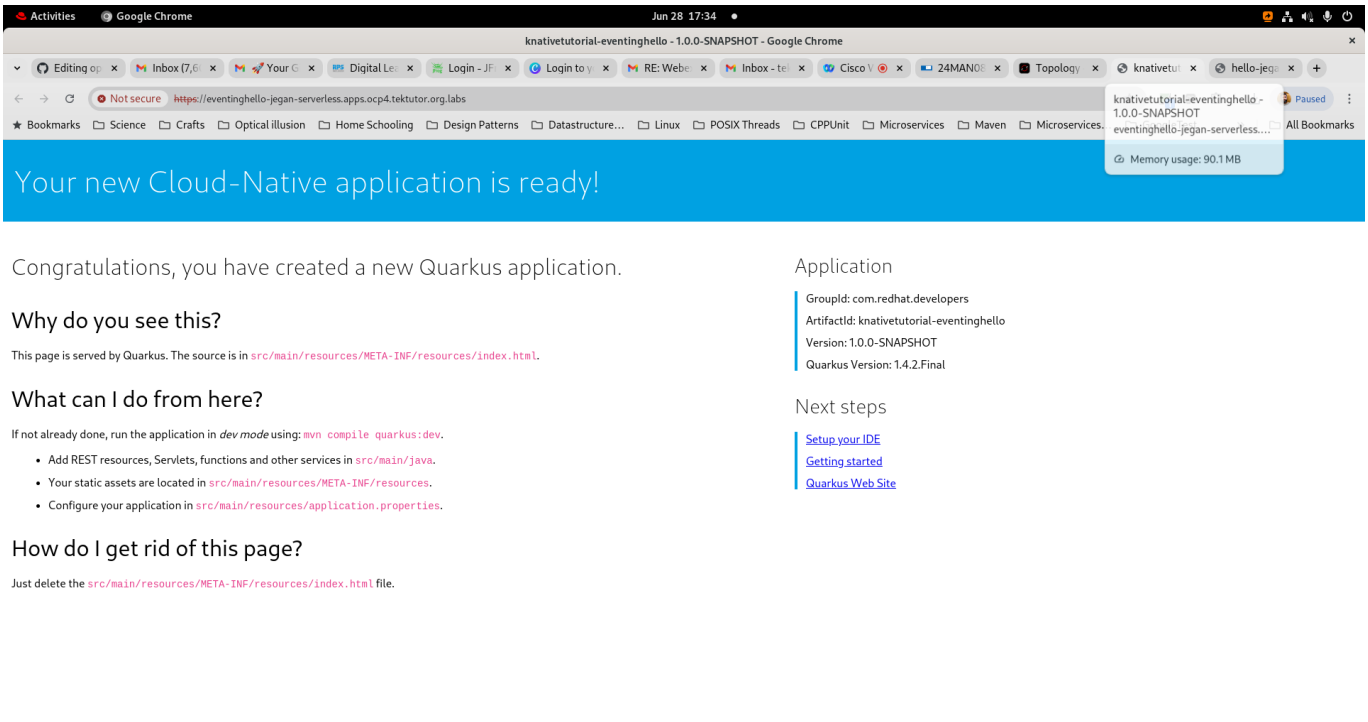
```
kn source ping create eventinghello-ping-source --schedule="*/2 * * * *" --data '{"message": "Thanks for your message"}' --sink ksvc:eventinghello
```

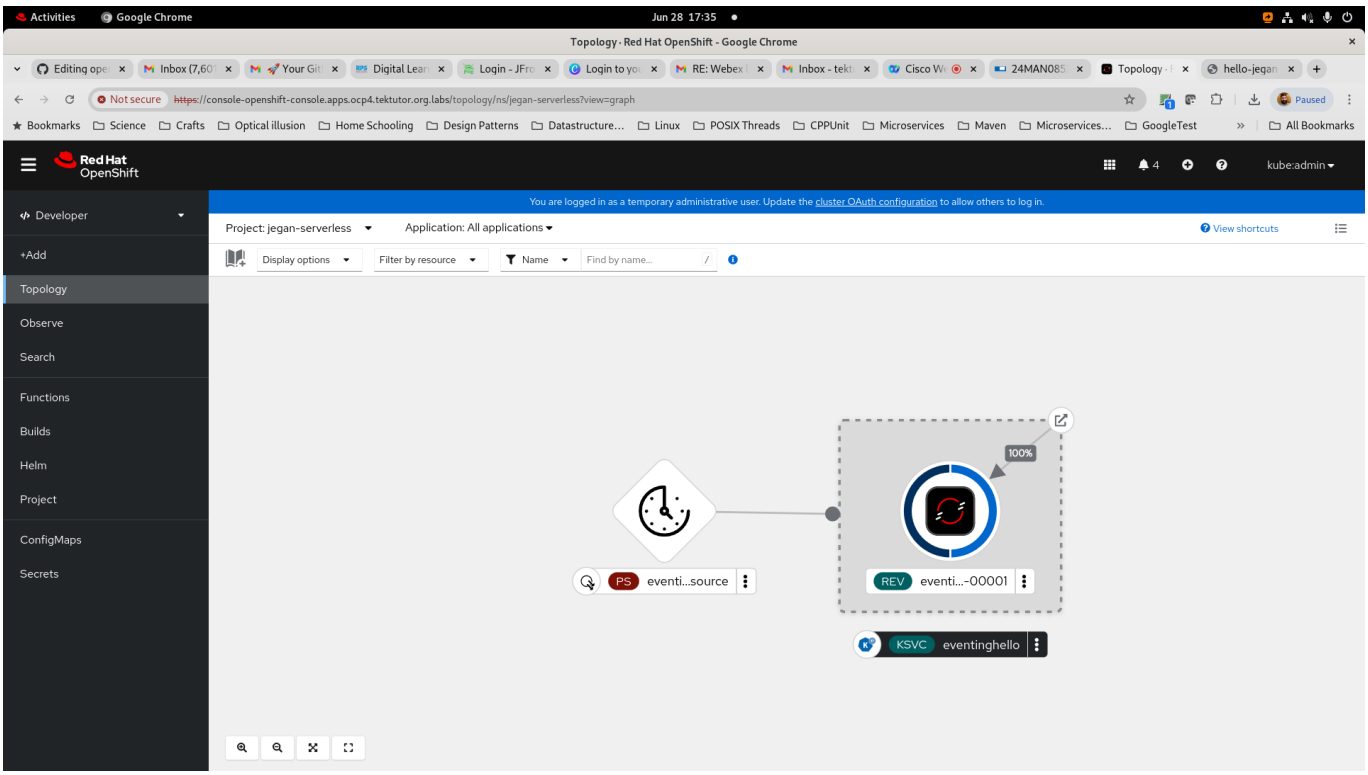
Expected output

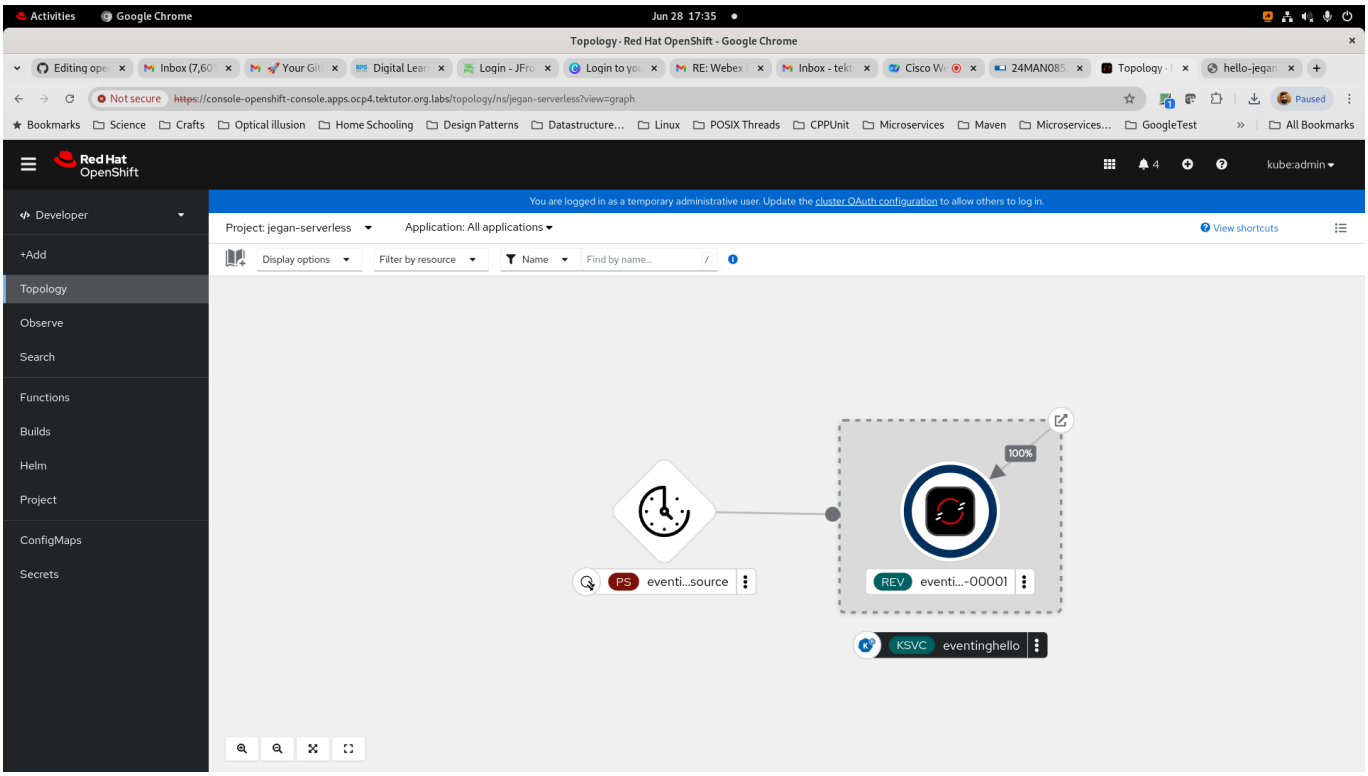



Activities
Google Chrome
Jun 28 17:33
Topology - Red Hat OpenShift - Google Chrome
Not secure
https://console-openshift-console.apps.ocp4.tektutor.org.labs/topology/ns/jegan-serverless?view=graph
Red Hat OpenShift
kube:admin
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Developer
+Add
Topology
Observe
Search
Functions
Builds
Helm
Project
ConfigMaps
Secrets
Project: jegan-serverless
Application: All applications
View shortcuts
Display options
Filter by resource
Name
Find by name...
100%
PS eventi...source
REV eventi...-00001
KSVC eventinghello


Activities
Google Chrome
Jun 28 17:34
Topology - Red Hat OpenShift - Google Chrome
Not secure
https://console-openshift-console.apps.ocp4.tektutor.org.labs/topology/ns/jegan-serverless?view=graph
Red Hat OpenShift
kube:admin
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Developer
+Add
Topology
Observe
Search
Functions
Builds
Helm
Project
ConfigMaps
Secrets
Project: jegan-serverless
Application: All applications
View shortcuts
Display options
Filter by resource
Name
Find by name...
100%
PS eventi...source
REV eventi...-00001
KSVC eventinghello


Activities
Google Chrome
Jun 28 17:34
knativetutorial-eventinghello - 1.0.0-SNAPSHOT - Google Chrome
Not secure
https://eventinghello-jegan-serverless.apps.ocp4.tektutor.org.labs
Bookmarks
Science
Crafts
Optical illusion
Home Schooling
Design Patterns
Datastructure...
Linux
POSIX Threads
CPPUnit
Microservices
Maven
All Bookmarks
knativetutorial-eventinghello - 1.0.0-SNAPSHOT
eventinghello-jegan-serverless....
Memory usage: 90.1 MB
Your new Cloud-Native application is ready!
Congratulations, you have created a new Quarkus application.
Why do you see this?
This page is served by Quarkus. The source is in src/main/resources/META-INF/resources/index.html.
What can I do from here?
If not already done, run the application in dev mode using: mvn compile quarkus:dev.
Add REST resources, Servlets, functions and other services in src/main/java.
Your static assets are located in src/main/resources/META-INF/resources.
Configure your application in src/main/resources/application.properties.
How do I get rid of this page?
Just delete the src/main/resources/META-INF/resources/index.html file.
Application
GroupId: com.redhat.developers
ArtifactId: knativetutorial-eventinghello
Version: 1.0.0-SNAPSHOT
Quarkus Version: 1.4.2.Final
Next steps
Setup your IDE
Getting started
Quarkus Web Site


Activities
Google Chrome
Jun 28 17:35
Topology · Red Hat OpenShift - Google Chrome
Not secure
https://console-openshift-console.apps.ocp4.tektutor.org.labs/topology/ns/jegan-serverless?view=graph
Bookmarks
Science
Crafts
Optical illusion
Home Schooling
Design Patterns
Datastructure...
Linux
POSIX Threads
CPPUnit
Microservices
Maven
Microservices...
GoogleTest
All Bookmarks
Red Hat OpenShift
kube:admin
Developer
+Add
Topology
Observe
Search
Functions
Builds
Helm
Project
ConfigMaps
Secrets
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: jegan-serverless
Application: All applications
View shortcuts
Display options
Filter by resource
Name
Find by name...
100%
PS eventi...source
REV eventi...-00001
KSVC eventinghello



Lab - Developing a simple knative function in nodejs and deploying into Openshift cluster

This will generate a basic nodejs application in your current directory

```
kn func create -l node
```

If you wish to build your application

```
kn func build
```

If you wish to run the application locally and test it

```
kn func run
```

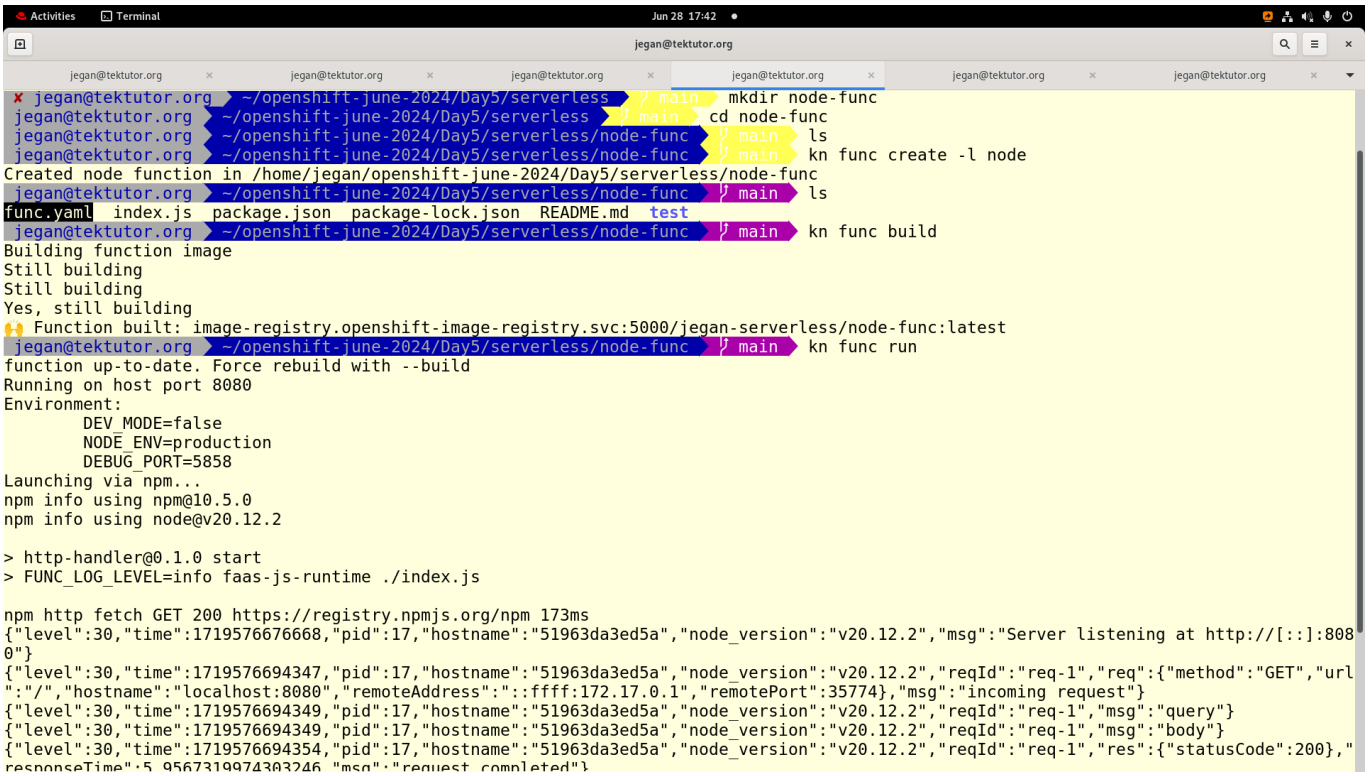
Deploy the nodejs application into openshift after building it

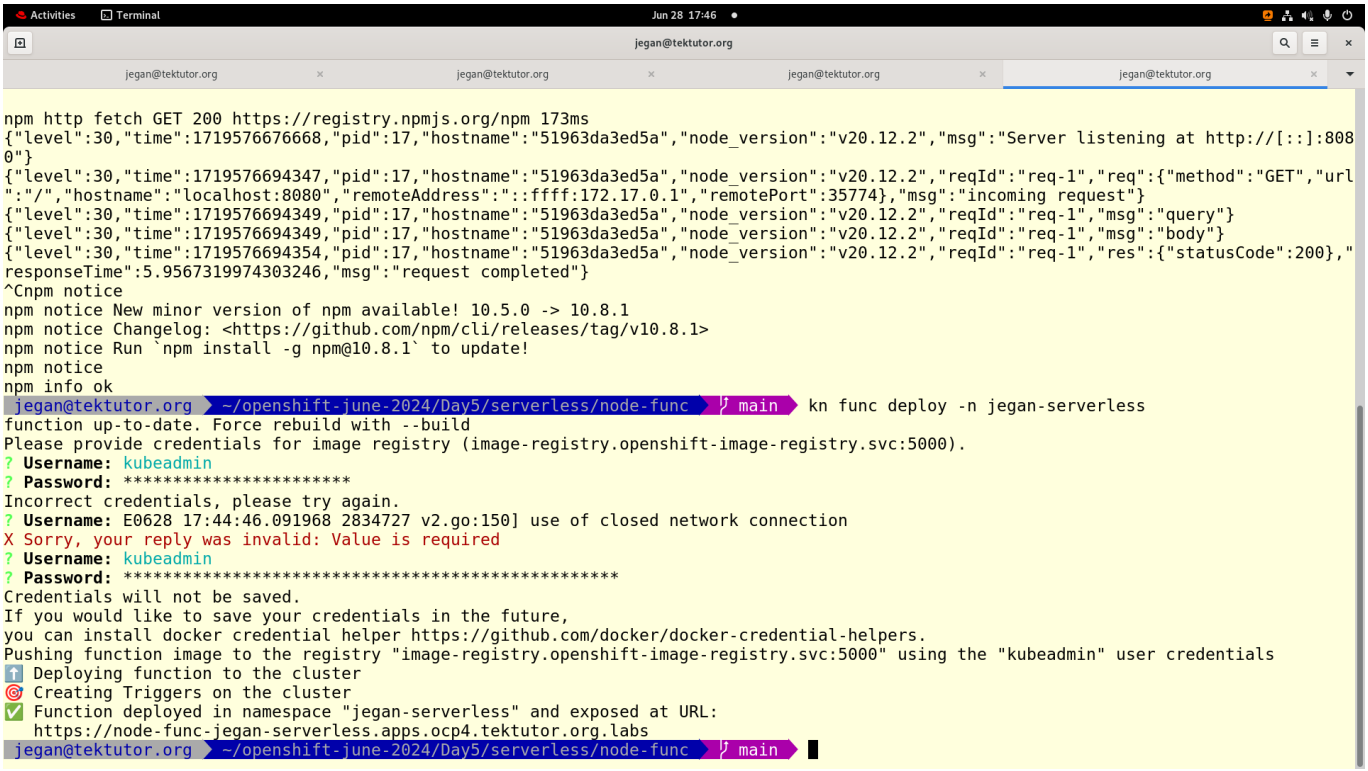
```
kn func deploy -n jegan-serverless
```

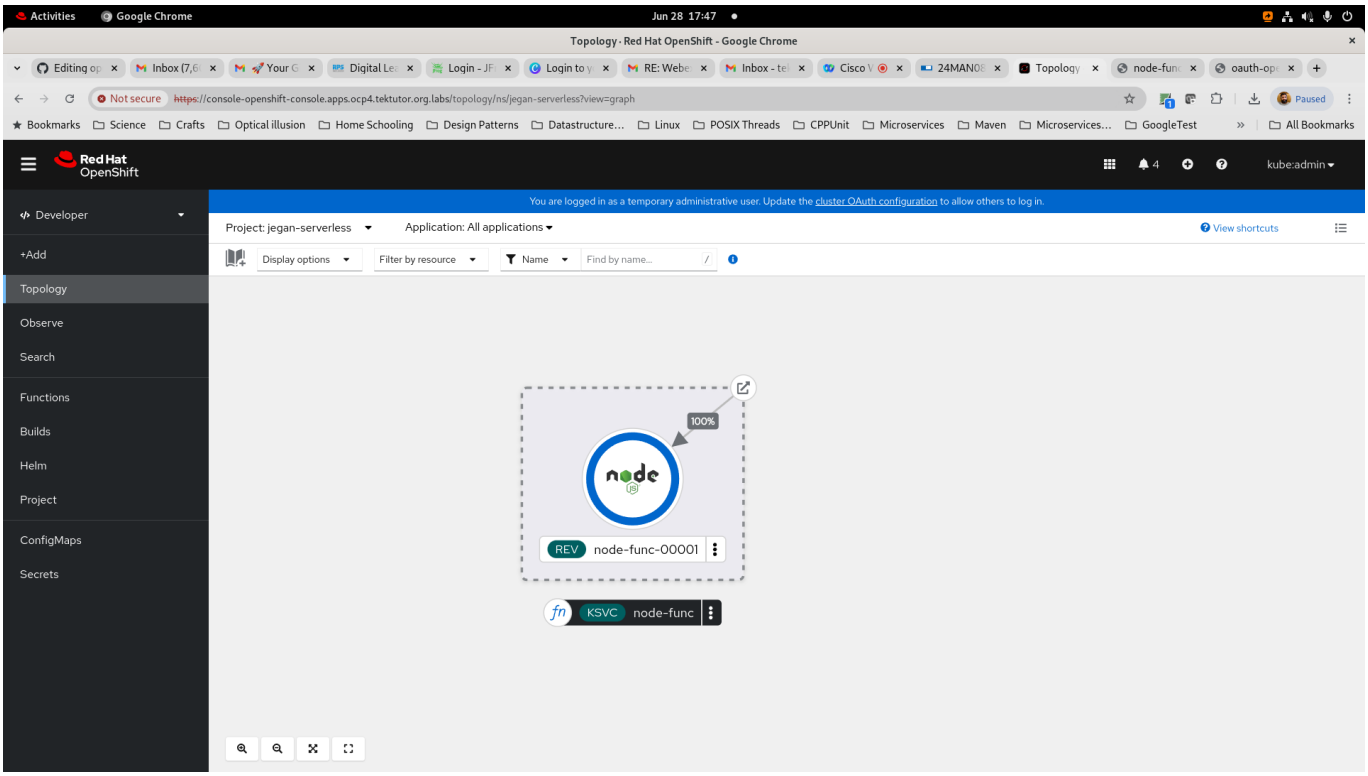
Test the knative function

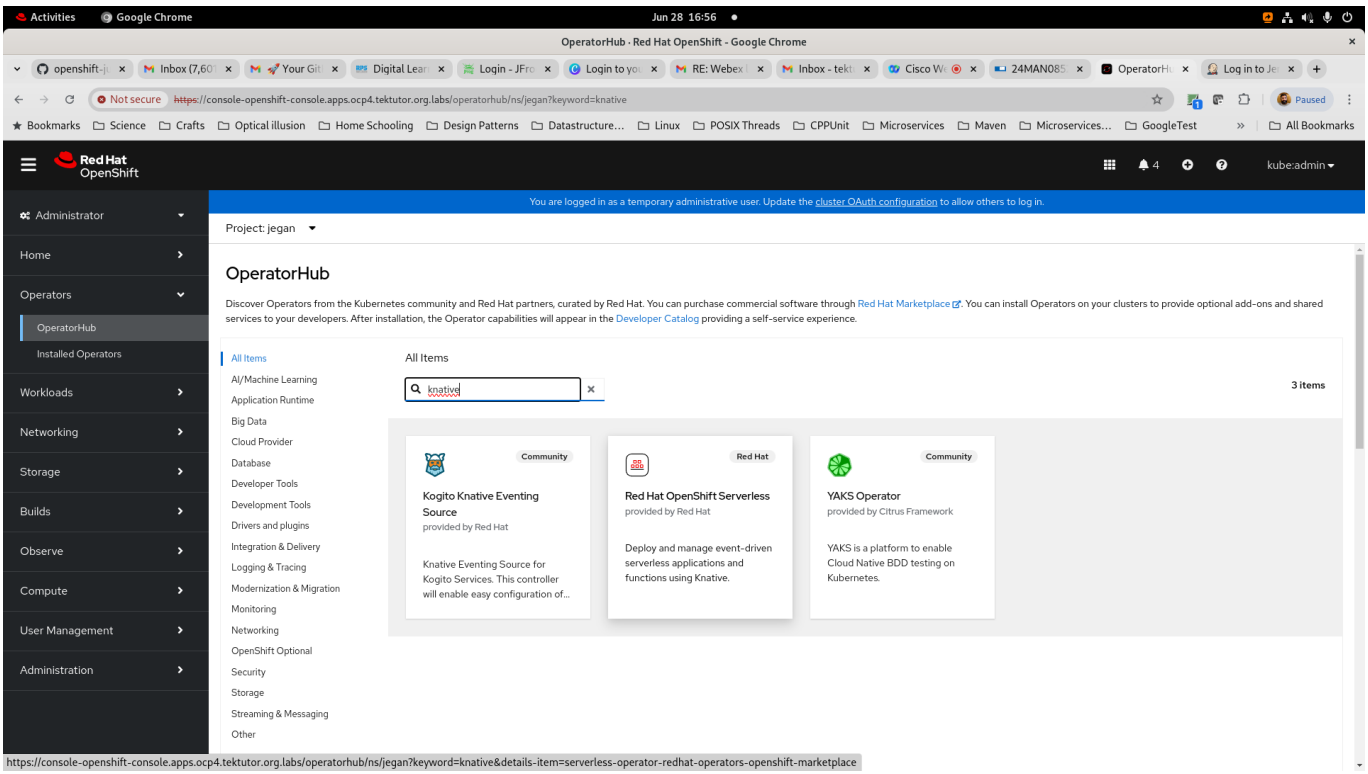
```
curl -k https://functions-jegan.apps.ocp4.tektutor.org.labs
```

Expected output






Activities
Google Chrome
Jun 28 17:47
Topology · Red Hat OpenShift - Google Chrome
Not secure
https://console-openshift-console.apps.ocp4.tektutor.org.labs/topology/ns/jegan-serverless?view=graph
Red Hat OpenShift
kube:admin
Developer
+Add
Topology
Observe
Search
Functions
Builds
Helm
Project
ConfigMaps
Secrets
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: jegan-serverless
Application: All applications
View shortcuts
Display options
Filter by resource
Name
Find by name...
100%
node
REV
node-func-00001
fn
KSVC
node-func


Activities
Google Chrome
Jun 28 16:56
OperatorHub · Red Hat OpenShift - Google Chrome
Not secure
https://console-openshift-console.apps.ocp4.tektutor.org.labs/operatorhub/ns/jegan?keyword=knative
Red Hat OpenShift
kube:admin
Administrator
Home
Operators
OperatorHub
Installed Operators
Workloads
Networking
Storage
Builds
Observe
Compute
User Management
Administration
You are logged in as a temporary administrative user. Update the cluster OAuth configuration to allow others to log in.
Project: jegan
OperatorHub
Discover Operators from the Kubernetes community and Red Hat partners, curated by Red Hat. You can purchase commercial software through Red Hat Marketplace. You can install Operators on your clusters to provide optional add-ons and shared services to your developers. After installation, the Operator capabilities will appear in the Developer Catalog providing a self-service experience.
All Items
AI/Machine Learning
Application Runtime
Big Data
Cloud Provider
Database
Developer Tools
Development Tools
Drivers and plugins
Integration & Delivery
Logging & Tracing
Modernization & Migration
Monitoring
Networking
OpenShift Optional
Security
Storage
Streaming & Messaging
Other
All Items
knative
3 items
Community
Kogito Knative Eventing Source
provided by Red Hat
Knative Eventing Source for Kogito Services. This controller will enable easy configuration of...
Red Hat
Red Hat OpenShift Serverless
provided by Red Hat
Deploy and manage event-driven serverless applications and functions using Knative.
Community
YAKS Operator
provided by Citrus Framework
YAKS is a platform to enable Cloud Native BDD testing on Kubernetes.
https://console-openshift-console.apps.ocp4.tektutor.org.labs/operatorhub/ns/jegan?keyword=knative&details-item=serverless-operator-redhat-operators-openshift-marketplace