Introduction to Red Hat OpenShift

Skills Network

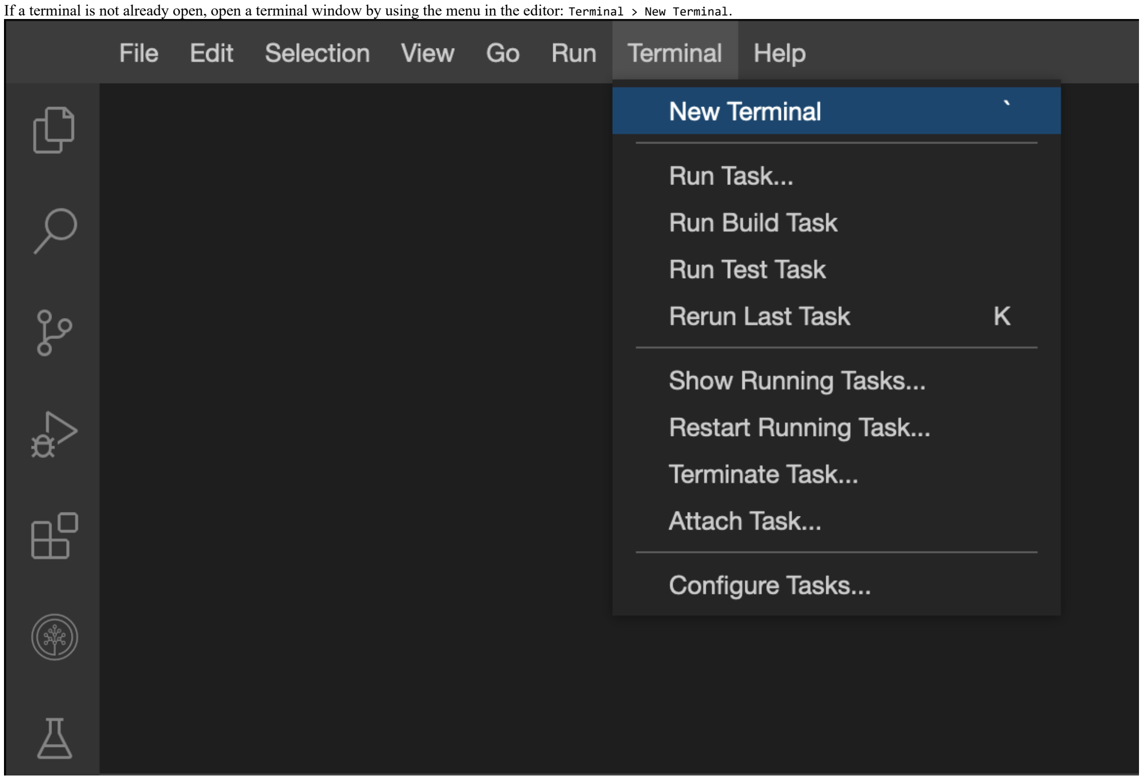
Objectives

In this lab, you will:

- Use the oc CLI (OpenShift command line interface)
- Use the OpenShift web console
- Build and deploy an application using s2i ('Source-to-image' build strategy)
- Inspect a BuildConfig and an ImageStream
- Autoscale the application

Verify the environment and command line tools

1. If a terminal is not already open, open a terminal window by using the menu in the editor: `Terminal > New Terminal`.

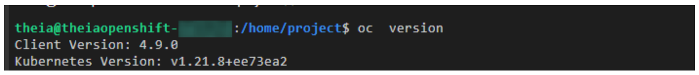


Note: Please wait for some time for the terminal prompt to appear.

2. Verify that oc CLI is installed.

```
1. 1
1. oc version
```

Copied! Executed!



```
theia@theiaopenshift-[redacted]:/home/project$ oc  version
Client Version: 4.9.0
Kubernetes Version: v1.21.8+ee73ea2
```

You should see output similar to this, although the versions may be different.

3. Change to your project folder.

NOTE: If you are already on `home/project` please skip this step

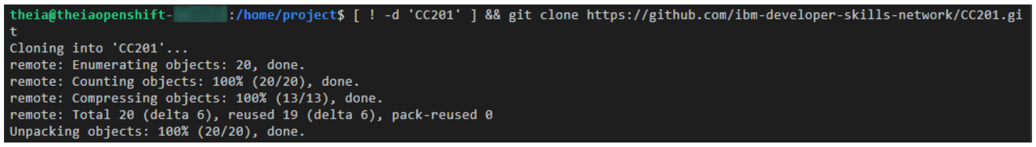
```
1. 1
1. cd /home/project
```

Copied! Executed!

4. Clone the git repository that contains the artifacts needed for this lab, if it doesn't already exist.

```
1. 1
1. [ ! -d 'CC201' ] && git clone https://github.com/ibm-developer-skills-network/CC201.git
```

Copied! Executed!



```
theia@theiaopenshift-[redacted]:/home/project$ [ ! -d 'CC201' ] && git clone https://github.com/ibm-developer-skills-network/CC201.gi
t
Cloning into 'CC201'...
remote: Enumerating objects: 20, done.
remote: Counting objects: 100% (20/20), done.
remote: Compressing objects: 100% (13/13), done.
remote: Total 20 (delta 6), reused 19 (delta 6), pack-reused 0
Unpacking objects: 100% (20/20), done.
```

Use the oc CLI

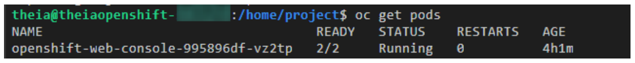
OpenShift projects are Kubernetes namespaces with additional administrative functions. Therefore, projects also provide isolation within an OpenShift cluster. You already have access to one project in an OpenShift cluster, and `oc` is already set to target that cluster and project.

Let's look at some basic `oc` commands. Recall that `oc` comes with a copy of `kubectl`, so all the `kubectl` commands can be run with `oc`.

1. List the Pods in this namespace.

```
oc get pods
```

Copied! Executed!



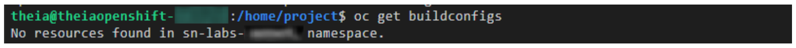
```
theia@theiaopenshift-[redacted]:/home/project$ oc get pods
NAME                                   READY   STATUS    RESTARTS   AGE
openshift-web-console-995896df-vz2tp   2/2     Running   0          4h1m
```

You will likely see a few Pods that are part of the environment. You don't need to worry about these.

2. In addition to Kubernetes objects, you can get OpenShift specific objects.

```
oc get buildconfigs
```

Copied! Executed!



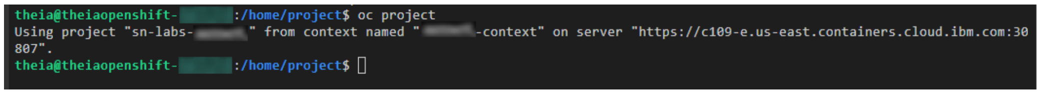
```
theia@theiaopenshift-[redacted]:/home/project$ oc get buildconfigs
No resources found in sn-labs-[redacted] namespace.
```

Because you haven't created a BuildConfig yet, this will not return any resources.

3. View the OpenShift project that is currently in use.

```
oc project
```

Copied! Executed!



```
theia@theiaopenshift-[redacted]:/home/project$ oc project
Using project "sn-labs-[redacted]" from context named "[redacted]-context" on server "https://c109-e.us-east.containers.cloud.ibm.com:30
807".
theia@theiaopenshift-[redacted]:/home/project$ 
```

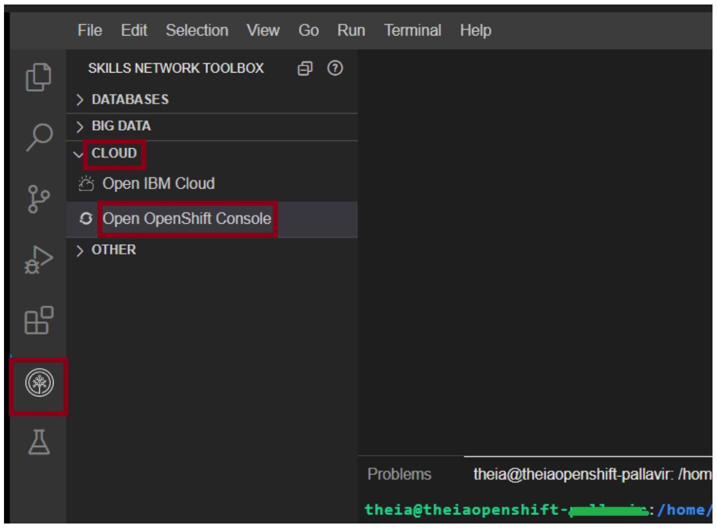
This project is specific to you and provides isolation within the cluster so that you can deploy your own applications.

Use the OpenShift web console

In addition to the CLI, OpenShift provides an intuitive web console. This is a useful and powerful feature because it enables you to deploy applications, view resources, monitor applications and view logs, and much more right in the console.

Let's open up the console and have a look around.

1. To open openshift web console, click on the Skills Network button on the right, it will open the **"Skills Network Toolbox"**. Then click the **Cloud** then **Open OpenShift console** as shown in the following image.



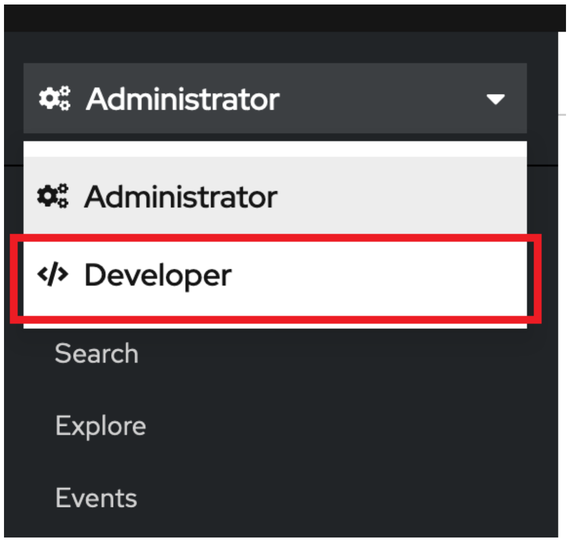
```
theia@theiaopenshift-[redacted]:/home/
```

It can take a few minutes to become available after opening the lab environment, so if you get an error, wait a minute and try again.

2. The console should open to the project details for the project you have been assigned. Take a look at all the information OpenShift provides you in an intuitive, visual manner. Click through the Dashboard, Overview, and other tabs for this project to see additional information. You should see inventory on the resources that currently exist in this project, the YAML that defines this project, and much more.

3. Familiarize yourself with the items in the left navigation menu. You can see Operators, many different Kubernetes objects, and some OpenShift-specific objects, all of which we have talked about in this course. There won't yet be many instances of these objects, but they will fill up once we deploy our application.

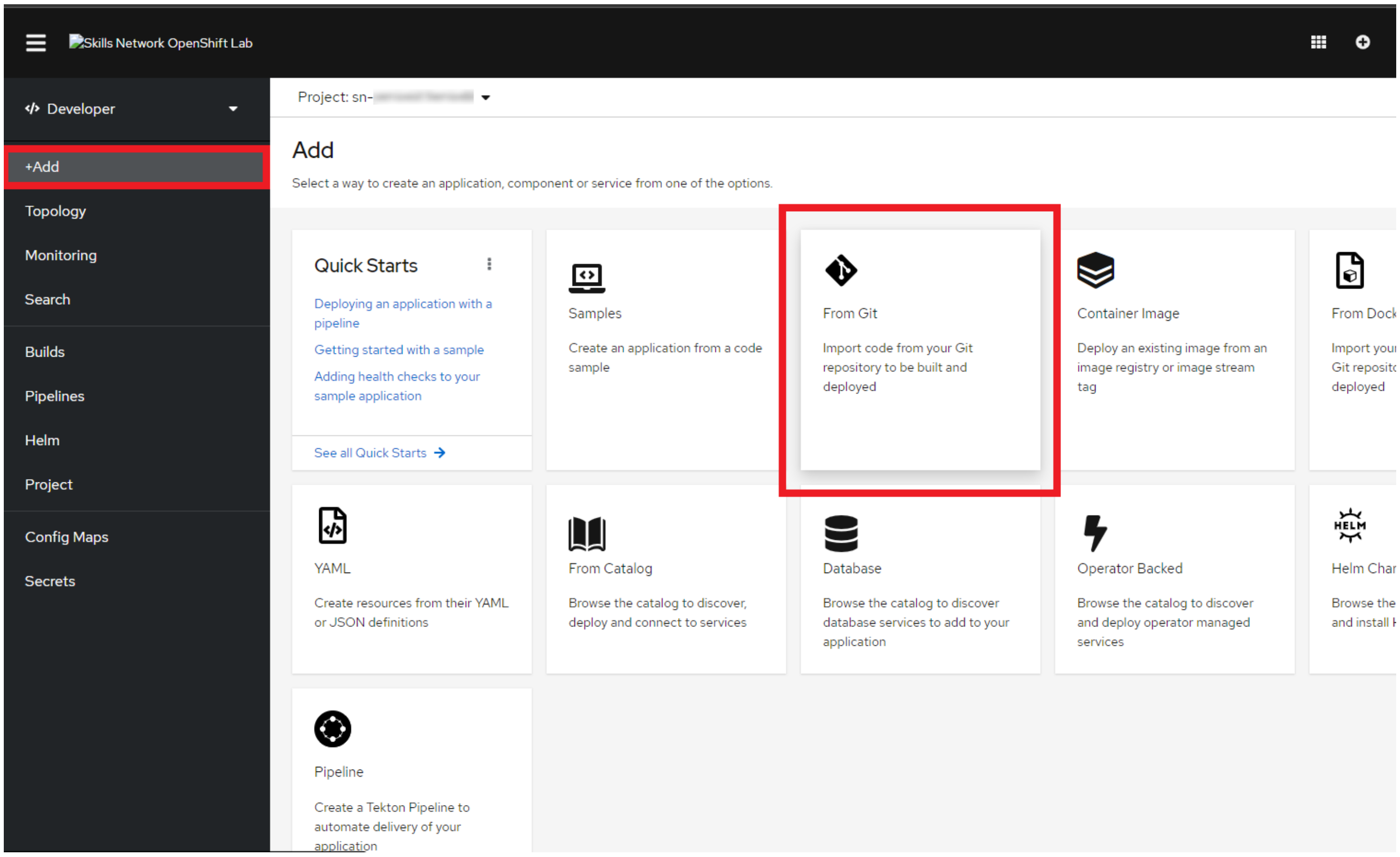
4. Notice the word **"Administrator"** at the top left. This indicates that you are in the Administrator perspective. There is also a Developer perspective. Each perspective provides workflows specific to that persona. **Switch to the Developer perspective** to begin deploying an application. (If it says "Developer" already, don't change it.)



Deploy an application in the web console

The Developer perspective provides workflows specific to developer use cases, such as the ability to create and deploy applications. Let's start here! You are likely in the "Topology" view, which provides a visual representation of applications. If not, switch to it to take a look.

1. Let us add a new application to this project. There are several ways to add a new application in Openshift.
2. Click the **+Add** button to add a new application.
3. Select **From Git** among the options.



Select a way to create an application, component or service from one of the options.

Create an application from a code sample

Import code from your Git repository to be built and deployed

Deploy an existing image from an image registry or image stream tag

Import you Git reposit deployed

Create resources from their YAML or JSON definitions

Browse the catalog to discover, deploy and connect to services

Browse the catalog to discover database services to add to your application

Browse the catalog to discover and deploy operator managed services

Browse the and install

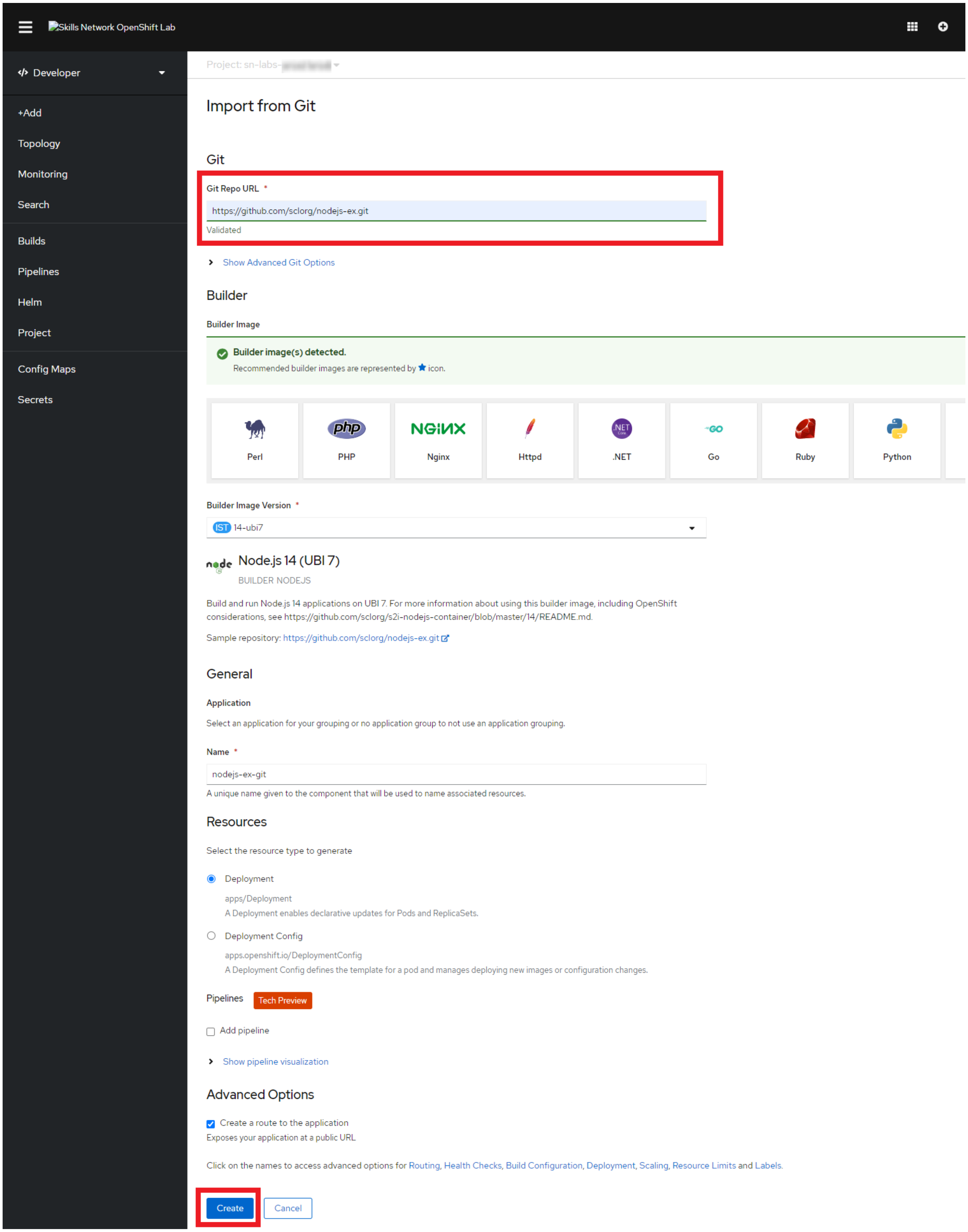
Create a Tekton Pipeline to automate delivery of your application

4. You will be redirected to **Import from Git** window. OpenShift will deploy an application using only one input from you: the application source.
5. In the **Git Repo URL** box, paste the sample one mentioned below.

```
https://github.com/sclorg/nodejs-ex.git
```

Copied!

In the Builder section, scroll down to see the various builder images. We shall be using the Node.js image for our application. Ensure that this image has been selected.



Skills Network OpenShift Lab

Developer

+Add
Topology
Monitoring
Search
Builds
Pipelines
Helm
Project
Config Maps
Secrets

Project: sn-labs-[redacted]

Import from Git

Git

Git Repo URL *

https://github.com/sclorg/nodejs-ex.git

Validated

Show Advanced Git Options

Builder

Builder Image

Builder image(s) detected.
Recommended builder images are represented by ★ icon.

Perl | PHP | Nginx | Httpd | .NET | Go | Ruby | Python

Builder Image Version *

IST 14-ubi7

Node.js 14 (UBI 7)
BUILDER NODEJS

Build and run Node.js 14 applications on UBI 7. For more information about using this builder image, including OpenShift considerations, see https://github.com/sclorg/s2i-nodejs-container/blob/master/14/README.md.

Sample repository: https://github.com/sclorg/nodejs-ex.git

General

Application

Select an application for your grouping or no application group to not use an application grouping.

Name *

nodejs-ex-git

A unique name given to the component that will be used to name associated resources.

Resources

Select the resource type to generate

● Deployment
apps/Deployment
A Deployment enables declarative updates for Pods and ReplicaSets.

○ Deployment Config
apps.openshift.io/DeploymentConfig
A Deployment Config defines the template for a pod and manages deploying new images or configuration changes.

Pipelines Tech Preview

☐ Add pipeline

Show pipeline visualization

Advanced Options

☑ Create a route to the application
Exposes your application at a public URL

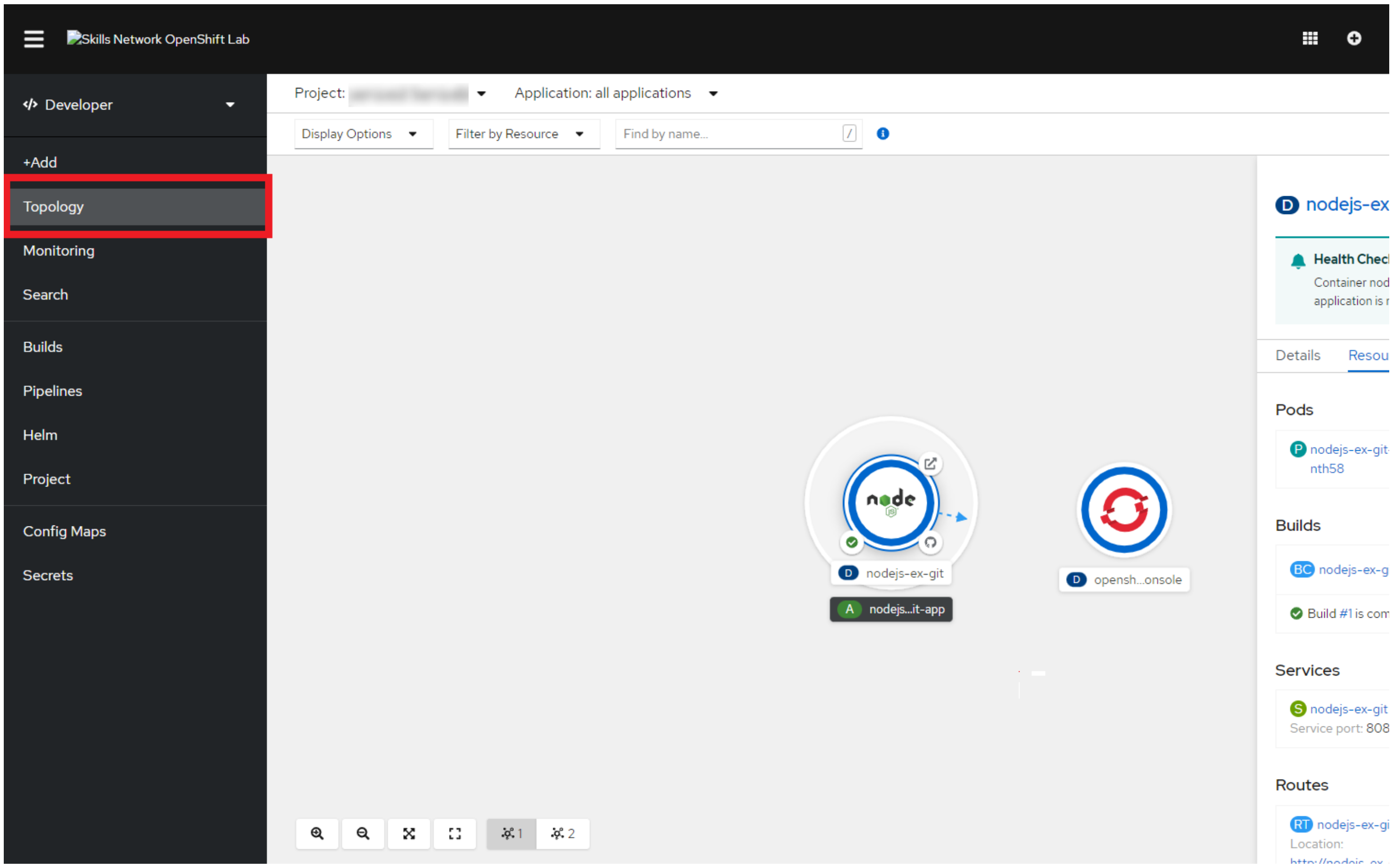
Click on the names to access advanced options for Routing, Health Checks, Build Configuration, Deployment, Scaling, Resource Limits and Labels.

Create   Cancel

6. Keep the rest of the default options as they already are. Then scroll down and click **Create**.

In the Topology view, you should now see your newly created application.

NOTE: It will take several minutes for the application to appear. Refresh the browser if within 3 minutes, you don't see any application.



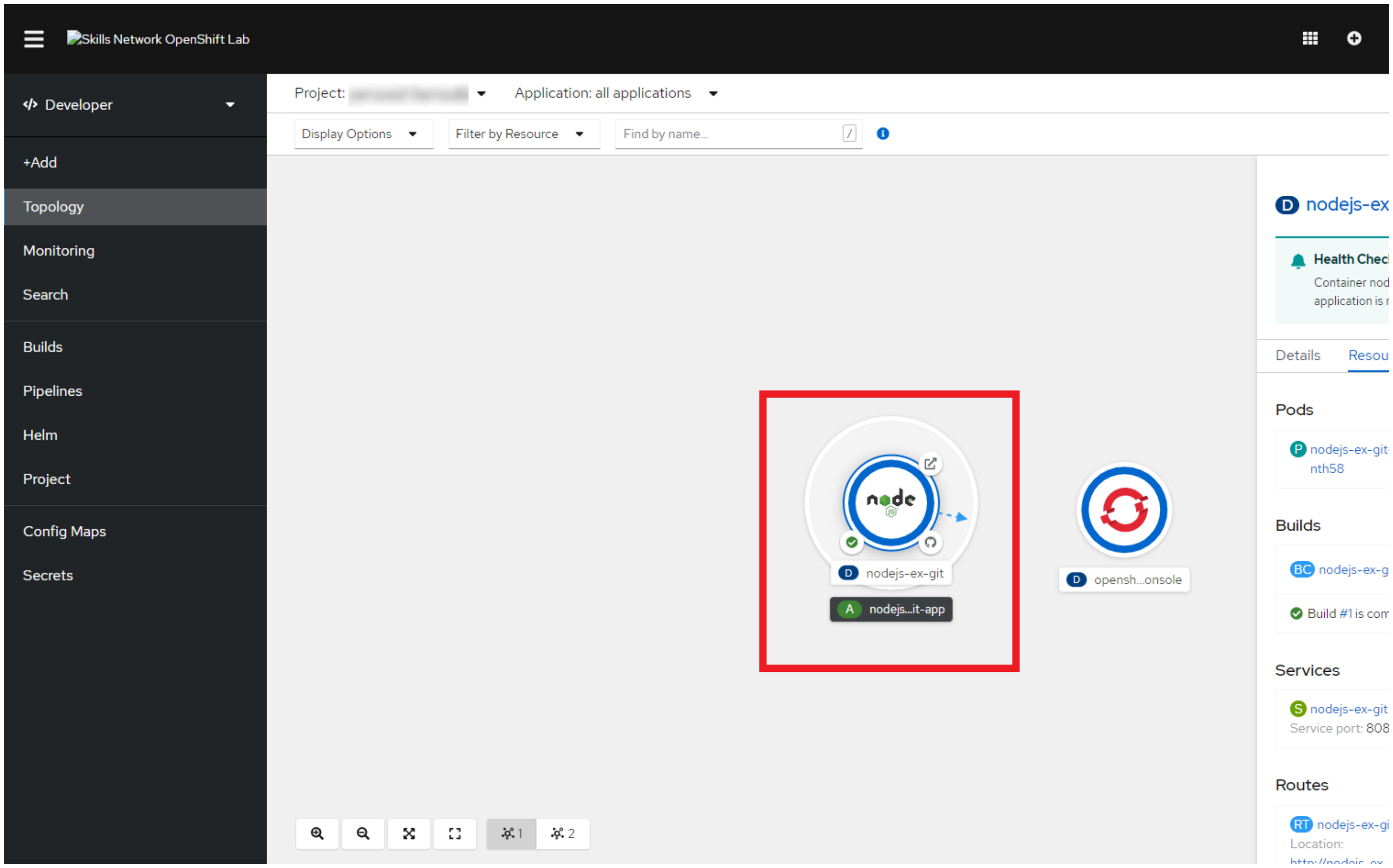
View application in the web console

The Topology view provides quick links to a lot of important parts of an application:

- The outer circle gets the information on the application.
- The inner circle with the Node.js logo gives information about the Deployment.
- The GitHub icon is used to access the code repository.
- The check mark shows the most recent build (you will see circular arrows if the build is in progress).
- The arrow coming out of a box can be used to view the application in the browser if the application is externally available.

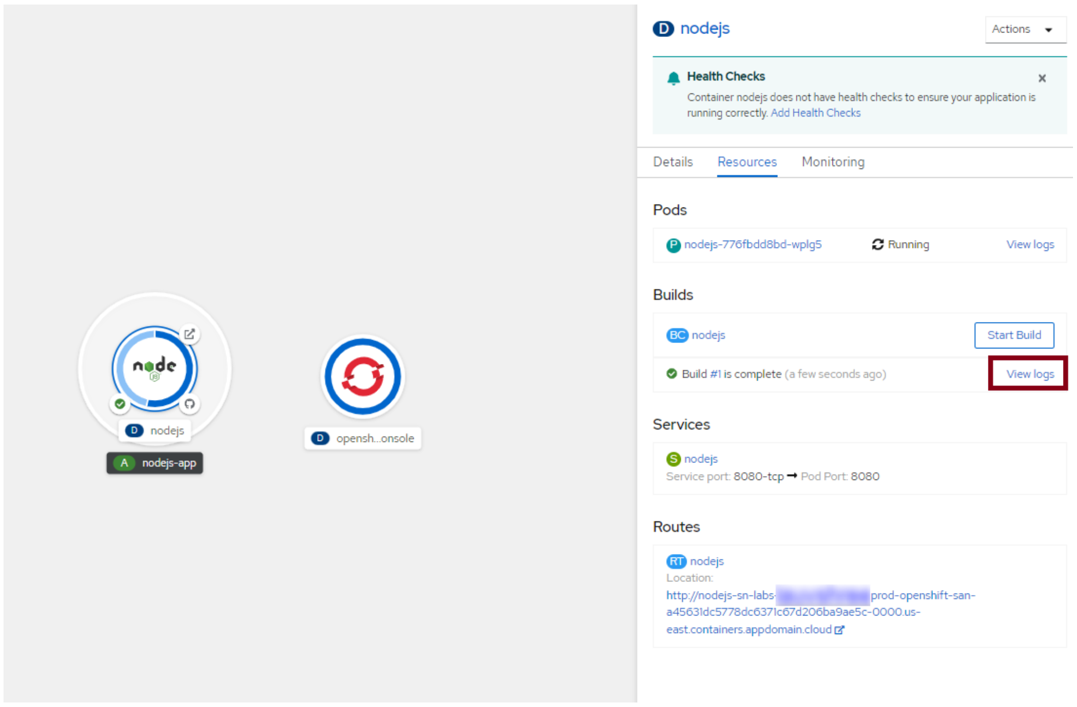
Let's try some specific steps:

1. Click the inner circle with the Node.js logo to bring up information on the Deployment and observe the four resources associated with this Deployment: a Pod that runs the containerized application; a Build that uses the s2i strategy to build the application into a container image; a Service that exposes the application as a network service; and a Route that provides an externally reachable hostname.

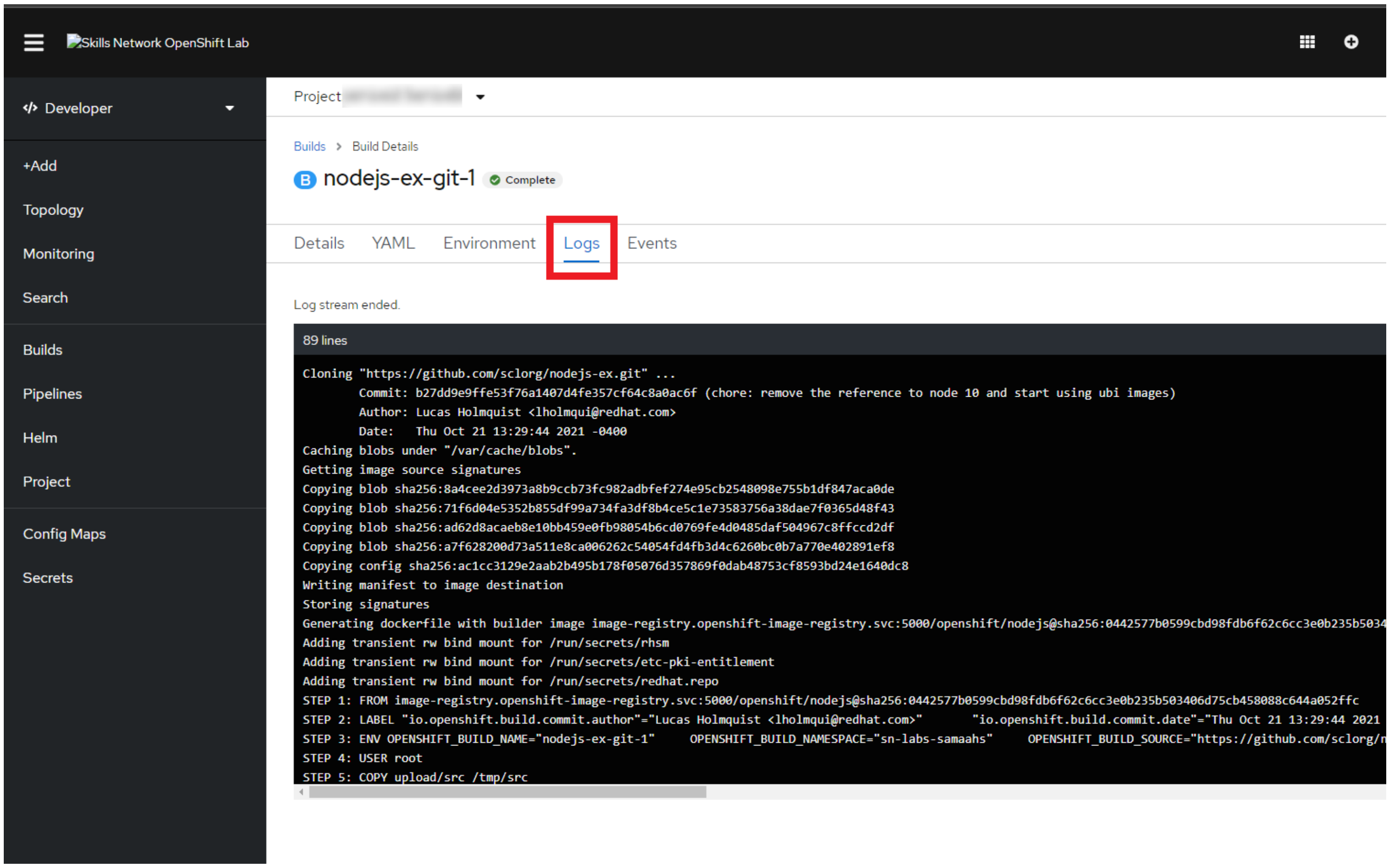


Note: Please wait for status of the pod to change to 'Running' and for the Build to complete.

2. Click **View logs** on the line that says **Build #1**.


nodejs
nodejs-app
opensh...onsole
nodejs
Actions
Health Checks
Container nodejs does not have health checks to ensure your application is running correctly. Add Health Checks
Details
Resources
Monitoring
Pods
nodejs-776fbdd8bd-wplg5
Running
View logs
Builds
nodejs
Start Build
Build #1 is complete (a few seconds ago)
View logs
Services
nodejs
Service port: 8080-tcp → Pod Port: 8080
Routes
nodejs
Location:
http://nodejs-sn-labs-[redacted]prod-openshift-san-a45631dc5778dc6371c67d206ba9ae5c-0000.us-east.containers.appdomain.cloud

3. Read the logs to see a few key completed steps. The repository is cloned, a Dockerfile is generated, an image is built, and the image is pushed to the internal registry.



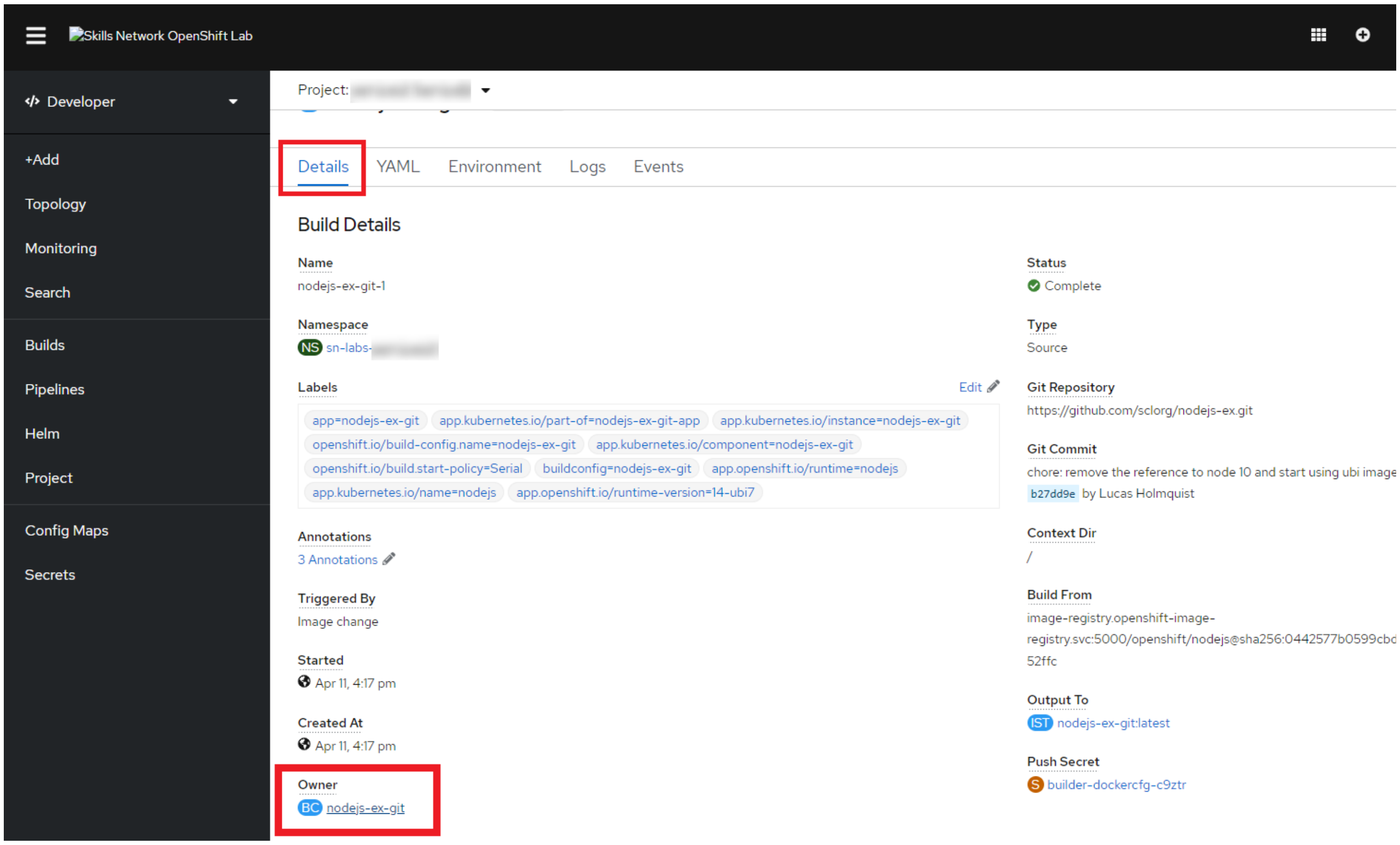
Log stream ended.

89 lines

```
Cloning "https://github.com/sclorg/nodejs-ex.git" ...
        Commit: b27dd9e9ffe53f76a1407d4fe357cf64c8a0ac6f (chore: remove the reference to node 10 and start using ubi images)
        Author: Lucas Holmquist <lholmqui@redhat.com>
        Date:   Thu Oct 21 13:29:44 2021 -0400
Caching blobs under "/var/cache/blobs".
Getting image source signatures
Copying blob sha256:8a4cee2d3973a8b9ccb73fc982adbfef274e95cb2548098e755b1df847aca0de
Copying blob sha256:71f6d04e5352b855df99a734fa3df8b4ce5c1e73583756a38dae7f0365d48f43
Copying blob sha256:ad62d8acaeb8e10bb459e0fb98054b6cd0769fe4d0485daf504967c8ffccd2df
Copying blob sha256:a7f628200d73a511e8ca006262c54054fd4fb3d4c6260bc0b7a770e402891ef8
Copying config sha256:ac1cc3129e2aab2b495b178f05076d357869f0dab48753cf8593bd24e1640dc8
Writing manifest to image destination
Storing signatures
Generating dockerfile with builder image image-registry.openshift-image-registry.svc:5000/openshift/nodejs@sha256:0442577b0599cbd98fdb6f62c6cc3e0b235b5034
Adding transient rw bind mount for /run/secrets/rhsm
Adding transient rw bind mount for /run/secrets/etc-pki-entitlement
Adding transient rw bind mount for /run/secrets/redhat.repo
STEP 1: FROM image-registry.openshift-image-registry.svc:5000/openshift/nodejs@sha256:0442577b0599cbd98fdb6f62c6cc3e0b235b503406d75cb458088c644a052ffc
STEP 2: LABEL "io.openshift.build.commit.author"="Lucas Holmquist <lholmqui@redhat.com>"       "io.openshift.build.commit.date"="Thu Oct 21 13:29:44 2021
STEP 3: ENV OPENSHIFT_BUILD_NAME="nodejs-ex-git-1"     OPENSHIFT_BUILD_NAMESPACE="sn-labs-samaahs"     OPENSHIFT_BUILD_SOURCE="https://github.com/sclorg/n
STEP 4: USER root
STEP 5: COPY upload/src /tmp/src
```

4. Click the **Details** tab for this Build.

5. And then click the link under **Owner** (at the very bottom) that says BC (Build Config).



Build Details

Name
nodejs-ex-git-1

Namespace
NS sn-labs-[redacted]

Labels Edit
app=nodejs-ex-git
app.kubernetes.io/part-of=nodejs-ex-git-app
app.kubernetes.io/instance=nodejs-ex-git
openshift.io/build-config.name=nodejs-ex-git
app.kubernetes.io/component=nodejs-ex-git
openshift.io/build.start-policy=Serial
buildconfig=nodejs-ex-git
app.openshift.io/runtime=nodejs
app.kubernetes.io/name=nodejs
app.openshift.io/runtime-version=14-ubi7

Annotations
3 Annotations

Triggered By
Image change

Started
Apr 11, 4:17 pm

Created At
Apr 11, 4:17 pm

Owner
BC nodejs-ex-git

Status
Complete

Type
Source

Git Repository
https://github.com/sclorg/nodejs-ex.git

Git Commit
chore: remove the reference to node 10 and start using ubi image
b27dd9e by Lucas Holmquist

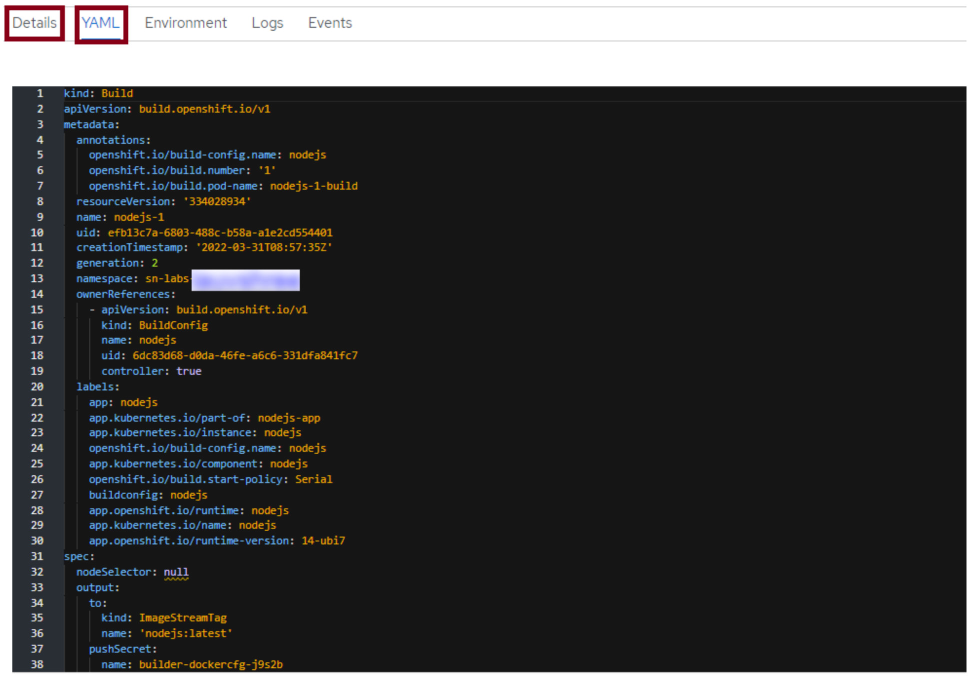
Context Dir
/

Build From
image-registry.openshift-image-registry.svc:5000/openshift/nodejs@sha256:0442577b0599cbd
52ffc

Output To
IST nodejs-ex-git:latest

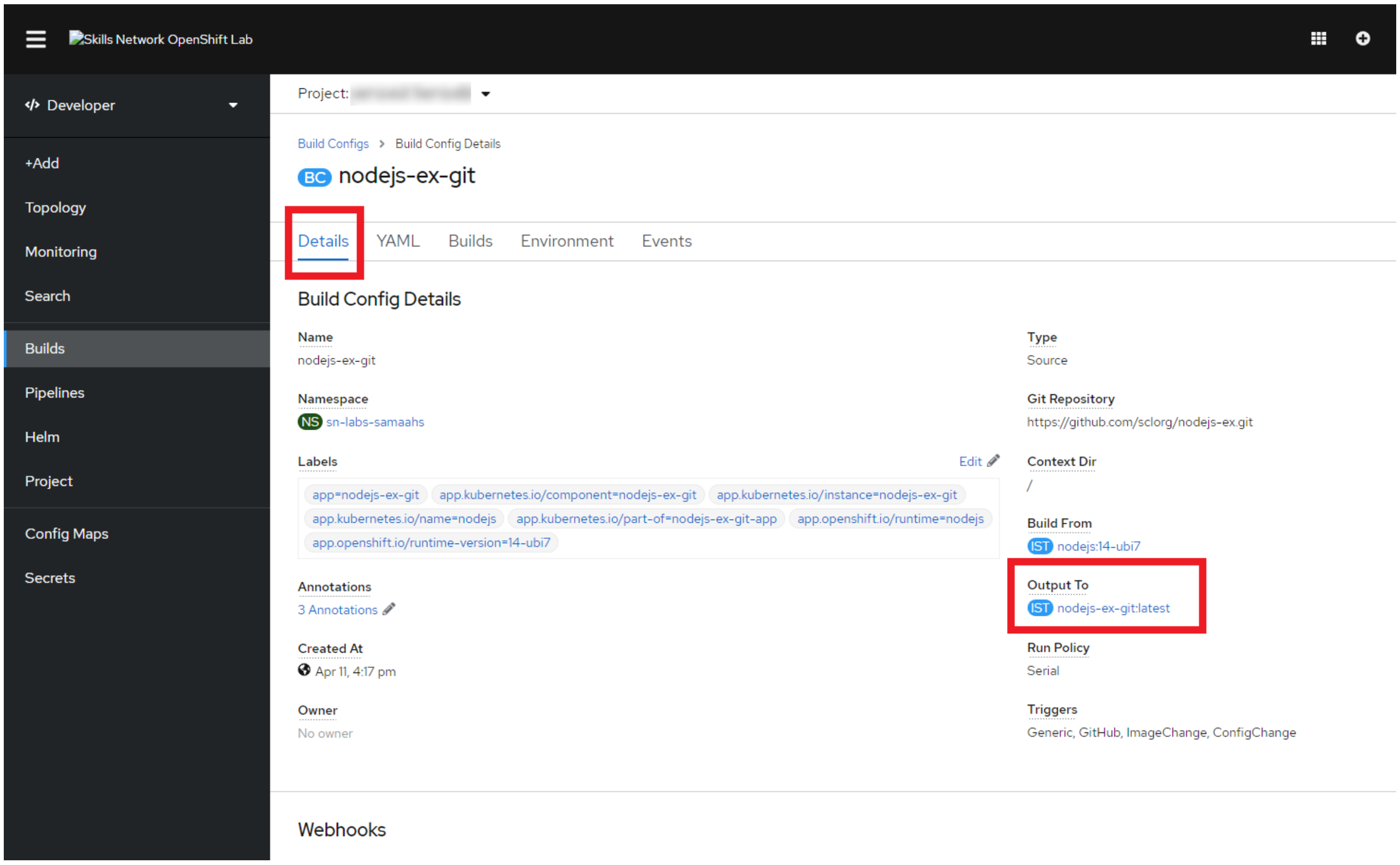
Push Secret
S builder-dockercfg-c9ztr

6. If you look at the **Details** and **YAML** tabs, you'll see many concepts that we talked about in this module: triggers, build strategy, webhooks, and more.



```yaml
kind: Build
apiVersion: build.openshift.io/v1
metadata:
  annotations:
    openshift.io/build-config.name: nodejs
    openshift.io/build.number: '1'
    openshift.io/build.pod-name: nodejs-1-build
  resourceVersion: '334028934'
  name: nodejs-1
  uid: efb13c7a-6803-488c-b58a-a1e2cd554401
  creationTimestamp: '2022-03-31T08:57:35Z'
  generation: 2
  namespace: sn-labs[redacted]
  ownerReferences:
    - apiVersion: build.openshift.io/v1
      kind: BuildConfig
      name: nodejs
      uid: 6dc83d68-d0da-46fe-a6c6-331dfa841fc7
      controller: true
  labels:
    app: nodejs
    app.kubernetes.io/part-of: nodejs-app
    app.kubernetes.io/instance: nodejs
    openshift.io/build-config.name: nodejs
    app.kubernetes.io/component: nodejs
    openshift.io/build.start-policy: Serial
    buildconfig: nodejs
    app.openshift.io/runtime: nodejs
    app.kubernetes.io/name: nodejs
    app.openshift.io/runtime-version: 14-ubi7
spec:
  nodeSelector: null
  output:
    to:
      kind: ImageStreamTag
      name: 'nodejs:latest'
    pushSecret:
      name: builder-dockercfg-j9s2b
```

7. On the **Details** tab, click the link under **Output To** that says IST (ImageStreamTag).



Build Config Details

Name
nodejs-ex-git

Namespace
NS sn-labs-samaahs

Labels Edit
app=nodejs-ex-git
app.kubernetes.io/component=nodejs-ex-git
app.kubernetes.io/instance=nodejs-ex-git
app.kubernetes.io/name=nodejs
app.kubernetes.io/part-of=nodejs-ex-git-app
app.openshift.io/runtime=nodejs
app.openshift.io/runtime-version=14-ubi7

Annotations
3 Annotations

Created At
Apr 11, 4:17 pm

Owner
No owner

Type
Source

Git Repository
https://github.com/sclorg/nodejs-ex.git

Context Dir
/

Build From
IST nodejs:14-ubi7

Output To
IST nodejs-ex-git:latest

Run Policy
Serial

Triggers
Generic, GitHub, ImageChange, ConfigChange

Webhooks

8. You can now see the ImageStreamTag that was created as an output of the build. Click the **History** tab to see the image in the internal registry to which this ImageStreamTag points.

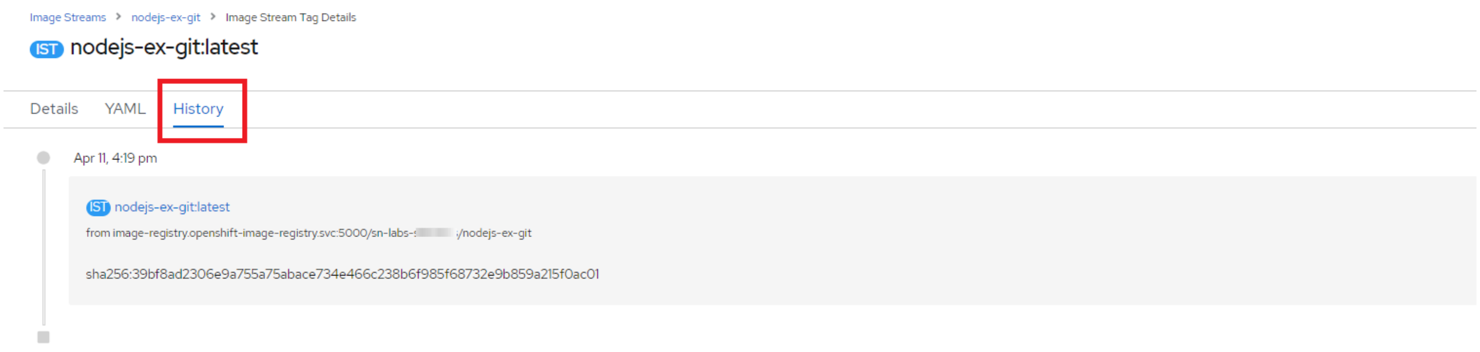


Image Streams > nodejs-ex-git > Image Stream Tag Details

IST nodejs-ex-git:latest

Details YAML History

Apr 11, 4:19 pm

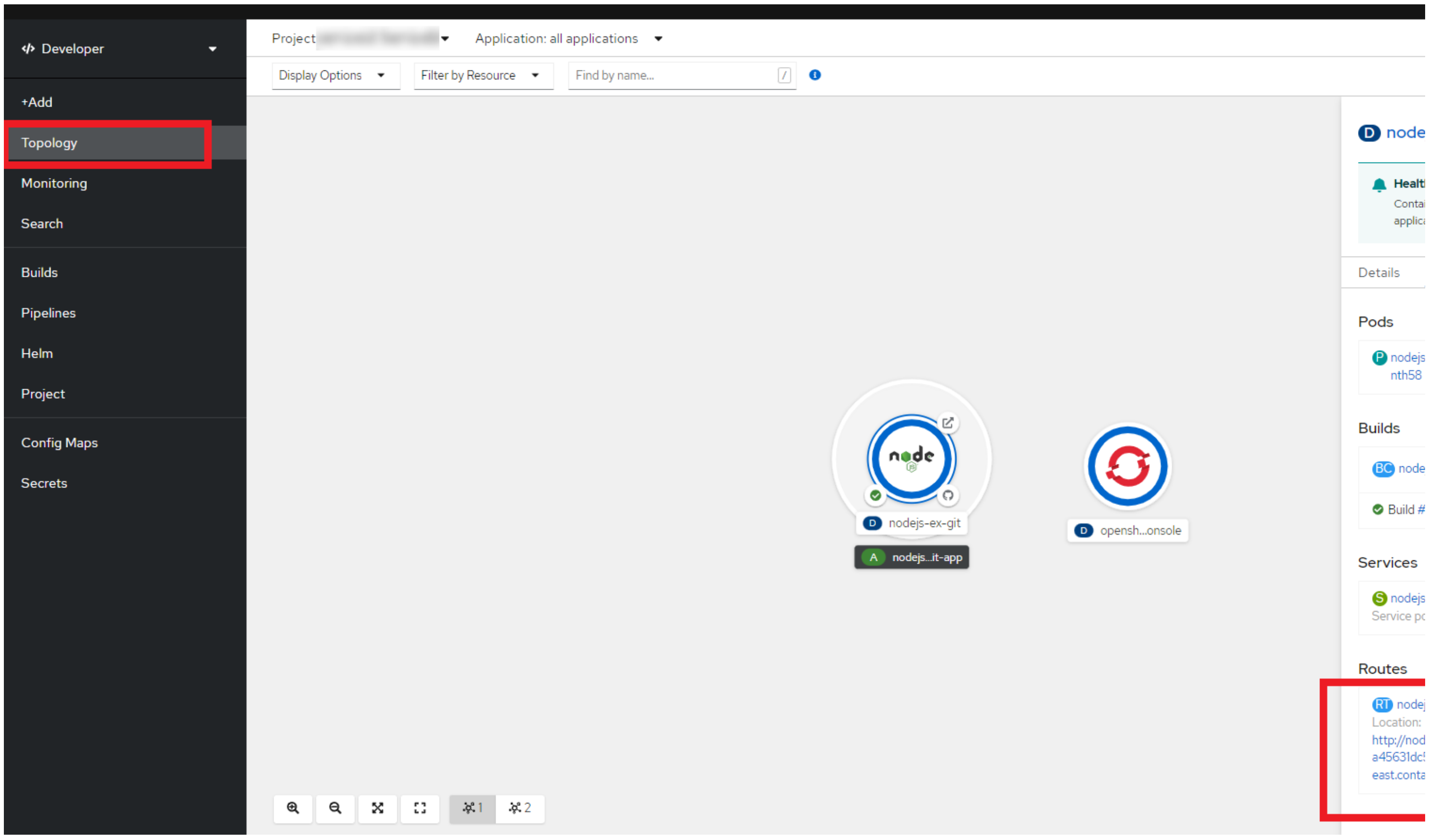
IST nodejs-ex-git:latest

from image-registry.openshift-image-registry.svc:5000/sn-labs-[redacted]/nodejs-ex-git

sha256:39bf8ad2306e9a755a75abace734e466c238b6f985f68732e9b859a215f0ac01

9. Return to the Topology view and click on your Deployment info. Click the Route that OpenShift automatically created for you. This will open the application in the browser.

   Note: Please note down this URL as it will be used in the next section



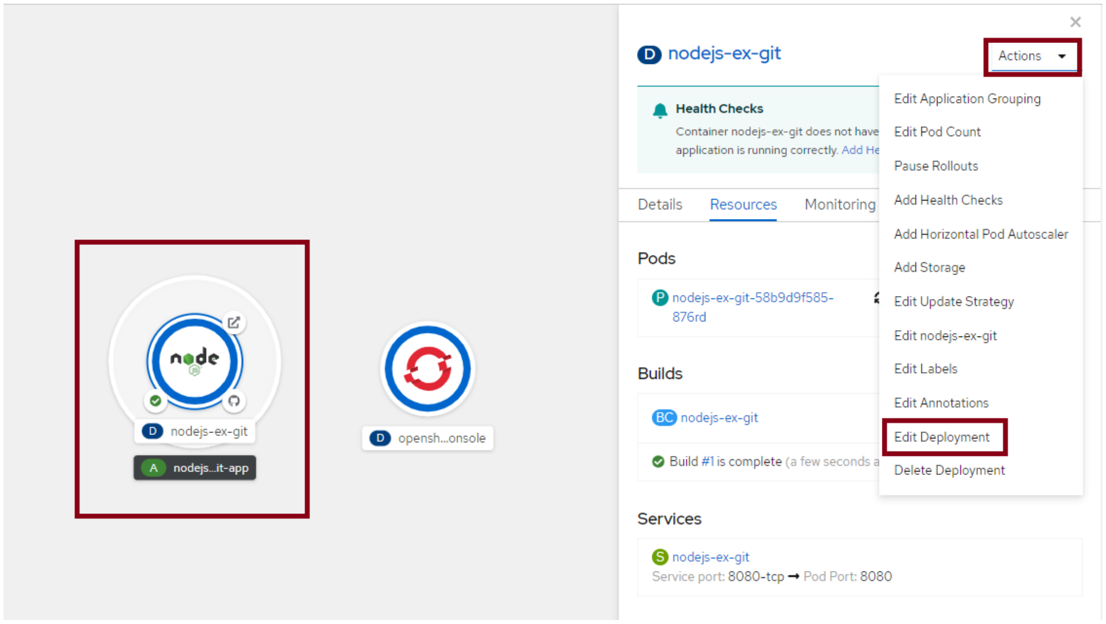
Autoscaling the `nodejs-ex-git` application

Now that the `nodejs-ex-git` app is successfully up and running, let's set up a horizontal pod autoscaler (HPA) so that it can handle any load that comes its way. Make sure to keep the `nodejs-ex-git` app open in a browser tab so that it continues to make requests and consume resources so that it can be successfully autoscaled.

First, we need to set resource requests and limits for the containers that will run. If a container requests a resource like CPU or memory, Kubernetes will only schedule it on a node that can give it that resource. On the other hand, limits prevent a container from consuming more than a certain amount of a resource.

In this case, we're going to request 3 millicores of CPU and 40 MB of RAM. We'll limit the containers to 30 millicores and 100 MB. These numbers are contrived in order to ensure that the app scales.

1. From the Topology view, click the `nodejs-ex-git` Deployment. Then click Actions > Edit Deployment.

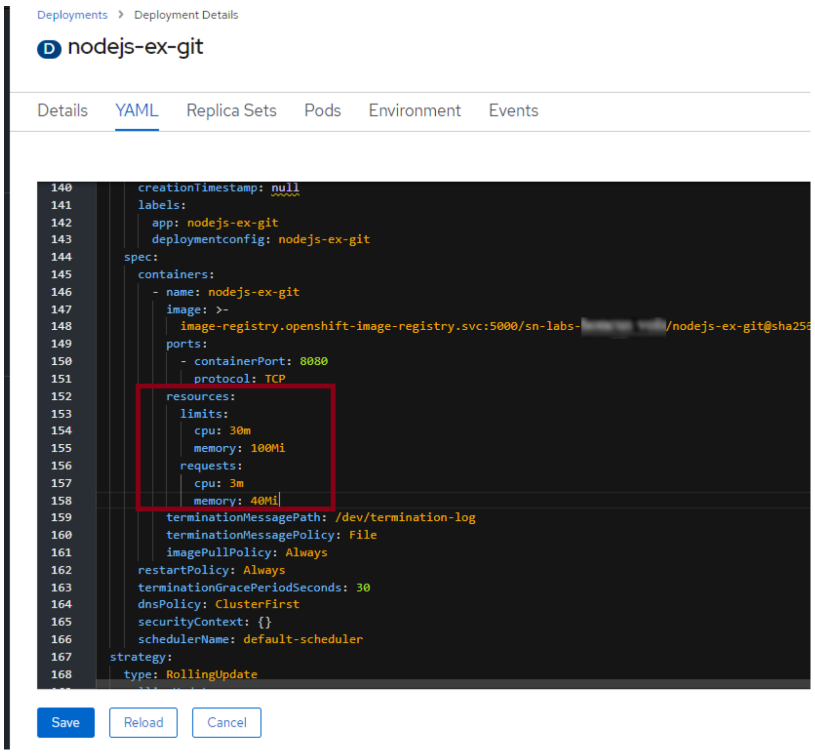


2. In the template.spec.containers section, find resources: {}. Replace that with the following text. Make sure the spacing is correct as YAML uses strict indentation.

```
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
```

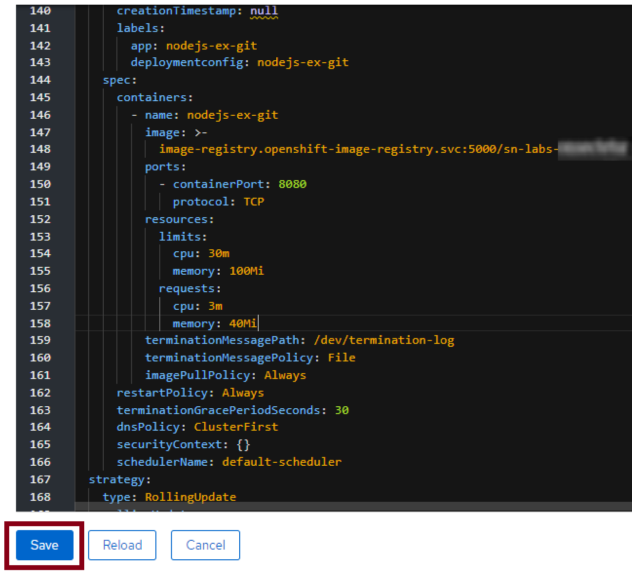
```
        resources:
          limits:
            cpu: 30m
            memory: 100Mi
          requests:
            cpu: 3m
            memory: 40Mi
```

Copied!



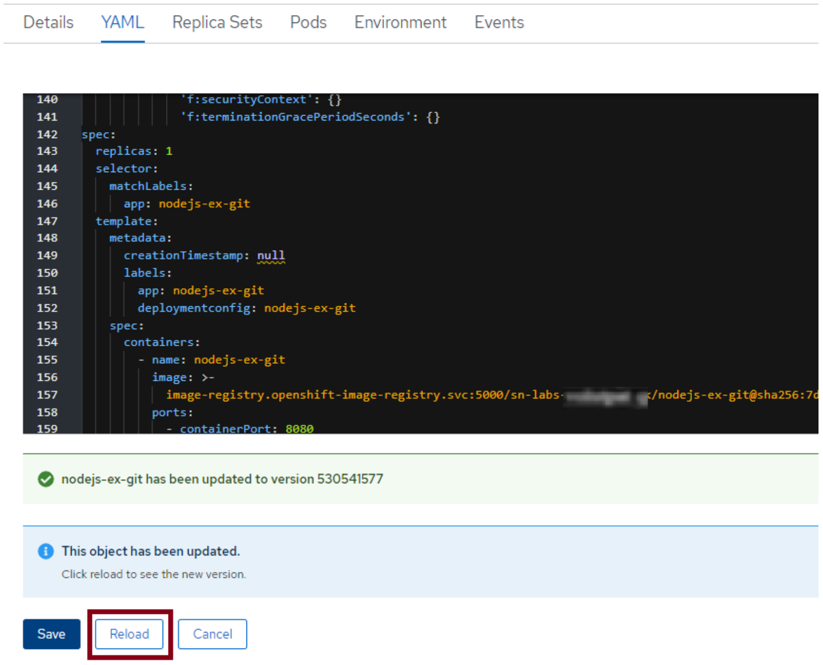
```
      creationTimestamp: null
      labels:
        app: nodejs-ex-git
        deploymentconfig: nodejs-ex-git
    spec:
      containers:
        - name: nodejs-ex-git
          image: >-
            image-registry.openshift-image-registry.svc:5000/sn-labs-[redacted]/nodejs-ex-git@sha25
          ports:
            - containerPort: 8080
              protocol: TCP
          resources:
            limits:
              cpu: 30m
              memory: 100Mi
            requests:
              cpu: 3m
              memory: 40Mi
          terminationMessagePath: /dev/termination-log
          terminationMessagePolicy: File
          imagePullPolicy: Always
      restartPolicy: Always
      terminationGracePeriodSeconds: 30
      dnsPolicy: ClusterFirst
      securityContext: {}
      schedulerName: default-scheduler
  strategy:
    type: RollingUpdate
```

3. Click Save.



```
      creationTimestamp: null
      labels:
        app: nodejs-ex-git
        deploymentconfig: nodejs-ex-git
    spec:
      containers:
        - name: nodejs-ex-git
          image: >-
            image-registry.openshift-image-registry.svc:5000/sn-labs-[redacted]
          ports:
            - containerPort: 8080
              protocol: TCP
          resources:
            limits:
              cpu: 30m
              memory: 100Mi
            requests:
              cpu: 3m
              memory: 40Mi
          terminationMessagePath: /dev/termination-log
          terminationMessagePolicy: File
          imagePullPolicy: Always
      restartPolicy: Always
      terminationGracePeriodSeconds: 30
      dnsPolicy: ClusterFirst
      securityContext: {}
      schedulerName: default-scheduler
  strategy:
    type: RollingUpdate
```

4. Click Reload.



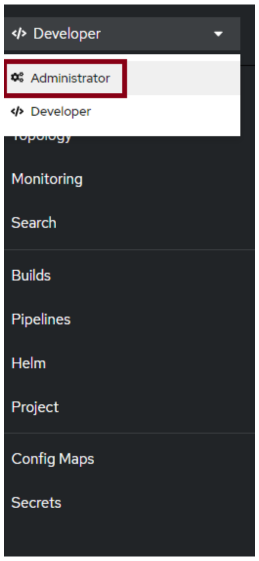
```
              'f:securityContext': {}
              'f:terminationGracePeriodSeconds': {}
spec:
  replicas: 1
  selector:
    matchLabels:
      app: nodejs-ex-git
  template:
    metadata:
      creationTimestamp: null
      labels:
        app: nodejs-ex-git
        deploymentconfig: nodejs-ex-git
    spec:
      containers:
        - name: nodejs-ex-git
          image: >-
            image-registry.openshift-image-registry.svc:5000/sn-labs-[redacted]/nodejs-ex-git@sha256:7d
          ports:
            - containerPort: 8080
```

nodejs-ex-git has been updated to version 530541577

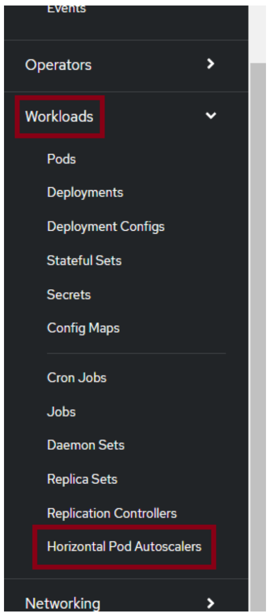
This object has been updated.

Click reload to see the new version.

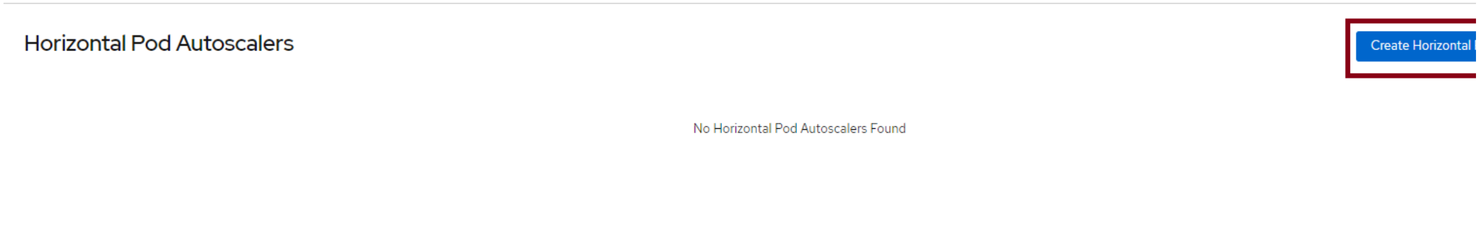
5. Switch to the Administrator perspective.



6. Select Workloads > Horizontal Pod Autoscalers



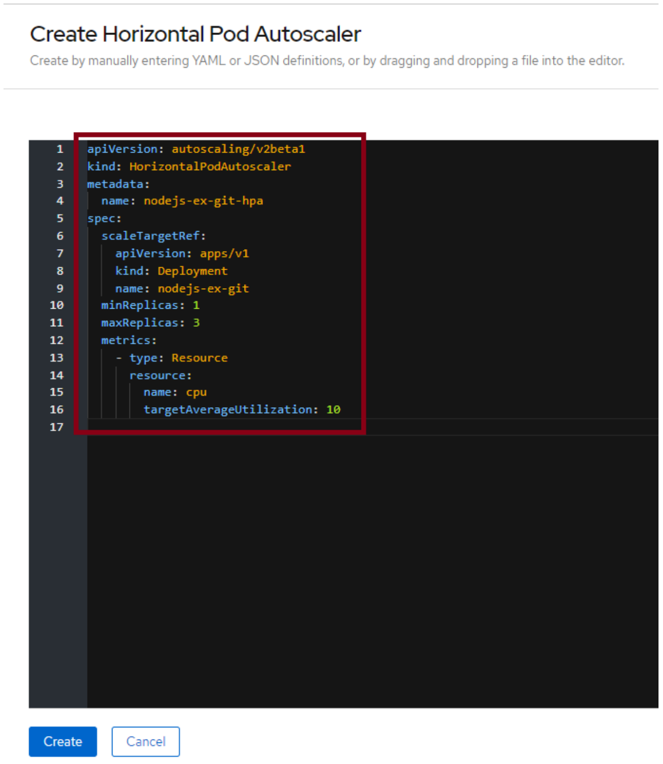
7. Click Create Horizontal Pod Autoscaler


Horizontal Pod Autoscalers
Create Horizontal
No Horizontal Pod Autoscalers Found

8. Paste the following YAML into the editor

```yaml
apiVersion: autoscaling/v2beta1
kind: HorizontalPodAutoscaler
metadata:
  name: nodejs-ex-git-hpa
spec:
  scaleTargetRef:
    apiVersion: apps/v1
    kind: Deployment
    name: nodejs-ex-git
  minReplicas: 1
  maxReplicas: 3
  metrics:
    - type: Resource
      resource:
        name: cpu
        targetAverageUtilization: 10
```

Copied!

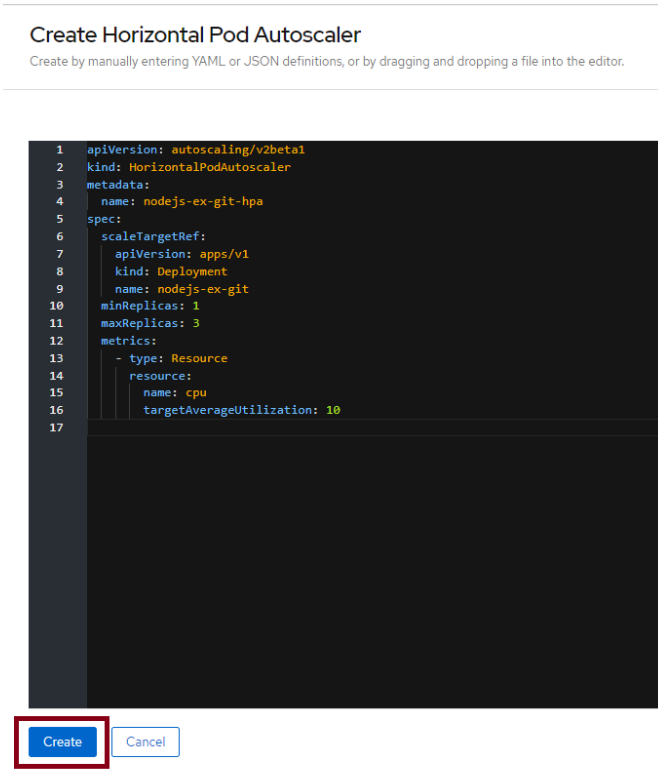

Create Horizontal Pod Autoscaler

Create by manually entering YAML or JSON definitions, or by dragging and dropping a file into the editor.

```
apiVersion: autoscaling/v2beta1
kind: HorizontalPodAutoscaler
metadata:
  name: nodejs-ex-git-hpa
spec:
  scaleTargetRef:
    apiVersion: apps/v1
    kind: Deployment
    name: nodejs-ex-git
  minReplicas: 1
  maxReplicas: 3
  metrics:
    - type: Resource
      resource:
        name: cpu
        targetAverageUtilization: 10
```

This HPA indicates that we're going to scale based on CPU usage. Generally you want to scale when your CPU utilization is in the 50-90% range. For this example, we're going to use 10% so that the app is more likely to need scaling. The minReplicas and maxReplicas fields indicate that the Deployment should have between one and three replicas at any given time depending on load.

8. Click Create


Create Horizontal Pod Autoscaler

Create by manually entering YAML or JSON definitions, or by dragging and dropping a file into the editor.

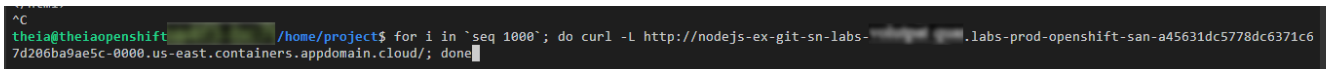
```
apiVersion: autoscaling/v2beta1
kind: HorizontalPodAutoscaler
metadata:
  name: nodejs-ex-git-hpa
spec:
  scaleTargetRef:
    apiVersion: apps/v1
    kind: Deployment
    name: nodejs-ex-git
  minReplicas: 1
  maxReplicas: 3
  metrics:
    - type: Resource
      resource:
        name: cpu
        targetAverageUtilization: 10
```

9. Run the below command on the terminal in Theia to increase the load on the `nodejs-ex-git` and view the Autoscaling:

```
for i in `seq 1000`; do curl -L <your app URL>; done
```

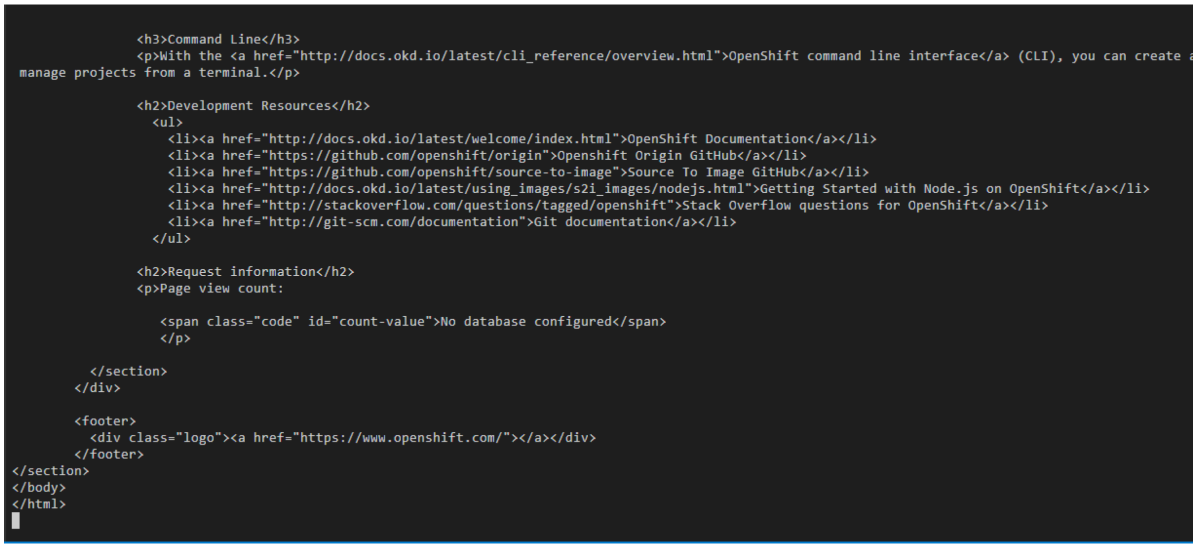
Copied!

Note: Replace `<your app URL>` with the URL that you obtained in Step 9 of the previous section.



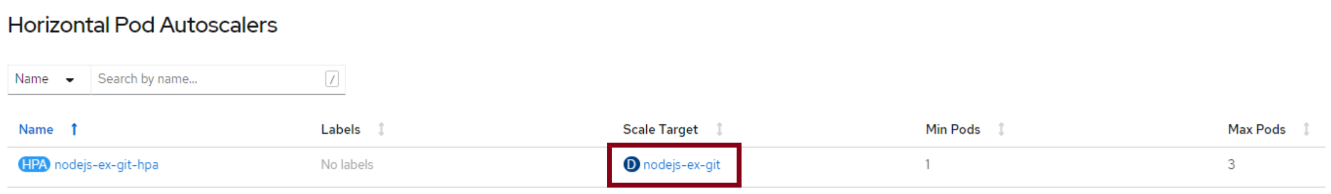
```
^C
theia@theiaopenshift[redacted]/home/project$ for i in `seq 1000`; do curl -L http://nodejs-ex-git-sn-labs-[redacted].labs-prod-openshift-san-a45631dc5778dc6371c6
7d206ba9ae5c-0000.us-east.containers.appdomain.cloud/; done
```

The command will keep giving an output as below indicating successful load generation:



```
              <h3>Command Line</h3>
              <p>With the <a href="http://docs.okd.io/latest/cli_reference/overview.html">OpenShift command line interface</a> (CLI), you can create a
 manage projects from a terminal.</p>

              <h2>Development Resources</h2>
                <ul>
                  <li><a href="http://docs.okd.io/latest/welcome/index.html">OpenShift Documentation</a></li>
                  <li><a href="https://github.com/openshift/origin">Openshift Origin GitHub</a></li>
                  <li><a href="https://github.com/openshift/source-to-image">Source To Image GitHub</a></li>
                  <li><a href="http://docs.okd.io/latest/using_images/s2i_images/nodejs.html">Getting Started with Node.js on OpenShift</a></li>
                  <li><a href="http://stackoverflow.com/questions/tagged/openshift">Stack Overflow questions for OpenShift</a></li>
                  <li><a href="http://git-scm.com/documentation">Git documentation</a></li>
                </ul>

              <h2>Request information</h2>
              <p>Page view count:

                 <span class="code" id="count-value">No database configured</span>
                 </p>

        </section>
      </div>

      <footer>
        <div class="logo"><a href="https://www.openshift.com/"></a></div>
      </footer>
</section>
</body>
</html>
```

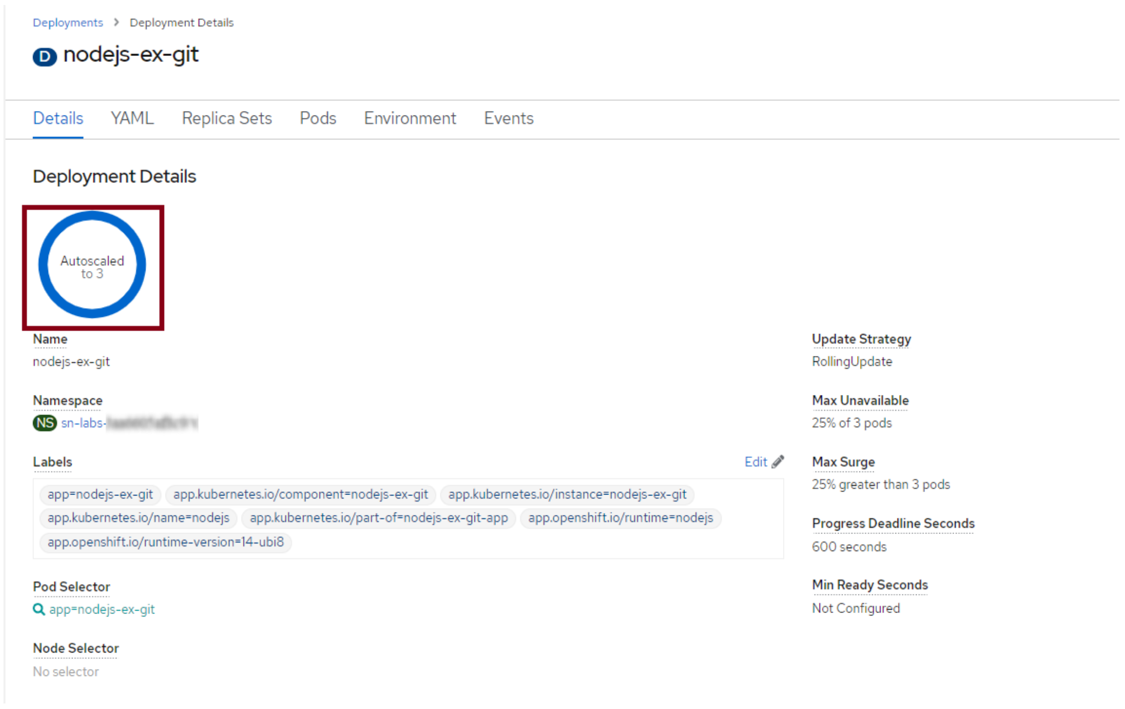
10. Click on `nodejs-ex-git` under `Scale Target`.



Horizontal Pod Autoscalers

Name	Labels	Scale Target	Min Pods	Max Pods
HPA nodejs-ex-git-hpa	No labels	D nodejs-ex-git	1	3

11. If you wait, you'll see both Current Replicas and Desired Replicas become three. This is because the HPA detected sufficient load to trigger a scale up to the maximum number of Pods, which is three. You can also view the Last Scale Time as well as the current and target CPU utilization. The target is obviously 1% since that's what we set it to. Note that it can take a few minutes to trigger the scale up.



Name
nodejs-ex-git

Namespace
NS sn-labs-[redacted]

Labels
app=nodejs-ex-git
app.kubernetes.io/component=nodejs-ex-git
app.kubernetes.io/instance=nodejs-ex-git
app.kubernetes.io/name=nodejs
app.kubernetes.io/part-of=nodejs-ex-git-app
app.openshift.io/runtime=nodejs
app.openshift.io/runtime-version=14-ubi8

Pod Selector
app=nodejs-ex-git

Node Selector
No selector

Update Strategy
RollingUpdate

Max Unavailable
25% of 3 pods

Max Surge
25% greater than 3 pods

Progress Deadline Seconds
600 seconds

Min Ready Seconds
Not Configured

Wow! OpenShift did some pretty incredible work on your behalf. All it needed was a code repository and it was able to build the code into a container image, push that image to a registry, create a Deployment that references that image, and also expose the application to the internet with a hostname.

Congratulations! You have completed the lab for the fourth module of this course.

Changelog

Date	Version	Changed by	Change Description
2022-04-08	1.1	Samaah Sarang	Updated Lab instructions & images
2022-04-13	1.2	Samaah Sarang	Updated Lab instructions & images
2022-04-14	1.3	K Sundararajan	Updated Lab instructions & images
2022-04-19	1.4	K Sundararajan	Updated Lab instructions
2022-07-22	1.5	K Sundararajan	Updated Lab instructions to include HPA
2022-08-02	1.6	K Sundararajan	Added new IDSN logo

Date	Version	Changed by	Change Description
2022-08-12	1.7	K Sundararajan	Updated Lab instructions