TUTORIAL:

DEPLOYING A 3SCALE API GATEWAY ON RED HAT OPENSHIFT

This tutorial describes how to deploy a dockerized version of the 3scale API Gateway 1.0 (APIcast) that is packaged for easy installation and operation on OpenShift V3.

In the tutorial we use the OpenShift Origin VM—a Virtual Machine image you can download and run locally, so that you can follow this tutorial without running a full OpenShift deployment.

3scale offers multiple options for implementing traffic management

- **Deploy an API gateway**, which is a customized reverse proxy between the client application and your API backend. The gateway then handles authorization of incoming calls and traffic reporting
- **Integrate using a software plugin** embedded in your API application code. Native-language plugins manage request authorization via 3scale's Service Management API.

3scale BY RED HAT

Tutorial Prerequisites

To follow the tutorial steps below, you'll first need to address the following prerequisites:

3scale Account Configuration

You should have a 3scale API provider account (you can easily create one here) and have an API configured in the 3scale Admin Portal.

These steps will show you how to find the following necessary information:

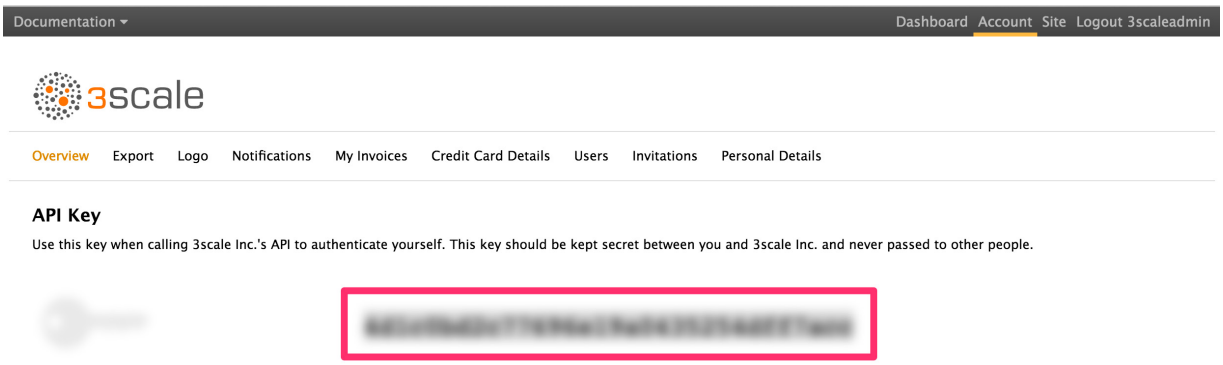
- Your 3scale admin URL
- The API provider key for your 3scale account
- Your user key

If you already have this information handy and your API is already configured in 3scale, feel free to skip to the **Set up OpenShift** section.

If you do not have an API running and configured in your 3scale account, please follow the instructions in our Quickstart to do so.

Log in to your 3scale Admin Portal with the URL provided to you. It will look something like this: `https://MYDOMAIN-admin.3scale.net/`

> Note down your 3scale Admin Portal URL, in this tutorial we will refer to it as `THREESCALE_ADMIN_URL`



From the **Overview** sub-tab note down your 3scale Provider Key, referred to in the UI as **API Key**.

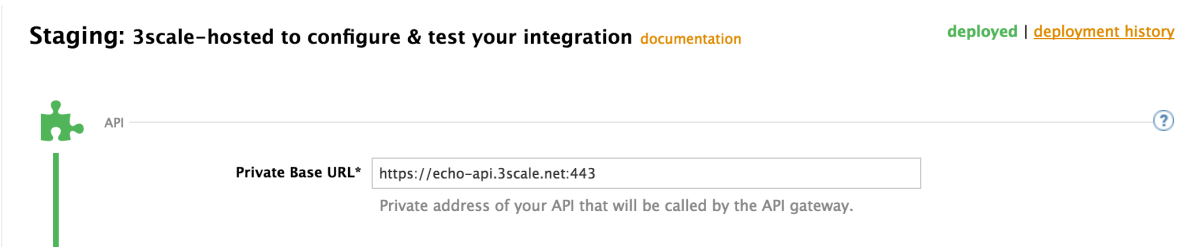
Later in this tutorial we refer to this as your `THREESCALE_PROVIDER_KEY`

> Keep your 3scale Provider Key private. Do not share it with anyone and do not put into code repositories or into any document that may reveal it to others.

In the 3scale Admin Portal you should either have an API of your own running and configured or use the Echo API that was set up by the onboarding wizard. This tutorial will use the Echo API as an example throughout.

Navigate to the **Dashboard > API** tab. If you have more than one API in your account, select the API you want to manage with the API gateway. Select the Integration link at top-left.

If you're setting this up for the first time, you'll need to test to confirm that your private (unmanaged) API is working before proceeding. If you've already configured your API and sent test traffic, feel free to skip this step.



In the screenshot above, the 3scale provided Echo API is used as an example. You can use this or configure the API to refer to your real API's Private Base URL

Test your private (unmanaged) API is working using this `curl` command:

```
curl "https://echo-api.3scale.net:443/"
```

You should get a response similar to this:

```
{
  "method": "GET",
  "path": "/",
  "args": "",
  "body": "",
  "headers": {
    "HTTP_VERSION": "HTTP/1.1",
    "HTTP_HOST": "echo-api.3scale.net",
    "HTTP_USER_AGENT": "curl/7.43.0",
    "HTTP_ACCEPT": "*/*",
    "HTTP_X_FORWARDED_FOR": "10.1.0.154",
    "HTTP_CONNECTION": "close"
  }
```

Once you've confirmed that your API is working, scroll down to the bottom of the **Staging** section where you can see a sample `curl` command:

```
curl "https://XXXXXX.staging.apicast.io:443/?user_key=[MY_USER_KEY]"
```

> Note down your `MY_USER_KEY` to use later to authenticate to your managed API

Set up OpenShift

1. Download required tools and files
   a. Go to https://www.openshift.org/vm/ and click on the **Downloads** menu item
   b. Download and install the required tools `vagrant` and `VirtualBox`
   c. Download and install the OpenShift Client tools for your operating system and check they can be executed by typing `oc version` at a terminal prompt.

2. Start the OpenShift Origin VM
   a. Start a command prompt, create a new directory and change into it.
   b. At the terminal prompt type:

```
vagrant init thesteve0/openshift-origin
```

That will create a file called `Vagrantfile` in the current directory.

c. Start the VM using the command `vagrant up`. Downloading the image and starting the VM may take several minutes (it may take a bit longer if you're running Windows).

Upon starting the VM, you'll see output which includes instructions for logging in to your OpenShift Origin VM. :

```
oc login https://[OPENSHIFT-VM-IP]:8443
```

Your `OPENSHIFT-VM-IP` will be unique.

> Note down your `OPENSHIFT-VM-IP` as you'll need to use it repeatedly in this tutorial.

3. Configure a host for the OpenShift Origin VM on your local machine. This will later allow you to expose the managed API using a hostname (this tutorial uses the example `gateway.openshift.demo`).
   You'll need to add an entry for the Origin VM to your local hosts file.
   If your host PC is linux-based, this file is `/etc/hosts`.
   If you are running Windows PC, this hosts file will typically be: `C:\Windows\System32\drivers\etc\hosts`

   Add a new line like this:

   ```
   OPENSHIFT-VM-IP gateway.openshift.demo
   ```

   Example:

   ```
   10.2.2.2 gateway.openshift.demo
   ```

Tutorial Steps

Create your 3scale API Gateway using a template

1. Login into OpenShift using the `oc` command from the OpenShift Client tools you downloaded and installed in step 1. The default login credentials are **username: admin** and **password: admin**

   ```
   oc login https://OPENSHIFT-VM-IP:8443
   ```

> You may get a security warning and asked whether you wish to continue with an insecure selection. Choose **yes** to proceed.

The response should indicate `Login successful`.

2. Create your project. This example sets the display name as gateway

```
oc new-project "3scalegateway" --display-name="gateway" --description="3scale gateway demo"
```

The response should look like this: :

```
Now using project "3scalegateway" on server "https://[OPENSHIFT-VM-IP]:8443".
```

3. Create an application template for your 3scale API Gateway.

```
oc create -f https://raw.githubusercontent.com/3scale/docker-gateway/master/3scale-gateway-openshift-template.yml -n openshift
```

The response should look like this:

```
template "3scale-gateway" created
```

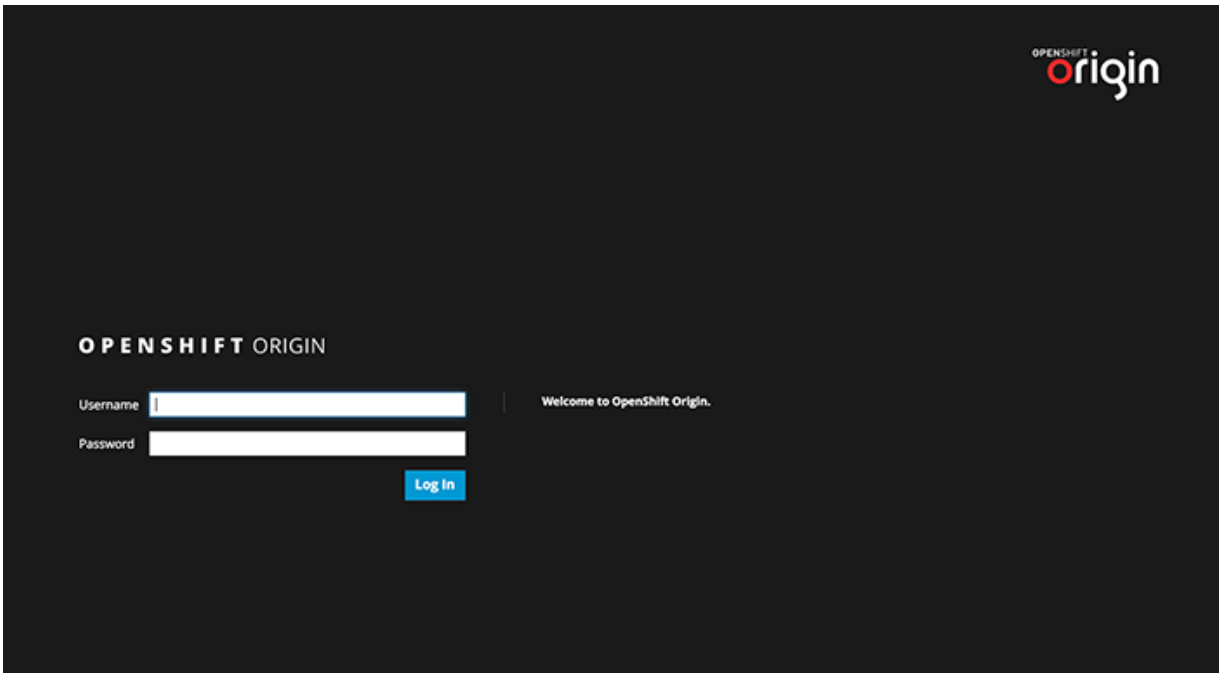
> You may receive an error warning that the template already exists if you've previously attempted this step. You can continue, or login to the UI as described below and delete any projects from previous attempts and then return to this point.

Deploying the 3scale API Gateway

1. 1. Open the web console for your OpenShift Origin VM in your browser: https://[OPENSHIFT-VM-IP]:8443/console/

> You may receive a warning about an untrusted web-site. As this is the Origin VM running on your local machine there are no real risks. Select **Accept the Risks** in the browser and proceed to view the Web console.

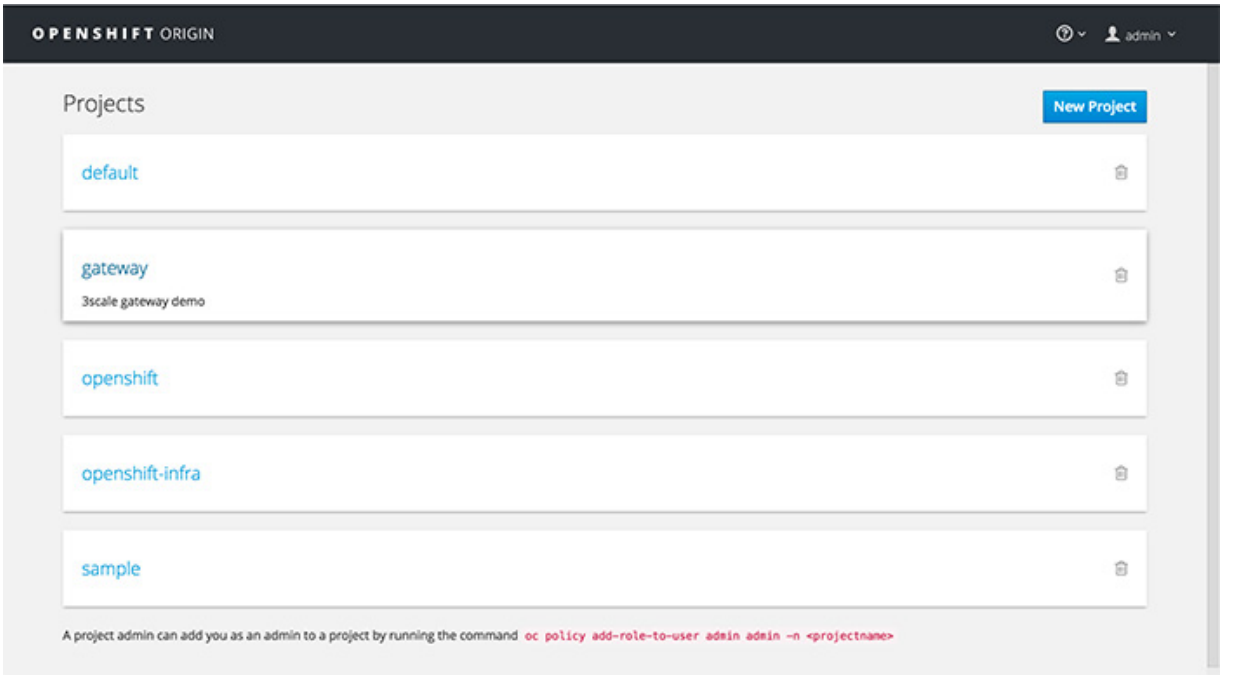
You should see the login screen:



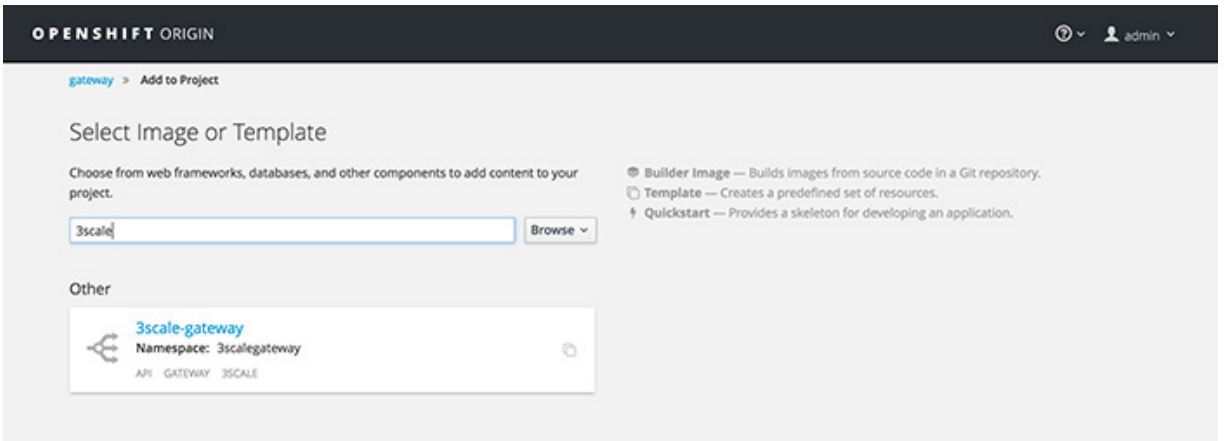
2. Login using the default credentials of **u: admin** and **p: admin**

   Your list of projects will now include the gateway project you created from the command line above.

3. Select the gateway project and then click the **Add to Project** button.

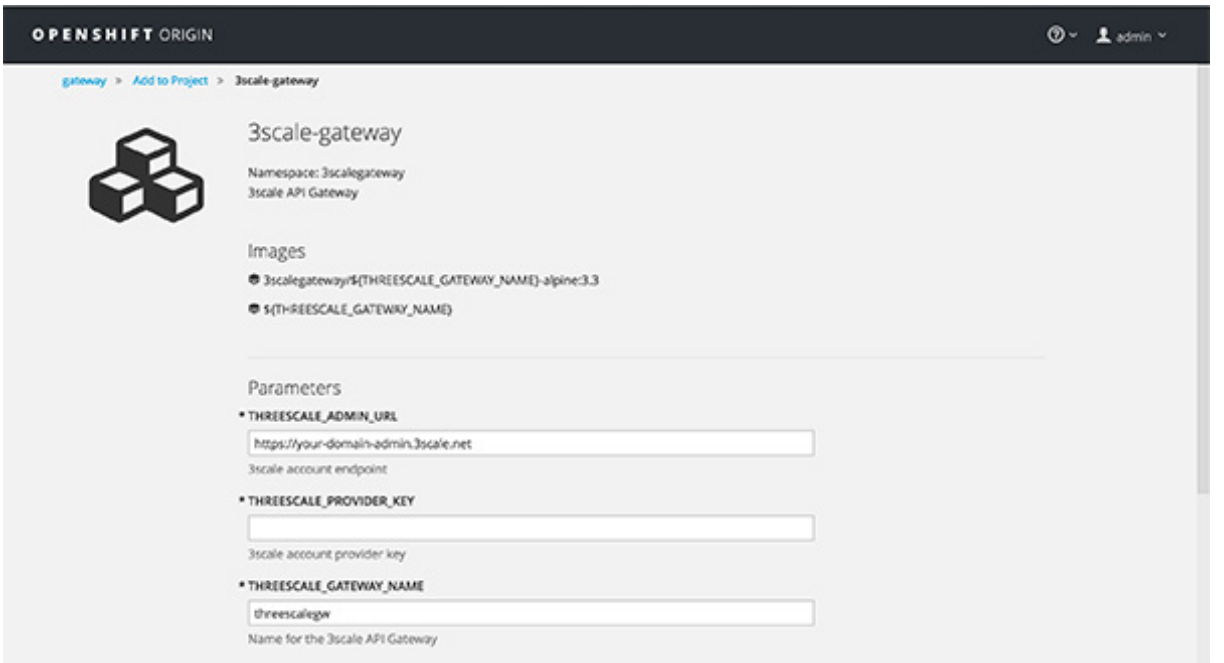


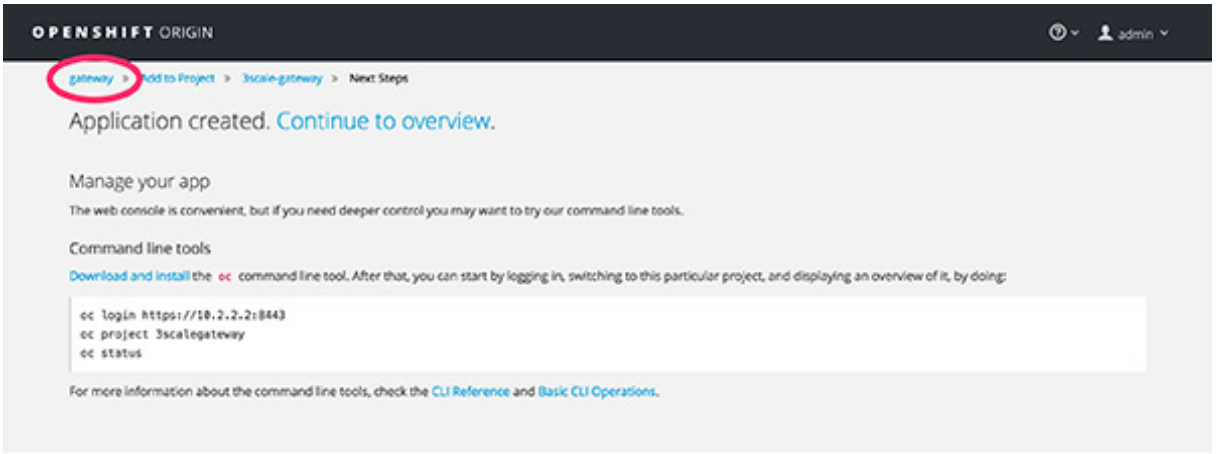
4. Search for 3scale and select the `3scale-gateway` template.
5. You'll be prompted to add your 3scale account details at this step. You'll need to include: `THREESCALE_ADMIN_URL` (including "https://") and `THREESCALE_PROVIDER_KEY`



When you've added this information, scroll to the bottom of the page and click **Create**

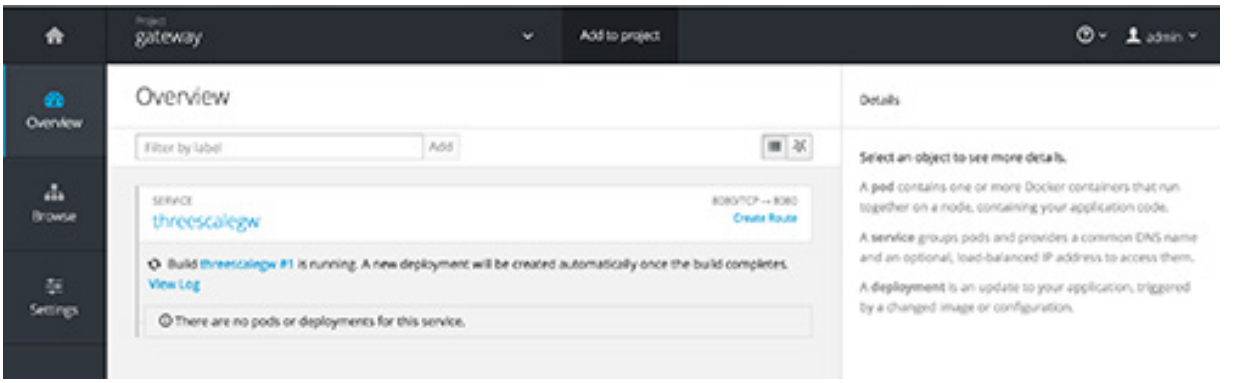
6. You will be shown the **Application** created screen:
7. Click on **gateway** (top left in the breadcrumbs) and you will be shown the **Overview** tab.





OpenShift has now downloaded the code for the API gateway and has started a build to construct it.

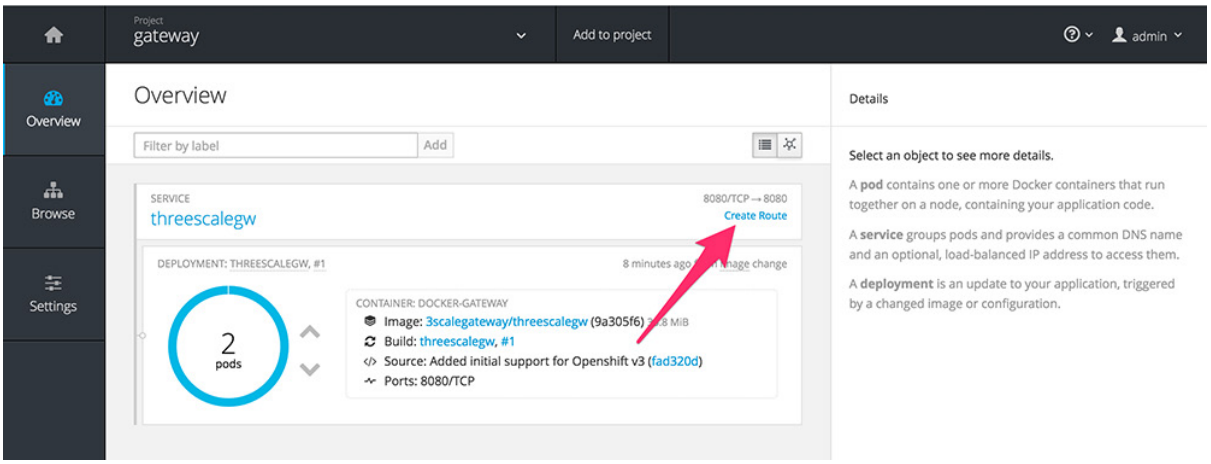
8. When the build completes, the UI will refresh and show two instances of the API gateway (2 "pods") that have been started by OpenShift, as defined in the template.



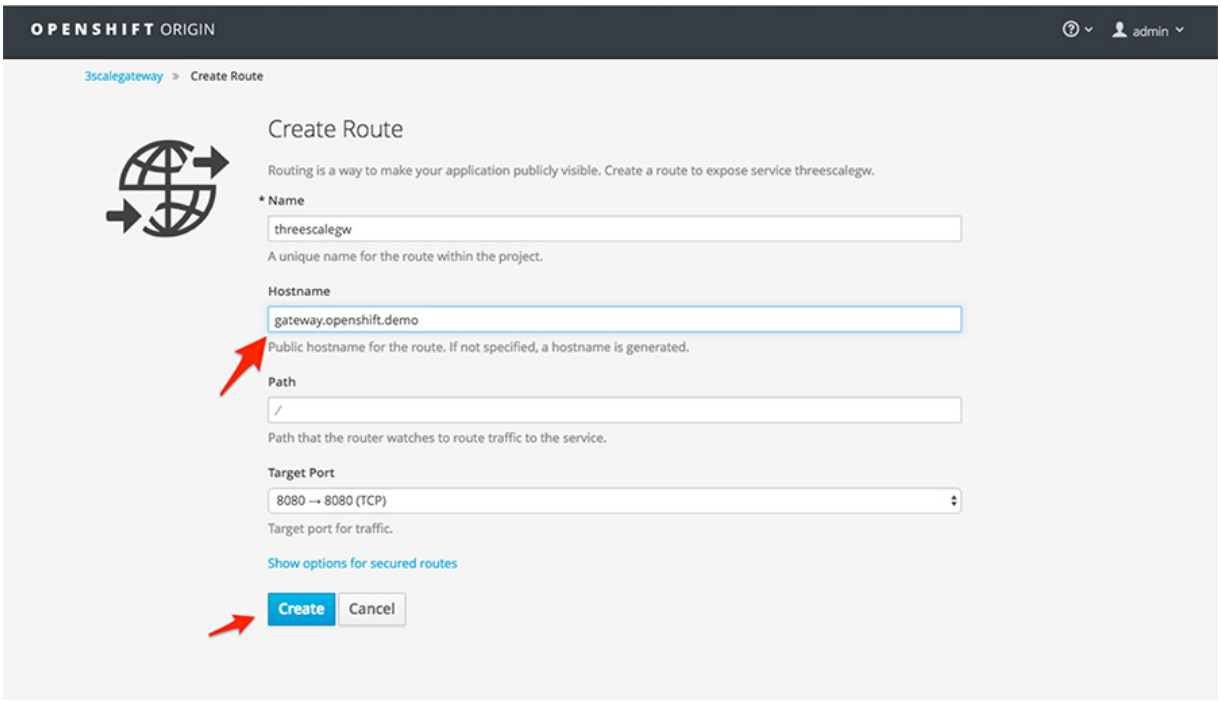
Each instance of the 3scale API Gateway, upon starting, downloads the required configuration files and code from 3scale using the configuration settings you provided on the **Integration** tab of your 3scale Admin Portal.

OpenShift will maintain two gateway instances and monitor the health of both; an unhealthy API gateway will automatically be replaced with a new one.

9. In order to allow your API gateways to receive traffic, you'll need to create a route. Start by clicking on **Create route.**



In the **Configure a host for the Origin Virtual Machine** section, enter the hostname you set in your `/etc/hosts` file in the Hostname field (e.g. `gateway.openshift.demo`) and then click the **Create** button.



10. Your API gateways are now ready to receive traffic. OpenShift takes care of load-balancing incoming requests to the route across the two running instances of the API gateway.

Test that the API gateway authorizes a valid call to your API, by executing a `curl` command with the valid `MY_USER_KEY` that you noted down earlier:

```
curl "http://gateway.openshift.demo/?user_key= MY_USER_KEY"
```

11. Test it does not authorize an invalid call to your API

    ```
    curl "http://gateway.openshift.demo/?user_key=[bad key value]"
    ```

    You can access see the logs of API gateway traffic by clicking **Browse > Pods** and then select one of the pods and then selecting **Logs**.

Success!!

Your API is now protected by two instances of the 3scale running on RedHat OpenShift, following all the configuration that you set-up in the 3scale Admin Portal.

If you wish to shut down the OpenShift Origin VM to save resources, you can do so by opening VirtualBox and right-clicking on the **origin vm** then selecting **Close > ACPI Shutdown**. You can then close VirtualBox.

Next Steps

Now that you have an API Gateway up and running on your local machine you can:

- Explore how to configure access policies for your API, and engage developers with a Developer Portal by following the Quickstart
- Whenever you make changes to your API definition in the 3scale Admin Portal — in particular the 3scale metrics/methods and mapping rules — you should create a new deployment in OpenShift. This will start new instances that will download and run your new API definition. Then OpenShift will shut down gracefully the previous instances.
- Run Openshift Enterprise V3 on your dedicated datacenter or on your favorite cloud platform and then follow the same instructions to open up your API to the world.