Red Hat 3scale 2-saas

Installing 3scale

Install and configure 3scale API Management.

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Legal Notice

Abstract

This guide provides the information to install and configure 3scale API Management.

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PREFACE

This guide will help you to install and configure 3scale

CHAPTER 1. REGISTRY SERVICE ACCOUNTS FOR 3SCALE

To use container images from **registry.redhat.io** in a shared environment with 3scale 2-saas, you must use a *Registry Service Account* instead of an individual user's *Customer Portal* credentials.

To create and modify a registry service account, perform the steps outlined in the following sections:

- Section 1.1, "Creating a registry service account"
- Section 1.2, "Modifying a registry service account"

1.1. CREATING A REGISTRY SERVICE ACCOUNT

To create a registry service account, follow the procedure below.

Procedure

1. Navigate to the Registry Service Accounts page and log in.
2. Click **New Service Account**
3. Fill in the form on the *Create a New Registry Service Account* page.
   a. Add a name for the *service account*.
   Note: You will see a fixed-length, randomly generated numerical string before the form field.
   b. Enter a *Description*.
   c. Click **Create**.
4. Navigate back to your *Service Accounts*.
5. Click the *Service Account* you created.
6. Make a note of the username, including the prefix string, for example **12345678|username**, and your password. This username and password will be used to log in to **registry.redhat.io**.

NOTE

There are tabs available on the *Token Information* page that show you how to use the authentication token. For example, the *Token Information* tab shows the username in the format **12345678|username** and the password string below it.

1.2. MODIFYING A REGISTRY SERVICE ACCOUNT

You can edit or delete service accounts from the *Registry Service Account* page, by using the pop-up menu to the right of each authentication token in the table.

WARNING

The regeneration or removal of *service accounts* will impact systems that are using the token to authenticate and retrieve content from **registry.redhat.io**.

A description for each function is as follows:

- **Regenerate token:** Allows an authorized user to reset the password associated with the *Service Account*.
  Note: You cannot modify the username for the *Service Account*.
- **Update Description:** Allows an authorized user to update the description for the *Service Account*.
- **Delete Account:** Allows an authorized user to remove the *Service Account*.

1.3. ADDITIONAL RESOURCES

- Red Hat Container Registry Authentication
- Authentication enabled Red Hat registry

CHAPTER 2. INSTALLING APICAST

APIcast is an NGINX based API gateway used to integrate your internal and external API services with the Red Hat 3scale Platform. APIcast does load balancing by using round-robin.

In this guide you will learn about deployment options, environments provided, and how to get started.

Prerequisites

APIcast is not a standalone API gateway. It needs connection to 3scale API Manager.

- You will need a working 3scale On-Premises instance.

To install APIcast, perform the steps outlined in the following sections:

2.1. APICAST DEPLOYMENT OPTIONS

You can use hosted or self-managed APIcast. In both cases, APIcast must be connected to the rest of the 3scale API Management platform:

- Hosted APIcast: 3scale hosts APIcast in the cloud. In this case, APIcast is already deployed for you and it is limited to 50,000 calls per day.
- **Self-managed APIcast**: You can deploy APIcast wherever you want. Here are a few recommended options to deploy APIcast:
  - Deploying APIcast on the Docker containerized environment : Download a ready to use Docker-formatted container image, which includes all of the dependencies to run APIcast in a Docker-formatted container.
  - ** Running APIcast on Red Hat OpenShift : Run APIcast on a supported version of OpenShift. You can connect self-managed APIcasts to a 3scale On-premises installation or to a 3scale Hosted (SaaS) account.

2.2. APICAST ENVIRONMENTS

By default, when you create a 3scale account or create a new API service, you get an APIcast **hosted** in two different environments:

- **Staging**: Intended to be used only while configuring and testing your API integration. When you have confirmed that your setup is working as expected, then you can choose to deploy it to the production environment.
- **Production**: Limited to 50,000 calls per day and supports the following out-of-the-box authentication options: API key, and App ID and App key pair, OpenID Connect.

When you use a Self-managed deployment, you still have the same two environments, and you need to deploy an APIcast instance for each. You can specify which configuration (Staging or Production) the APIcast instance will use by setting the environment variable **THREESCALE_DEPLOYMENT_ENV**, which can take values **staging** or **production**.

2.3. CONFIGURING THE INTEGRATION SETTINGS

Go to **[your_API_name] > Integration > Configuration**

On the Configuration page you will see the *Integration settings*.

By default, you find these values:

- Deployment Option: hosted APIcast.
- Authentication mode: API key.

You can change these settings by clicking on **edit integration settings** in the upper-right corner.

2.4. CONFIGURING YOUR SERVICE

You must declare your API back-end in the *Private Base URL* field, which is the endpoint host of your API back-end. APIcast will redirect all traffic to your API back-end after all authentication, authorization, rate limits and statistics have been processed.

This section will guide you through configuring your service:

- Declaring the API backend
- Configuring the authentication settings
- Configuring the API test call

2.4.1. Declaring the API backend

Typically, the Private Base URL of your API will be something like **https://api-backend.yourdomain.com:443**, on the domain that you manage (**yourdomain.com**). For instance, if you were integrating with the Twitter API the Private Base URL would be **https://api.twitter.com/**.

In this example, you will use the **Echo API** hosted by 3scale, a simple API that accepts any path and returns information about the request (path, request parameters, headers, etc.). Its Private Base URL is **https://echo-api.3scale.net:443**.

Procedure

- Test your private (unmanaged) API is working. For example, for the Echo API you can make the following call with **curl** command:

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

You will get the following response:

```
{
   "method": "GET",
   "path": "/",
   "args": "",
   "body": "",
   "headers": {
     "HTTP_VERSION": "HTTP/1.1",
     "HTTP_HOST": "echo-api.3scale.net",
     "HTTP_ACCEPT": "*/*",
     "HTTP_USER_AGENT": "curl/7.51.0",
     "HTTP_X_FORWARDED_FOR": "2.139.235.79, 10.0.103.58",
     "HTTP_X_FORWARDED_HOST": "echo-api.3scale.net",
     "HTTP_X_FORWARDED_PORT": "443",
     "HTTP_X_FORWARDED_PROTO": "https",
     "HTTP_FORWARDED": "for=10.0.103.58;host=echo-api.3scale.net;proto=https"
   },
   "uuid": "ee626b70-e928-4cb1-a1a4-348b8e361733"
 }
```

2.4.2. Configuring the authentication settings

You can configure authentication settings for your API in the **AUTHENTICATION SETTINGS** section.

The following fields are all optional:

Field	Description
Host Header	Define a custom Host request header. This is required if your API backend only accepts traffic from a specific host.
Secret Token	Used to block direct developer requests to your API backend. Set the value of the header here, and ensure your backend only allows calls with this secret header.
Credentials location	Define whether credentials are passed as HTTP headers, query parameters or as HTTP basic authentication.
Auth user key	Set the user key associated with the credentials location
Errors	Define the response code, content type, and response body, for the following errors: authentication failed, authentication missing, no match.

2.4.3. Configuring the API test call

Procedure

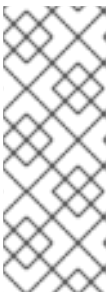
1. Configure the test call for the hosted staging environment.
2. Enter a path existing in your API in the **API test GET request field** (for example, **/v1/word/good.json**).
3. Save the settings by clicking on the **Update & Test Staging Configuration** button in the bottom right part of the page.
    a. This will deploy the APIcast configuration to the 3scale Hosted staging environment. If everything is configured correctly, the vertical line on the left should turn green.

NOTE

If you are using one of the Self-managed deployment options, save the configuration from the GUI and make sure it is pointing to your deployed API gateway by adding the correct host in the staging or production public base URL field. Before making any calls to your production gateway, do not forget to click on the **Promote v.x to Production** button.

4. Find the sample **curl** at the bottom of the staging section and run it from the console:

```
curl "https://XXX.staging.apicast.io:443/v1/word/good.json?user_key=YOUR_USER_KEY"
```



NOTE

You should get the same response as above, however, this time the request will go through the 3scale hosted APIcast instance. **Note:** You should make sure you have an application with valid credentials for the service. If you are using the default API service created on sign up to 3scale, you should already have an application. Otherwise, if you see **USER_KEY** or **APP_ID** and **APP_KEY** values in the test curl, you need to create an application for this service first.

Now you have your API integrated with 3scale.

3scale Hosted APIcast gateway does the validation of the credentials and applies the rate limits that you defined for the application plan of the application. If you try to make a call without credentials, or with invalid credentials, you will see an error message.

2.5. INSTALLING THE APICAST OPERATOR

This guide provides steps for installing the APIcast operator through the OpenShift Container Platform (OCP) console.

Procedure

1. Log in to the OCP console using an account with administrator privileges.
2. Create new project **operator-test** in **Projects > Create Project**

3. Click **Operators > Installed Operators**
4. Type *apicast* in the *Filter by keyword* box to find the APIcast operator. Do not use the community version.
5. Click the APIcast operator. You will see information about the APIcast operator.
6. Click *Install*. The *Create Operator Subscription* page opens.
7. Click *Subscribe* to accept all of the default selections on the *Create Operator Subscription* page.
    a. The subscription upgrade status is shown as *Up to date*.
8. Click **Operators > Installed Operators** to verify that the APIcast operator *ClusterServiceVersion* (CSV) status displays to *InstallSucceeded* in the **operator-test** project.

2.6. DEPLOYING AN APICAST GATEWAY SELF-MANAGED SOLUTION USING THE OPERATOR

This guide provides steps for deploying an APIcast gateway self-managed solution using the APIcast operator via the Openshift Container Platform console.

Prerequisites

- OpenShift Container Platform (OCP) 4.x or later with administrator privileges.
- You must first follow the steps in Installing the APIcast operator .

Procedure

1. Log in to the OCP console using an account with administrator privileges.
2. Click **Operators > Installed Operators**.
3. Click the *APIcast Operator* from the list of *Installed Operators*.
4. Click the **APIcast > Create APIcast**

2.6.1. APICast deployment and configuration options

You can deploy and configure an APIcast gateway self-managed solution using two approaches:

- Providing a 3scale system endpoint
- Providing a configuration secret

2.6.1.1. Providing a 3scale system endpoint

Procedure

1. Create an OpenShift secret that contains 3scale System Admin Portal endpoint information:

```
oc create secret generic ${SOME_SECRET_NAME} --from-
literal=AdminPortalURL=MY_3SCALE_URL
```

- **${SOME_SECRET_NAME}** is the name of the secret and can be any name you want as long as it does not conflict with an existing secret.
- **${MY_3SCALE_URL}** is the URI that includes your 3scale access token and 3scale System portal endpoint.

  Example

  ```
  oc create secret generic 3scaleportal --from-literal=AdminPortalURL=https://access-token@account-admin.3scale.net
  ```

  For more information about the contents of the secret see the Admin portal configuration secret reference.

2. Create the OpenShift object for APIcast

   ```
   apiVersion: apps.3scale.net/v1alpha1
   kind: APIcast
   metadata:
     name: example-apicast
   spec:
     adminPortalCredentialsRef:
       name: SOME_SECRET_NAME
   ```

   The **spec.adminPortalCredentialsRef.name** must be the name of the existing OpenShift secret that contains the 3scale system Admin Portal endpoint information.

3. Verify the APIcast pod is running and ready, by confirming that the **readyReplicas** field of the OpenShift Deployment associated with the APIcast object is *1*. Alternatively, wait until the field is set with:

   ```
   $ echo $(oc get deployment apicast-example-apicast -o jsonpath='{.status.readyReplicas}')
   1
   ```

2.6.1.1.1. Verifying the APIcast gateway is running and available

Procedure

1. Ensure the OpenShift Service APIcast is exposed to your local machine, and perform a test request. Do this by port-forwarding the APIcast OpenShift Service to **localhost:8080**:

   ```
   oc port-forward svc/apicast-example-apicast 8080
   ```

2. Make a request to a configured 3scale service to verify a successful HTTP response. Use the domain name configured in **Staging Public Base URL** or **Production Public Base URL** settings of your service. For example:

   ```
   $ curl 127.0.0.1:8080/test -H "Host: myhost.com"
   ```

2.6.1.1.2. Exposing APIcast externally via a Kubernetes Ingress

To expose APIcast externally via a Kubernetes Ingress, set and configure the **exposedHost** section

When the **host** field in the **exposedHost** section is set, this creates a Kubernetes Ingress object. The Kubernetes Ingress object can then be used by a previously installed and existing Kubernetes Ingress Controller to make APIcast accessible externally.

To learn what Ingress Controllers are available to make APIcast externally accessible and how they are configured see the Kubernetes Ingress Controllers documentation .

The following example to expose APIcast with the hostname **myhostname.com**:

```
apiVersion: apps.3scale.net/v1alpha1
kind: APIcast
metadata:
  name: example-apicast
spec:
  ...
  exposedHost:
    host: "myhostname.com"
  ...
```

The example creates a Kubernetes Ingress object on the port 80 using HTTP. When the APIcast deployment is in an OpenShift environment, the OpenShift default Ingress Controller will create a Route object using the Ingress object APIcast creates which allows external access to the APIcast installation.

You may also configure TLS for the **exposedHost** section. Details about the available fields in the **exposedHost** section can be found in the APIcast Custom Resource reference documentation.

2.6.1.2. Providing a configuration secret

Procedure

1. Create a secret with the configuration file:

   ```
   $ curl
   https://raw.githubusercontent.com/3scale/APIcast/master/examples/configuration/echo.json -
   o $PWD/config.json

   oc create secret generic apicast-echo-api-conf-secret --from-file=$PWD/config.json
   ```

   The configuration file must be called **config.json**. This is an APIcast CRD reference requirement.

   For more information about the contents of the secret see the Admin portal configuration secret reference.

2. Create an APIcast custom resource:

   ```
   $ cat my-echo-apicast.yaml
   apiVersion: apps.3scale.net/v1alpha1
   kind: APIcast
   metadata:
     name: my-echo-apicast
   spec:
     exposedHost:
       host: YOUR DOMAIN
     embeddedConfigurationSecretRef:
   ```

```
    name: apicast-echo-api-conf-secret

$ oc apply -f my-echo-apicast.yaml
```

a. The following is an example of an embedded configuration secret:

```
apiVersion: v1
kind: Secret
metadata:
  name: SOME_SECRET_NAME
type: Opaque
stringData:
  config.json: |
    {
      "services": [
        {
          "proxy": {
            "policy_chain": [
              { "name": "apicast.policy.upstream",
                "configuration": {
                  "rules": [{
                    "regex": "/",
                    "url": "http://echo-api.3scale.net"
                  }]
                }
              }
            ]
          }
        }
      ]
    }
```

3. Set the following content when creating the APIcast object:

```
apiVersion: apps.3scale.net/v1alpha1
kind: APIcast
metadata:
  name: example-apicast
spec:
  embeddedConfigurationSecretRef:
    name: SOME_SECRET_NAME
```

The **spec.embeddedConfigurationSecretRef.name** must be the name of the existing OpenShift secret that contains the configuration of the gateway.

4. Verify the APIcast pod is running and ready, by confirming that the **readyReplicas** field of the OpenShift Deployment associated with the APIcast object is *1*. Alternatively, wait until the field is set with:

```
$ echo $(oc get deployment apicast-example-apicast -o jsonpath='{.status.readyReplicas}')
1
```

2.6.1.2.1. Verifying APIcast gateway is running and available

Procedure

1. Ensure the OpenShift Service APIcast is exposed to your local machine, and perform a test request. Do this by port-forwarding the APIcast OpenShift Service to **localhost:8080**:

```
oc port-forward svc/apicast-example-apicast 8080
```

2. Make a request to a configured 3scale Service to verify a successful HTTP response. Use the domain name configured in **Staging Public Base URL** or **Production Public Base URL** settings of your service. For example:

```
$  curl 127.0.0.1:8080/test -H "Host: localhost"
{
  "method": "GET",
  "path": "/test",
  "args": "",
  "body": "",
  "headers": {
    "HTTP_VERSION": "HTTP/1.1",
    "HTTP_HOST": "echo-api.3scale.net",
    "HTTP_ACCEPT": "*/*",
    "HTTP_USER_AGENT": "curl/7.65.3",
    "HTTP_X_REAL_IP": "127.0.0.1",
    "HTTP_X_FORWARDED_FOR": ...
    "HTTP_X_FORWARDED_HOST": "echo-api.3scale.net",
    "HTTP_X_FORWARDED_PORT": "80",
    "HTTP_X_FORWARDED_PROTO": "http",
    "HTTP_FORWARDED": "for=10.0.101.216;host=echo-api.3scale.net;proto=http"
  },
  "uuid": "603ba118-8f2e-4991-98c0-a9edd061f0f0"
```

2.7. WEBSOCKET PROTOCOL SUPPORT FOR APICAST

Red Hat 3scale provides support in the APIcast gateway for WebSocket protocol connections to backend APIs.

The following list are points to consider in if you are planning to implement WebSocket protocols:

- The WebSocket protocol does not support JSON Web Token (JWT).
- The WebSocket standard does not allow extra-headers.
- The WebSocket protocol is not part of the HTTP/2 standard.

2.7.1. WebSocket protocol support

The APIcast configuration policy chain is as follows:

```
"policy_chain": [
  { "name": "apicast.policy.websocket" },
  { "name": "apicast.policy.apicast" }
],
```

The API backend can be defined as **http[s]`** or **ws[s]**.

2.8. HTTP/2 IN THE APICAST GATEWAY

Red Hat 3scale provides APIcast gateway support for HTTP/2 and Remote Procedure Calls (gRPC) connections. The HTTP/2 protocol controls enables data communication between APIcast and the API backend.

NOTE

- You cannot use **api_key** authorization. Use JSON Web Token (JWT) or Headers instead.
- gRPC endpoint terminates Transport Layer Security (TLS).
- The gRPC policy (HTTP/2) must be above the APIcast policy in the policy chain.

2.8.1. HTTP/2 protocol support

With HTTP/2 termination, APICast enabled HTTP/2 and backends can be HTTP/1.1 plaintext or TLS.

In HTTP/2 endpoints, where the policy is used, there are some constraints:

- The endpoint needs to listen on TLS in case this policy does not work expected.
- gRPC full flow will only work if the TLS policy is enabled.

The APIcast configuration policy chain is as follows:

```
"policy_chain": [
  { "name": "apicast.policy.grpc" },
  { "name": "apicast.policy.apicast" }
],
```

2.9. ADDITIONAL RESOURCES

To get information about the latest released and supported version of APIcast, see the articles:

- Red Hat 3scale API Management Supported Configurations
- Red Hat 3scale API Management - Component Details .
- For the updates on the hosted APIcast version please refer to Red Hat 3scale API Management Platform SaaS Release Notes.

CHAPTER 3. APICAST HOSTED

Once you complete this tutorial, you will have your API fully protected by a secure gateway in the cloud.

APIcast hosted is the best deployment option if you want to launch your API as fast as possible, or if you want to make the minimum infrastructure changes on your side.

Prerequisites

- You have reviewed Chapter 3, *APIcast hosted* for deployment alternatives and decided to use APIcast hosted to integrate your API with 3scale.
- Your API backend service is accessible over the public Internet. Secure communication will be established to prevent users from bypassing the access control gateway.
- You do not expect demand for your API to exceed the limit of 50,000 hits/day. Beyond beyond this, we recommend upgrading to the self-managed gateway.
- Section 3.1, "Deploying your API with APIcast hosted in a staging environment"
- Section 3.2, "Deploying your API with the APIcast hosted into production"

3.1. DEPLOYING YOUR API WITH APICAST HOSTED IN A STAGING ENVIRONMENT

The first step is to configure your API and test it in your staging environment:

Procedure

1. Define the private base URL and its endpoints.
2. Choose the placement of credentials and other configuration details. For more information see the APIcast Hosted documentation.
3. After entering your configuration, click **Update & test Staging Environment**to run a test call. This will go through the APIcast staging instance to your API.

You will see a green confirmation message when your configuration is complete.

Before moving on to the next step, make sure that you have configured a secret token to that you backend service validates. You can define the value for the secret token under **Authentication Settings**. This will ensure that nobody can bypass APIcast access control.

3.2. DEPLOYING YOUR API WITH THE APICAST HOSTED INTO PRODUCTION

At this point, you are ready to take your API configuration to a production environment. To deploy your 3scale Hosted APIcast instance:

Procedure

1. Go back to the **Integration and Configuration** page and click on the **'Promote to v.x to Production'** button.

2. Repeat this step to promote further changes in your staging environment to your production environment.

It will take between 5 and 7 minutes for your configuration to deploy and propagate to all the cloud APIcast instances. During redeployment, your API will not experience any downtime. API calls may return different responses depending on which instance serves the call. Deployment has been successful when the box around your production environment has turned green.

Both the staging and production APIcast instances have base URLs on the **apicast.io** domain. You can tell them apart because the staging environment URLs have a staging subdomain. For example:

- staging: https://api-2445581448324.staging.apicast.io:443
- production: https://api-2445581448324.apicast.io:443

3.3. ADDITIONAL INFORMATION

- 50,000 hits/day is the maximum allowed for your API through the APIcast production cloud instance. You can check your API usage in the Analytics section of your Admin Portal.
- There is a hard throttle limit of 20 hits/second on any spike in API traffic.
- Above the throttle limit, APIcast returns a response code of **403**. This is the same as the default for an application over rate limits. If you want to differentiate the errors, please check the response body.

CHAPTER 4. RUNNING APICAST ON RED HAT OPENSHIFT

This tutorial describes how to deploy the APIcast API Gateway on Red Hat OpenShift.

Prerequisites

- You must configure APIcast in your Red Hat 3scale Admin Portal as per Chapter 2, *Installing APIcast*.
- Make sure *Self-managed Gateway* is selected as the deployment option in the integration settings.
- You should have both staging and production environment configured to proceed.

To run APIcast on Red Hat OpenShift, perform the steps outlined in the following sections:

- Section 4.1, "Setting up Red Hat OpenShift"
- Section 4.2, "Deploying APIcast using the OpenShift template"
- Section 4.3, "Creating routes via the OpenShift console"

4.1. SETTING UP RED HAT OPENSHIFT

If you already have a running OpenShift cluster, you can skip this section. Otherwise, continue reading.

For production deployments you can follow the instructions for OpenShift installation.

In this tutorial the OpenShift cluster will be installed using:

- Red Hat Enterprise Linux (RHEL) 7
- Docker containerized environment v1.10.3
- OpenShift Origin command line interface (CLI) - v1.3.1

Use the following section to set up Red Hat OpenShift:

- Installing the Docker containerized environment
- Starting the OpenShift cluster
- Setting up the OpenShift cluster on a remote server (Optional)

4.1.1. Installing the Docker containerized environment

Docker-formatted container images provided by Red Hat are released as part of the Extras channel in RHEL. To enable additional repositories, you can use either the Subscription Manager, or yum config manager. See the RHEL product documentation for details.

For a RHEL 7 deployed on a AWS EC2 instance you will use the following the instructions:

Procedure

1. List all repositories:
   -

```
sudo yum repolist all
```

2. Find and enable the ***-extras** repository:

```
sudo yum-config-manager --enable rhui-REGION-rhel-server-extras
```

3. Install Docker-formatted container images:

```
sudo yum install docker docker-registry
```

4. Add an insecure registry of **172.30.0.0/16** by adding or uncommenting the following line in **/etc/sysconfig/docker** file:

```
INSECURE_REGISTRY='--insecure-registry 172.30.0.0/16'
```

5. Start the Docker service:

```
sudo systemctl start docker
```

6. Verify that the container service is running with the following command:

```
sudo systemctl status docker
```

4.1.2. Starting the OpenShift cluster

To start the OpenShift cluster, do the following:

Procedure

1. Download the latest stable release of the client tools (**openshift-origin-client-tools-VERSION-linux-64bit.tar.gz**) from OpenShift releases page, and place the Linux **oc** binary extracted from the archive in your **PATH**.

NOTE

The docker command runs as the **root** user, so you will need to run any **oc** or docker commands with root privileges.

2. Open a terminal with a user that has permission to run docker commands and run:

```
oc cluster up
```

At the bottom of the output you will find information about the deployed cluster:

```
-- Server Information ...
  OpenShift server started.
  The server is accessible via web console at:
  https://172.30.0.112:8443

  You are logged in as:
    User:     developer
    Password: developer
```

```
To login as administrator:
  oc login -u system:admin
```

3. Note the IP address that is assigned to your OpenShift server. You will refer to it in the tutorial as **OPENSHIFT-SERVER-IP**.

4.1.3. Setting up the OpenShift cluster on a remote server (Optional)

If you are deploying the OpenShift cluster on a remote server, you will need to explicitly specify a public hostname and a routing suffix on starting the cluster, so that you will be able to access the OpenShift web console remotely.

For example, if you are deploying on an AWS EC2 instance, you should specify the following options:

```
oc cluster up --public-hostname=ec2-54-321-67-89.compute-1.amazonaws.com --routing-suffix=54.321.67.89.xip.io
```

where **ec2-54-321-67-89.compute-1.amazonaws.com** is the Public Domain, and **54.321.67.89** is the IP of the instance. You will then be able to access the OpenShift web console at https://ec2-54-321-67-89.compute-1.amazonaws.com:8443.

4.2. DEPLOYING APICAST USING THE OPENSHIFT TEMPLATE

Use the following to deploy APIcast unsing the OpenShift template:

Procedure

1. By default you are logged in as *developer* and can proceed to the next step.
   Otherwise login into OpenShift using the **oc login** command from the OpenShift Client tools you downloaded and installed in the previous step. The default login credentials are *username = "developer"* and *password = "developer"*:

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

   You should see **Login successful.** in the output.

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://172.30.0.112:8443"
   ```

   Ignore the suggested next steps in the text output at the command prompt and proceed to the next step below.

3. Create a new secret to reference your project by replacing **<access_token>** and **<domain>** with your own credentials. See below for more information about the **<access_token>** and **<domain>**.

```
oc create secret generic apicast-configuration-url-secret --from-
literal=password=https://<access_token>@<admin_portal_domain>  --
type=kubernetes.io/basic-auth
```

Here **<access_token>** is an Access Token for the 3scale account, and **<domain>-admin.3scale.net** is the URL of your 3scale Admin Portal.

The response should look like this:

```
secret/apicast-configuration-url-secret
```

4. Create an application for your APIcast gateway from the template, and start the deployment:

```
oc new-app -f https://raw.githubusercontent.com/3scale/3scale-amp-openshift-
templates/2.8.0.GA/apicast-gateway/apicast.yml
```

You should see the following messages at the bottom of the output:

```
--> Creating resources with label app=3scale-gateway ...
    deploymentconfig "apicast" created
    service "apicast" created
--> Success
    Run 'oc status' to view your app.
```

4.3. CREATING ROUTES VIA THE OPENSHIFT CONSOLE

To create routes via the OpenShift console, do the following:

Procedure

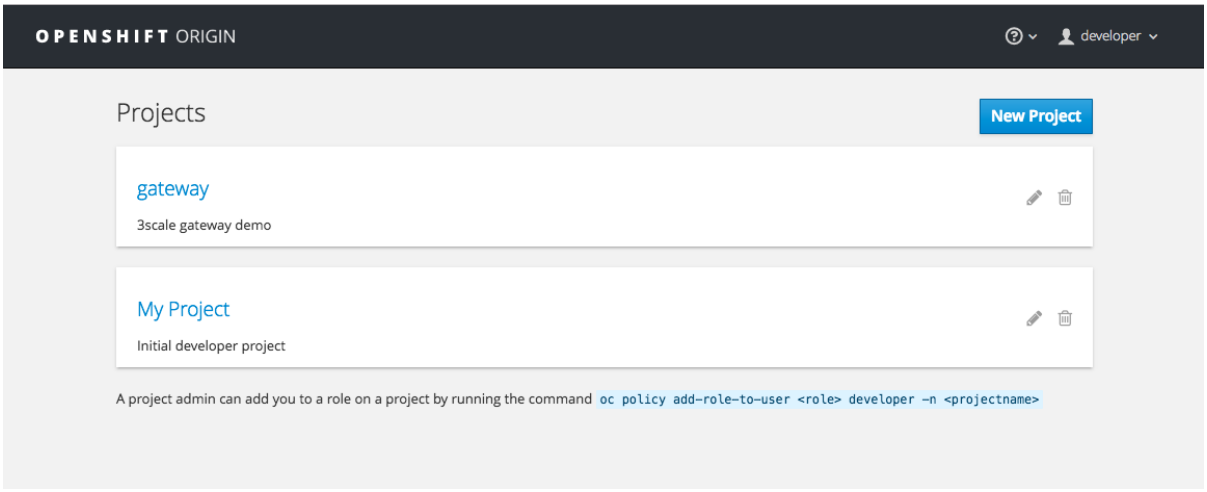
1. Open the web console for your OpenShift cluster in your browser: https://OPENSHIFT-SERVER-IP:8443/console/
   Use the value specified in **--public-hostname** instead of **OPENSHIFT-SERVER-IP** if you started OpenShift cluster on a remote server.

   You will see the login screen for OpenShift.

NOTE

You may receive a warning about an untrusted website. This is expected, as you are trying to access the web console through secure protocol, without having configured a valid certificate. While you should avoid this in production environment, for this test setup you can go ahead and create an exception for this address.

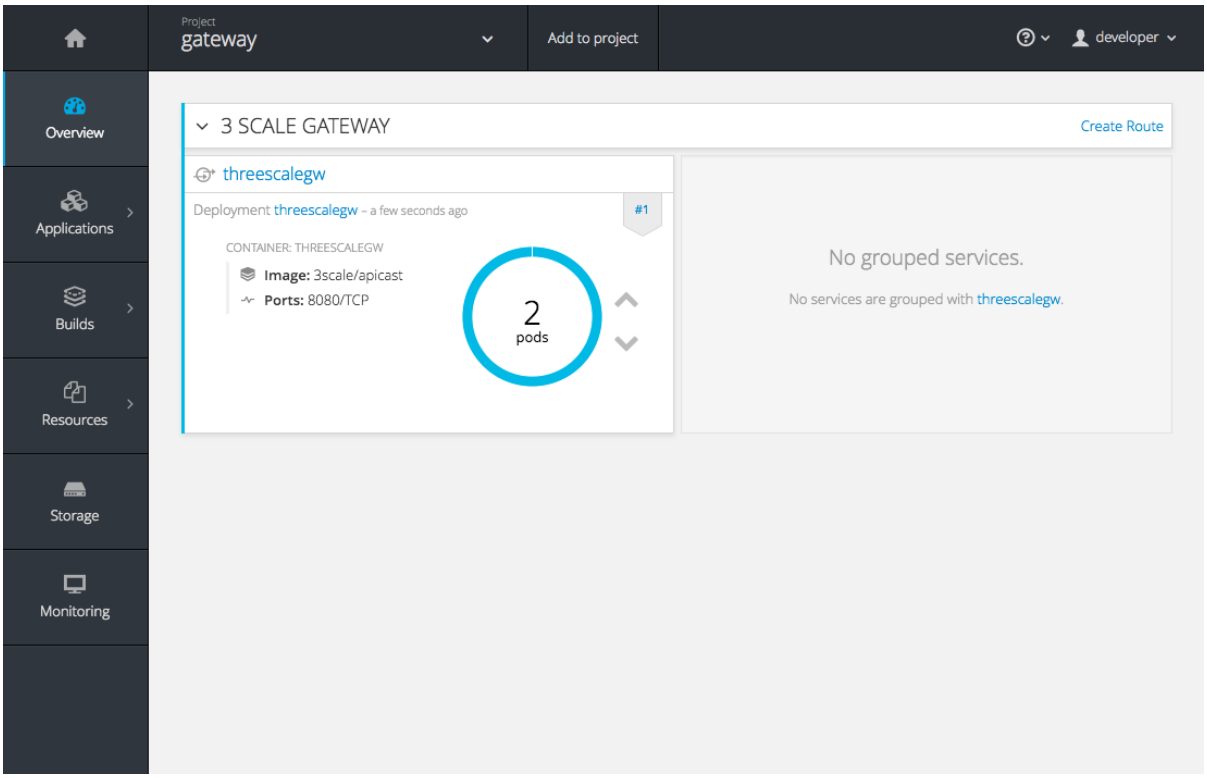
2. Log in using the *developer* credentials created or obtained in the Setting up Red Hat OpenShift section.
   You will see a list of projects, including the *gateway* project you created from the command line above.



If you do not see your gateway project, you probably created it with a different user and will need to assign the policy role to to this user.

3. Click on the *gateway* link and you will see the *Overview* tab.
OpenShift downloaded the code for APIcast and started the deployment. You may see the message *Deployment #1 running* when the deployment is in progress.

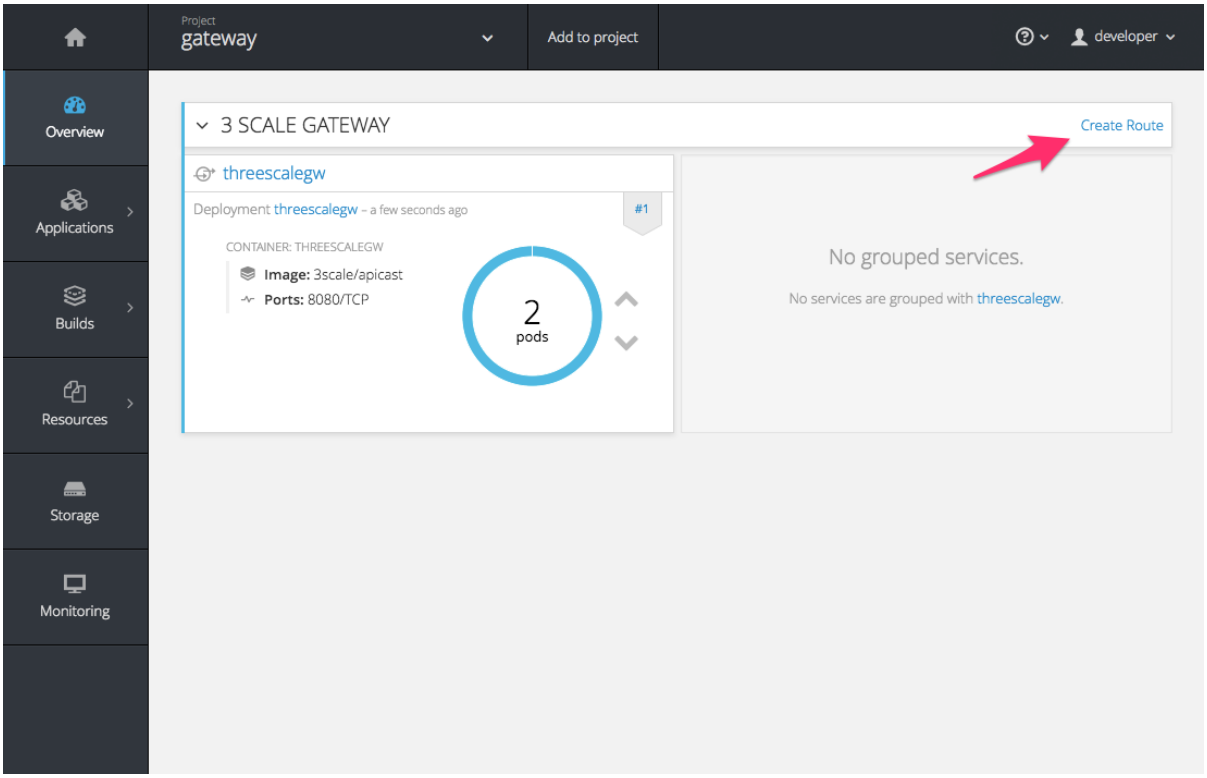
   When the build completes, the user interface (UI) will refresh and show two instances of APIcast (*2 pods*) that have been started by OpenShift, as defined in the template.



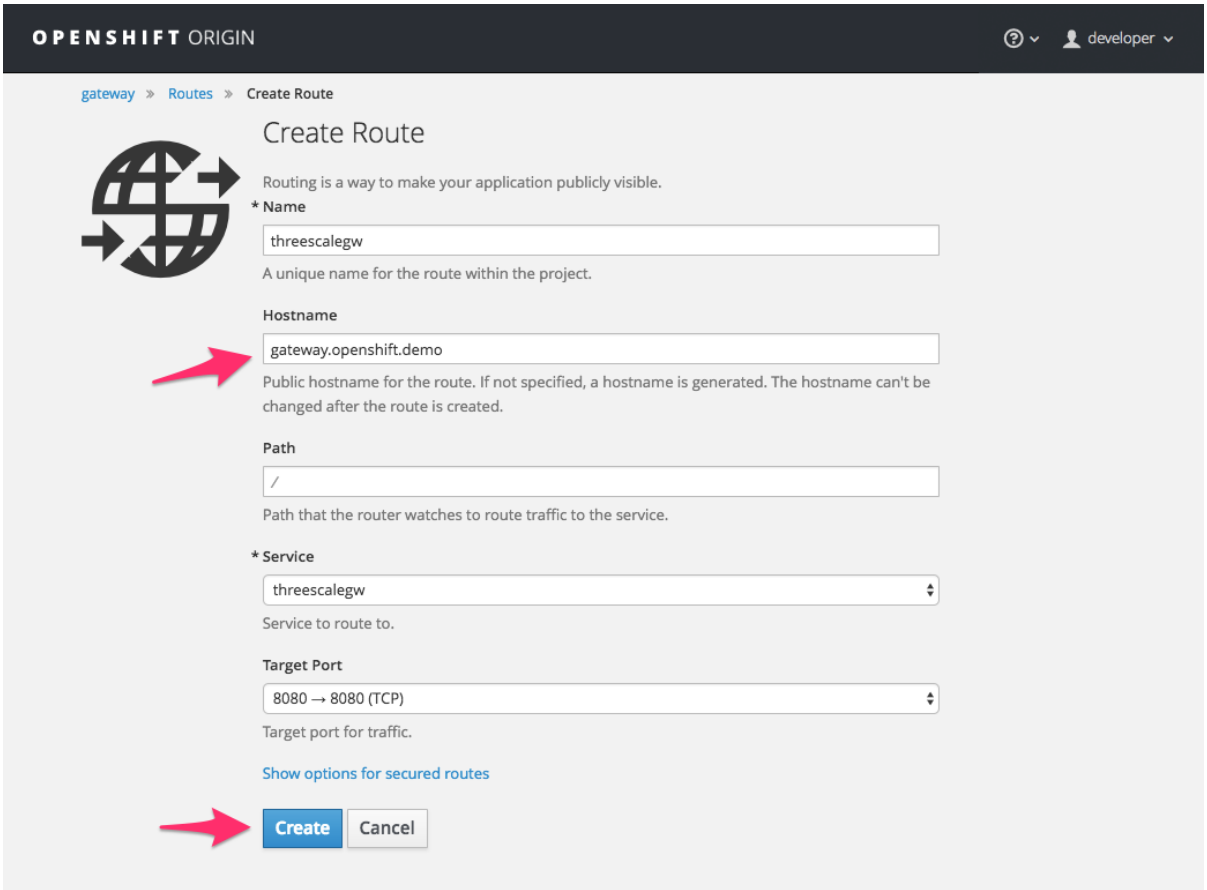
Each APIcast instance, upon starting, downloads the required configuration from 3scale using the settings you provided on the **Integration** page of your 3scale Admin Portal.

OpenShift will maintain two APIcast instances and monitor the health of both; any unhealthy APIcast instance will automatically be replaced with a new one.

4. To allow your APIcast instances to receive traffic, you need to create a route. Start by clicking on **Create Route**.



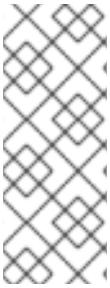
Enter the same host you set in 3scale above in the section *Public Base URL* (without the *http://* and without the port) , e.g. **gateway.openshift.demo**, then click the **Create** button.



For every 3scale service you define, you must create a new route.

CHAPTER 5. DEPLOYING APICAST ON THE DOCKER CONTAINERIZED ENVIRONMENT

This is a step-by-step guide to deploy APIcast inside a Docker container engine that is ready to be used as a Red Hat 3scale API gateway.



NOTE

When deploying APIcast on the Docker containerized environment, the supported versions of Red Hat Enterprise Linux (RHEL) and Docker are as follows:

- RHEL 7.7
- Docker 1.13.1

Prerequisites

- You must configure APIcast in your 3scale Admin Portal as per Chapter 2, *Installing APIcast*.
- Access to the Red Hat container catalog.
  - To create a registry service account, see Creating and modifying registry service accounts .

To deploy APIcast on the docker containerized environment, perform the steps outlined in the following sections:

- Section 5.1, “Installing the Docker containerized environment”
- Section 5.2, “Running the Docker containerized environment gateway”

5.1. INSTALLING THE DOCKER CONTAINERIZED ENVIRONMENT

This guide covers the steps to set up the Docker containerized environment on RHEL 7.x.

The Docker container engine provided by Red Hat is released as part of the Extras channel in RHEL. To enable additional repositories, you can use either the Subscription Manager or the *yum-config-manager* option. For details, see the RHEL product documentation.

To deploy RHEL 7.x on an Amazon Web Services (AWS), Amazon Elastic Compute Cloud (Amazon EC2) instance, take the following steps:

Procedure

1. List all repositories: **sudo yum repolist all**.
2. Find the ***-extras** repository.
3. Enable the **extras** repository: **sudo yum-config-manager --enable rhui-REGION-rhel-server-extras**.
4. Install the Docker containerized environment package: **sudo yum install docker**.

Additional resources

For other operating systems, refer to the following Docker documentation:

- Installing the Docker containerized environment on Linux distributions
- Installing the Docker containerized environment on Mac
- Installing the Docker containerized environment on Windows

5.2. RUNNING THE DOCKER CONTAINERIZED ENVIRONMENT GATEWAY

To run the docker containerized environment gateway, do the following:

Procedure

1. Start the Docker daemon:

```
sudo systemctl start docker.service
```

2. Check if the Docker daemon is running:

```
sudo systemctl status docker.service
```

You can download a ready to use Docker container engine image from the Red Hat registry:

+

```
sudo docker pull registry.redhat.io/3scale-amp2/apicast-gateway-rhel8:3scale2.9
```

1. Run APIcast in a Docker container engine:

```
sudo docker run --name apicast --rm -p 8080:8080 -e
THREESCALE_PORTAL_ENDPOINT=https://<access_token>@<domain>-admin.3scale.net
registry.redhat.io/3scale-amp2/apicast-gateway-rhel8:3scale2.9
```

Here, **<access_token>** is the Access Token for the 3scale Account Management API. You can use the Provider Key instead of the access token. **<domain>-admin.3scale.net** is the URL of your 3scale Admin Portal.

This command runs a Docker container engine called *"apicast"* on port **8080** and fetches the JSON configuration file from your 3scale Admin Portal. For other configuration options, see Installing APIcast.

5.2.1. The docker command options

You can use the following options with the **docker run** command:

- **--rm**: Automatically removes the container when it exits.
- **-d** or **--detach**: Runs the container in the background and prints the container ID. When it is not specified, the container runs in the foreground mode and you can stop it using **CTRL + c**. When started in the detached mode, you can reattach to the container with the **docker attach** command, for example, **docker attach apicast**.
- **-p** or **--publish**: Publishes a container's port to the host. The value should have the format **<host port="">:<container port="">**, so **-p 80:8080** will bind port **8080** of the container to port **80** of the host machine. For example, the Management API uses port **8090**, so you may want to

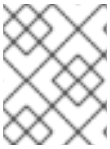
publish this port by adding **-p 8090:8090** to the **docker run** command.

- **-e** or **--env**: Sets environment variables.
- **-v** or **--volume**: Mounts a volume. The value is typically represented as **<host path="">:<container path="">[:<options>]**. **<options>** is an optional attribute; you can set it to **:ro** to specify that the volume will be read only (by default, it is mounted in read-write mode). Example: **-v /host/path:/container/path:ro**.

5.2.2. Testing APIcast

The preceding steps ensure that your Docker container engine is running with your own configuration file and the Docker container image from the 3scale registry. You can test calls through APIcast on port **8080** and provide the correct authentication credentials, which you can get from your 3scale account.

Test calls will not only verify that APIcast is running correctly but also that authentication and reporting is being handled successfully.



NOTE

Ensure that the host you use for the calls is the same as the one configured in the *Public Base URL* field on the **Integration** page.

Additional resources

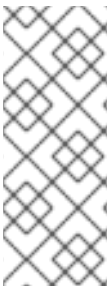
- For more information on available options, see Docker run reference.

5.3. ADDITIONAL RESOURCES

- For more information about tested and supported configuration, see Red Hat 3scale Supported Configurations

CHAPTER 6. DEPLOYING APICAST ON PODMAN

This is a step-by-step guide for deploying APIcast on a Pod Manager (Podman) container environment to be used as a Red Hat 3scale API gateway.



NOTE

When deploying APIcast on a Podman container environment, the supported versions of Red Hat Enterprise Linux (RHEL) and Podman are as follows:

- RHEL 8.x
- Podman 1.4.2

Prerequisites

- You must configure APIcast in your 3scale Admin Portal as per Chapter 2, *Installing APIcast*.
- Access to the Red Hat container catalog.
  - To create a registry service account, see Creating and modifying registry service accounts .

To deploy APIcast on the Podman container environment, perform the steps outlined in the following sections:

- Section 6.1, "Installing the Podman container environment"
- Section 6.2, "Running the Podman environment"

6.1. INSTALLING THE PODMAN CONTAINER ENVIRONMENT

This guide covers the steps to set up the Podman container environment on RHEL 8.x. Docker is not included in RHEL 8.x, therefore, use Podman for working with containers.

For more details about Podman with RHEL 8.x, see the Container command-line reference.

Procedure

- Install the Podman container environment package:
  sudo dnf install podman

Additional resources

For other operating systems, refer to the following Podman documentation:

- Podman Installation Instructions

6.2. RUNNING THE PODMAN ENVIRONMENT

To run the Podman container environment, follow the procedure below.

Procedure

1. Download a ready to use Podman container image from the Red Hat registry:

```
podman pull registry.redhat.io/3scale-amp2/apicast-gateway-rhel8:3scale2.9
```

2. Run APIcast in a Podman:

```
podman run --name apicast --rm -p 8080:8080 -e
THREESCALE_PORTAL_ENDPOINT=https://<access_token>@<domain>-admin.3scale.net
registry.redhat.io/3scale-amp2/apicast-gateway-rhel8:3scale2.9
```

Here, **<access_token>** is the Access Token for the 3scale Account Management API. You can use the Provider Key instead of the access token. **<domain>-admin.3scale.net** is the URL of your 3scale Admin Portal.

This command runs a Podman container engine called *"apicast"* on port **8080** and fetches the JSON configuration file from your 3scale Admin Portal. For other configuration options, see Installing APIcast.

6.2.1. Testing APIcast with Podman

The preceding steps ensure that your Podman container engine is running with your own configuration file and the Podman container image from the 3scale registry. You can test calls through APIcast on port **8080** and provide the correct authentication credentials, which you can get from your 3scale account.

Test calls will not only verify that APIcast is running correctly but also that authentication and reporting is being handled successfully.

NOTE

Ensure that the host you use for the calls is the same as the one configured in the *Public Base URL* field on the **Integration** page.

6.3. THE PODMAN COMMAND OPTIONS

You can use the following option examples with the **podman** command:

- **-d**: Runs the container in *detached mode* and prints the container ID. When it is not specified, the container runs in the foreground mode and you can stop it using **CTRL + c**. When started in the detached mode, you can reattach to the container with the **podman attach** command, for example, **podman attach apicast**.
- **ps** and **-a**: Podman **ps** is used to list creating and running containers. Adding **-a** to the **ps** command will show all containers, both running and stopped, for example, **podman ps -a**.
- **inspect** and **-l**: Inspect a running container. For example, use **inspect** to see the ID that was assigned to the container. Use **-l** to get the details for the latest container, for example, **podman inspect -l | grep Id\":**.

6.4. ADDITIONAL RESOURCES

- For more information about tested and supported configurations, see Red Hat 3scale Supported Configurations.
- For information about getting started with Podman, see Basic Setup and Use of Podman.