

Red Hat CodeReady Studio 12.21.3

Getting Started with Container and Cloudbased Development

Starting Development of Container and Cloud-based Applications Using Red Hat CodeReady Studio

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Abstract

This compilation of topics contains information on how to start developing containerized applications and applications for cloud deployment.

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MAKING OPEN SOURCE MORE INCLUSIVE

Red Hat is committed to replacing problematic language in our code, documentation, and web properties. We are beginning with these four terms: master, slave, blacklist, and whitelist. Because of the enormity of this endeavor, these changes will be implemented gradually over several upcoming releases. For more details, see our CTO Chris Wright's message.

CHAPTER 1. DEVELOPING USING CONTAINERS AND THE CLOUD IN CODEREADY STUDIO

1.1. USING RED HAT CODEREADY CONTAINERS TOOLS IN CODEREADY STUDIO

Red Hat CodeReady Containers (CRC) brings a minimal OpenShift 4 cluster to your local computer. This cluster provides a minimal environment for development and testing purposes. It is mainly targeted at running on developers' desktops. For other use cases, such as headless, multi-developer or team-based setups, use of the full-fledged OpenShift installer is recommended.

For a more in-depth introduction to OpenShift, see OpenShift documentation.

1.1.1. Downloading and installing Red Hat CodeReady Containers

The following section describes how to set up CodeReady Containers in CodeReady Studio.

Prerequisites

- 1. Download the latest release of CodeReady Containers and the pull secret .
- 2. Extract the CRC file.

For more information on how to install and set up CRC, see the Installation chapter of the Getting started with CodeReady Containers Guide.

Procedure

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

	Show View	×
server		×
🕶 🗁 Server		
👭 Servers		
	Cancel	Open

- 3. Enter **Server** in the search field.
- 4. Select Servers.
- 5. Click **Open**.

The **Servers** view appears.

🙇 Tasks	😳 Palette	Properties	붜 Servers ¤	
No serve	rs are availa	able. Click this li	ink to create a n	ew server

6. Right-click any area in the **Servers** view.

Tasks SPalette F No servers are available.	Click this link to create a new se	erver	
	New	•	🚏 Server
	🔗 Refresh		
	Properties	Alt+Enter	
	📒 New Connectio	n	
Click New → Server . The Define a New Server	window appears.		
	New Server		
Define a New Server			
Choose the type of serve Select the server type: type filter text			
Choose the type of serve Select the server type: type filter text	er to create		
Choose the type of server Select the server type: type filter text Red Hat CodeRe Red Hat Contain	eady Containers 1.0+ her Development Kit 2.x		
Choose the type of server Select the server type: type filter text Red Hat CodeRe Red Hat Contain Red Hat Contain	eady Containers 1.0+ her Development Kit 2.x her Development Kit 3		
Choose the type of server Select the server type: type filter text Red Hat CodeRe Red Hat Contain Red Hat Contain	eady Containers 1.0+ her Development Kit 2.x her Development Kit 3 her Development Kit 3.2+		
Choose the type of server Select the server type: type filter text Red Hat CodeRe Red Hat Contain Red Hat Contain Red Hat Contain Red Hat Contain	eady Containers 1.0+ her Development Kit 2.x her Development Kit 3 her Development Kit 3.2+ + Server	4.3 (End Of Life)	
Choose the type of server Select the server type: type filter text Red Hat CodeRe Red Hat Contain Red Hat Contain Red Hat Contain Red Hat Fuse 7-4 Red Hat Fuse 7-4	eady Containers 1.0+ her Development Kit 2.x her Development Kit 3 her Development Kit 3.2+ + Server Enterprise Application Platform		
Choose the type of server Select the server type: type filter text Red Hat CodeRe Red Hat Contain Red Hat Contain Red Hat Contain Red Hat Fuse 7-4 Red Hat Fuse 7-4	eady Containers 1.0+ her Development Kit 2.x her Development Kit 3 her Development Kit 3.2+ + Server		
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Choose the type of server Select the server type: type filter text Red Hat CodeRe Red Hat Contain Red Hat Contain Red Hat Contain Red Hat Contain Red Hat Fuse 74 Red Hat Fuse 74 Red Hat JBoss E	eady Containers 1.0+ her Development Kit 2.x her Development Kit 3 her Development Kit 3.2+ + Server Enterprise Application Platform	ers 1.0+	

?

< Back

Cancel

Finish

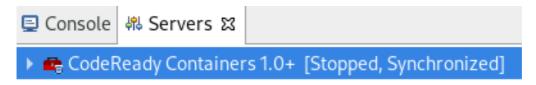
- 8. Select CodeReady Containers 1.0+.
- 9. Click Next.

The CodeReady Containers window appears.

	New Server	
Red Hat CodeRead	y Containers	217 . 🚄
A server adapter repr	esenting a Red Hat CodeReady Container.	
	Download and	l install runtim
CRC Binary:	/home/user/Downloads/crc-linux-1.12.0-amd64/crc	Browse
CRC Pull Secret File:	/home/user/Downloads/pull-secret	Browse
?	< Back Next > Cancel	Finish

- 10. Click **Browse** to locate the **CRC binary**.
- 11. Click Browse to locate the CRC Pull Secret File
- 12. Click Finish.

Your newly added CodeReady Containers 1.0+ server adapter is now listed in the Servers view.



NOTE

In case you did not set up CRC prior to starting the server adapter, you will see a warning: **CRC has not been properly initialized!**



Warning: CRC has not been properly initialized!

Your CRC installation has not been properly initialized. Would you like us to run crc setup for you?

Cancel

OK

Follow the on-screen instructions to initialize CRC.

The instructions prompt you for optional, anonymous usage data collection to assist with development. No personally identifiable information is collected. For information on changing your settings later, visit Red Hat CodeReady Containers – Consent for telemetry data collection.

1.1.2. Using OpenShift Container Platform tools

The following section describes how to use OpenShift Containers in CodeReady Studio.

Prerequisites

• The CRC server adapter is set up and configured. For more information, see Downloading and installing CRC.

Procedure

- 1. Start CodeReady Studio.
- 2. Start the CRC server adapter.

📃 Console 🚜 Servers 🕱 🟮 OpenShift Explorer CodeReady Containers 1.0+ [Stopped, Synchronized] New ۲ Open F3 Shift+Alt+W Show In Setup CRC Copy Ctrl+C Paste X Delete Re<u>n</u>ame F2 🏇 Debuq Start Profile Stop Ctrl+Alt+S

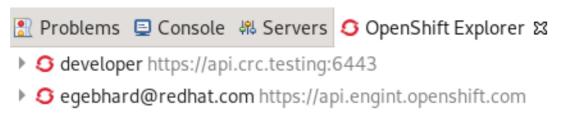
3. Click **Window** → **Show** View → Other.

The **Show View** window appears.

Show View	×
openshift	€
➡ JBoss Tools	
OpenShift Application Explorer	
OpenShift Explorer	
Cancel Open	

- 4. Enter **OpenShift** in the search field.
- 5. Select OpenShift Explorer.
- 6. Click **Open**.

The **OpenShift Explorer** view appears.



For information on how to set up a new OpenShift connection, visit Creating a new OpenShift Container Platform connection.

7. Press Ctrl+N.

The Select a wizard window appears.

		New		×
Select a wizard				-
Create a new OpenSh	ift Application			
Wizards:				
openshift				×
🝷 🗁 OpenShift				
🖸 OpenShift Ap	plication			
Show All Wizards.				
\odot	< Back	Next >	Cancel	Finish

- 8. Enter **OpenShift** in the search field.
- 9. Select OpenShift Application.
- 10. Click Next.

The Sign in to OpenShift window appears.

different Opens Want to try Ope	Shift client. enShift online? You can sign up for an acco	ount <u>he</u>	re	OPEN
Connection:	developer - https://api.crc.testing:644	3		
Server:	https://api.crc.testing:6443	•	Paste Login C	ommar
Authentication				
Protocol: B	lasic 🔻			
<u>U</u> sername:	developer			
Password:	•••••			
<mark> </mark>	word (could trigger secure storage login)			
Advanced >>				

Provide your credentials and click Next.
 The Create OpenShift Project window appears.

•	Create OpenShift Project	
New OpenShift	Project	6
	ame, display name and description. Iay only contains lowercase letters, numbers or dashes. They may not start or end with a dash.	OPENSHIFT
Project Name:	my-openshift-project	
Display Name:		
Description:		
?	Cancel	inish

12. Name your project.

13. Click **Finish**.

The **Select template** window appears.

•	New	OpenShift Application		
Select template	vices may be filtered by typing t		d.	OPENSHIF
OpenShift project:	OpenShift Project (os-project)		▼ Ne	w Refresh
Eclipse Project:				Browse
Server application	source Custom template			
 dotnet:3.1-e dotnet:3.1-u dotnet:lates eap-cd-bas eap-cd-ope 	puilder, .net, dotnet, dotnetcore, el7 (builder, .net, dotnet, dotnet ubi8 (builder, .net, dotnet, dotnet t (builder, .net, dotnet, dotnet t (builder, .net, dotnet, dotnetco ic-s2i (eap, javaee, java, jboss) - nshift:12 (builder, eap, javaee, ja nshift:13 (builder, eap, javaee, ja nshift:13.0 (builder, eap, javaee, ja nshift:14 (builder, eap, javaee, ja nshift:14 (builder, eap, javaee, ja nple JBoss Enterprise Applicatio	core, rh-dotnet31) - openshift tcore, dotnet31) - openshift re, hidden) - openshift openshift ava, jboss, hidden) - openshift , java, jboss, hidden) - openshift ava, jboss, hidden) - openshift , java, jboss, hidden) - openshift ava, jboss, hidden) - openshift	ft	For more information
JBoss about us	sing this template, see <u>https://g</u> p-cd/README.adoc			
?		< Back Next >	Car	ncel Finish

- 14. Select a template.
- 15. Click Next.

The **Template Parameters** window appears.

New OpenShift Application

Template Parameters

Edit the parameter values to be substituted into the template.



Name	Value	Edit
APPLICATION_NAME *	eap-app	
ARTIFACT_DIR		Reset
AUTO_DEPLOY_EXPLODED	false	Reset All
CONTEXT_DIR	kitchensink	
ENABLE_GENERATE_DEFAULT_DATASOURC	false	
GALLEON_PROVISION_LAYERS		
GENERIC_WEBHOOK_SECRET *	(generated)	
GITHUB_WEBHOOK_SECRET *	(generated)	
IMAGE_STREAM_NAMESPACE *	openshift	
JGROUPS_CLUSTER_PASSWORD *	(generated)	
MAVEN_ARGS_APPEND	-Dcom.redhat.xpaas.repo.jbossorg	
MAVEN_MIRROR_URL		
MEMORY_LIMIT	1Gi	
* = value required, click the 'Edit' button or doub	le-click on a value to edit it.	
Details APPLICATION_NAME The name for the application.		
0	< Back Next > Cancel	Finish

16. Ensure that the template parameters are correct.

17. Click Finish.

The Create Application Summary window appears.

Create Application Summary

Results of creating the resources from the eap-cd-basic-s2i template.



OK

New Resources Created:

Service - eap-app
 Service - eap-app-ping
 Route - eap-app
 ImageStream - eap-app
 ImageStream - eap-app-build-artifacts
 BuildConfig - eap-app
 BuildConfig - eap-app
 DeploymentConfig - eap-app

Click here for webhooks available to automatically trigger builds.

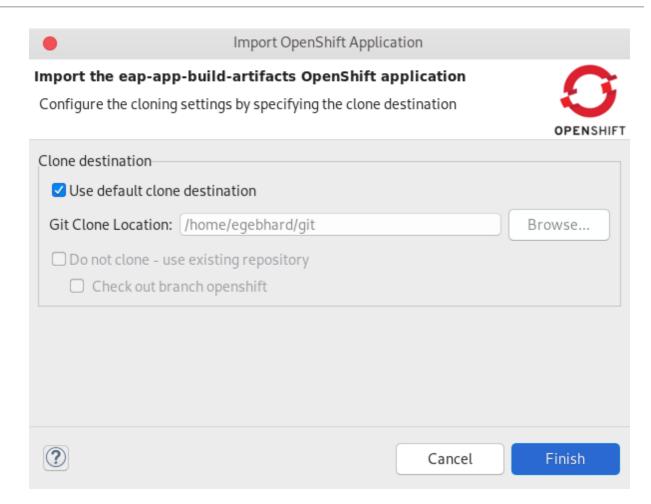
Note the following parameters reuired to administer your resources:

Name	Value	
APPLICATION_NAME	eap-app	
ARTIFACT_DIR		
AUTO_DEPLOY_EXPLODED	false	
CONTEXT_DIR	kitchensink	
ENABLE_GENERATE_DEFAULT_DATASOURC	false	
GALLEON_PROVISION_LAYERS		
GENERIC_WEBHOOK_SECRET	NuwdNl2E	

18. Ensure that the application details are correct.

19. Click **OK**.

The Import OpenShift Application window appears.



20. Choose the location for your git repository clone.

21. Click Finish.

Your newly created OpenShift project and application are now listed in the **OpenShift Explorer** view.



- G developer https://api.crc.testing:6443
 - OpenShift Project os-project
 - eap-app https://eap-app-os-project.apps-crc.testing/
 - Image: Image

Additional resources

• For more information on how to perform additional tasks with OpenShift Container Platform projects and applications, see Developing for the Cloud with OpenShift in CodeReady Studio .

CHAPTER 2. DEVELOPING FOR THE CLOUD WITH OPENSHIFT IN CODEREADY STUDIO

2.1. CREATING AN OPENSHIFT CONTAINER PLATFORM APPLICATION IN CODEREADY STUDIO

Using the OpenShift Container Platform tools you can create, import, and modify OpenShift Container Platform applications.

2.1.1. Creating a new OpenShift Container Platform connection

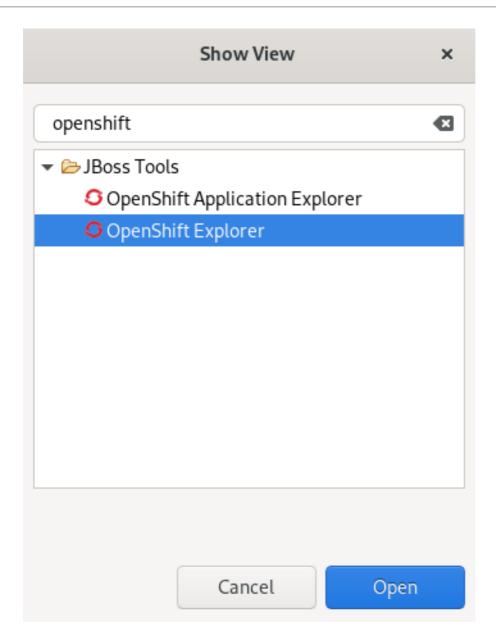
To use OpenShift tools in CodeReady Studio, you must create an OpenShift connection in the **OpenShift Explorer** view. An OpenShift connection connects CodeReady Studio to an OpenShift instance (based on OpenShift Online, Kubernetes or minishift). The connection is listed in the **OpenShift Explorer** view. You can have more than one OpenShift connection configured in CodeReady Studio.

Prerequisites

• A running OpenShift cluster.

Procedure

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.



- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.
- 5. Click **Open**.

The **OpenShift Explorer** view appears.

📮 Console 🍀 Servers	🖸 OpenShift Explorer 🛿			
• O developer https://	192.168.42.215:8443			
• O developer https://a	api.crc.testing:6443			
		New	Þ	Connection
		Show In	•	🐞 Project
		Edit	•	😭 Application
		💢 Delete		陷 Resource
		눰 Import OpenShift Application		
		🖑 Refresh		
		Properties	Alt+Enter	

6. Right-click any area in the **OpenShift Explorer**.

7. Click **New** \rightarrow **Connection**.

The **Sign in to OpenShift** window appears.

	New OpenShift Conn	nection ×
Sign in to Open	Shift	0
Please sign in to y	our OpenShift server.	OPENSHIFT
Want to try Oper	nShift online? You can sign up for an	
Connection:	<new connection=""></new>	•
Server:	https://api.crc.testing:6443	← Paste Login Command
Authentication		
Protocol: O/	Auth 🗸	
Enter a token o	or <u>retrieve</u> a new one.	
Token z7opc	o3Jr9lD08_ENgZreYmDMaYLzxWH	HPnlok3j3k1Xk
Save token	(could trigger secure storage login)))
Advanced >>		
?		Cancel Finish

- 8. Paste the URL of your OpenShift server into the **Server** field.
- 9. Authenticate with a token or login credentials.



NOTE

Alternatively, you can copy the Login Command from the OpenShift Container Platform web UI.

To get login credentials, click the drop-down menu in the top right corner \rightarrow Copy Login Command.

Red Hat OpenShift C	ontainer Platf	orm 🗰 G	kube:adr	nin
🕫 Administrator	•	You are logged in as a temporary administrative user. Update the <u>cluster OF</u> to log in.	L Copy Login Command	Ē
lome	~	Dashboards		
Dashboards	_	Quandan		
		Overview		
		Cluster Health		
Operators		✔ Cluster is healthy		
Workloads		Cluster Capacity		

10. Click Finish.

Your newly added connection is now listed in the **OpenShift Explorer** view.

2.1.2. Creating a new OpenShift Container Platform project

You must create an OpenShift Container Platform project, which essentially is a namespace with additional annotations, to centrally manage the access to resources for regular users of your OpenShift Container Platform.

Prerequisites

- A running OpenShift cluster.
- An OpenShift Container Platform connection. For more information on how to create an OpenShift Container Platform connection, see Creating a new OpenShift Container Platform connection.

Procedure

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

Show View	×
openshift	
🕶 🗁 JBoss Tools	
OpenShift Application Explorer	
OpenShift Explorer	
Cancel Oper	1

- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.
- 5. Click **Open**.

The **OpenShift Explorer** view appears.

🗐 Console 🚜 Servers 🖸 OpenShift Explorer 🛿

G developer https://192.168.42.215:8443
 G developer https://api.crc.testing:6443

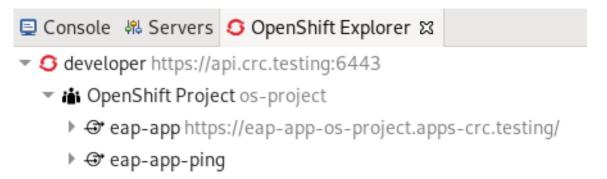
ttps://api.crc.testing:6443			
	New	•	🕴 Connection
	Show In	•	🍅 Project
	Edit	•	😭 Application
	🗙 Delete		陷 Resource
	눰 Import OpenShift Application		
	🚸 Refresh		
	Properties	Alt+Enter	

 Right-click the OpenShift Container Platform connection → New → Project. The New OpenShift Project window appears.

•	Create OpenShift Project	
New OpenShift	Project	0
	ame, display name and description. Iay only contains lowercase letters, numbers or dashes. They may not start or end with a dash.	OPENSHIFT
Project Name:	my-openshift-project	
Display Name:		
Description:		
?	Cancel	inish

- 7. Name your project.
- 8. Click **Finish**.

Your newly created OpenShift project is now listed in the **OpenShift Explorer** view.



2.1.3. Creating a new OpenShift Container Platform application

You can use the **OpenShift Application** wizard in CodeReady Studio to create OpenShift Container Platform applications from default or custom templates.

Prerequisites

- A running OpenShift cluster.
- An OpenShift Container Platform connection. For more information on how to create an OpenShift Container Platform connection, see Creating a new OpenShift Container Platform connection.
- An OpenShift Container Platform project. For more information on how to create a new OpenShift Container Platform project, see Creating a new OpenShift Container Platform project .

Procedure

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

Show View	×
openshift	×
✓ ▷ JBoss Tools	
OpenShift Application Explorer	
OpenShift Explorer	
Cancel	en

- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.
- Click **Open**. The **OpenShift Explorer** view appears.

📮 Console 🛛 Servers 🔇 OpenShift Explore	r 🛙		
• S developer https://192.168.42.215:8443			
O developer https://api.crc.testing:6443			
	New	•	Connection
	Show In	•	🐞 Project
	Edit	•	📑 Application
	🗙 Delete		陷 Resource
	눰 Import OpenShift Application		
	🖑 Refresh		
	Properties	Alt+Enter	

 Right-click the OpenShift Container Platform connection → New → Application. The Select template window appears.

	Nev	v OpenShift Applicatio	on		×
Select template Server template cho	ices may be filtered by typing	the name of a tag in th	e text field.		OPENSHIFT
OpenShift project:	my-openshift-project		•	New	Refresh
Eclipse Project:					Browse
Server applicatio	n source Custom template	2			
Q dotnet					
 dotnet:2.1 (b dotnet:3.0 (b dotnet:3.1 (b dotnet:lates 	l-persistent (quickstart, dotne uilder, .net, dotnet, dotnetcor ouilder, .net, dotnet, dotnetcor uilder, .net, dotnet, dotnetcor t (builder, .net, dotnet, dotnet	re, rh-dotnet21) - opens re, rh-dotnet30) - open re, rh-dotnet31) - opens	shift		
Details 💮 An example .	NET Core application.			Define	ed Resources
(?)		< Back	Next >	Cancel	Finish
U			, and a second s	Currect	

7. Select a template.

8. Click Next.

The **Template Parameters** window appears.

New	Onon	Chift	An	alica	tion
INGW	Open	SIIII	AP	JUCO	LIOII

Template Parameters

Edit the parameter values to be substituted into the template.



Name	Value	Edit
APPLICATION_NAME *	eap-app	
ARTIFACT_DIR		Reset
AUTO_DEPLOY_EXPLODED	false	Reset All
CONTEXT_DIR	kitchensink	
ENABLE_GENERATE_DEFAULT_DATASOURC	false	
GALLEON_PROVISION_LAYERS		
GENERIC_WEBHOOK_SECRET *	(generated)	
GITHUB_WEBHOOK_SECRET *	(generated)	
IMAGE_STREAM_NAMESPACE *	openshift	
JGROUPS_CLUSTER_PASSWORD *	(generated)	
MAVEN_ARGS_APPEND	-Dcom.redhat.xpaas.repo.jbossorg	
MAVEN_MIRROR_URL		
MEMORY_LIMIT	1Gi	
* = value required, click the 'Edit' button or doub Details	le-click on a value to edit it.	
APPLICATION_NAME The name for the application.		
The name for the application.		
	< Back Next > Cancel	Finish

- 9. Ensure that the template parameters are correct.
- 10. Click Next.

The **Resource Labels** window appears.

abels		
Кеу	Value	Add
		Edit
		Remove

- 11. Click **Add** to add labels.
- 12. Click **Finish**.

The Create Application Summary window appears.

Results of creating the resources from t	ne dotnet-example template.	E
5		PEN
New Resources Created:		
 Route - dotnet-example Service - dotnet-example ImageStream - dotnet-example 	✓ Resource Details	
 ⊗ BuildConfig - dotnet-example ⊗ DeploymentConfig - dotnet-examp Click <u>here</u> for webhooks available to automatical structure 		
⊘ DeploymentConfig - dotnet-examp	omatically trigger builds.	
⊘ DeploymentConfig - dotnet-examp Click <u>here</u> for webhooks available to auto	omatically trigger builds.	ſ

13. Ensure that the application details are correct.

14. Click **OK**.

The Import OpenShift Application window appears.

-	example OpenShift application g settings by specifying the clone destination	£
configure the cloning	j settings by speen ying the clone destination	OPENS
Clone destination		
Use default clor	ne destination	
Git Clone Location:	/home/levi/OS/git	Browse
🗌 Do not clone - u	se existing repository	
Check out bra	anch dotnetcore-3.0	

15. Choose the location for your git repository clone.

16. Click Finish.

Your newly created OpenShift Container Platform application is now listed in the **OpenShift Explorer** view.

Additional Resources

• For more information about using and creating templates with OpenShift Container Platform, see the upstream documentation Official OKD documentation, Using templates.

2.1.4. Importing an existing OpenShift Container Platform application into CodeReady Studio

The **OpenShift Explorer** view in CodeReady Studio lists applications associated with your OpenShift Container Platform accounts. You can import the source code for these applications individually into CodeReady Studio using the **Import OpenShift Application** wizard. After the application is imported, you can easily modify the application source code, build the application, and view it in a web browser.

Prerequisites

- The application that you are importing into CodeReady Studio has its source specified in the **build config** file.
- A running OpenShift cluster.
- An OpenShift Container Platform connection.

For more information on how to create an OpenShift Container Platform connection, see Creating a new OpenShift Container Platform connection .

Procedure

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

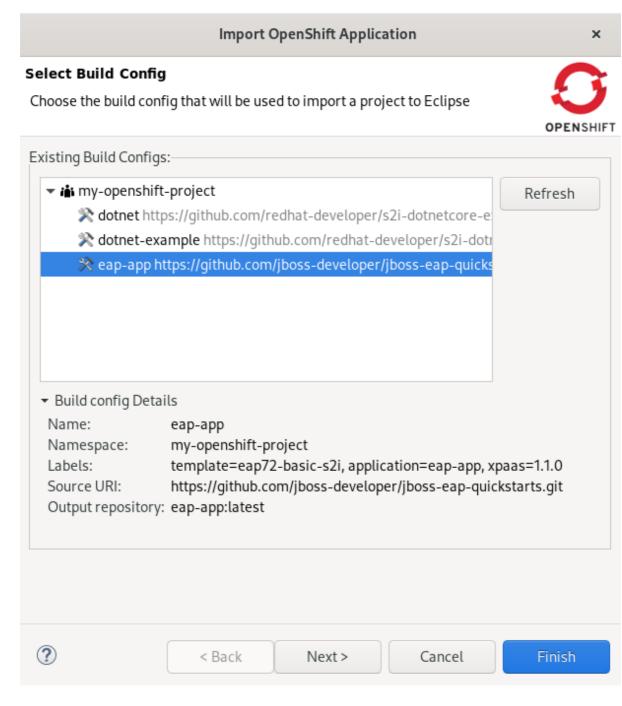
Show View	×
openshift	Ø
→ Boss Tools	
OpenShift Application Explorer	
OpenShift Explorer	
Cancel Ope	n

- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.
- 5. Click **Open**.

The **OpenShift Explorer** view appears.

📮 Console 🕷 Servers 🔇 OpenShift Explore	r 🛙	
• O developer https://192.168.42.215:8443		
• O developer https://api.crc.testing:6443	New	•
	Show In	•
	Edit	•
	🗙 Delete	
	🔄 Import OpenShift Application	
	🖑 Refresh	
	Properties	Alt+Enter

6. Right-click your **OpenShift Container Platform connection** → **Import OpenShift Application**. The **Select Build Config** window appears.



- 7. Select the application you want to import.
- 8. Click Next.

The Import OpenShift Application window appears.

ure the cloning s	xample OpenShift application settings by specifying the clone destination	
destination		
lse default clone	destination	
lone Location:	/home/levi/OS/git	Browse
o not clone - use	e existing repository	
) Check out brar	nch dotnetcore-3.0	

9. Select your Git Clone Location

10. Click Finish.

Your newly imported OpenShift Container Platform application is now listed in the **OpenShift Explorer** view.

2.1.5. Deploying an application using the server adapter

The server adapter enables you to publish the changes that you made in your workspace project to the running OpenShift application on the OpenShift instance. It enables incremental deployment of applications directly into the deployed pods on OpenShift. You can use the server adapter to push changes in your application directly to the running OpenShift application without committing the source code to the Git repository.

Prerequisites

- A running OpenShift cluster.
- An OpenShift Container Platform connection. For more information on how to create an OpenShift Container Platform connection, see Creating a new OpenShift Container Platform connection.

Procedure

- 1. Start CodeReady Studio.
- 2. Click Window → Show View → Other.

The **Show View** window appears.

Show View	×
openshift	Ø
✓ ➢ JBoss Tools	
OpenShift Application Explorer	
OpenShift Explorer	
Cancel Open	

- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.

5. Click **Open**.

The **OpenShift Explorer** view appears.

📃 Console 🛛 👭 Servers	🖸 OpenShift Explorer 🛛			
• O developer https://	192.168.42.215:8443			
	api.crc.testing:6443			
👻 👪 my-openshift-p	project			
	nple http://dotnet-example- //dotnet-my-openshift-proje	11 5.	New	•
			Show In	•
I ⊕ eap-app-pin	Image: Show in a stress of the stress of		•	
	X Delete	🔀 Delete		
			💢 Delete Resources	
			눰 Import OpenShift Application	
			Server Adapter	
			🖑 Refresh	
			Deploy Latest	
			Scale	•
			Properties	Alt+Enter

- 6. Expand the OpenShift Container Platform connection.
- Right-click your application → Server Adapter. The Server Settings window appears.

	OpenShift Server Adapter Settings		×
Server Settings			<u> </u>
Create an OpenShift Server Adapter by sele	cting the project, resource and folders used for	file synchronizatior	n. 🤍
Eclipse Project Source (From) Eclipse Project: kitchensink		P Browse	OPENSHIFT
Source Path: \${workspace_loc:/kitcl	hensink}	Browse	Workspace
OpenShift Application Destination (To) Q type filter text dotnet deploymentconfig=dotnet dotnet-example name=dotnet-exa eap-app deploymentConfig=eap-a eap-app deploymentConfig=eap-a eap-app deploymentConfig=eap-a eap-app Deployment Path Pod Deployment Path:	Selectors: deploymentConfig=eap-app IP: None:8888	lication=eap-app, x	paas=1.1.0
Advanced >>		Cancel	Finish



NOTE

If you are using EAP 7.3, you need to set the path for the deployment of your server adapter due to changes in the templates.

To do so, uncheck the **Use inferred Pod Deployment Path** checkbox and set the Pod Deployment Path field to /**opt/eap/standalone/deployments**/.

8. Click Finish.

The **Servers** view appears, starting your server adapter.

To open your application in a browser, right-click **application** → **Show In** → **Web Browser**.

Console 🖏 Servers 🧿 OpenShift Explorer 🛛			
G developer https://192.168.42.215:8443			
Odveloper https://api.crc.testing:6443			
🔻 🚵 my-openshift-project			
State: dotnet-example http://dotnet-exampleect.apps-crc.testing/			
Other and the state of the s			
Image: Second	New		
▶ ⊕* eap-app-ping	Show In		💰 Web <u>B</u> rowser
	Edit	•	🔁 Web Console
	X Delete		
	•••		
	X Delete Resources		
	🗞 Import OpenShift Application		
	Server Adapter		
	🔗 Refresh		
	Deploy Latest		
	Scale	•	

The CodeReady Studio built-in web browser opens, displaying your application.

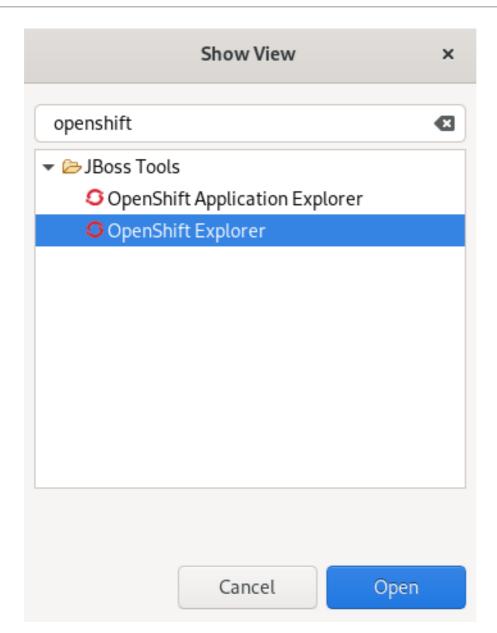
2.1.6. Deleting an OpenShift Container Platform project

You may choose to delete a project from the workspace for a fresh start in project development or after you have concluded development in a project. When you delete a project, all resources associated with the project are deleted as well.

Prerequisites

• An existing OpenShift Container Platform project.

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.



- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.
- 5. Click **Open**.

The **OpenShift Explorer** view appears.

🛿 Console 🕷 Servers 🗳 OpenShift Explorer 🕱		
• O developer https://192.168.42.215:8443		
S developer https://api.crc.testing:6443		
🕶 🏜 my-openshift-project		
Optimized and the state of t		
Image: Second		
▶ 🚭 eap-app-ping	New	•
	Show In)
	Edit	•
	🔀 Delete	
	🔀 Delete Resources	
	踚 Import OpenShift Application	
	Server Adapter	
	🖑 Refresh	
	Deploy Latest	
	Scale	•
	Properties	Alt+Enter

- 6. Expand the OpenShift Container Platform connection.
- Right-click your project → Delete.
 A Delete OpenShift Resource window prompts you for consent.
- 8. Click **OK**.

Your project is now deleted.

2.2. SETTING UP AND REMOTELY MONITORING AN OPENSHIFT CONTAINER PLATFORM APPLICATION IN CODEREADY STUDIO

CodeReady Studio allows users to set up a connection to a remote instance of OpenShift Container Platform and use application and build logs to troubleshoot and monitor running applications.

Prerequisites

- A running OpenShift cluster.
- An OpenShift Container Platform connection. For more information on how to create an OpenShift Container Platform connection, see Creating a new OpenShift Container Platform connection .

2.2.1. Setting up OpenShift Client Binaries

Before setting up port forwarding or streaming application and build logs, set up OpenShift Client Binaries.

- 1. Start CodeReady Studio.
- Click Window → Preferences. The Preferences window appears.

	Preferences ×
openshift 🗨	
✓ JBoss Tools OpenShift	The OpenShift client binary (oc) is required for features such as Port Forwarding or Log Streaming. Please <u>download</u> it and read the <u>instructions</u> on how to install it.
	'oc' executable location rver-v3.11.0-0cbc58b-linux-64bit/oc Browse
	Your OpenShift client version is 3.11.0
	Restore <u>D</u> efaults Apply
? 2 2 0	Cancel Apply and Close

- 3. Enter OpenShift in the search field.
- 4. Select OpenShift.
- 5. Click **Browse** to locate the **oc** executable.
- 6. Click Apply and Close.

OpenShift Client Binaries are now set up.

2.2.2. Setting up Port Forwarding

Using the **Application Port Forwarding** window, you can connect local ports to their remote counterparts to access data or debug your application.

Port forwarding automatically stops due to any of the following reasons:

- The OpenShift Container Platform connection terminates
- CodeReady Studio shuts down
- The workspace is changed

Port forwarding must be enabled each time to connect to OpenShift Container Platform from CodeReady Studio.

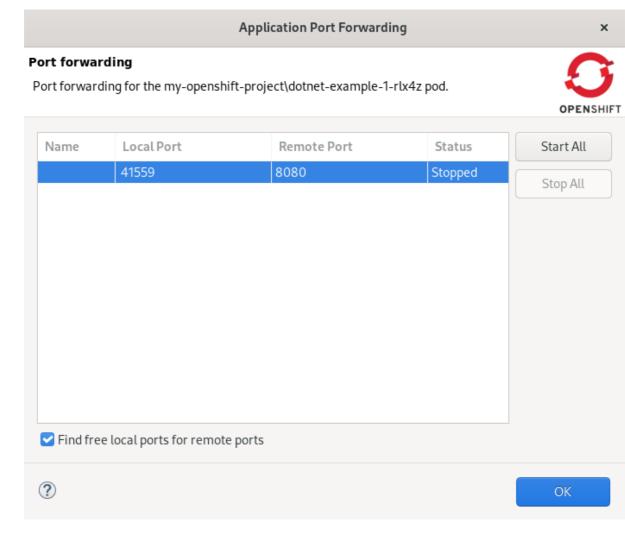
- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

Show View	×
openshift	×
✓ ➢ JBoss Tools	
OpenShift Application Explorer	
OpenShift Explorer	
Cancel	en

- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.
- 5. Click **Open**. The **OpenShift Explorer** view appears.

🗐 Console 🕸 Servers 🤇 OpenShift Explorer 🛿		
• O developer https://192.168.42.215:8443		
🕶 👪 my-openshift-project		
	ect.apps-crc.testing/	
😚 dotnet-example-1-deploy Pod Complete	ed	
🏠 dotnet-example-1-rlx4z Pod Running		
Interpretended and the state of the state	New	•
▶ 🐨 eap-app-ping	Show In	•
	Edit	•
	🗙 Delete	
	💢 Delete Resources	
	Server Adapter	
	🚸 Refresh	
	Scale	•
	Pod Log	
	Port Forwarding	
	Properties	Alt+Enter

- 6. Expand the OpenShift Container Platform connection.
- Right-click your application → Port Forwarding. The Port Forwarding window appears.



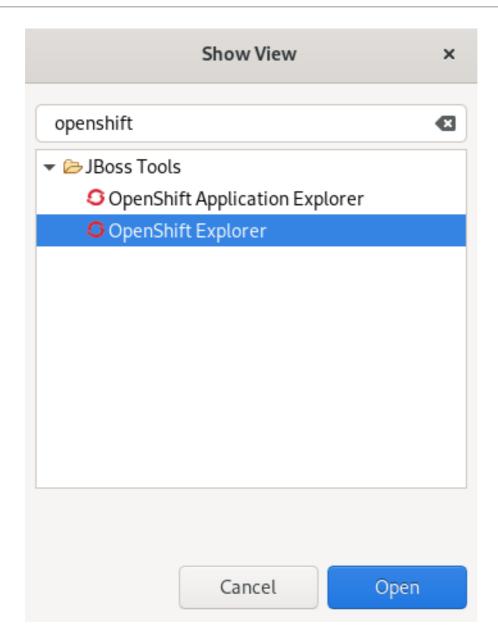
- 8. Check the Find free local ports for remote portsbox.
- 9. Click Start All.
- 10. Click **OK**.

The **Console** view appears showing the port-forwarding starting process.

2.2.3. Streaming Pod Logs

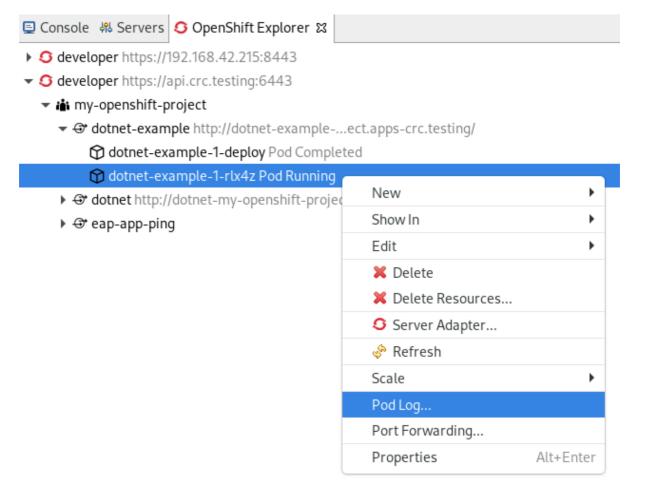
Pod logs are general logs for an application running on a remote OpenShift Container Platform instance. The streaming pod logs feature in CodeReady Studio is used to monitor applications and use the previous pod log to troubleshoot if the application fails or returns errors.

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.



- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.
- 5. Click **Open**.

The **OpenShift Explorer** view appears.



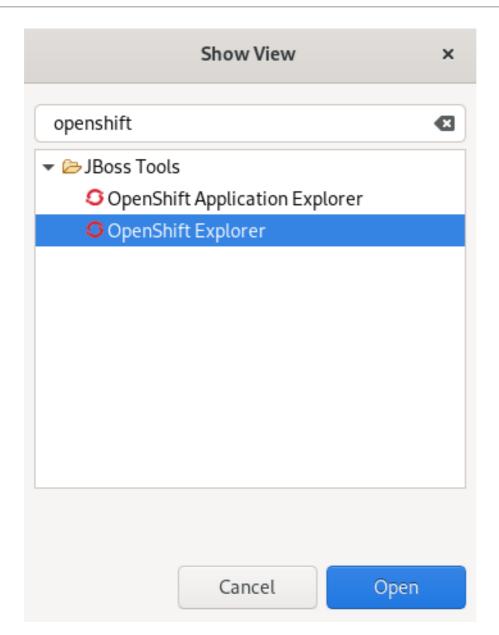
- 6. Expand the OpenShift Container Platform connection.
- 7. Right-click the **application** \rightarrow **Pod Log**.

The **Console** view appears displaying the Pod Log.

2.2.4. Streaming Build Logs

Build logs are logs that document changes to applications running on a remote OpenShift Container Platform instance. The streaming build logs feature in CodeReady Studio is used to view the progress of the application build process and to debug the application.

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.



- 3. Enter **OpenShift** in the search field.
- 4. Select OpenShift Explorer.
- 5. Click **Open**.

The **OpenShift Explorer** view appears.

G developer https://api.crc.testing:6443		
🔻 🏜 my-eap-project		
eap-app https://eap-app-my-eap-project.apps-crc.testing/		
⊕ eap-app-ping		
📸 my-openshift-project		
💌 📸 OpenShift Project os-project	New	
Image: State of the state of	Show In	
▶ 🗇 eap-app-ping	💢 Delete	
▶ 😌 postgresql	X Delete Resources	
Gegebhard@redhat.com https://api.engint.openshift.com	🔗 Refresh	
▼ 📸 eap2	Build Log	
 General and the second s	Properties	Alt+Ent
😂 eap-app-1 Build Running		

- 6. Expand the OpenShift Container Platform connection.
- 7. Right-click the **application** \rightarrow **Build Log**.

The **Console** view appears displaying the Build Log.

2.3. ADDITIONAL RESOURCES

• For more information on OpenShift Application Explorer, see Getting started with CodeReady Studio Tools.

CHAPTER 3. DEVELOPING WITH DOCKER IN CODEREADY STUDIO

3.1. MANAGING DOCKER CONNECTIONS

3.1.1. Setting up a Docker account

The following section describes how to set up a Docker account in CodeReady Studio.

Prerequisites

- Docker is installed on your system. For more information on how to install Docker, see Docker Docs - Get Docker.
- You have a Docker ID. For more information on how to get a Docker ID, see Register for a Docker ID.

- 1. Start CodeReady Studio.
- Click Window → Preferences.
 The Preferences window appears.

	Prefe	rences		×
registry accounts	Registry Account	5		← ▼ ⇒ ▼ 8
✓ Docker	Server Address	Username	Email	Add Edit Remove
? 🖻 🗹 🖲			Cancel	Apply and Close

3. Enter **Registry Accounts** in the search field.

4. Select Registry Accounts.

5. Click Add.

The New Registry Account window appears.

Edit Registry Account ×				
Add/Edit a Regist	ry Account			
Server Address:	https://index.docker.io			
Username:	levilee			
Email:	levi@redhat.com			
Password:	*****			
	Cancel OK			

- 6. Enter the Server Address.
- 7. Enter your Doker ID as the **Username**.
- 8. Enter the email associated with your Docker account.
- 9. Enter your password.
- 10. Click **OK**.
- 11. Click Apply and Close.

Your Docker account has been set up.

3.1.2. Testing an existing Docker connection

Prerequisites

- Your Docker account in CodeReady Studio is set up. For more information on how to set up a Docker account in CodeReady Studio, see Setting up a Docker account.
- You are logged in to your Docker account.

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

	Show View	×
docker		Ø
→ Docker ☐ Docker	Containers	
🎁 Docker	Explorer	
tocker	Image Hierarchy Images	
	Cancel	Open
. Enter Docker in the sea	rch field.	
Select Docker Explorer	:	

5. Click **Open**.

The **Docker Explorer** view appears.

🎁 Docker Explorer 🛿		i ×	§ 🖗	000		
Q						
Il Container Development	Environme	ent 3.2+	(https://	192.16	58.42	.215

- Container Devel it Environment 3.2 v٢
- iii unix:///var/run/docker.sock (unix:///var/run/docker.sock)
 - Containers
 - 🕨 🛅 Images
- 6. Right-click **Docker socket** \rightarrow **Edit**.

) Docker Explorer ដ	□ 0	×	Ŷ	₿⁄	000				
Q									
Container Development Envir	onment	3.2+	(htt	ps://	192.1	68.42	2.215		
🗸 🧵 unix:///var/run/docker.sock (u	nix:///va	r/ru	n/do	cker.	sock)	_			
🕨 🛅 Containers							Show	/In	►
🕨 🛅 Images							🕲 E	dit	
							₿ <u>₽</u>	nable	
							🗞 R	efresh	
							× <u>R</u>	emove	
							P ∎		

The Edit Docker Connection window appears.

	Edit Docker Connection	×
Connect to a Dock	ker daemon	
Connection name:	unix:///var/run/docker.sock	
🔾 Unix socket		
Location:	unix:///var/run/docker.sock	Browse
O TCP Connection		
URI:]
Enable authe	ntication	
Path:		Browse
		Test Connection
?	Cancel	Finish

7. Click Test Connection.

If the connection is configured correctly, a window stating **Ping succeeded!** appears.

8. Click **OK**.

9. Click Finish.

3.1.3. Editing a Docker connection

Prerequisites

- A set up Docker account in CodeReady Studio. For more information on how to set up a Docker account in CodeReady Studio, see Setting up a Docker account.
- You are logged in to your Docker account.

Procedure

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

Show View	×
docker	Ø
▼ 🗁 Docker	
💼 Docker Containers	
🕅 Docker Explorer	
🕆 Docker Image Hierarchy	
Docker Images	
Cancel	Open

3. Enter **Docker** in the search field.

- 4. Select Docker Explorer.
- 5. Click **Open**.

The Docker Explorer view appears.

The Docker Explorer view appears.							
🍘 Docker Explorer 🛿	E	Û	×	S.	₿⁄	000	
٩							

- Container Development Environment 3.2+ (https://192.168.42.215)
- iii unix:///var/run/docker.sock (unix:///var/run/docker.sock)
 - 🕨 🛅 Containers
 - 🕨 🛅 Images
- 6. Right-click **Docker socket** \rightarrow **Edit**.

ᆌ Docker Explorer 🛿	🖻 🚺 🗙 🤞	s 🖏 🖗		
۹				
Container Development	t Environment 3.2+ (h	nttps://192.16	58.42.215	
	ock (unix:///var/run/o	docker.sock)		
🕨 🖣 Containers			Show In	- F
🕨 🛅 Images			🗟 Edit	
			🕼 <u>E</u> nable	
			🦃 Refresh	
			X <u>R</u> emove	

The Edit Docker Connection window appears.

	Edit Docker Connec	tion	×
Connect to a Docl	ker daemon		
Connection name:	unix:///var/run/docker.sock		
🔾 Unix socket			
Location:	unix:///var/run/docker.sock		Browse
O TCP Connection			
URI:			
🗌 Enable authe	entication		
Path:			Browse
			Test Connection
?		Cancel	Finish

- 7. Click **Browse** in the **Unix socket Location** field to locate a new socket or check the **TCP Connection** option and add your host URI.
- 8. Click Finish.

Your docker connection has been edited.

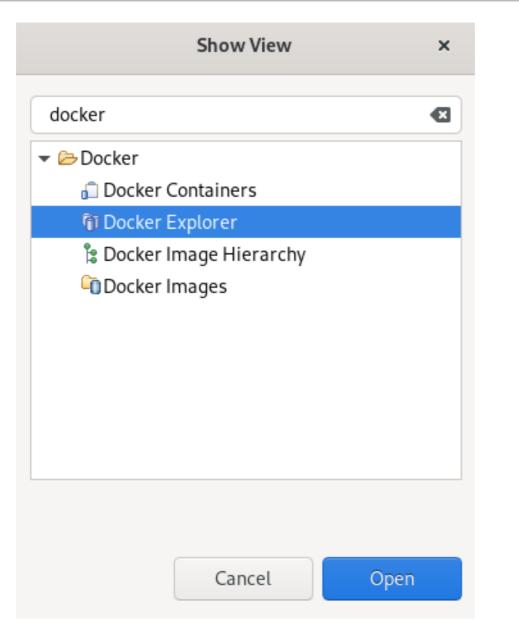
3.2. MANAGING DOCKER IMAGES

Prerequisites

- A set up Docker account in CodeReady Studio. For more information on how to set up a Docker account in CodeReady Studio, see Setting up a Docker account.
- You are logged in to your Docker account.

3.2.1. Pulling Docker images

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.



- 3. Enter **Docker** in the search field.
- 4. Select Docker Explorer.
- 5. Click **Open**.

The **Docker Explorer** view appears.

🎁 Docker Explorer 🛿	E	6 x	§% 🕑	000		
٩						
II Container Development	Environme	ont 3 7+	(https://	192 16	58 47	215

Container Development Environment 3.2+ (https://192.168.42.215)

i unix:///var/run/docker.sock (unix:///var/run/docker.sock)

- 🕨 🛅 Containers
- 🕨 🛅 Images
- 6. Expand the **Docker socket** folder.

7. Right-click Images → Pu	11.								
🕅 Docker Explore	r 🛙		Û	×	S.	¢	8		
۹									
🕨 🔋 Container D	evelopment Env	ironm	ent	3.2+	(htt	ps://	192.16	8.42	.215
👻 📋 unix:///var/r	un/docker.sock	(unix:/	//va	r/ru	n/do	cker.	sock)		
🕨 🛅 Containe	rs								
🕨 🕨 👘 Images			_						
	🦑 Refresh	F5	5						
	,ª <u>P</u> ull								
The Pull Image window a	ppears.								
	Pul	l Image							×
Pull an image or a re	epository from th	e regis	try						9
Specify a repository or	a single image to pul	l down t	o the	host					

Registry account:	https://index.docker.io	•	Add a registry account
Image name:			Search
?		Cance	el Finish

8. Click Search.

The Search the Docker Registry for images window appears.

		Search and	pull a Docker i	mage	×
Search the Docker Registry for images					
Image:	Q wildfly				Search
Matchin	g images				
Name			Stars	Official	Automated
jboss/w	vildfly		534		×
openshi	ift/wildfly-101 ift/wildfly-81-		8 1		
Descript WildFly	r application s	erver image			
?		< Back	Next >	Cance	el Finish

9. Enter your image name into the search field.

10. Click Next.

The Choose a tag for the selected image window appears.

Tag	Layer	Pulled	
15.0.1.Final			
16.0.0.Final			
17.0.0.Final			
17.0.1.Final			
18.0.0.Final			
18.0.1.Final			
19.0.0.Final			
19.1.0.Final			
20.0.0.Final			
20.0.1.Final			

11. Choose a tag for your image.

12. Click Finish.

The Pull an image or a repository from the registry window appears.

	Pull Image		×
Pull an image or	a repository from the registry		
Registry account:	https://index.docker.io	•	Add a registry account
Image name:	jboss/wildfly:20.0.1.Final		Search
?		Cano	cel Finish

13. Click Finish.

Your new Docker image is now listed in the **Docker Explorer** view.

询 Docker Explorer 🛛	E	Û	×	S.	₿⁄	8		
٩								
Container Development En				-			8.42	.215
unix:///var/run/docker.sock	k (unix:/	//va	r/rui	n/do	cker.	.sock)		
🕨 🛅 Containers								
🔻 🛅 Images								
🗊 alpine:latest (a24bb4	013296	5)						
🗊 hello-world:latest (bf	756fb1a	ae65	5)					

💼 jboss/wildfly:20.0.1.Final (d44b13971eb9)

3.2.2. Pushing Docker images

Before pushing an image you must tag it. The following section describes how to tag and push a Docker image in CodeReady Studio.

Procedure

1. Start CodeReady Studio.

 Click Window → Show View → Other. The Show View window appears.

Show View	×
docker	•
 Docker Docker Containers 	
🕅 Docker Explorer	
Docker Image Hierarchy Docker Images	
Cancel Ope	n

- 3. Enter **Docker** in the search field.
- 4. Select Docker Explorer.
- 5. Click **Open**.

The **Docker Explorer** view appears.

🎁 Docker Exp	olorer 🛛		E	Û	×	S.	02	000		
Q										
Contair	ner Develo	pment Env	ironm	ent	3.2+	· (htt	ps://	192.16	8.42	.215
← 📋 unix:///	var/run/do	cker.sock	(unix://	//vai	r/rui	n/do	cker.	.sock)		
🕨 🛅 Cont	ainers									
🕨 🛅 Imag	jes									
	,									
6. Expand Docker so	cket → Image	S.								
7. Right-click the ima	ge you want to	o tag.								
8. Click Add tag.										
🕅 Docker Explore	er 🔀	□ 🗊	× \$	₿⁄	8					
Q										
Container D)evelopment F	nvironment	3.2+ (htt	ps://1	92.16	68.42	.215			
▼ ii unix:///var/										
🕨 🗐 Containe	rs									
👻 🛅 Images										
	:latest (a24bl		3							
	world:latest (I wildfly:20.0.1									_
						<u>R</u> un				
					Sho	ow In				•
							-	e Hiera	rchy	
						Re <u>m</u>				_
						P <u>u</u> sh				
						Add] move				
							2	DpenShi	ft	
							,			

The Tag Image window appears.

Tag Imag	Je	×
Tag Image Specify new additional tag for image with id 'd44	b13971eb9'	
New Tag: username/wildfly:20.0.1.Final		
?	Cancel	Finish

- 9. Enter your tag in the New Tag field.
 The tag should be in the form of username/image_name:tag_name, where username is your Docker ID on https://hub.docker.com, image_name is the name of your image, and tag_name is the version of your image.
- 10. Click Finish.
- 11. Right-click the **tagged image** \rightarrow **Push**.

ᆌ Docker Explorer 🛿			()	ে প্রু	₿⁄	8					
Q											
🕨 📋 Container Develo	pment Envir	onme	ent 3.2	2+ (htt	ps://1	92.16	58.42	2.215			
	ocker.sock (u	nix://	/var/r	un/do	cker.	sock)					
🕨 🛅 Containers											
🔻 🛅 Images											
🗊 alpine:lates	st (a24bb401	3296)								
🗊 hello-world	l:latest (bf75)	6fb1a	e65)								
🗊 jboss/wildf	l <mark>y:20.0.1.Fin</mark> a	al (d44	4b139	71eb9)						
👩 levilee/wild	fly:20.0.1.Fir	nal (d4	44b13	971et	9) –	_	_				
							<u>R</u> un				- 1
						Sh	ow Ir	۱			•
						18	Оре	en Ima	ige Hier	rarchy	
						×	Re <u>n</u>	nove			
						Ľ	P <u>u</u> s	h			
						T	Add	<u>T</u> ag			
						<u>R</u> e	mov	e Tag			
						9	Dep	loy to	OpenS	hift	
					_						

The **Push image to Registry** window appears.

	Push Image	:	×
Push Image to R (i) Select an image	egistry name (or input a new one), then select	ct a target registry.]
	levilee@https://index.docker.io levilee/wildfly:20.0.1.Final mage with selected registry nage upon completion	► Add a registry account	<u>it</u>
?		Cancel Finish	

- 12. Select the **Registry Account** that starts with your Docker ID.
- 13. Click **Finish**.

After you push the image it appears in the Docker Cloud. This image is then available for other developers to use.

3.2.3. Running Docker images

Procedure

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

Show View	×
docker	
🔫 🗁 Docker	
💼 Docker Containers	
🕅 Docker Explorer	
🕆 Docker Image Hierarchy	
Docker Images	
Cancel	Open

- 3. Enter **Docker** in the search field.
- 4. Select Docker Explorer.

5. Click **Open**.

The **Docker Explorer** view appears.

	🎁 Docker Explorer 🛱		Ē	Û	×	S.	02	000		
	٩									
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6. I	Expand Docker socket → Images .									
7. I	Right-click an image you want to r	un.								
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The $\operatorname{\textbf{Docker}}$ Container settings window appears.

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	<u>Pull this i</u>	mage				
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Command:	/opt/jbo	ss/wildfly/bin/st	andalone.sh -b ().0.0.0		
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- 9. Name the container.
- 10. Clear the **Publish all exposed ports to random ports on the host interfaces**check box.

- 11. Check the box for the **8080** port.
- 12. Click **Finish**.

The **Console** view appears showing the process of starting the image.

13. In the web browser, navigate to http://localhost:8080/ to see the image running.



3.2.4. Building images with Dockerfile

You can build or create an image by modifying an existing image. Typically, this involves installing new packages. The specification of the new Docker image is done via **Dockerfile**.

Prerequisites

• You must have a Dockerfile created on your local machine.

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

Show View	×
docker	Ø
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🗖 Docker Images	
Cancel Ope	n

- 3. Enter **Docker** in the search field.
- 4. Select Docker Images.
- 5. Click **Open**.

The **Docker Images** view appears.

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unix:///var/run/docker.sock (3/3 l	ages)							

Q							
Id	Repo Tags	Created	 Virtual Size 				
3723f7584875	jboss/wildfly:20.0.0.Final levilee/wildfly:latest	2020-06-22	765.8 MB				
a24bb4013296	alpine:latest	2020-05-29	5.6 MB				
bf756fb1ae65	hello-world:latest	2020-01-03	13.3 kB				

6. Click the **Build Image** icon.

	ild Image		
	Build a Docker I	Image	×
Build a Dock Specify a new	er Image image name and a directory containi	ing a Dockerfile to build it.	
Image Name: Directory:	my-docker-repo/wildfly:20.0.1Fina /home/levi/eclipse-workspace/my-		(erfile
?		Cancel	ih

- 7. Name the image in the format of **repo/name:version**.
- 8. Click **Browse** to locate the Dockerfile.
- 9. Click Finish.

The **Console** view appears displaying the build process.

3.3. MANAGING DOCKER CONTAINERS

Docker containers are isolated processes that are based on Docker images. Once created, users can stop, start, pause, unpause, kill, or remove the containers as well as read their logs.

The following section describes how to manage Docker containers in CodeReady Studio.

- 1. Start CodeReady Studio.
- Click Window → Show View → Other. The Show View window appears.

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Docker Explorer Docker Image Hier Docker Images	archy
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nter Docker into the search field.	
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The **Docker Containers** view appears.

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4.

5.

📋 Docker Containe	rs 🛛			▶ 00	ID 🛛 🛇 🗞 🗙	S 00 □ □
unix:///var/run	/docker.sock (5	6 Containe	rs)			
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Name	Image	Created	Ŧ	Command	Ports	Status
🗟 blissful_lamarr	sha256:4109fef685	2020-07-21		/bin/sh -c 'cd \$HO№		Exited (6) 10 minute
嶺 cool_blackwell	sha256:53abac4f18	2020-07-21		/bin/sh -c 'cd \$HO№		Exited (6) 6 minutes
🖡 my-docker-conta	levilee/wildfly:lates	2020-07-21		/opt/jboss/wildfly/b	0.0.0.0:8080->808	Up About an hour
🗟 practical_bell	hello-world	2020-07-21		/hello		Exited (0) 6 hours ag
🗟 relaxed_lalande	hello-world	2020-07-21		/hello		Created

You can start, pause, unpause, stop, kill, restart, remove, or refresh the containers by using the panel.

