

Part E: Create CI/CD Pipeline

Estimated time needed: 30 minutes

Lab Overview

IBM provides a Continuous Delivery service along with an integrated set of tools to build, deploy and manage your applications. You can build, test, and deploy in a repeatable way with minimal human intervention. You can create a toolchain from a template or build one from scratch by enabling an application for continuous delivery. The toolchain will use the Continuous Delivery service under the covers. By default, Continuous Delivery automatically runs the build and deploy tasks when you commit changes to the Git repository (repo). The pipeline also features a "run" icon that runs a stage of the pipeline but only runs on committed code or builds, depending on the stage.

Objectives

After completing this lab, you will be able to:

1. Create a Continuous Delivery service on IBM Cloud
2. Add automated pipeline to your application
3. Be able to commit new code to github repo to automatically start the deployment process

Lab Instructions

This lab is broken up into the following tasks:

- [Part E: Create CI/CD Pipeline](#)
 - [Lab Overview](#)
 - [Objectives](#)
 - [Lab Instructions](#)
 - [1. Create a Continuous Delivery Service from the Catalog](#)
 - [2. Add Continuous Delivery to your Cloud Foundry Application](#)
 - [Author\(s\)](#)
 - [Changelog](#)

Note: If you already have an IBM Cloud account, you can skip Tasks 1 and 2 and proceed with Task 3: Login to your IBM Cloud account.

1. Create a Continuous Delivery Service from the Catalog

Navigate to <https://cloud.ibm.com/catalog> to launch the IBM Cloud Catalog.

From the catalog, choose the **Services** menu on the left, and filter by **Developer Tools** and **Lite**. Then click on the **Continuous Delivery** tile.

The screenshot shows the IBM Cloud Catalog interface. On the left sidebar, the 'Catalog' menu is expanded, and the 'Developer Tools' category is selected. Below it, the 'Provider' section has 'IBM' selected, and the 'Pricing plan' section has 'Lite' selected. The main content area displays 'Services' with a search bar and filters for 'Developer Tools', 'IBM', and 'Lite'. Four service tiles are shown: 'API Gateway', 'Continuous Delivery' (highlighted with a red box), 'Schematics', and 'Toolchain'. Each tile includes a description and the pricing plan 'Lite • Free • IAM-enabled'. A 'FEEDBACK' button is visible on the right side of the service tiles.

On the next screen, choose the Lite tier. You can optionally give your service a name. Click the **Create** button to continue.

IBM Cloud

Search resources and offerings...

Q

Catalog


Docs

Support

Manage

Cloudapp Devs

Catalog / Services /

Continuous Delivery

Author: IBM • Date of last update: 10/02/2020 • Docs

Create

About

Select a region

Select a region

Dallas

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or region: [United States](#)

Plan	Features	Pricing
Lite	<div>Continuous Delivery for organizations (orgs) or resource groups of up to 5 users</div> <div>5 users per organization or resource group</div> <div>500 Delivery Pipeline jobs run per organization per month or per resource group per month</div> <div>500 MB of private Git Repos storage per organization or resource group</div> <div>The Lite plan offers the full capabilities of Continuous Delivery, with usage limits, to small teams at no cost.</div> <div>Lite plan services are deleted after 30 days of inactivity.</div>	Free


Create

Add to estimate


View terms





FEEDBACK

You will be taken to the Continuous Delivery home page. Click on the **Create new toolchain** link



 IBM Cloud

Search resources and offerings...

 Catalog Docs Support Manage Cloudapp Devs



Resource list /

Continuous Delivery-ub  Active Add tags 

Details Actions...

Getting started


Manage

Plan

Getting started with Continuous Delivery

Last Updated: 2020-07-30

Adopt a DevOps approach by using IBM® Cloud Continuous Delivery, which includes open toolchains that automate the building and deployment of applications. You can get started by creating a simple deployment toolchain that supports development, deployment, and operations tasks.

 **Tip:** If you already have an instance of Continuous Delivery, you can [create a toolchain](#) or [view existing toolchains](#).

Prerequisites

Before you can create a continuous delivery toolchain from a template, you must create an instance of Continuous Delivery by selecting it from the IBM Cloud catalog. The toolchain integrates tools for planning, developing, deploying pipelines, and managing your applications. You can always add or remove tools from your toolchains. If you already have toolchains, you can [view existing toolchains](#). For more information about working with toolchains, see [Using toolchains](#).

FEEDBACK

2. Add Continuous Delivery to your Cloud Foundry Application

Pick **Develop a Cloud Foundry app** from the templates provided on this page.

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Cloudapp Devs

Toolchains /

Create a Toolchain

To get started, select a toolchain template. You can use the filters or the search box to narrow the scope.

Filters

Deployment targets

☐ Cloud Foundry

☐ Kubernetes

Tool integrations

☐ Delivery Pipeline - Tekton

☐ Delivery Pipeline - Classic

☐ DevOps Insights

☐ Eclipse Orion Web IDE

☐ Git Repos and Issue Tracking

☐ GitHub


☐ PagerDuty

☐ Sauce Labs

Search toolchain templates

All (13)




Build and Deploy Templates




Develop a Cloud Foundry app

IBM

Continuously deliver a Cloud Foundry app with repos and issue tracking hosted by IBM.




Tools:   




Develop a Kubernetes app

IBM

Continuously deliver a secure Docker app to a Kubernetes Cluster.




Tools:   




Develop a Kubernetes app with Helm

IBM

Continuously deliver a secure Docker app to a Kubernetes Cluster using a Helm Chart.




Tools:   




Develop a Kubernetes app with Razee

IBM

Continuously deliver a secure Docker app to a Kubernetes Cluster using Razee




Tools:   



Develop a Kubernetes app with image signing

IBM

Continuously deliver a secure signed Docker app to a Kubernetes Cluster.

Tools:   

ASK A QUESTION

FEEDBACK

Give your toolchain a meaningful name, pick the region that your application is running in and then pick **github** from the list of source providers.

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[Toolchains](#) / [Create a toolchain](#)

Develop a Cloud Foundry app

Create

About

Toolchain Name:

simple-toolchain-20201018192616928

Select Region:

Dallas

Select a resource group:

Default

Select a CF Organization (deprecated)

Select a source provider:

GitHub

✓ Git Repos and Issue Tracking

GitLab

Bitbucket

GitHub Enterprise Whitewater

The bottom of the page should change and you can configure your github account. Click **Authorize** to integrate your github account with this toolchain.

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Search resources and offerings...

Q

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[Toolchains](#) / [Create a toolchain](#) /

Develop a Cloud Foundry app

Create

About

Toolchain Name:

simple-toolchain-20201018192851573

Select Region:

Dallas

Select a resource group:


Default


Select a source provider:


GitHub

Select a CF Organization (deprecated)

Tool Integrations

 **GitHub**
Required

 **Delivery Pipeline**
Required


 **More tools**

Store your source code in a new or existing repository on GitHub.com, or on your own GitHub Enterprise server.
Engage in social coding through wikis, issue tracking, and pull requests.

GitHub Server:

GitHub (https://github.com)

Unauthorized on GitHub. Please click Authorize to continue with this server.

 You must authorize before you can configure this tool integration.

Authorize

This opens a new tab and you are asked to sign into your github account. Once you do this, the tab closes and you are taken back to finish configuring the toolchain.

Pick **Existing** as **Repository Type** and then pick the fork you created in the previous step. If the repo is not listed, you can enter the URL of the repository manually and click on **Create**.

IBM Cloud

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Q Catalog Docs Support Manage Cloudapp Devs

Dallas

Default

Select a CF Organization (deprecated)

Select a source provider:

GitHub

Tool Integrations

GitHub

Delivery Pipeline
Required

More tools

Store your source code in a new or existing repository on GitHub.com, or on your own GitHub Enterprise server.
Engage in social coding through wikis, issue tracking, and pull requests.

GitHub Server:

GitHub (https://github.com)

Authorized as lidderupk with access granted to IBM, sellatech GitHub organization(s) [Manage Authorization](#)

Repository type:

Existing

Link to the repository that is specified in the Repository URL field.

Repository URL: ⓘ

https://github.com/lidderupk/qkfls-Movie-Reviews-Database X

Integration Owner: ⓘ

lidderupk

☒ Enable GitHub Issues ⓘ

☒ Track deployment of code changes ⓘ

Cancel

Create

You will be taken to the API screen . Click **New** to create a new key.

IBM Cloud

Search resources and offerings...

Q

Catalog

Docs

Support

Manage

Cloudapp Devs

Toolchain Name:

simple-toolchain-20201018195223656

Select Region:

Dallas

Select a resource group:

Default

Select a CF Organization (deprecated)

Select a source provider:

GitHub

Tool Integrations

GitHub

Delivery Pipeline

Required

More tools

The Delivery Pipeline automates continuous deployment.

App name: ①

simple-toolchain-20201018195223656

IBM Cloud API key: ①

IBM Cloud API key

New +

The value is required.

Region

Organization

Space

The IBM Cloud region

The IBM Cloud org

The IBM Cloud space

Cancel

Create

Accept the default in this screen.

Select Region: Dallas Select a resource group: Default

Select a source provider: GitHub

Select a CF Organization (deprecated)

Tool Integrations

GitHub Delivery Pipeline Required

The Delivery Pipeline automates continuous deployment.

App name: simple-toolchain-20201018195223656

IBM Cloud API key: IBM Cloud API key

The value is required.

Region	Organization	Space
The IBM Cloud region	The IBM Cloud org	The IBM Cloud space

Cancel Create

Create a new API key with full access

Warning: This will create a new API key that allows anyone who has it the ability to do anything you could do. You can improve your security posture by using the [IAM UI to create a service ID API key](#) that limits access to only what your pipeline requires, and then pasting that into the template UI instead. For more information on API keys and access see the [IAM documentation](#).

Name	Description
API Key for simple-toolchain-20201018195223656	

☐ Save this key in a secrets store for reuse

Cancel OK

The **Region**, **Organization** and **Space** will be autofilled. Pick the correct values if the default ones are incorrect. Ensure the **App Name** is the same as your application name in the manifest file. If the application name is not the same, the toolchain will create a brand new application for you instead of adding continuous delivery to the application you deployed earlier. Finally, click on **Create** to create the toolchain.

Tool Integrations



GitHub



Delivery Pipeline



More tools

The Delivery Pipeline automates continuous deployment.

App name: ⓘ

movies-reviews-database-38a



IBM Cloud API key: ⓘ

.....



New



Region

Organization

Space ⓘ

Dallas



cloudappdevs@gmail.com




dev




Cancel





Create

You are now taken to the toolchain. Click on **Delivery** pipeline.

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Toolchains /

simple-toolchain-20201018195223656 [Add tags](#)



Details

Actions...

Overview

Connections


Manage

 Your toolchain is ready! Quick start: Commit a change to the Git repo to trigger a new build and deployment. For step-by-step instructions, see the [tutorial](#) for this toolchain. 

Think

Code


Deliver



Issues

qkfls-Movie-Reviews...


✓ Configured



GitHub

qkfls-Movie-Reviews...


✓ Configured



Delivery Pipeline

simple-toolchain-20...

No stages detected




Eclipse Orion Web IDE

✓ Configured


FEEDBACK





ASK A QUESTION

You may see the **BUILD** or the **DEPLOY** stages running. The screen here shows the **BUILD** stage as passed and the **DEPLOY** stage as currently running.

 IBM Cloud

Search resources and offerings...



 Catalog Docs Support Manage ▾ Cloudapp Devs


Toolchains / [simple-toolchain-20201018195223656](#) / [simple-toolchain-20201018195223656](#) /


simple-toolchain-20201018195223656 | Delivery Pipeline

Add Stage + Actions... ▾


BUILD  

STAGE PASSED



LAST INPUT [Git URL](#) 



 Last commit by Upkar Lidder 3d ago
regenerating package-json to clean u...

JOBS [View logs and history](#)

 Build Passed now


LAST EXECUTION RESULT

 Build 1 


DEPLOY  

STAGE RUNNING...

LAST INPUT Stage: BUILD / Job: Build

 Build 1

JOBS [View logs and history](#)

 Rolling Deploy Running

LAST EXECUTION RESULT

No results

FEEDBACK

ASK A QUESTION

Click on the gear setting on the **BUILD** stage and then select **Configure Stage**.

The screenshot displays the IBM Cloud Delivery Pipeline interface. At the top, there's a navigation bar with the IBM Cloud logo, a search bar, and links to Catalog, Docs, Support, Manage, and Cloudapp Devs. Below this, the breadcrumb trail shows 'Toolchains / simple-toolchain-20201018195223656 / simple-toolchain-20201018195223656 /'. The main heading is 'simple-toolchain-20201018195223656 | Delivery Pipeline'. To the right of the heading are buttons for 'Add Stage +', 'Actions...', and a dropdown arrow. The main content area shows two stages: 'BUILD' and 'DEPLOY'. The 'BUILD' stage is highlighted with a green bar and labeled 'STAGE PASSED'. It has a 'LAST INPUT' section showing 'Git UI' and 'Last commit by Upkar Lidder' with a link to 'regenerating package-json to clear'. Below this is a 'JOBS' section with a 'Build' job that is 'Passed now'. The 'DEPLOY' stage is highlighted with a blue bar and labeled 'STAGE RUNNING...'. It has a 'LAST INPUT' section showing 'Stage: BUILD / Job: Build' and a 'Rolling Deploy' job that is 'Running'. A context menu is open over the 'BUILD' stage, showing options: 'Configure Stage', 'Clone Stage', 'Reorder Stage', and 'Delete Stage'. The 'DEPLOY' stage also has a 'View logs and history' link. On the right side of the interface, there are two vertical buttons: 'FEEDBACK' and 'ASK A QUESTION'.

Take a screenshot as shown above. It must show the **Delivery Pipeline** with the **Build** and **Deploy** stages. Save the screenshot as **cicdtoolchain.jpg**. You will be asked to submit this file at the end of the final project.

You can see the job is setup to build every time a change is pushed to the master branch.

IBM Cloud Search resources and offerings... Catalog Docs Support Manage Cloudapp Devs

Toolchains / simple-toolchain-20201018195223656 / simple-toolchain-20201018195223656 / Stage Configuration /

simple-toolchain-20201018195223656 | Stage Configuration

Actions...

BUILD

Delete

Input Jobs Workers New Environment pro...

Input settings

Input type i

Git repository

Git repository

qkfls-Movie-Reviews-Database

Git URL

https://github.com/lidderupk/qkfls-Movie-Reviews-Database.git

Branch

master

Stage trigger

☐ Run jobs only when this stage is run manually

☒ Run jobs automatically for Git events on the chosen branch

FEEDBACK

ASK A QUESTION

Take a screenshot showing that “Git Repository” matches your fork of the project repository. Save the screenshot as **gitrepository.jpg**. You will be asked to submit this file at the end of the final project.

You have to take one last screenshot before finishing this lab. Click on the menu on the top left to go back to the resources page. Expand the **Services** section. You should see your **Continuous Delivery** service listed as shown

here.

The screenshot shows the IBM Cloud console interface. At the top is a dark navigation bar with the IBM Cloud logo, a search bar, and links for Catalog, Docs, Support, and Manage. Below this is a light gray header area with the title 'Resource list' (highlighted with a red box) and a blue 'Create resource' button. The main content area features a table with columns: Name, Group, Location, Status, and Tags. Below the table header are five filter boxes: 'Filter by name or IP address...', 'Filter by group or org...', 'Filter...', 'Filter...', and 'Filter...'. The table lists several resource categories: Devices (0), VPC infrastructure (0), Clusters (0), Cloud Foundry apps (1), Cloud Foundry services (1), and Services (21). Under the 'Services' category, the 'Continuous Delivery' service is listed (highlighted with a red box) with a group of 'default', location of 'Dallas', and status of 'Active'.

Name	Group	Location	Status	Tags
Filter by name or IP address...	Filter by group or org...	Filter...	Filter...	Filter...
Devices (0)				
VPC infrastructure (0)				
Clusters (0)				
Cloud Foundry apps (1)				
Cloud Foundry services (1)				
Services (21)				
Continuous Delivery	default	Dallas	Active	-

Take a screenshot of this page showing the service and save it as **resourcepage-cicd.jpg**. You will be asked to submit this file at the end of the final project.

Congratulations! You've now set up Continuous Delivery on your project. Next lab will ask you to push a new change to github that should automatically kick the toolchain using the Continuous Delivery service you just set up!

