



IBM Cloud Pak for Applications Solution Architect Workshop

Course description

WD108 (Classroom) ZD108 (Self-paced)

In this course, you learn how to use IBM Cloud Pak for Applications to modernize applications and build new cloud native architectures. It describes the features and capabilities of Cloud Pak for Applications and the Red Hat OpenShift Container Platform on which it runs.

This course covers the essentials that you need to use IBM Cloud Pak for Applications, such as cloud native, microservices, container orchestration, and DevOps. It describes how to use Cloud Pak for Applications tools to modernize applications and manage the governance and lifecycle of new applications, including serverless and mobile. You also learn how to build architectures that integrate with DevOps pipelines.

For more information about IBM course offerings, see the IBM Training website:

<http://www.ibm.com/training>

General information

Delivery method

Classroom, self-paced virtual classroom (SPVC)

Course level

ERC 1.0

Product and version

Cloud Pak for Applications V4.x

Audience

This course is for system architects and designers who want to build solution architecture by using IBM Cloud Pak for Applications.

Learning objectives

After completing this course, you should be able to:

- Describe the cloud native development approach.
- Describe key microservices principles.
- Explain how containers and container orchestration works.
- Describe features and capabilities of OpenShift Container Platform.
- Describe features and capabilities of Cloud Pak for Applications.
- Design a solution architecture for new applications, such as serverless and mobile.
- Use Accelerators for Teams to manage governance and lifecycles of new applications.
- Describe the application modernization journey and tools.
- Design a solution architecture that integrates DevOps.

Prerequisites

The ideal candidate for this course has a strong foundation in cloud computing and working knowledge of the Linux® operating system.

Duration

2 days

Skill level

Intermediate

Notes

The duration times given for each unit are time estimates for lecture material and hosted lab exercises only and do not include time for discussions, breaks, or supplemental learning materials such as videos, readings, and optional assignments.

This course compiles together several of the training resources and study aids that are suggested to prepare for the exam: IBM Cloud Pak for Applications Solution Architect V4.1 (C1000-087).

This course is a new course.

Course agenda

Course introduction

Presentation time: 10 minutes

Unit 1. Cloud Native Essentials

Duration: 1 hour

Overview	This unit introduces you to the important concepts you need to know about to use Cloud Pak for Applications. It is not an exhaustive discourse on the topic but summarizes essential knowledge and provides entry points for further study.
Learning objectives	<ul style="list-style-type: none">• Define cloud native.• List the 12-factors in the 12-factor methodology.• Describe key cloud native principles.• Describe the purpose of a service mesh.• Describe the cloud native reference architecture and components.• List the non-functional requirements of a cloud native solution.• Describe the cloud native development approach.• Define microservices.• Describe key microservices principles.• Describe the benefits of using microservices.• Describe the microservices reference architecture and components.• Describe some common microservices patterns.• Define containers.• List the benefits of using containers.• Describe the container lifecycle.• Describe container orchestration.• Describe Kubernetes features and components.

Unit 2. OpenShift Container Platform Overview

Duration: 1 hour

Overview	This unit introduces the Red Hat OpenShift Container Platform. It describes what you need to know to get started with using it with Cloud Pak for Applications and provides resources for further study.
Learning objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none">• Describe OpenShift architecture.• Use the OpenShift console to view cluster information.• Use the OpenShift command-line interface to work with pods, containers, and deployments.• Explain OpenShift authentication and security capabilities.• Describe the operator framework.• Explain routing and scheduling.• Work with images, daemon sets, and jobs.• Discuss OpenShift on multi-cloud.• Discuss storage considerations.• Explain OpenShift high availability.• Explain OpenShift disaster recovery.• Discuss backup and restore strategies.

Unit 3. Cloud Pak for Applications Overview

Duration: 40 minutes

Overview	This unit introduces the Cloud Pak for Applications. It highlights the components, features and benefits, and describes some use cases for Cloud Pak for Applications.
Learning objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none">• Define Cloud Paks.• Describe the IBM and Red Hat hybrid cloud strategy.• Define a successful application strategy.• Describe the features and benefits of using Cloud Pak for Applications.• Describe Cloud Pak for Applications support for existing applications.• List cloud native development and application modernization tools that are part of Cloud Pak for Applications.• List supported runtimes and frameworks.• List Cloud Pak virtual processor core (VPC) offerings and trade-up offerings.• Understand the business value of Cloud Pak for Applications.• Describe the Cloud Pak for Applications DevOps add-on.• Describe how Cloud Pak for Applications can be used with IBM Edge.• Describe how Cloud Pak for Applications can be used with blockchain.

Unit 4. Building a Cloud Native Solution Architecture

Duration: 1 hour

Overview	This unit discusses several options and considerations for building cloud native applications and describes the Cloud Pak for Applications components that support building a cloud native architecture.
Learning objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none">• Define build-to-manage.• Describe some practices to be considered in a build-to-manage approach.• Define serverless computing.• Explain what a serverless application is.• Describe the architecture and components of Knative.• Describe the structure of a Knative service definition.• Deploy a Knative application to OpenShift.• Describe event-driven architecture.• List some event-driven code patterns.• Describe IBM Mobile Foundation.• Describe how to deploy IBM Mobile Foundation with Cloud Pak for Applications.• Describe how to create CI/CD pipelines for mobile applications.• List the runtimes available in Cloud Pak for Applications.• List the supported integrated development environments (IDEs).

Unit 5. The Application Modernization Journey

Duration: 1 hour

Overview	This unit describes various strategies and techniques for modernizing your existing applications by using Cloud Pak for Applications.
Learning objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none">• Define application modernization.• List the benefits of modernizing applications.• Describe how to assess the application portfolio.• Describe some application modernization strategies.• Describe the Cloud Pak for Applications modernization solution in terms of build, deploy, and run phases.• Describe how to move or “replatform” an application with minimal code changes.• Describe how to containerize a traditional WebSphere application for operational modernization.• Describe the options for modernizing mainframe applications.• Describe how to modernize mobile applications.• Describe how to use Transformation Advisor to assess application cloud readiness.• Describe how to use Application Navigator to visualize, inspect, and interact with deployed resources in your environment.• Describe how to use WebSphere Server Migration Toolkit to evaluate and move applications to Liberty.

Exercise 1. Application Modernization Journey Part 1 - Evaluation

Duration: 45 minutes

Overview	In this exercise, you walk through the process to evaluate an existing Java® application by using IBM Cloud Transformation Advisor.
Learning objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none">• Download and run Transformation Advisor.• Use Transformation Advisor to evaluate on-premises Java® application.

Exercise 2. Application Modernization Journey Part 2 - Replatform

Duration: 45 minutes

Overview	In this exercise, you learn how to use Transformation Advisor to prepare a migration bundle for your application and deploy it to OpenShift.
Learning objectives	<p>After completing this unit, you should be able to:</p> <ul style="list-style-type: none">• Create and test a migration bundle.• Containerize and deploy a Liberty application to OpenShift.

Exercise 3. Application Modernization Journey Part 3 - Rehost

Duration: 1 hour

Overview	This exercise demonstrates how to move a selected candidate Java® application from a traditional WebSphere Application Server (WebSphere Application Server) environment to a WebSphere Application Server container without any code change, and then deploy it to OpenShift.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Build a WebSphere Application Server Base server container image.• Push the image to the OpenShift image registry.• Deploy the container to an OpenShift cluster.

Exercise 4. Application-centric Management with Application Navigator

Duration: 45 minutes

Overview	This exercise shows you how to use IBM Application Navigator as a single view to all of your applications across WebSphere Application Server cells, Liberty collectives, and Kubernetes containers.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Import a WebSphere Application Server Network Deployment cell and Liberty Collective resources into Application Navigator.• View applications in Application Navigator

Unit 6. Using Accelerators for Teams

Duration: 40 minutes

Overview	This unit describes the Accelerators for Teams component in Cloud Pak for Applications in more detail and explains how solution architects can use it to enable governance over application development.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Describe Accelerators for Teams tools and capabilities.• Describe the business value and outcomes of cloud native governance.• Describe the expanded tools and services for developers.• List Accelerators for Teams high-level tasks.• Set up application stacks.• Manage stacks with the CLI.• Customize stacks.• Work with custom resource definitions.

Exercise 5. Enable Governance on Application Development - Stack Management**Duration: 1 hour**

Overview	In this exercise, you take on the role of a solution architect to provide governance over the application stacks that are available to developers in your organization. You empower them with agility and speed while complying with company policies.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Create an application stack based on an existing stack.• Modify the stack.• Share the stack with developers.

Unit 7. Integrating a Solution Architecture with IBM DevOps**Duration: 45 minutes**

Overview	This unit describes the features and capabilities of IBM DevOps and discusses how to use those capabilities in a solution architecture.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Define DevOps• List DevOps principles and methodologies• Describe the IBM DevOps reference architecture• Describe OpenShift Pipelines• Define some basic pipeline concepts• Discuss rolling updates and rollbacks• Describe IBM Cloud DevOps features and benefits• Describe IBM Cloud DevOps continuous integration / continuous deployment (CI/CD) capabilities• Describe the main functions of UrbanCode Deploy• Describe the main functions of UrbanCode Velocity• Describe some IBM Cloud DevOps use cases• Discuss other DevOps tools• Explain how to install the IBM Cloud DevOps add-on for IBM Cloud Pak for Applications

Course summary**Duration: 5 minutes**

Overview	This unit summarizes the course and provides information for future study.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none">• Explain how the course met its learning objectives.• Access the IBM Training website.• Identify other IBM Training courses that are related to this topic.• Locate appropriate resources for further study.

For more information

To learn more about this course and other related offerings, and to schedule training, see ibm.com/training.

To learn more about validating your technical skills with IBM certification, see ibm.com/certify.

To stay informed about IBM training, see the following sites:

IBM Training News: ibm.com/blogs/ibm-training

YouTube: youtube.com/IBMTraining

Facebook: facebook.com/ibmtraining

Twitter: twitter.com/IBMTraining