**Developing Cloud-Native Applications for Bluemix**



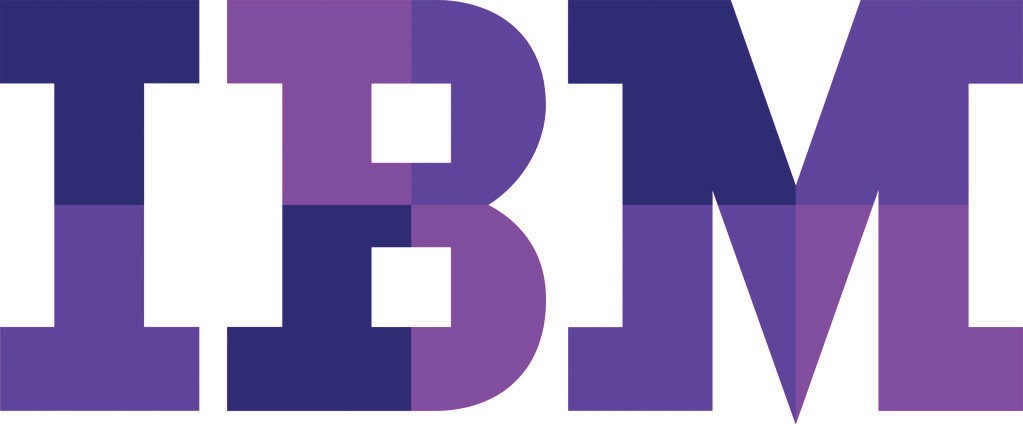
CK102 (Classroom)

# Course description

This course shows you how to design and develop cloud-native applications, ones that aren't just cloud-ready or cloud-hosted but that take maximum advantage of the cloud. It teaches practices for developing cloud applications, using Java EE as the primary programming language. You also learn how to deploy these applications using Bluemix®: its platform capabilities, PaaS capabilities, and its services.

The lab environment for this course uses IBM® Bluemix.

For information about other related courses, visit the IBM Training website:



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

# General information

## Delivery method

Classroom or instructor-led online (ILO)

## Course level

ERC 1.0

## Product and version

IBM Bluemix (May 2016)

## Audience

This course is designed for application developers who are responsible for designing and building applications in cloud-based environments, such as IBM Bluemix.

## Learning objectives

* Explain in detail the characteristics of a cloud-native application
* Describe Cloud Adoption Pattern to use application in cloud
* List the twelve factors for application in cloud
* Apply best practices to architect a cloud-native application using Java EE
* Design microservices as the building block for your application
* Use various data sources that can be used by your Bluemix application
* Describe and apply security for your cloud-based application

## Prerequisites

Before taking this course, that you have taken CK001: Introduction to Bluemix and that you understand the following concepts:

* Basic Java EE architecture and development skills
* Basic cloud concepts
* General Bluemix programming model

**Duration**

2 days

## Skill level

Intermediate

## Classroom (ILT) setup requirements

**Table 1 Configuration for each machine**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **System label** | **Server type and processor** | **RAM** | **Hard disk** | **Display resolution** | **Operating system** |
| Windows 7 | Intel Xeon 2.67 GHz or faster Duo Core | 4096 MB | 40 GB | 1024 x 768 | Windows 7  Enterprise 64 bit |

**Table 2 Required network configurations**

**Network configuration Classroom requirement**

Specify **isolated networks** or a **single network.** single network Specify whether **Internet access** is required. must be provided Specify whether a **DHCP server** is required. not necessary Specify whether **promiscuous mode** is required. not necessary

Obtain the following software before starting classroom setup. The classroom provider is responsible for obtaining software licenses for any non-IBM software.

**Table 3 Required software for class**

**Software product**

**Version**

**System labels requiring**

**Operating systems software product**

Microsoft Windows 7 Enterprise SP1 64-bit Windows-Server

Java JDK

1.8.0\_73

Java JRE

1.8.0\_73

Mozilla Firefox 45.0.1 or later

Windows Windows-Server

Windows Windows-Server

Windows Windows-Server

Notepad ++ 6.9 or later Windows Windows-Server

Eclipse JEE Mars Windows Windows-Server

**Notes**

The following unit and exercise durations are estimates, and might not reflect every class experience. This course is a new course.

# Course agenda

The course contains the following units:

## Unit 1 Introduction to cloud-native application development

Number of demonstrations: 0 Number of exercises: 0 Estimated time: 30 minutes

Lesson 1 Developer roles in Bluemix

Lesson 2 Cloud-native application characteristics Lesson 3 Course roadmap and positioning

## Unit 2 Cloud adoption patterns

Number of demonstrations: 0

Number of exercises: 0

Estimated time: 2 hours Lesson 1 Introduction Lesson 2 Adoption process

Lesson 3 Application architecture Lesson 4 DevOps

Lesson 5 Deployment Lesson 6 Hybrid connectivity Lesson 7 Conclusion

## Unit 3 The Twelve-Factor App

Number of demonstrations: 0 Number of exercises: 0

Estimated time: 1.5 hours Lesson 1 The twelve factors Lesson 2 Twelve-factor details

## Unit 4 Developing applications for IBM Bluemix

Number of demonstrations: 0 Number of exercises: 9

Estimated time: 2.5 hours + 3 hours of exercises Lesson 1 Introduction to WebSphere Liberty

Lesson 2 Liberty development environment and tools

Lesson 3 State in cloud applications

Lesson 4 Improving performance in Bluemix with data caching Lesson 5 Application scaling on IBM Bluemix

Exercise 1 Deploying a Java application in Bluemix

Exercise 2 Adding the Data Cache service to your application Exercise 3 Adding the Auto-Scaling service to your application Exercise 4 Creating and modifying Auto-Scaling policies

## Unit 5 Developing applications by using microservices

Number of demonstrations: 0 Number of exercises: 0 Estimated time: 3 hours

Lesson 1 Introduction to microservices Lesson 2 Application architecture evolution

Lesson 3 Microservices component architecture Lesson 4 Microservices integration

Lesson 5 Refactoring to microservices Lesson 6 Developing microservices

## Unit 6 Data management

Number of demonstrations: 0 Number of exercises: 0

Estimated time: 1.5 hours Lesson 1 IBM DB2 on Cloud Lesson 2 PostgreSQL

Lesson 3 Cloudant Lesson 4 Object Storage

Lesson 5 Data transformation

## Unit 7 Bluemix security

Number of demonstrations: 0 Number of exercises: 0

Estimated time: 1.5 hours Lesson 1 Terminology

Lesson 2 Java Enterprise security model, or Declarative security

Lesson 3 Application security enforced in code Lesson 4 External authentication

Lesson 5 Bluemix Single Sign-on

# For more information

To learn more about this course and other related offerings, and to schedule training, visit ibm.com/training. To learn more about validating your technical skills with IBM certification, visit ibm.com/certify.

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