Basic Spring 4.0

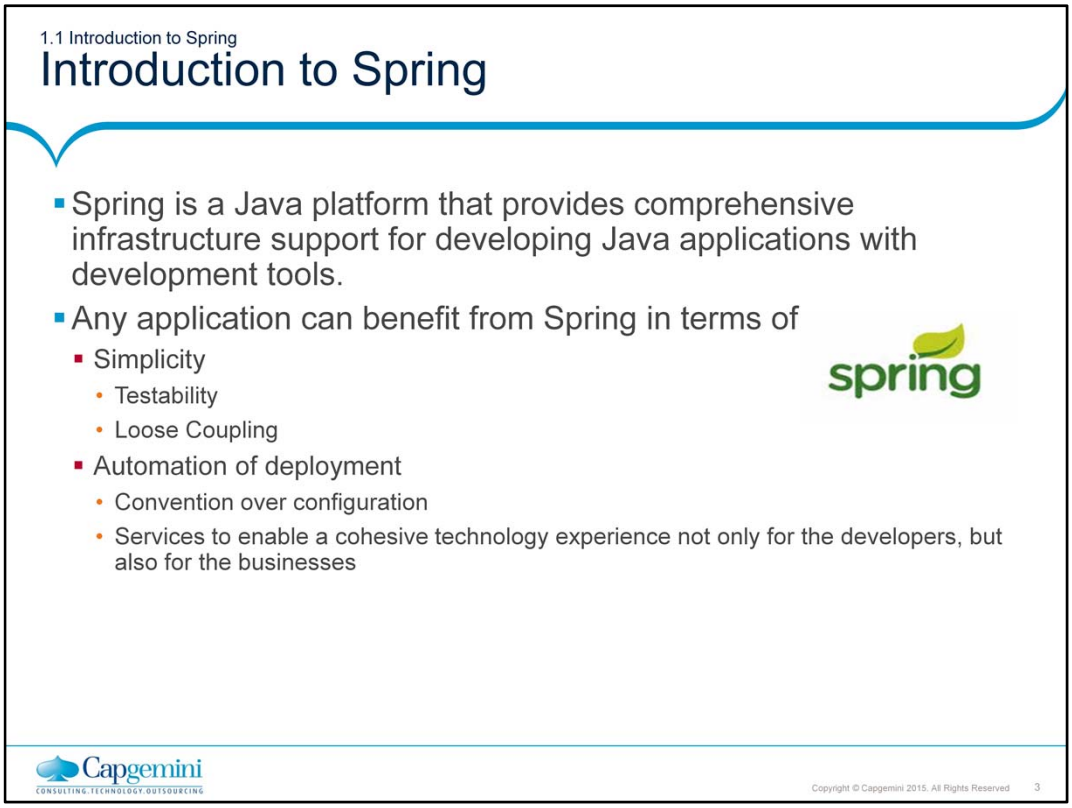
Lesson 1: Introduction to Spring Platform and environment

Lesson Objectives

- In this lesson , you will learn about
  - Introduction to Spring
  - Spring Projects at a glance
  - Spring IO Platform
    - Spring Framework
    - Spring Boot

Capgemini
CONSULTING.TECHNOLOGY.OUTSOURCING

 2



What is spring?
Spring is a Java platform that provides comprehensive infrastructure support for developing Java applications with development tools.
Any java application can benefit from Spring in terms of

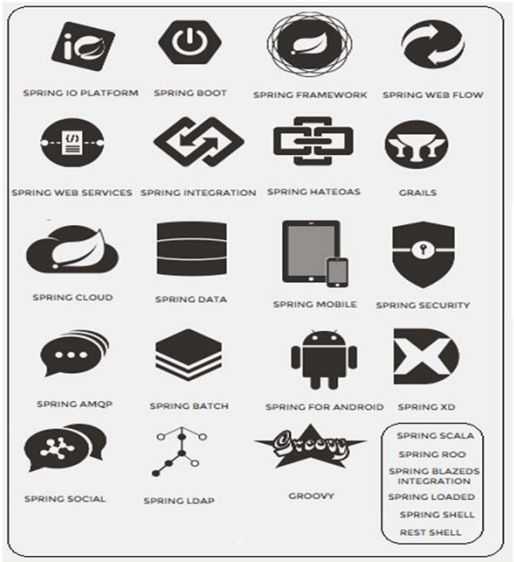
- Automation of deployment
- Convention over configuration
- Testing is simpler
- Services to enable a cohesive technology experience not only for the developers, but also for the businesses

Addresses the complexity of enterprise application development

1.2 Spring projects at a glance

Spring projects at a glance

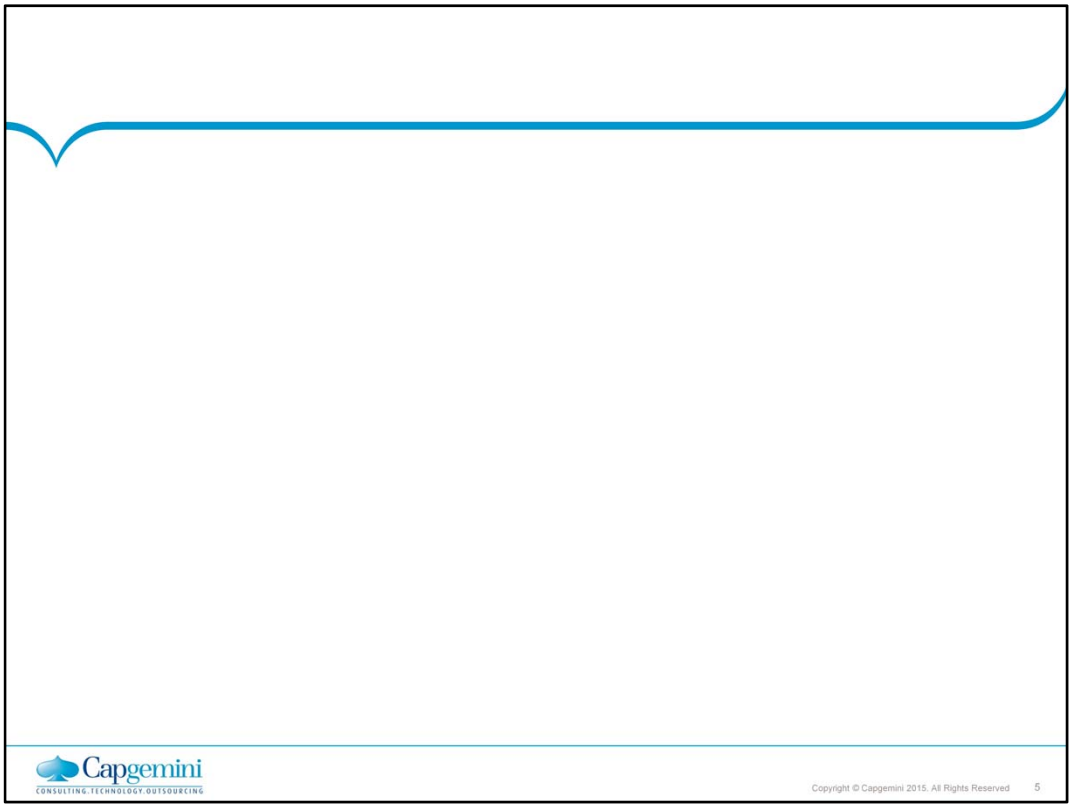
- Spring is modular by design
- Spring has many projects which helps us to build modern applications with any infrastructure needs such as
  - Simple Configuration
  - High Security
  - Connectivity to Big Data
  - Development of Web apps
  - Connectivity to cloud services
  - Integration with any framework.



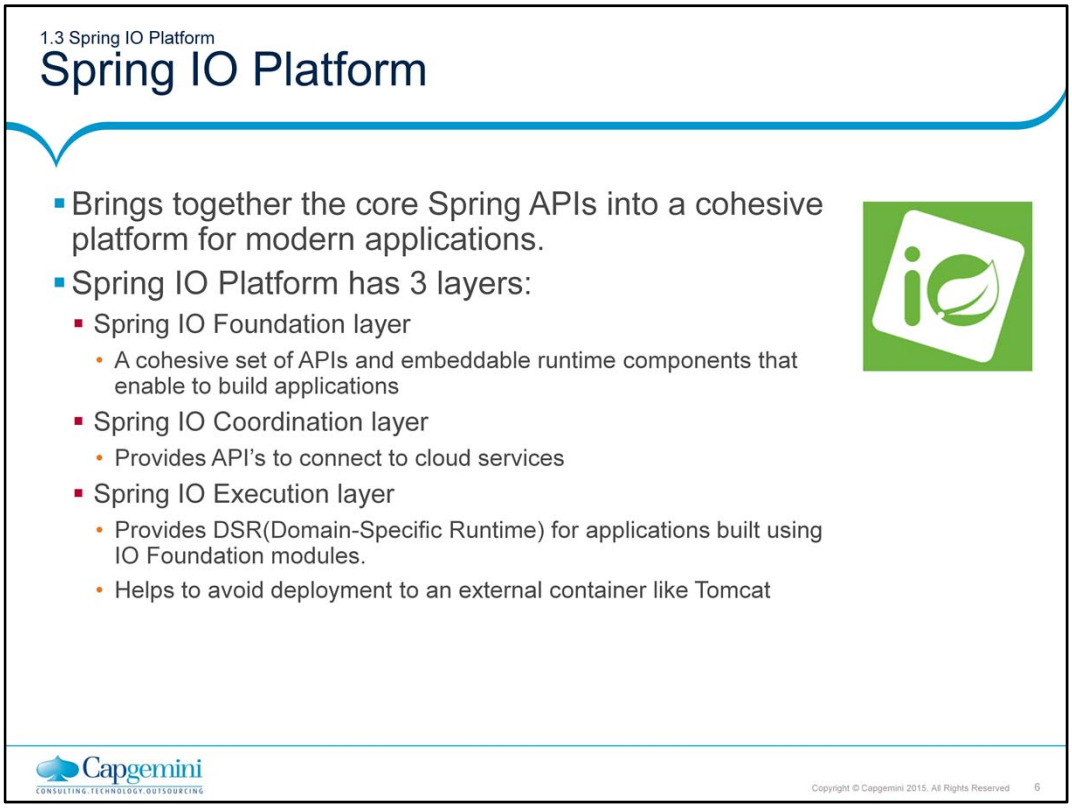
Capgemini
CONSULTING.TECHNOLOGY.OUTSOURCING

 4

Spring IO platform includes Foundation Layer modules and Execution Layer domain-specific runtimes (DSRs)
Spring Boot favors convention over configuration and is designed to get you up and running as quickly
Spring Framework provides a comprehensive programming and configuration model for modern Java-based enterprise applications on any kind of deployment platform
Spring Web Flow builds on Spring MVC and allows implementing the "flows" of a web application
Spring Web Services (Spring-WS) is a product of the Spring community focused on creating document-driven Web services
Spring Integration extends the Spring programming model to support the well-known Enterprise Integration Patterns
Spring eXtreem Data : The project‘s goal is to simplify the development of big data applications. the core Spring APIs into a cohesive and versioned foundational platform for modern applications.



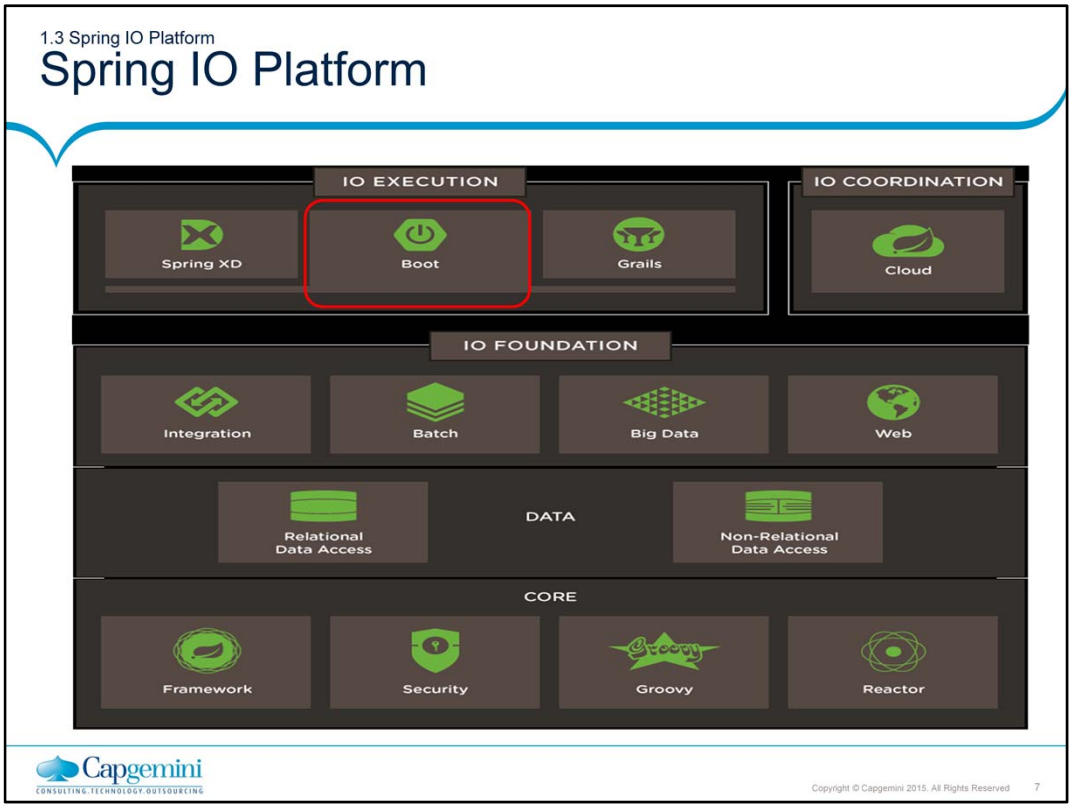
Spring Reactive : Reactive Streams, for handling live data (provide a standard for asynchronous stream processing with non-blocking back pressure on the JVM)
Hypermedia As The Engine Of application State : REST client interacts with a network application entirely through hypermedia provided dynamically by application servers. A REST client needs no prior knowledge about how to interact with any particular application or server beyond a generic understanding of hypermedia, in contrast with SOA.
Spring HATEOS :link creation and representation assembly
Microservices (wiki) : Software architecture design pattern, in which complex applications are composed of small, independent processes communicating with each other using language-agnostic APIs. These services are small, highly decoupled and focus on doing a small task.
Spring Boot : It's a new framework designed to simplify the bootstrapping and development of a new Spring application with opinionated approach to configuration, freeing developers from the need to define boilerplate configuration.
Spring Cloud : Provides tools for developers to quickly build some of the common patterns in distributed systems (e.g. configuration management, service discovery, circuit breakers, intelligent routing, micro-proxy, control bus, one-time tokens, global locks, leadership election, distributed sessions, cluster state).



Spring IO Platform brings together the core Spring APIs into a cohesive platform for modern applications.
For example, there are many existing applications designed based on the core Spring Framework, and customers may want these applications to be upgraded with features like adding an OAuth secured REST service, connect to cloud services, Moving data into Hadoop, bridging multiple data stores, etc.. In order to upgrade applications including all the services use Spring IO Platform modules.

Spring IO Platform is comprised of 3 layers:

- Spring IO Foundation layer
  - A cohesive set of APIs and embeddable runtime components that enable to build applications
- IO Coordination
  - Provides API's to connect to cloud services with Spring Cloud.
- IO Execution
  - Provides DSR(Domain-Specific Runtime) for applications built using IO Foundation modules.
  - Helps to avoid deployment to an external container like Tomcat
  - Spring IO execution includes three DSRs: Spring XD, Spring Boot, and Grails.



Spring IO Execution Layer:

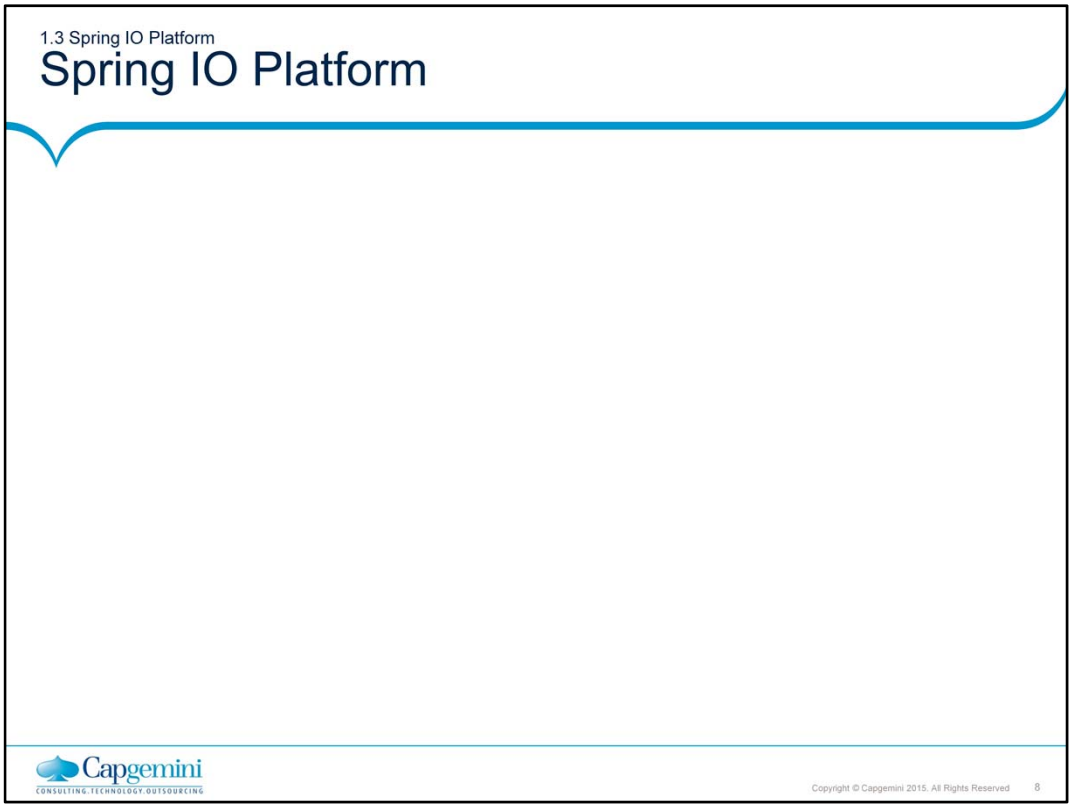
Spring XD provides a powerful runtime and DSL for describing big data ingestion and analytics, export, and Hadoop workflow management.
Spring Boot reduces the effort needed to create production-ready, DevOps-friendly, XML-free Spring applications. Spring Boot dynamically wires up beans and settings and applies them to your application context
Grails provides a productive and stream-lined full-stack web framework by combining the power of the Spring IO Foundation components with a set of comprehensive Groovy-based DSLs.

Spring IO Coordination Layer:

Spring Cloud is an open-source library with which an application can be connected with cloud environment. For example, Instead of creating data source object to connect with relational databases use Spring cloud which does all these work(like access and configure service connectors) by using cloud connector.

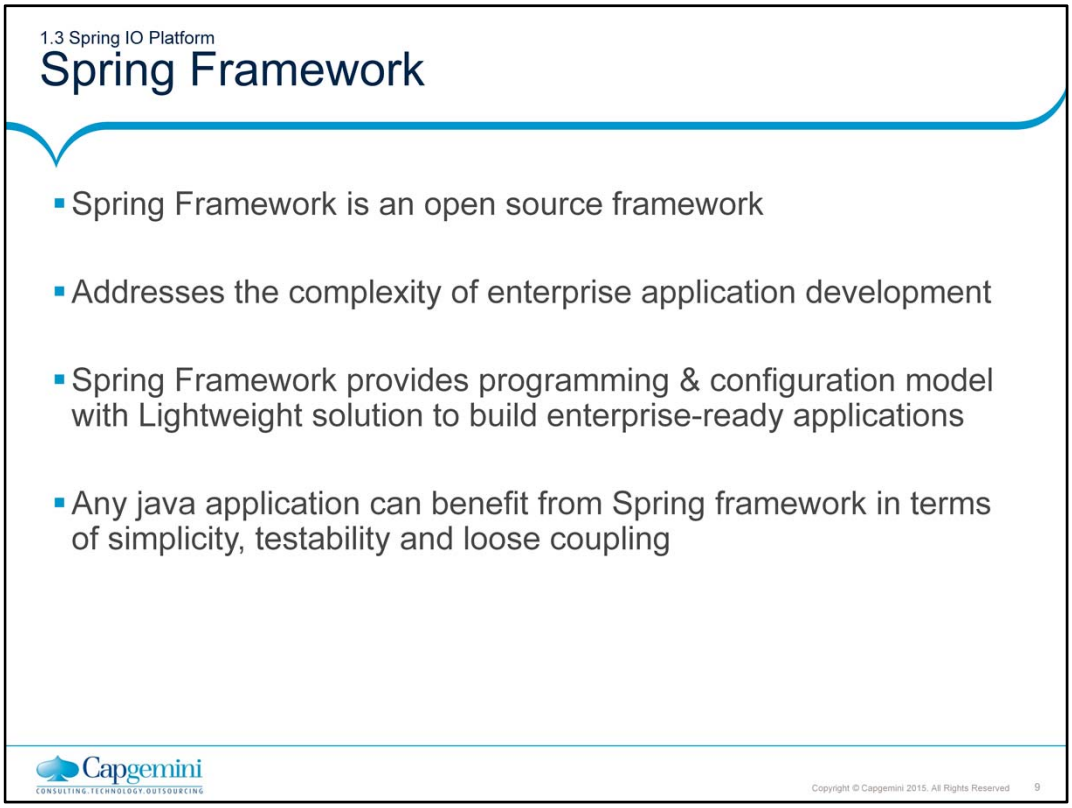
Spring IO Foundation Layer

Spring Integration extends the Spring programming model to support the well-known Enterprise Integration Patterns.
Spring Batch is a lightweight, comprehensive batch framework designed to enable the development of robust batch applications vital for the daily operations of enterprise systems.



Spring IO Foundation Layer:

Spring Big Data is used to simplify the development of big data applications.
Spring Web builds on Spring MVC and allows implementing the "flows" of a web application.
Spring data makes it easy to use new data access technologies, such as non-relational databases, map-reduce frameworks, and cloud based data services.
Spring Framework provides a comprehensive programming and configuration model for modern Java-based enterprise applications on any kind of deployment platform.
Spring security helps us to secure spring based applications since it is a powerful and highly customizable authentication and access-control framework.
Spring groovy can be used to integrate with groovy for building high-productivity dynamic application.
Spring Reactor is a Reactive Streams, for handling live data (provide a standard for asynchronous stream processing with non-blocking back pressure on the JVM)



Spring makes it easy to use POJO (Plain Old Java Objects) to achieve things that were previously only possible with EJBs. However, Spring's usefulness isn't restricted to server-side development. Any java application can benefit from Spring in terms of simplicity, testability and loose coupling.

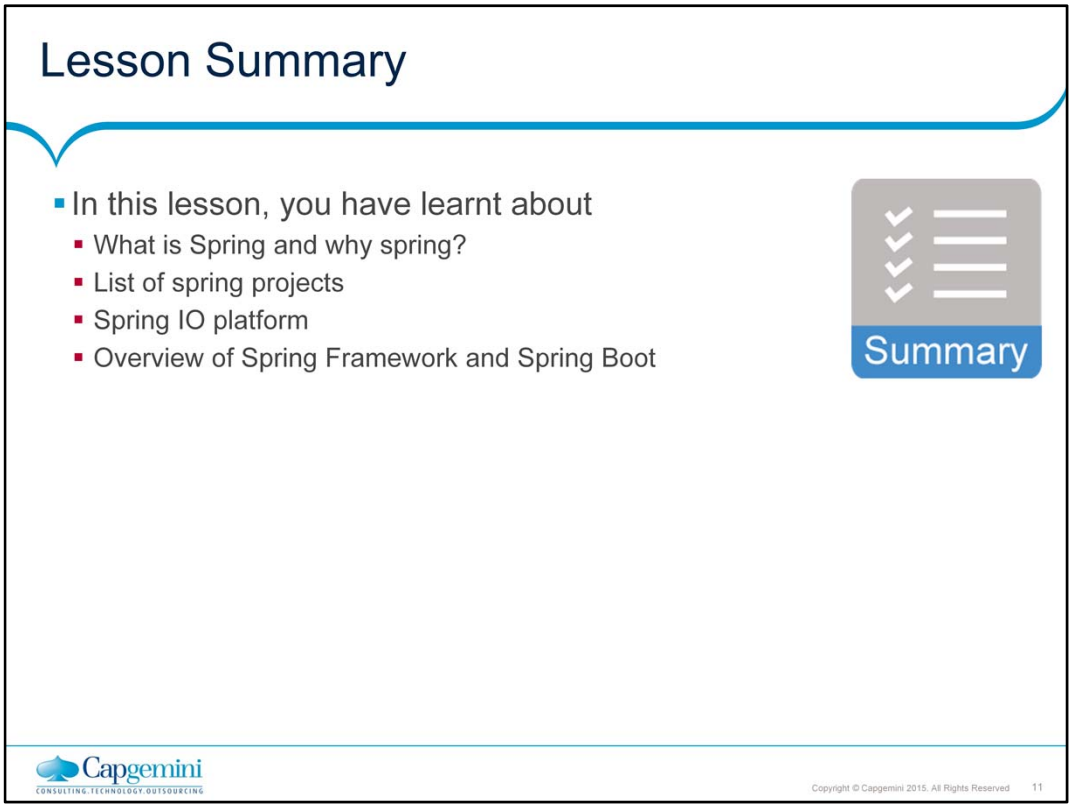
1.3 Spring IO Platform

Spring Boot

- Spring Boot ships with command line tool for executing spring applications
- Spring Boot dynamically wires up beans and settings and applies them to your application context.
- Advantages of using Spring Boot are:
  - No requirement for XML configuration
  - Annotation based configuration
  - Has embedded server
  - Reduces boiler plate code
  - Simplifies testing
  - Simplifies application maintenance
  - Reduces the size of build file

Capgemini
CONSULTING.TECHNOLOGY.OUTSOURCING

 10



Thus we have seen that Spring is the most popular and comprehensive of the lightweight J2EE frameworks that have gained popularity since 2003.
We saw how Spring is designed to promote architectural good practice. A typical spring architecture will be based on programming to interfaces rather than classes.
We have seen what is Inversion of control and dependency injection.
We also saw Bean containers and lifecycle of beans in containers. We saw how to hook into the lifecycle of a bean and make it aware of the Spring environment.

Review Questions

- Question 1: Spring IO _____ layer provides API to connect to cloud services
  - Option 1: Foundation
  - Option 2: Coordination
  - Option 3: Execution
- Question 2: Spring Boot reduces the effort needed to create production-ready, DevOps-friendly, XML-free Spring applications.
  - Option 1: True
  - Option 2: false

Capgemini
CONSULTING.TECHNOLOGY.OUTSOURCING

