Spring Framework Servlet-API

MVC Architecture : Manual

# Architecture is implemented strictly, disciplined way

# remove lot of Boiler-plate code

# abstract the low level complexity

# Focus more on business logic

Most popular frameworks to develop java application

J2EE : Java 2 Enterprise Edition : Framework to develop web app using java

Complex in nature

# lots of deployment descriptor

# lots of interface, abstract classes needs to be created to expose a single service

# productivity reduces, reduces efficiency

Rod Johnson

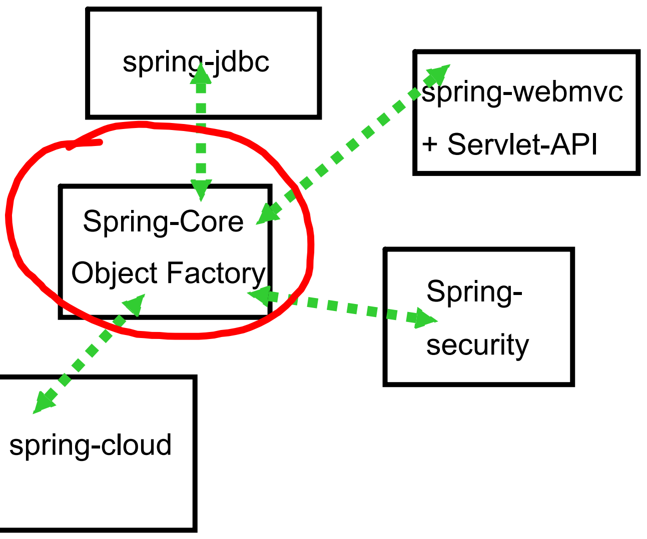
=> Object Factory : Responsible for creating and managing object

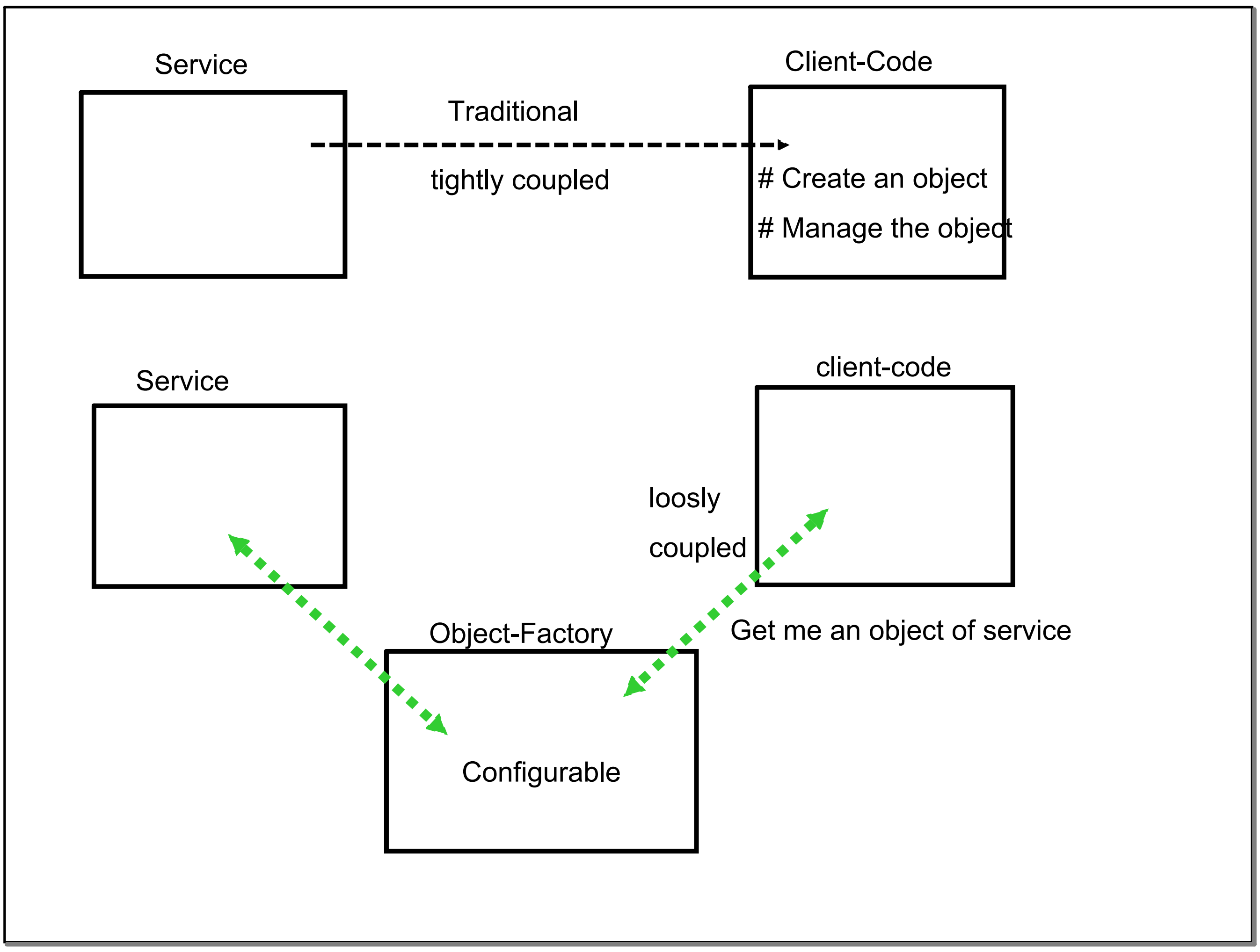
# Increased the Productivity

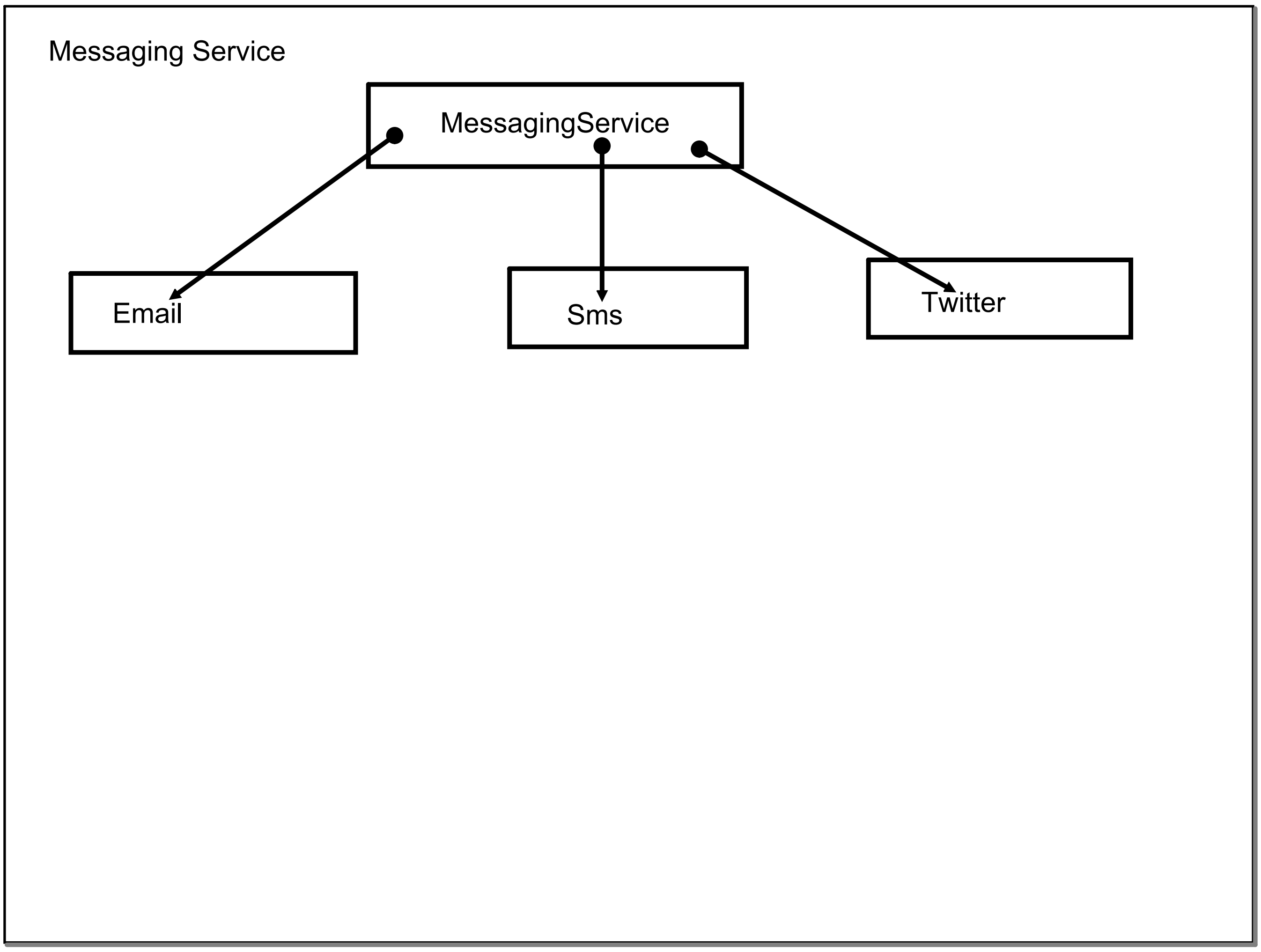
# Increased the efficiency

1. Object Factory
2. Highly Modular
3. POJOs

Spring Framework




Service
Client-Code
Traditional
tightly coupled
# Create an object
# Manage the object
Service
client-code
loosly
coupled
Object-Factory
Get me an object of service
Configurable


Messaging Service
MessagingService
Email
Sms
Twitter

Object Factory | Bean Factory | Application Context

Provided by Spring - Core Module

A Custom Configuration needs to be provided to define the behavior of Object Factory

# XML Based Configuration (Legacy)
# Annotation Based Configuration (Modern)
# Pure Java Based Configuration (Modern)

Std Spring Framework :

bundle of few Modules

=> Core

=> Spring-web-mvc

=> Spring AOP (proxy)

Bean Factory works on two key principals

1. IoC : Inversion of Control
2. DI : Dependency Injection

IoC : Outsourcing the (control of) creation and management of Object

XML Based Config :

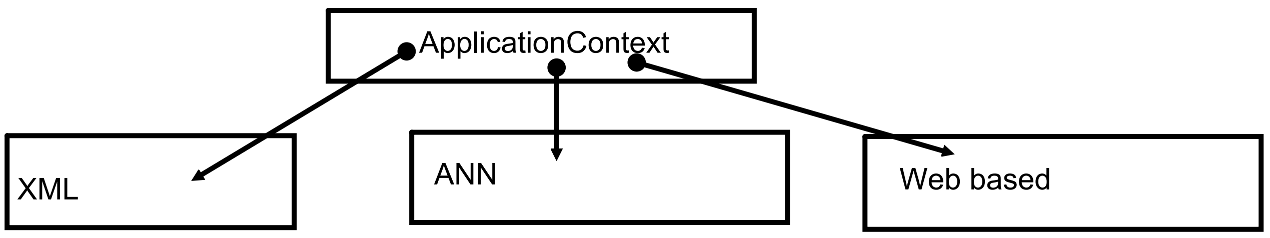
XML file + certain dependencies for support of additional spring tags

BEAN : Container(Object Factory) managed Object

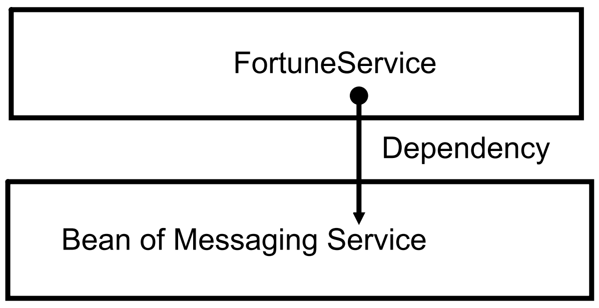
Multiple classes provided for Bean Factory

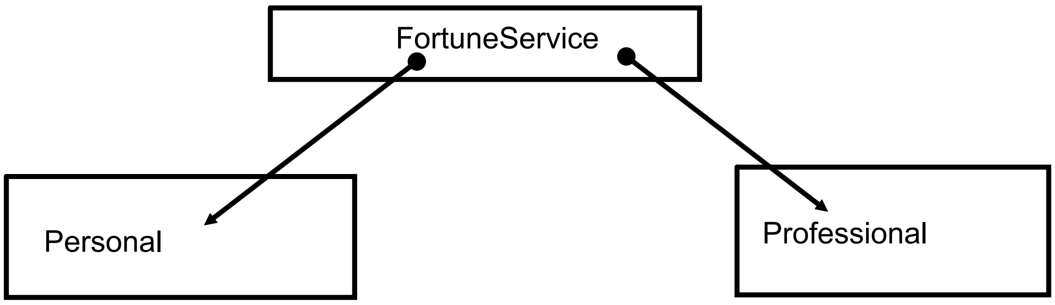
# way of config (XML or java)

# env for which bean factory (simple java, web app)



Each bean must have a unique id





Need the BEan factory to inject Fortune Service instance into EmailService

# Constructor Based DI

# Setter BAsed DI

```
<bean id="personal"
class="com.wf.training.spring.factory.service.PersonalFortune"></bean>
    <bean id="professional"
     <!-- Injecting Dependency -->

        <!-- Constructor Based -->
     <bean id="emailservice"
class="com.wf.training.spring.factory.service.EmailService">
        <constructor-arg ref="personal"/>
     </bean>
```

Injecting the literal values :

Delegate them to a text file (properties files)

literal values as key-value pair

need to specify property file in config

Bean Management :

1. Life cycle
2. Scope

=> Scope : Accessibility of bean

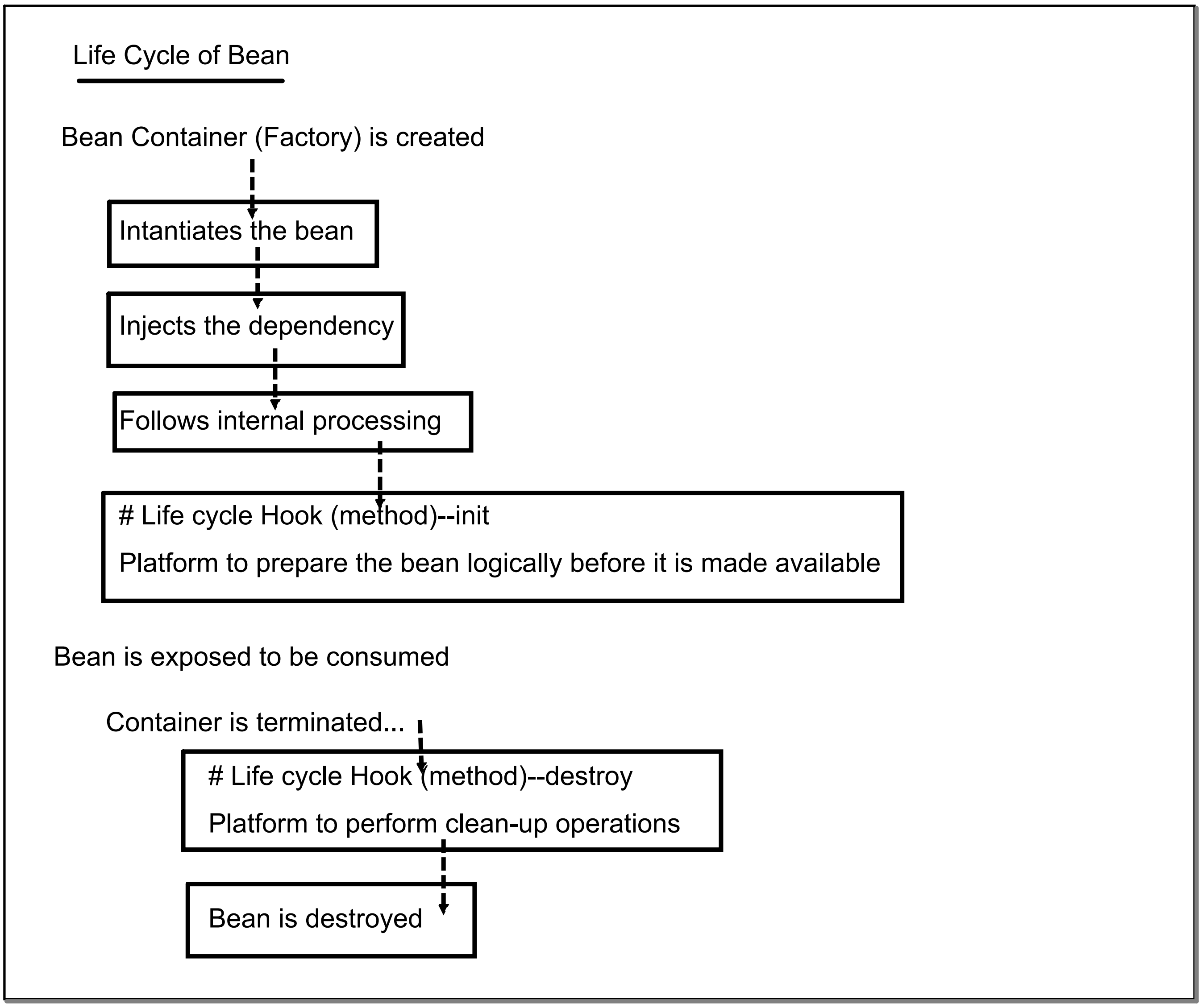
by default scope : Singleton : Single instance will be created

: Prototype : Diff each time

request

session : Web based

application


Life Cycle of Bean
Bean Container (Factory) is created
Intantiates the bean
Injects the dependency
Follows internal processing
# Life cycle Hook (method)--init
Platform to prepare the bean logically before it is made available
Bean is exposed to be consumed
Container is terminated...
# Life cycle Hook (method)--destroy
Platform to perform clean-up operations
Bean is destroyed

Prototype : BEan container does not maintain life cycle..

Annotation based config

xml file : path reference

Creating the bean

@Component :

Any class decorated with @Component will be initiated by bean factory

By default the class name itself becomes the id , first character being small case...

DI using annotation

1. Constructor
2. Setter
3. Field

@Autowired : search for bean, if found, inject it

Scope : @Scope

Life cycle hook methods : Annotations

Pure Java Based Config :

xml file will be replaced by Java class

Pure Java Config :

Programmatically configure Bean Factory

before 10 am or after 5 pm : personal fortune

else : professional fortune

Expose the bean

@Component

Class level

@Bean

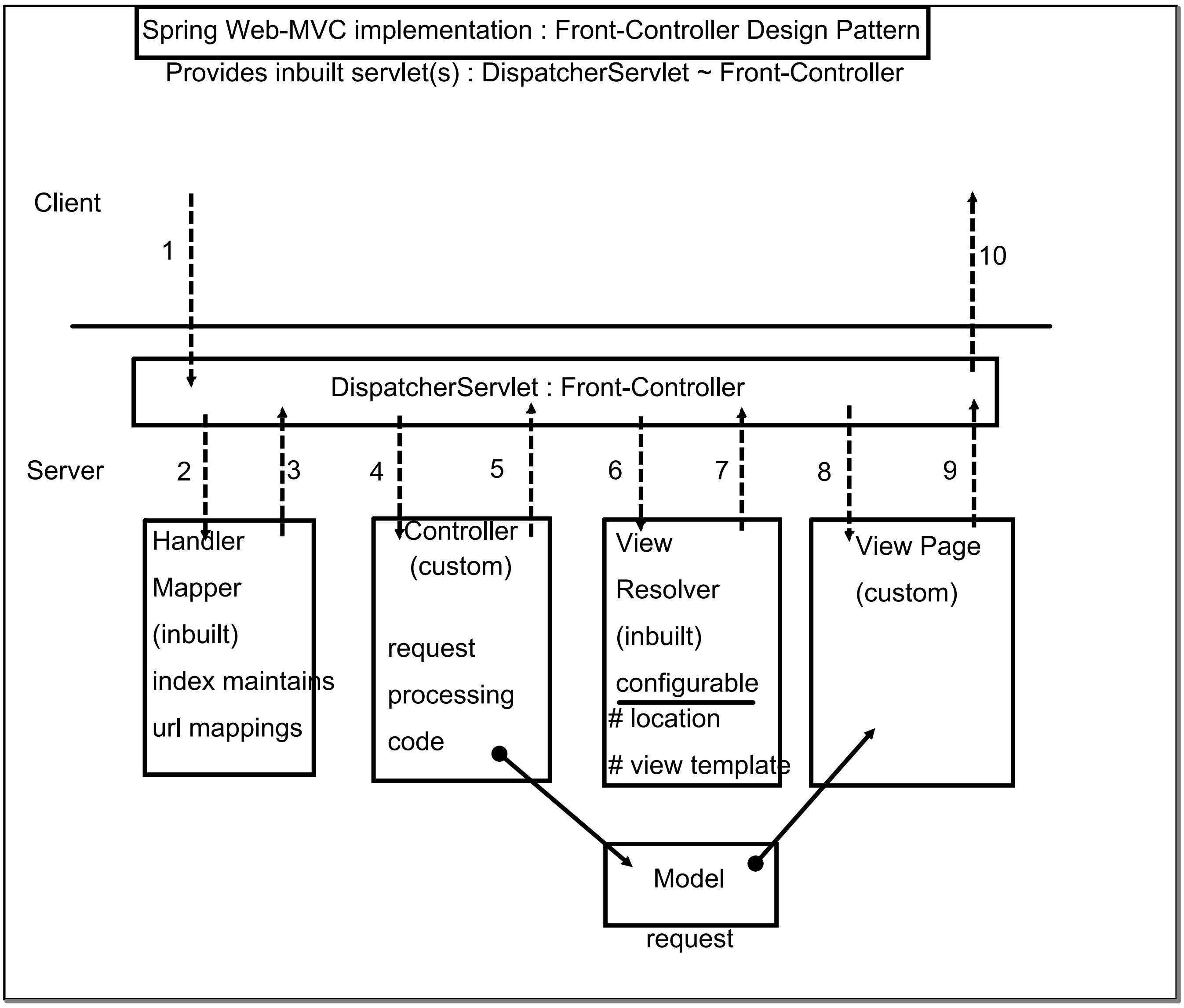
Method level

Spring web-mvc module : MVC architecture
uses Servlet-API : in an abstract
POJO

Controller : Servlet
View : JSP
Model : Data Structure

Controller : POJOs (Servlet capabilities)
View : Spring supports multiple view templates
- default : JSP + JSTL
- Thymeleaf
- Mustache
- FreeMarker
- Velocity
- Tiles

Model : Data Structure/Data Container


Spring Web-MVC implementation : Front-Controller Design Pattern
Provides inbuilt servlet(s) : DispatcherServlet ~ Front-Controller
Client
1
10
DispatcherServlet : Front-Controller
Server
2
3
4
5
6
7
8
9
Handler Mapper (inbuilt) index maintains url mappings
Controller (custom) request processing code
View Resolver (inbuilt) configurable # location # view template
View Page (custom)
Model
request

1. Need to register the DispatcherServlet
2. COnfig to target all requests to DS

web.xml (servlet-api)

Spring Based Config : (XML)

+ Bean Factory Config

+ web mvc config

<servlet-name>-servlet.xml

eg: dispatcher-servlet.xml

View Resolver :

eg : "index" (string) name of view page (controller)

prefix : location

suffix : View Template (extension)

```
<property name="prefix" value="/WEB-INF/views/"/>
<property name="suffix" value=".jsp"/>
```

$\boxed{\texttt{/WEB-INF/views/index.jsp}}$

Custom Resources

1. Controller : POJO, registered with Handler Mapper

$$\begin{tikzcd} \boxed{\text{@Component}} \arrow[d, dashed] \\ \boxed{\text{@Controller}} \end{tikzcd}$$

identifying the HTTP Verb

Mapping will take place using getter/setter only

Maven Project

1. archetype : web
2. Add the Server Runtime Library
3. convert java 1.5   to 1.8
4. Adding dependencies
    1. spring framework
    2. servlet for DS
    3. jsp+jstl

Pure Java Config

web.xml (servlet-api) ~ add a maven plugin
~ Java Class

dispatcher-servlet.xml (spring) ~ Java class

Java Class for web.xml

# Registered DS (auto - inherit inbuilt class)

# Mapped the url

Java Class for Spring config

# component scanning path

# exposed a bean of ViewResolver