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

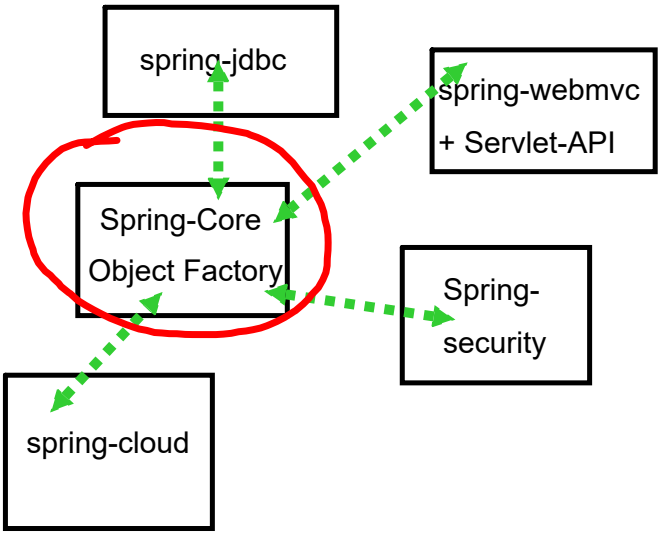
=> Object Factory : Responsible for creating and managing object

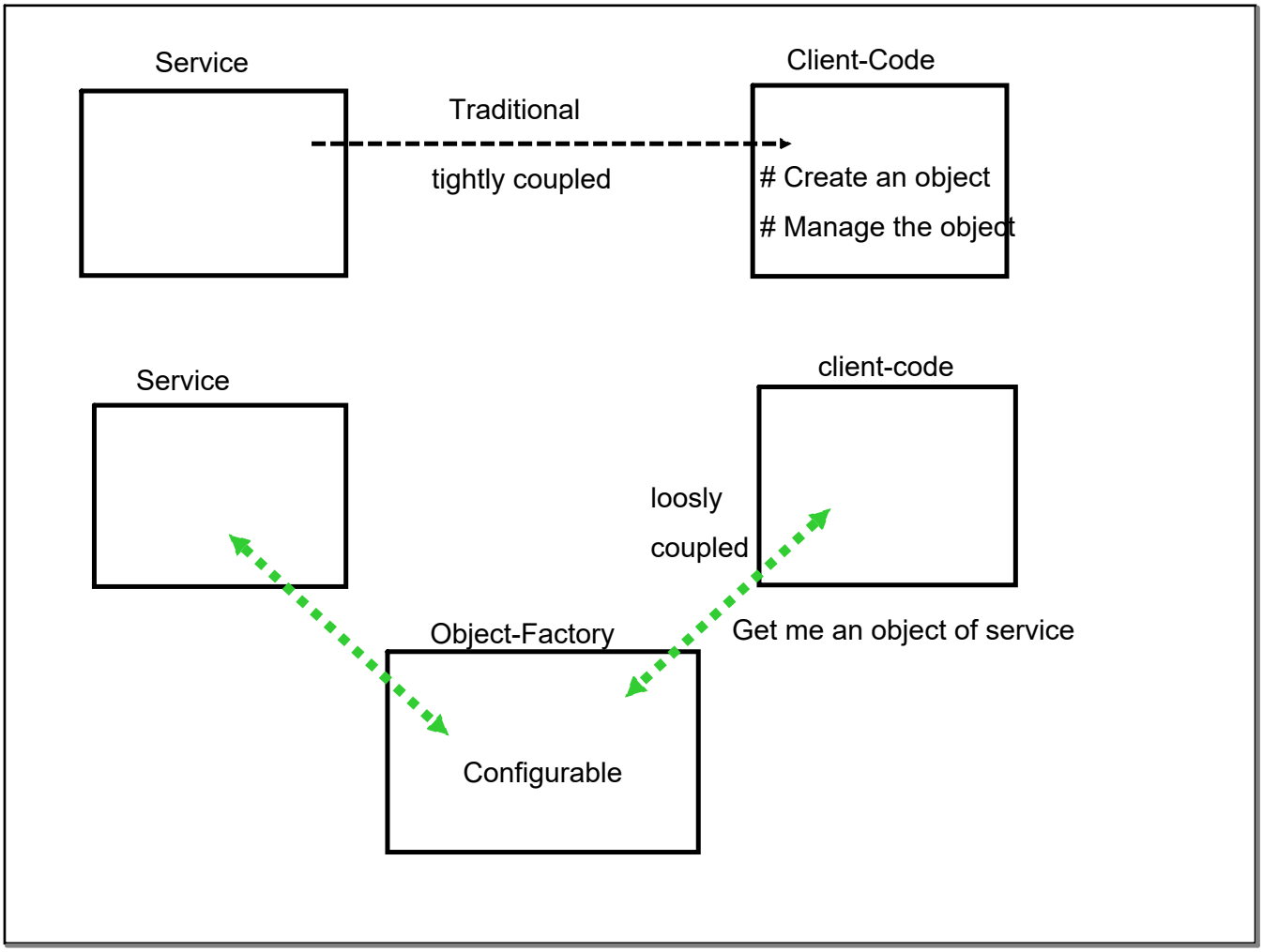
Increased the Productivity

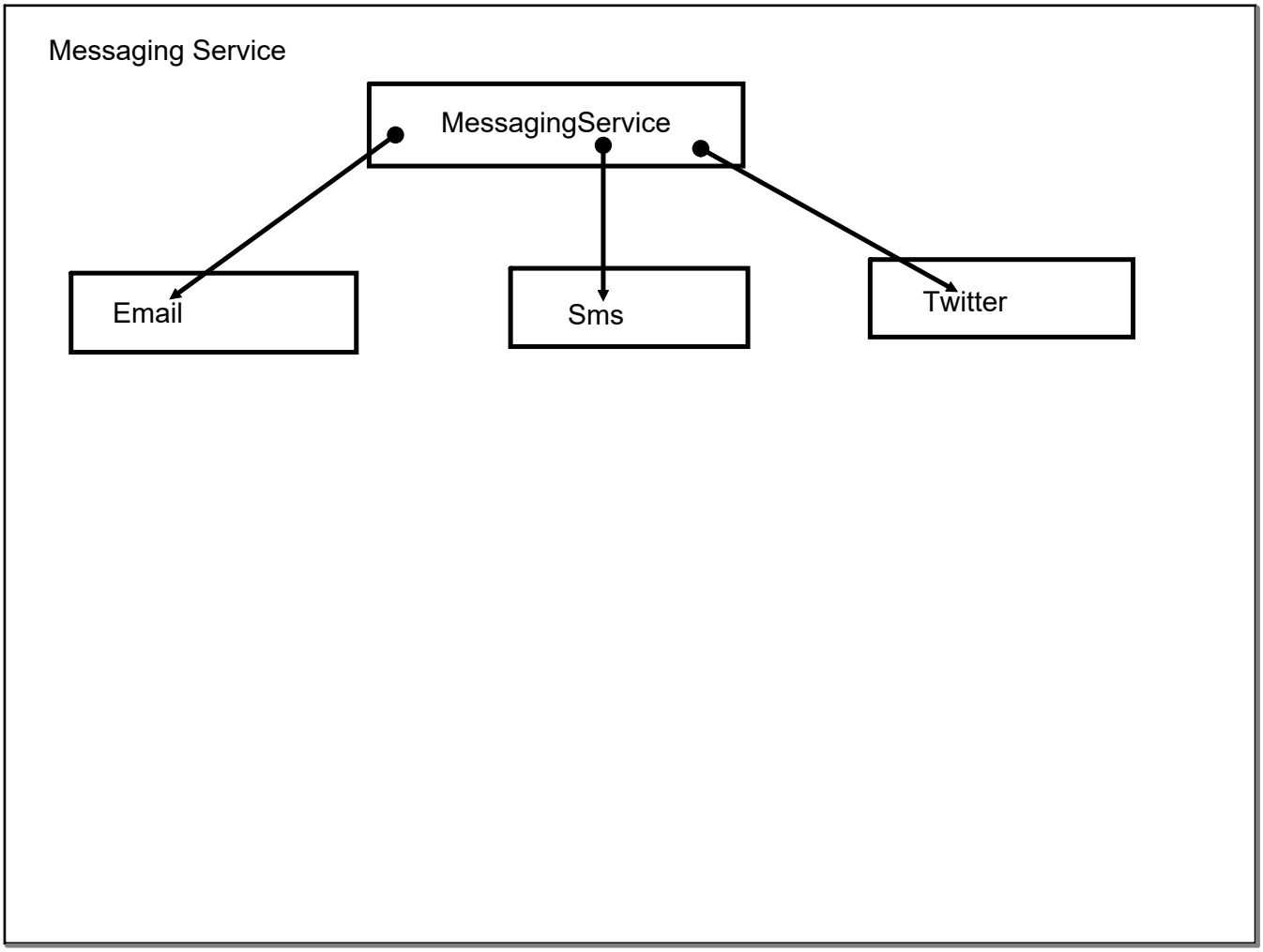
Increased the efficiency

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 :

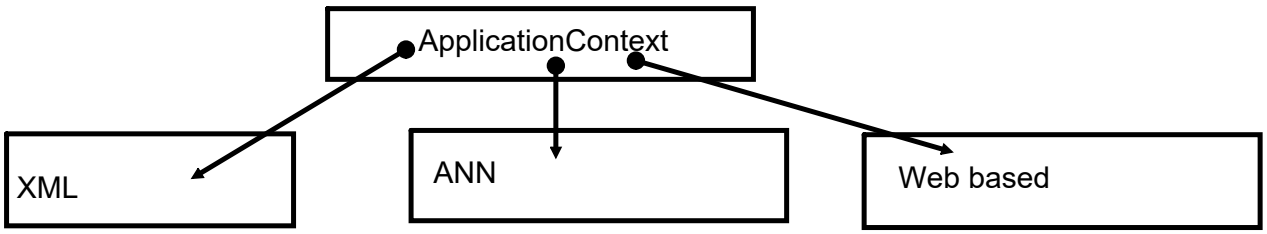
XML file + certain dependencies for support of additional spring tags

BEAN : Container(Object Factory) managed Object

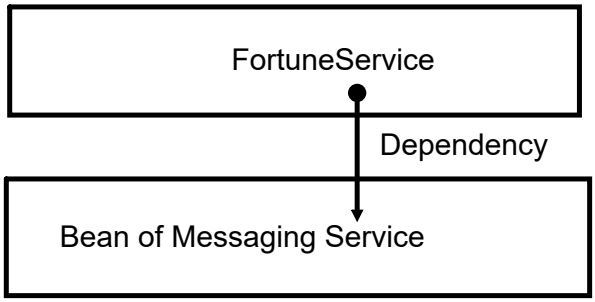
Multiple classes provided for Bean Factory

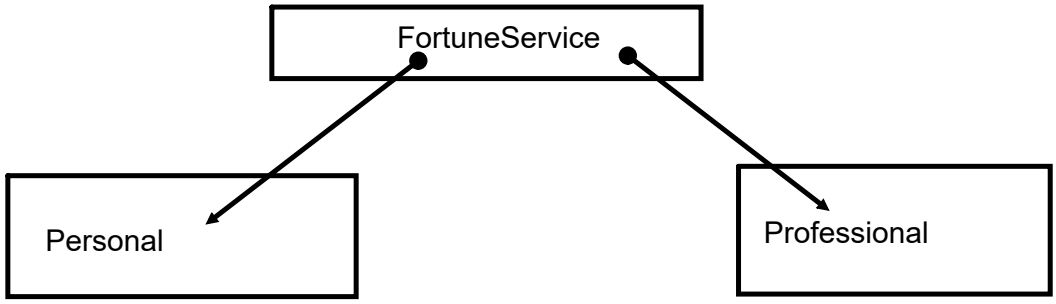
way of config (XML or java)

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

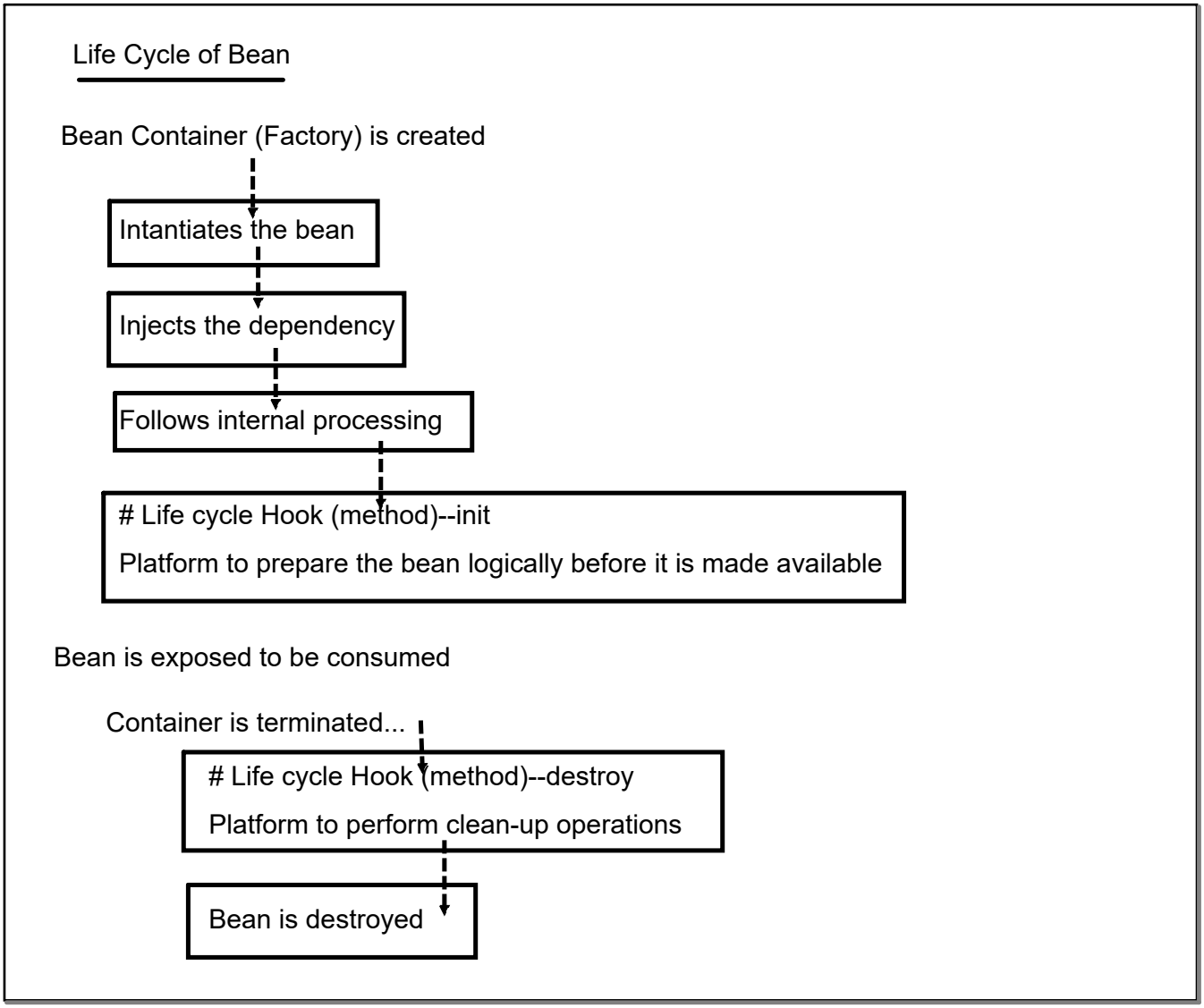
by default scope : Singleton : Single instance will be created

: 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

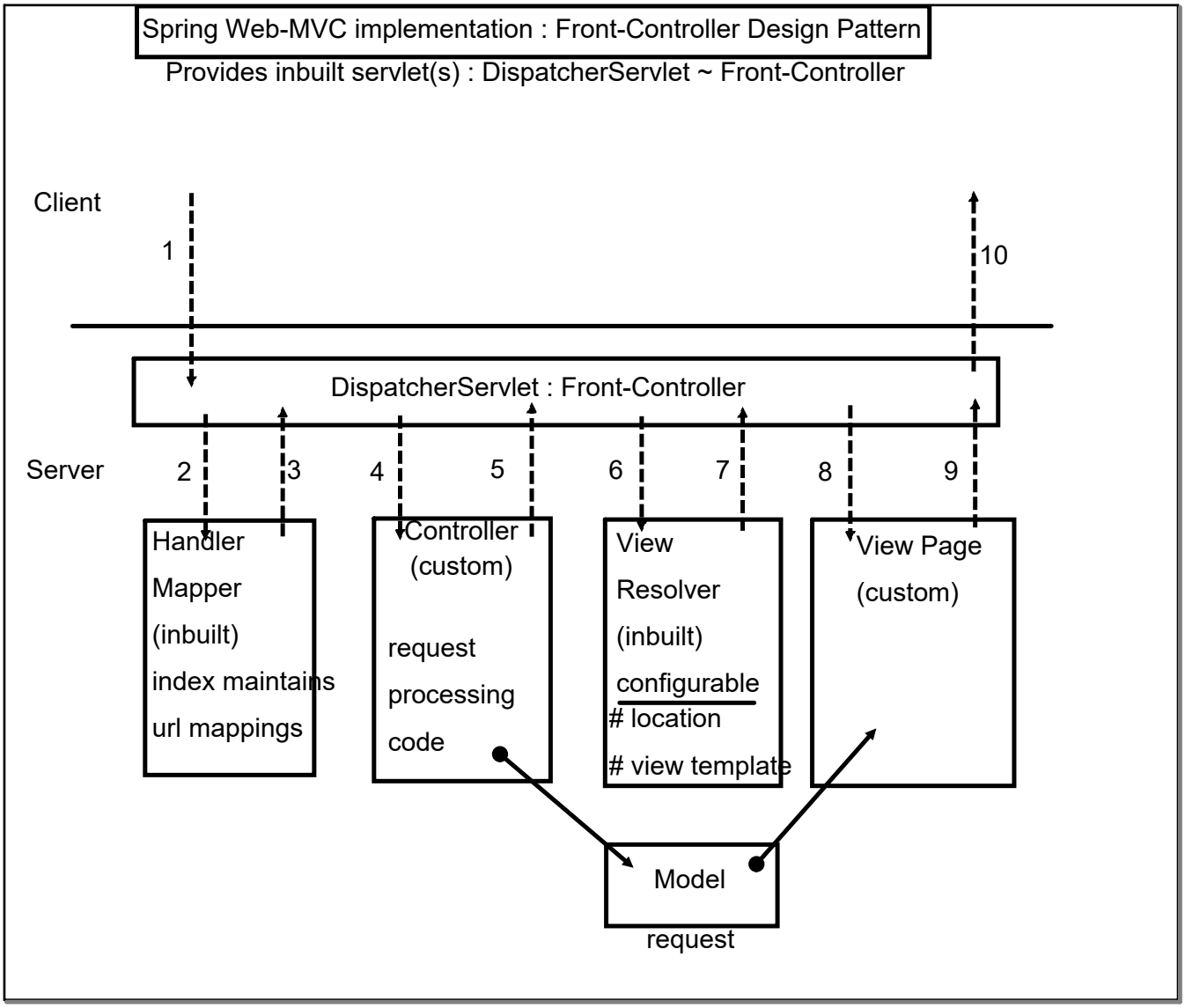
@Component	@Bean
Class level	Method level

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
Server
1
10
DispatcherServlet : Front-Controller
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

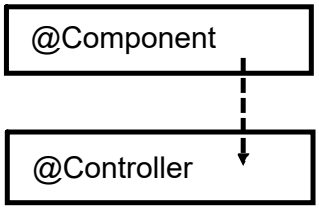
suffix : View Template (extension)

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

/WEB-INF/views/index.jsp

Custom Resources

1. Controller : POJO, registered with Handler Mapper



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

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

Form handling spring-way : Forms are critical

Custom Tag Library : JSP

Need to add the reference of custom tag library

Spring forms : map the forms (UI) with java classes

control the form behavior (UI) through java classes

Validation : Validator API : Hibernate-Validator (dependency)

Client - Side Validation : submission takes place when all constraint are satisfied
HTML5 attribute + JS

Server-Side Validation :

Absolute URL : fetch the context path : predeclared variable in JSP to access the context path

Annotation : interface(skeleton) + implementation class (logic)

@EmployeeCode
Rule
1. Retention policy : compile/runtime
compile : @Override/@FunctionalInterface
runtime : validation
2. Target : where that annotation can be used
method, class, field...

Spring - Security Module

authentication(valid) + authorization (role based)

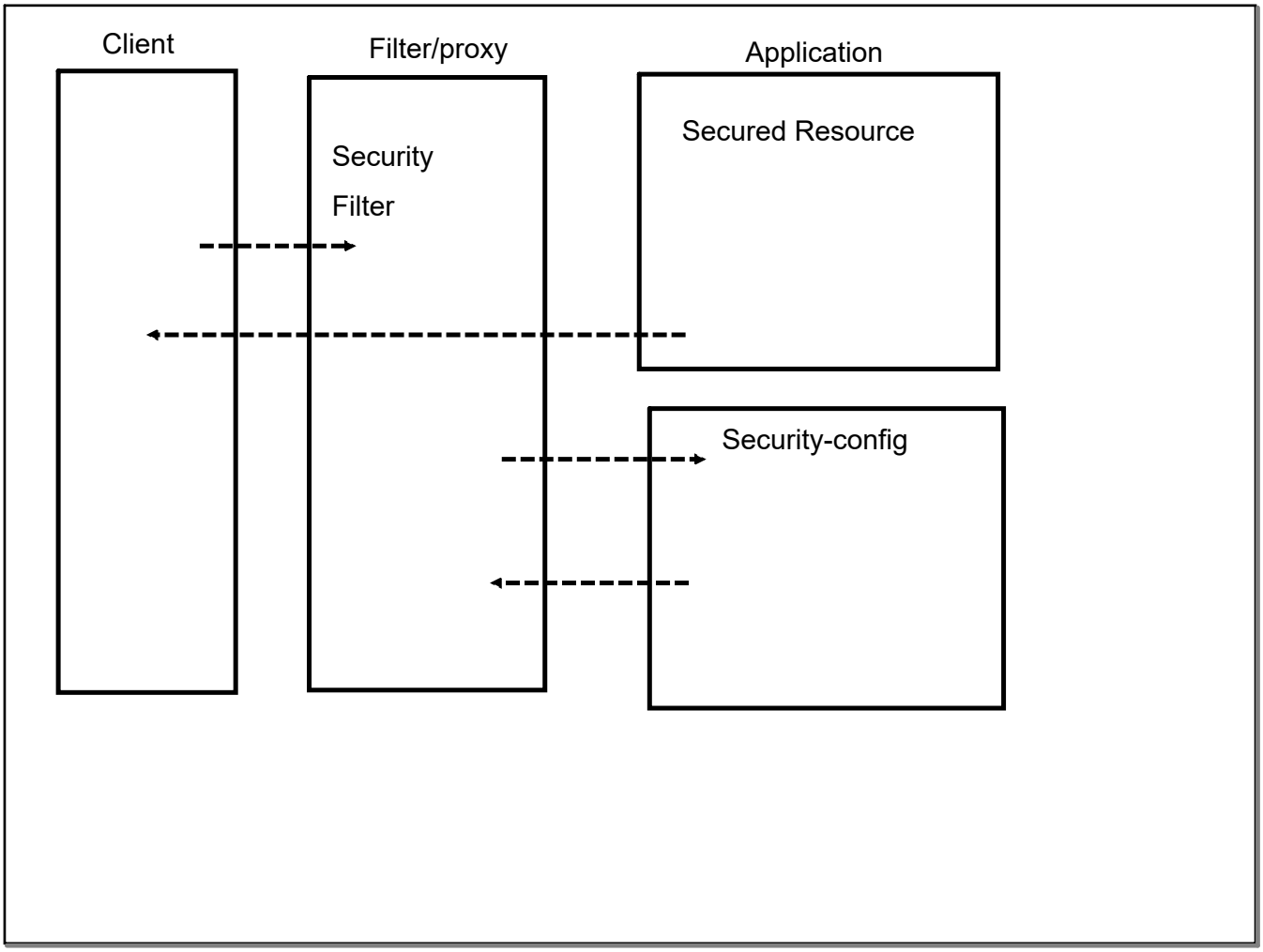
Dependency:

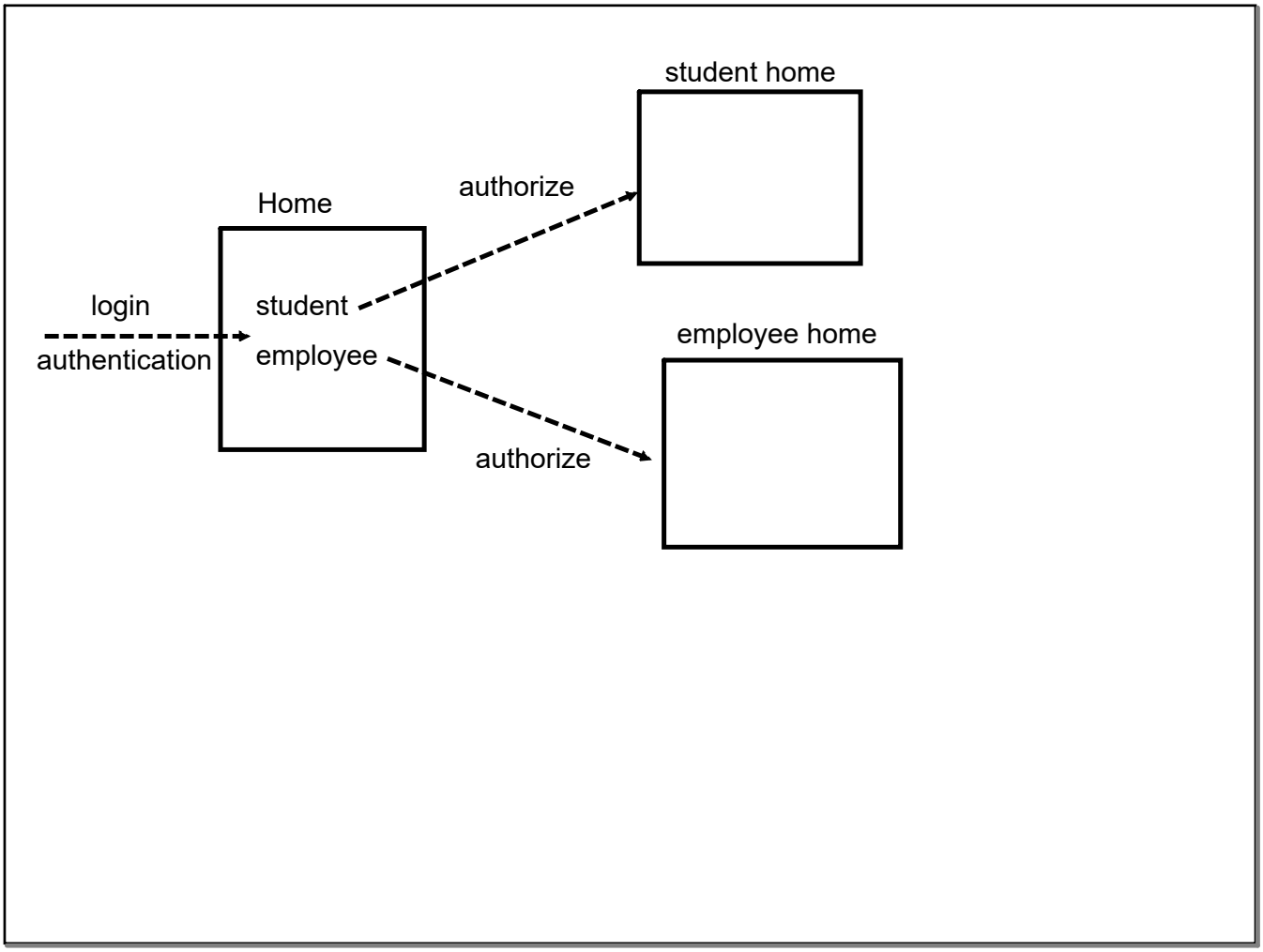
spring-security-web

spring-security-config

spring-security-taglibs

Spring Security Module


Client
Filter/proxy
Application
Secured Resource
Security
Filter
Security-config


student home
authorize
Home
login
student
authentication
employee
employee home
authorize

1.Add Dependency

2. a class to activate security filter

3. a class to add config

default security (all resources are secured) :

provide an inbuilt login form

3 authentication ways

1. httpBasic : not recommended
2. formLogin (inbuilt)
3. formLogin (custom)