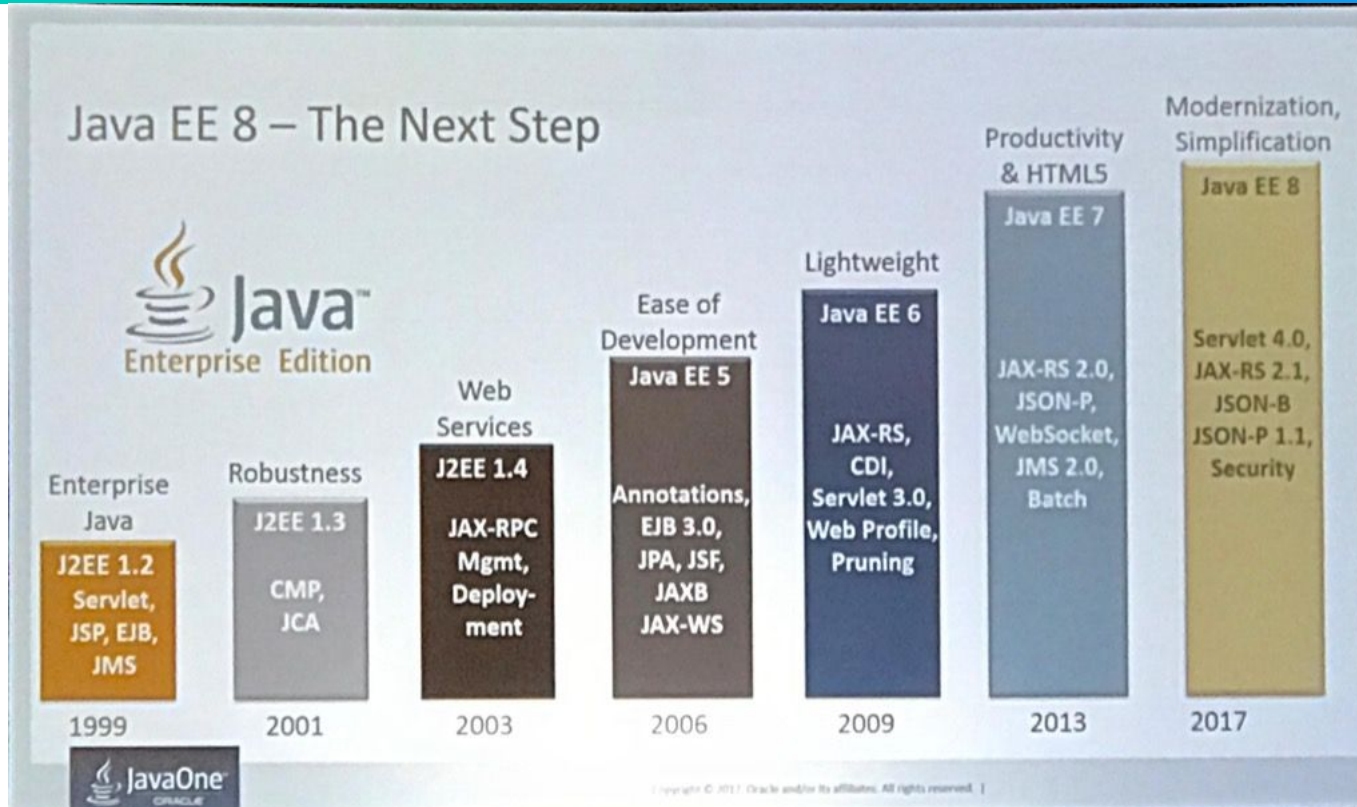# Lot 5 : Advanced modules of Jakarta EE stack
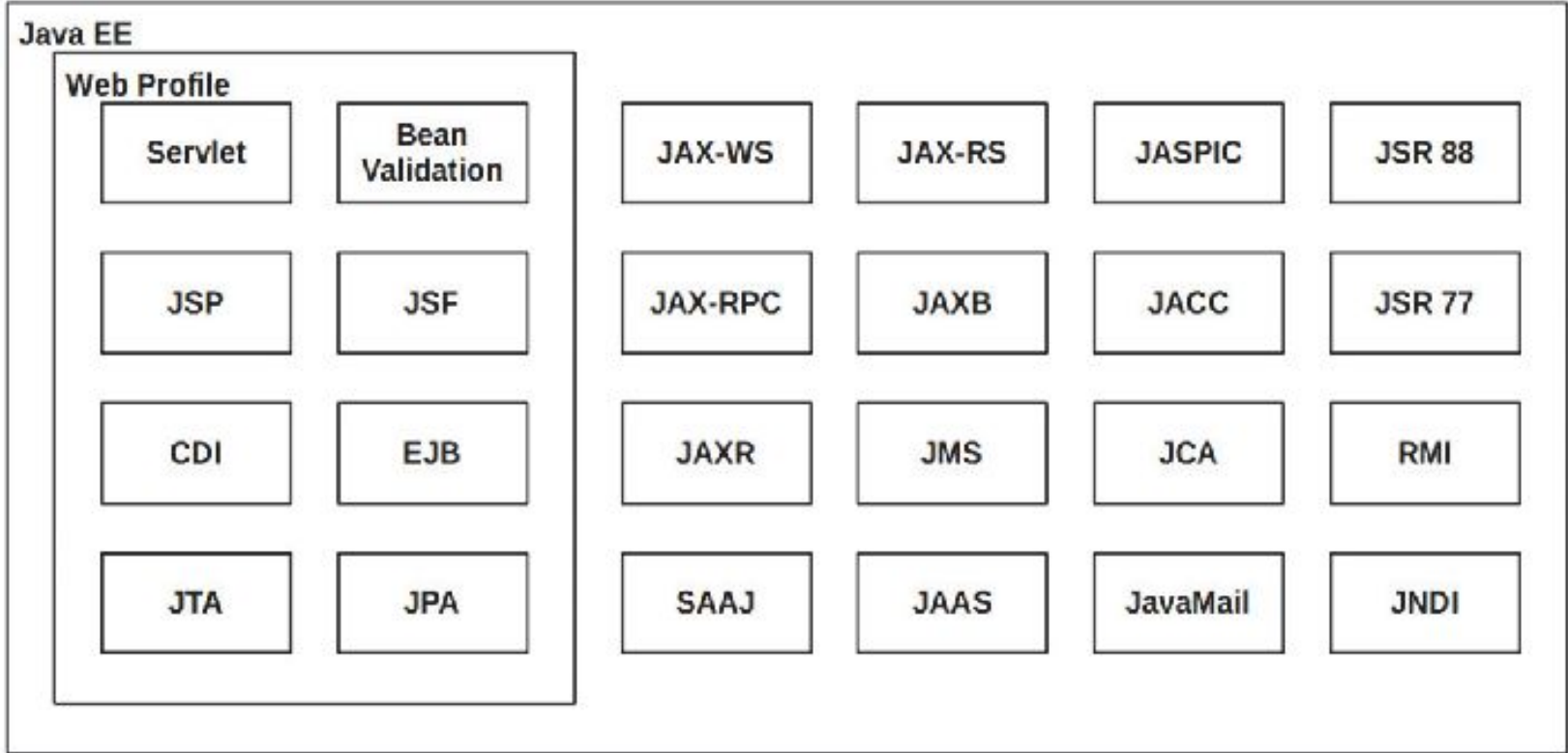# Day 4

Training @FPS on November 19th 2020

Agenda

1. Day 3 recap

2. JEE Platform

3. Popular Vendors

4. Understanding Dependency Injection

5. CDI Features

Credit : https://www.ivonet.nl/2017/10/02/CON2661__java-ee-8-what_s-new-in-the-java-ee-8-release/

Jakarta EE 8 Platform Compatible Products

Apusic AAS
Kingdee Apusic cloud computing Co., Ltd.

10

Eclipse Glassfish
Eclipse Foundation

5.1.0

FUJITSU Software Enterprise Application Platform
Fujitsu Limited

v1.0

IBM WebSphere Liberty
IBM Corporation

20.0.0.3

JBoss Enterprise Application Platform
Red Hat

7.3.0

JEUS
TmaxSoft Co., Ltd

8.5

Open Liberty
IBM Corporation

19.0.0.6 20.0.0.3

Payara Server
Payara Services Limited
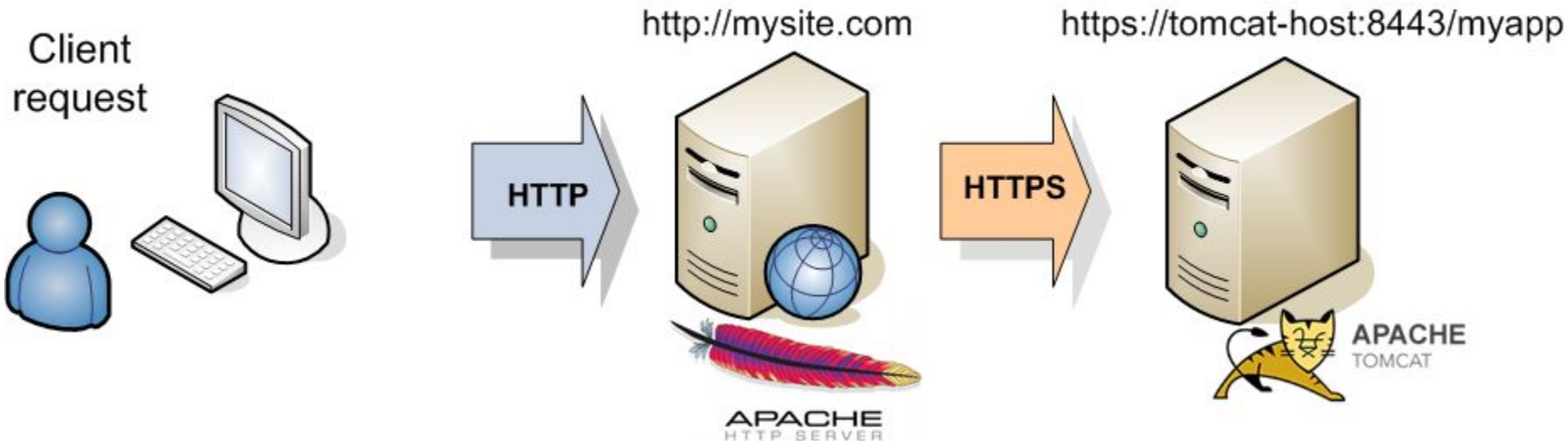
5.21.2

Primeton AppServer
Primeton

7

WildFly
Red Hat

18.0.0

Credit : https://jakarta.ee/compatibility/

Web Servers	Application Servers
Servlets	Servlets
JSP	JSP
Expression Language	Expression Language
WebSocket	WebSocket
JTA	JTA
JASPIC	Batch
	CDI
	Bean Validation
	EJB
	JPA
	JMS
	JSON-P
	JavaMail
	JAX-RS
	JAX-WS

Credit : https://www.baeldung.com/java-servers

HTTP to HTTPS

Client request

http://mysite.com

https://tomcat-host:8443/myapp

HTTP

HTTPS

APACHE
HTTP SERVER

APACHE
TOMCAT

HACKAGES

Apache TomEE WebProfile

☆	JSF MyFaces
☆	JPA OpenJPA
☆	**Jakarta Web Profile**

Apache TomEE MicroProfile

☆	MicroProfile
☆	JSF MyFaces
☆	JPA OpenJPA
☆	**Jakarta Web Profile**

Apache TomEE+

☆	JMS
☆	JAX-WS
☆	Jakarta Connectors
☆	MicroProfile
☆	JSF MyFaces
☆	JPA OpenJPA
☆	**Jakarta Web Profile**

Apache TomEE PluME

☆	JMS
☆	JAX-WS
☆	Jakarta Connectors
☆	MicroProfile
☆	JSF Mojarra
☆	JPA EclipseLink
☆	JPA OpenJPA
☆	**Jakarta Web Profile**

Credit : https://www.tomitribe.com/blog/tomee-webprofile-vs-tomee-microprofile-vs-tomee-vs-tomee-plume/

COMPARISON TABLE
GlassFish 5 x Payara Server 5

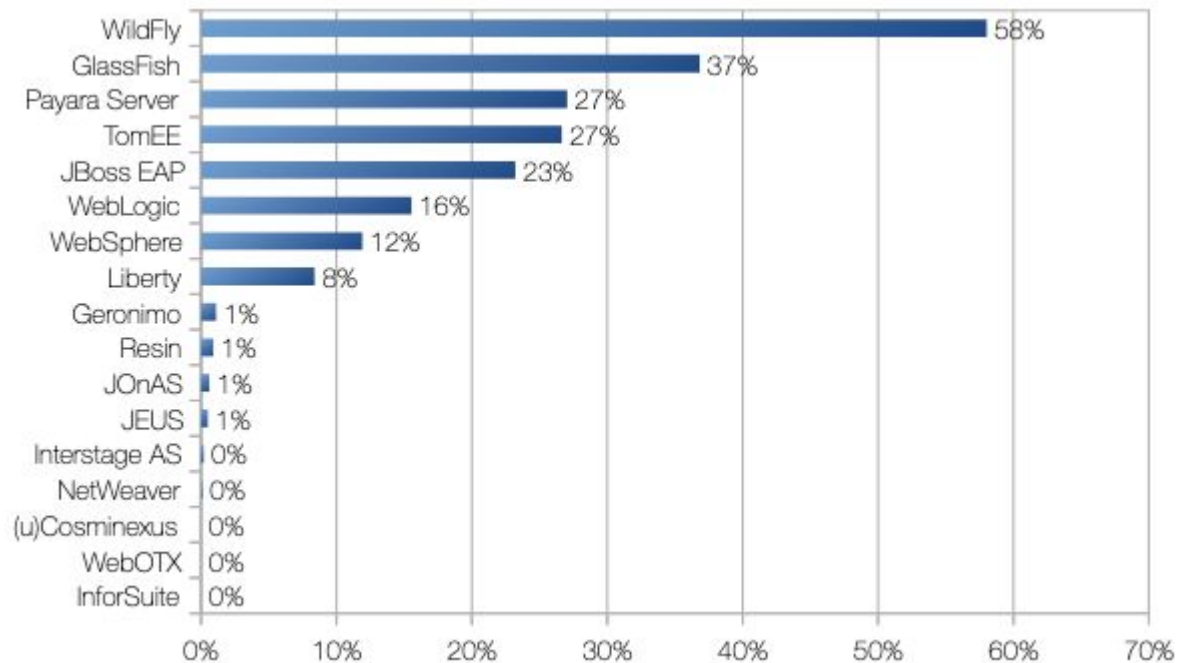| Features	GlassFish 5.x	Payara Server Enterprise
License	Open Source	Open Source
Release Frequency	Irregular	Monthly
Releases in 2019	1	22: 4 community stream, 12 stability stream, 8 feature stream
Security fixes	Infrequent	• Instant emergency and backported fixes for Payara Enterprise customers • As soon as possible for community
Component Upgrades (e.g. Tyrus, Mojarra)	Irregular	As Needed
Supported IDEs	• Eclipse • Netbeans • IntelliJ IDEA	• Eclipse • Netbeans • IntelliJ IDEA • Visual Studio Code
Caching tools	✗	JCache, Domain Data Grid, Payara Scales (additional cost)
MicroProfile Support	✗	Compatible with MicroProfile
Docker support	Community provided	Official images

Features	GlassFish 5.x	Payara Server Enterprise
Production Support	✗	✓
Migration & Project Support	✗	✓
Automatic Clustering	✗	✓ (via Hazelcast)
Asadmin command recorder	✗	✓
Slow SQL logging	✗	✓
Healthcheck service	✗	✓
Request Tracing	✗	✓
Monitoring logging	✗	✓
Microservices distribution	✗	✓ (Payara Micro)
HTTP & HTTPS port auto-binding	✗	✓ (Payara Micro only)
Generate Uber JAR	✗	✓ (Payara Micro only)
Production-tuned domain template	✗	✓
Upgrade tool	✗	✗ (coming soon)
Jakarta EE Compatible	✓	✓
Runs on JDK 11	✗	✓

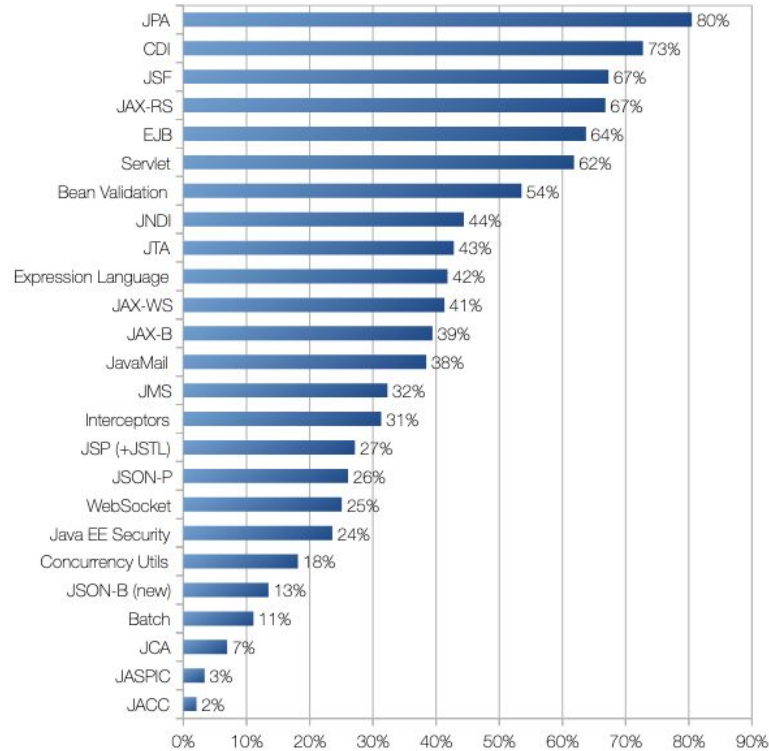Credit : https://www.payara.fish/solutions/migration-guide/glassfish-to-payara-server-migration/

Credit : https://arjan-tijms.omnifaces.org/2018/05/java-ee-survey-2018-results.html

Credit : https://arjan-tijms.omnifaces.org/2018/05/java-ee-survey-2018-results.html

	IBM WAS Liberty 8.5.5.7	IBM WAS full 8.5.5.6	Tomcat 8.0.26	TomEE+ 1.7.2[4]	Jetty 9.3.2	Glass Fish 4.1	Web Logic 12.1.3[3]	WildFly 9.0.1	JBoss EAP 6.4
Server stop+start[5]	4.9 sec	34.1 sec	5.5 sec	11.2 sec	3.1 sec	9.4 sec		10.2 sec	9.2 sec
App redeploy[5]	1.2 sec	6.1 sec	2.3 sec	2.5 sec	2.2 sec	2.5 sec		1.2 sec	1.2 sec
RAM[5]	59 MB	175 MB	125 MB	236 MB	102 MB	376 MB		269 MB	430 MB
Download size[1]	11 to 94 MB	3 GB	10 MB	48 MB	10 MB	103 MB		127 MB	158 MB
Size installed[1]	15-123 MB	2.6 GB	17 MB	52 MB	12 MB	214 MB		159 MB	174 MB
Size per instance	0.5 MB	40 MB	0.4 MB	0.4 MB	0.4 MB	96 MB		1.5 MB	1.2 MB
Dev. Install[6]	5 sec	30 min	2 sec	3 sec	1 sec	5 sec		5 sec	5 sec
# of config files	1+	100+	8+	12+	20+	14+		16+	16+
Dynamic config[2]	99%	80%	20%	20%	20%	20%	80%	60%	60%
IDE	Eclipse, IntelliJ IDEA, NetBeans are supported with some minor differences								
Configuration Editor	Eclipse UI	Browser UI	None	None	None	Browser UI	Browser UI	Browser UI	Browser UI
DevOps	Maven, Jenkins, Ant, Chef and other DevOps tools are supported with some minor differences								
Java EE	Java EE 7	Java EE 6+	JSP/Servlet	Java EE 6 Web Prof.	JSP/Servlet	Java EE 7	Java EE 6	Java EE 7	Java EE 6
Free Dev. License	IBM	IBM	Apache 2.0	Apache 2.0	EPL 1.0	CDDL 1.1	Oracle	LGPL 2.1	LGPL 2.1
Free Dev. Support	IBM[7]	IBM[7]	Self	Self	Self	Self	$	Self	Red Hat[8]

Legend:
- Excellent
- Good
- Limited
- Very Limited
- No support

Credit : https://webspherecompetition.wordpress.com/2015/09/22/lightweight-java-servers-and-developer-view-on-the-app-server-update/
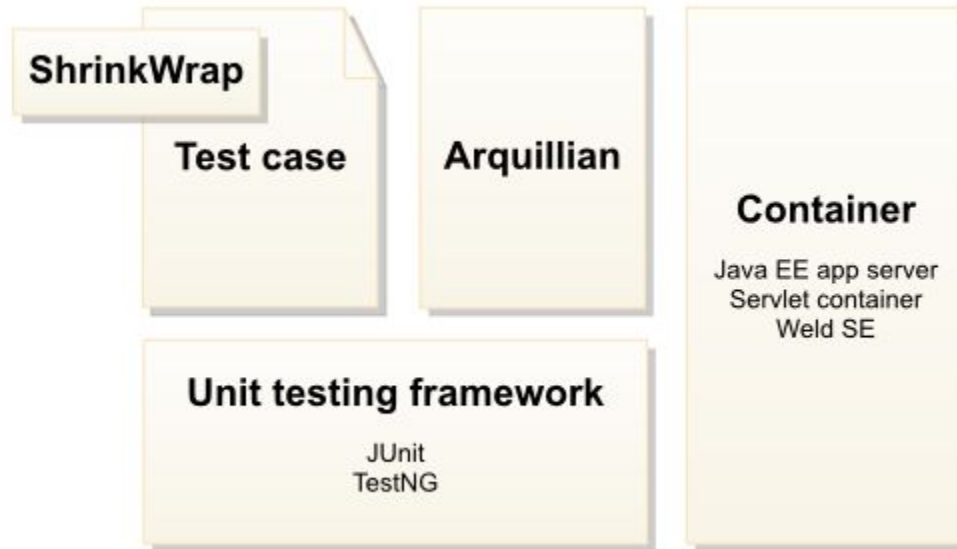
Arquillian

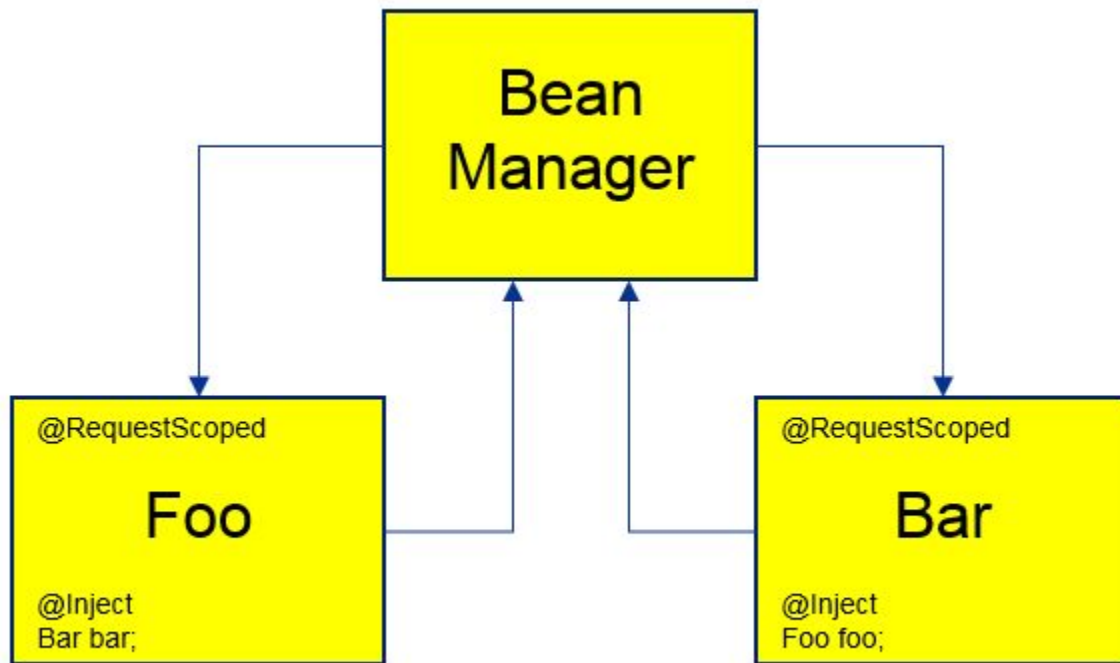Credit : https://docs.jboss.org/arquillian/reference/1.0.0.Alpha2/en-US/html_single/
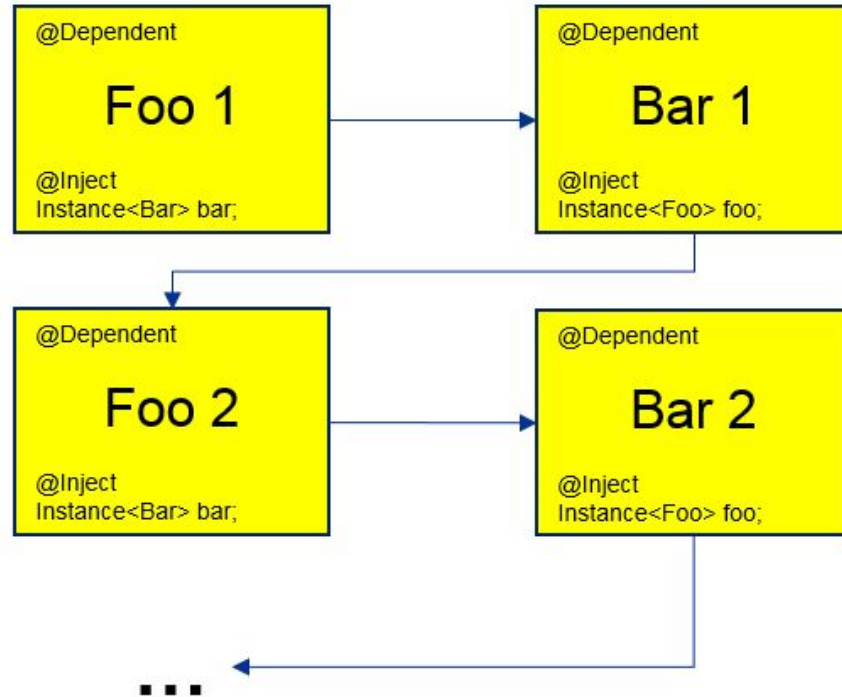
Arquillian Intro
Workshops

Dependency

- OOP

- Single purpose classes

- Class A depends on Class B

- Allows reuse of functionnality

CDI

- At least 2 beans/services working together

- Context service manages the object

- Injection service resolves dependencies and injects the object

Credit : https://www.knitelius.com/2015/10/20/cdi-voodoo-the-bean-manager-and-circular-injection/

Credit : https://www.knitelius.com/2015/10/20/cdi-voodoo-the-bean-manager-and-circular-injection/

Context Service

- Refined by scopes with annotations

  - RequestScoped

  - ApplicationScoped

  - SessionScoped

  - ConversationScoped

  - Dependent

- Provides a managed environment

CDI Bean

- Part of the CDI ecosystem

- Instantiated by the CDI container

- Bean discovery initiated during deployment

- CDI for Java 2.0 (JSR 365)

JSR Implementations

- Reference Implementation : Jboss Weld

- Apache OpenWebBeans

- CDI Extensions : APache DeltaSpike and Jboss Seam

CDI Bean usage

- Injection can be any type

- Programming to interfaces

- Which instance to Inject ?
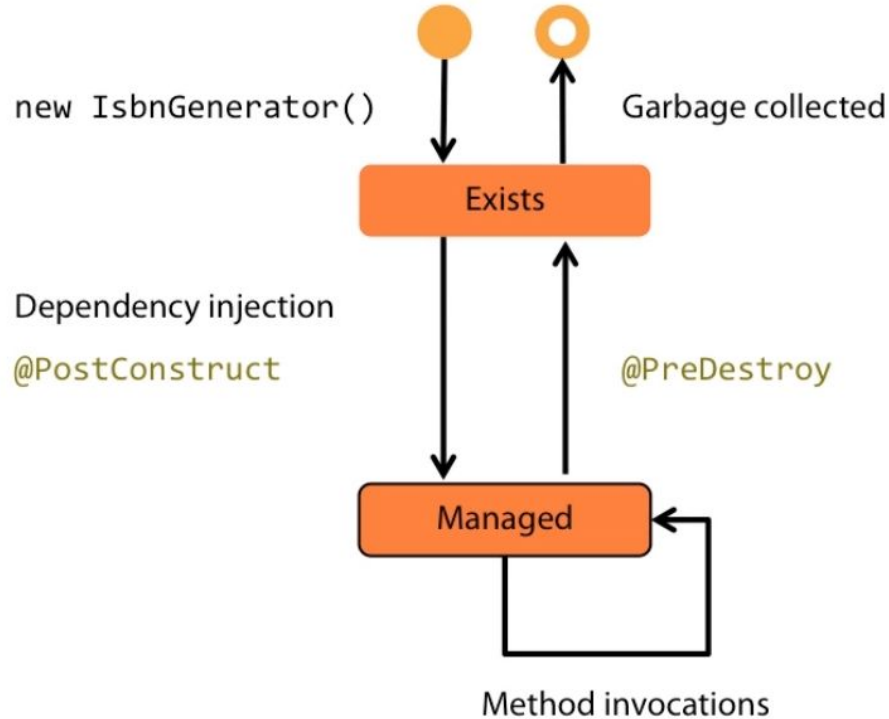
- Qualifiers disambiguate

CDI Bean Usage

@Vetoed : Prevents instantiation

@Alternative : provides alternative implementations

@Any & @Default

CDI Bean Lifecycle Management

CDI Bean : Scopes and Context

- Lifecycle duration match to web/application concepts

- Automatically created and destroyed

- Default scope : @Dependent

Workshops on CDI & Integration with JPA