

JAVA EE 7 AND MIGRATION TO THE CLOUD

Prof. dr. Matjaž B. Jurič

Java Champion

Oracle ACE Director

University of Ljubljana, FRI

SOA Competence Centre www.soa.si

Cloud Computing Centre www.cloud.si



Univerza v Ljubljani
Fakulteta *za računalništvo
in informatiko*

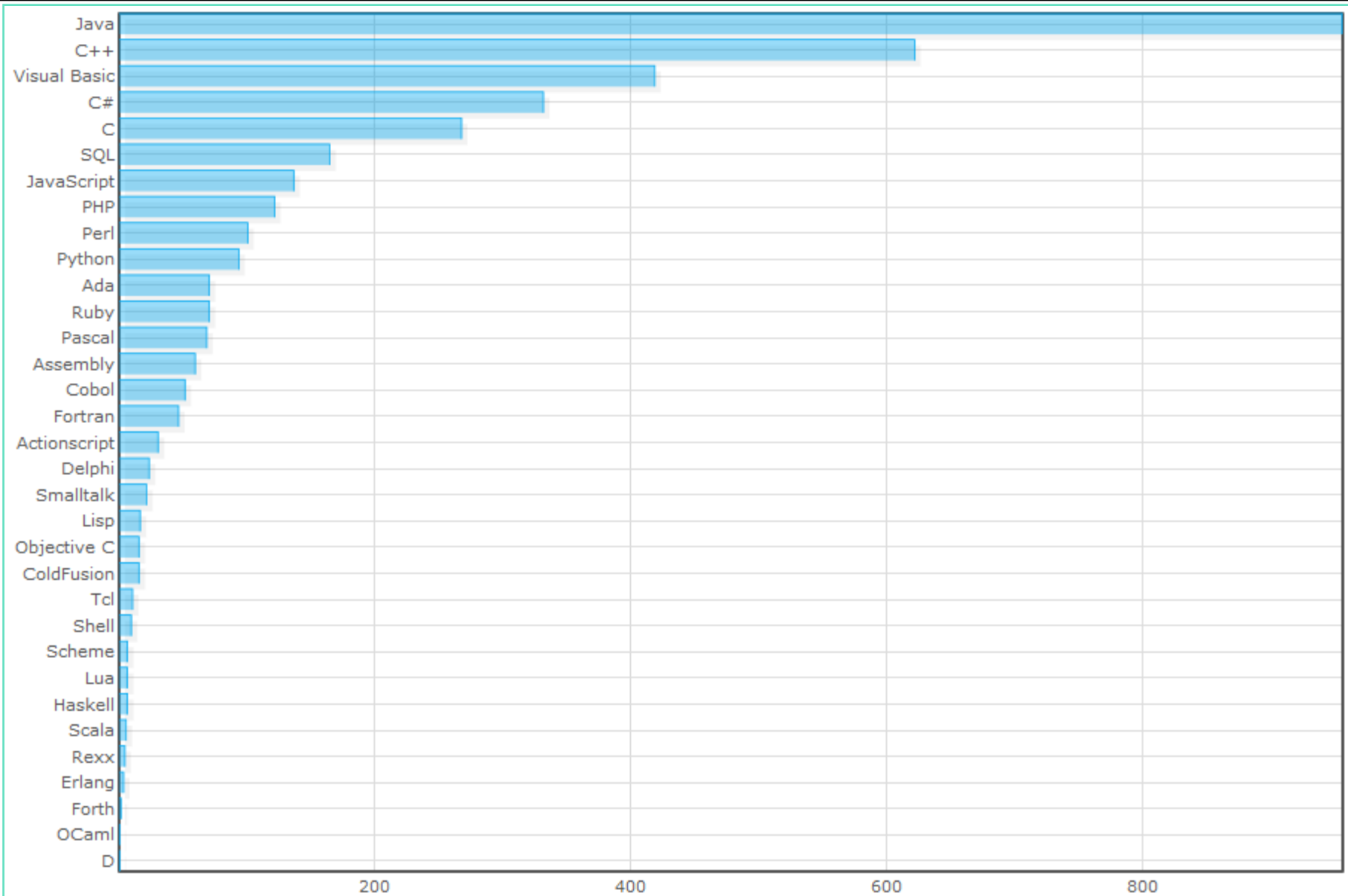
Java EE

- Commonly accepted standard for the development and deployment of business applications
- De-facto standard
 - In addition to .NET
- Can be found anywhere: from mobile devices to data centres
 - *Smart cards*
 - *Blu-ray players*

Java Programming Language

Position Sep 2011	Position Sep 2010	Delta in Position	Programming Language	Ratings Sep 2011	Delta Sep 2010	Status
1	1	=	Java	18.761%	+0.85%	A
2	2	=	C	18.002%	+0.86%	A
3	3	=	C++	8.849%	-0.96%	A
4	6	↑↑	C#	6.819%	+1.80%	A
5	4	↓	PHP	6.596%	-1.77%	A
6	8	↑↑	Objective-C	6.158%	+2.79%	A
7	5	↓↓	(Visual) Basic	4.420%	-1.38%	A
8	7	↓	Python	4.000%	-0.58%	A
9	9	=	Perl	2.472%	+0.03%	A
10	11	↑	JavaScript	1.469%	-0.20%	A
11	10	↓	Ruby	1.434%	-0.47%	A
12	12	=	Delphi/Object Pascal	1.313%	-0.27%	A
13	24	↑↑↑↑↑↑↑↑↑↑	Lua	1.154%	+0.60%	A
14	13	↓	Lisp	1.043%	-0.04%	A
15	15	=	Transact-SQL	0.860%	+0.09%	A
16	14	↓↓	Pascal	0.845%	+0.06%	A-
17	20	↑↑↑	PL/SQL	0.720%	+0.08%	A-
18	19	↑	Ada	0.682%	+0.01%	B
19	17	↓↓	RPG (OS/400)	0.666%	-0.05%	B
20	30	↑↑↑↑↑↑↑↑↑↑	D	0.609%	+0.20%	B

Java Programming Language



Java on Web Pages

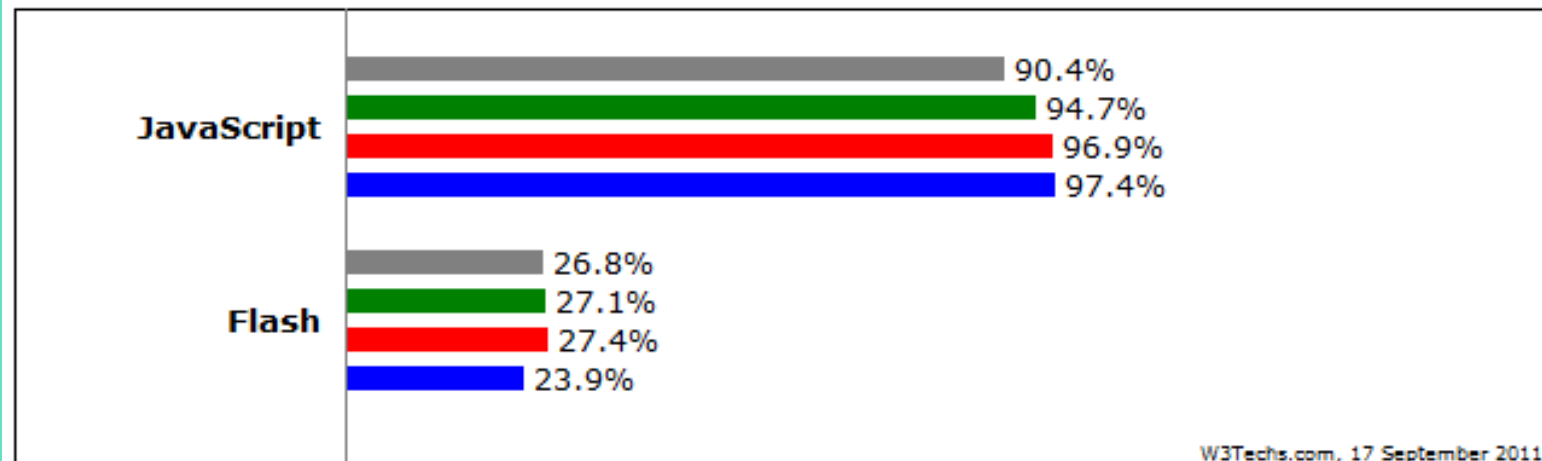
Usage of client-side programming languages broken down by ranking

This diagram shows the percentages of websites using various client-side programming languages broken down by ranking. Cross-technology reports only include technologies with more than 1% usage to ensure statistical significance of the results. See [technologies overview](#) for explanations on the methodologies used in the surveys.

How to read the diagram:

JavaScript is used by 90.4% of all the websites.

JavaScript is used by 94.7% of all the websites that rank in the top 100,000.



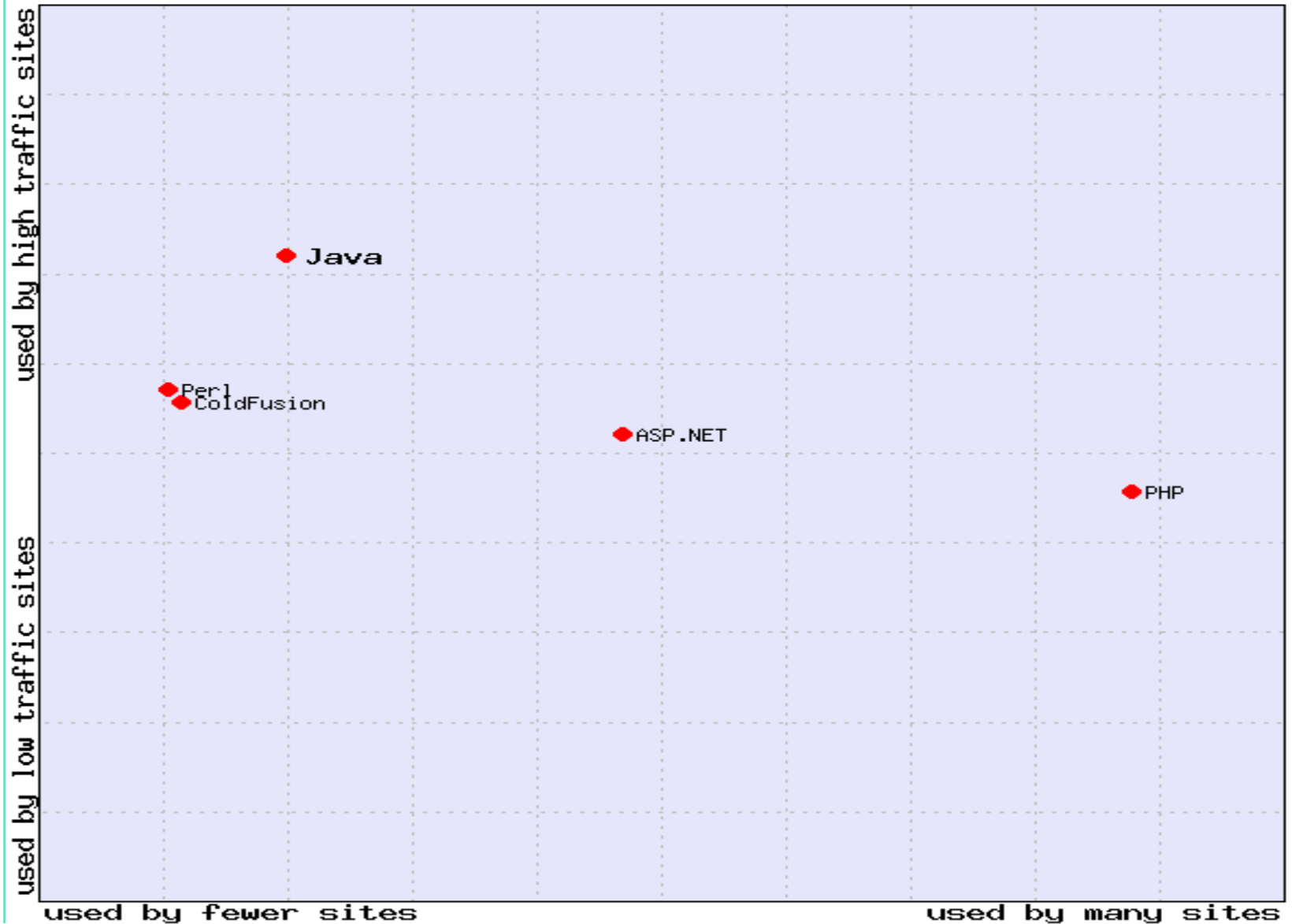
■ top 1.000.000 ■ top 100.000 ■ top 10.000 ■ top 1.000

Percentages of websites using various client-side programming languages broken down by ranking

Note: a website may use more than one client-side programming language

Java on Web Pages

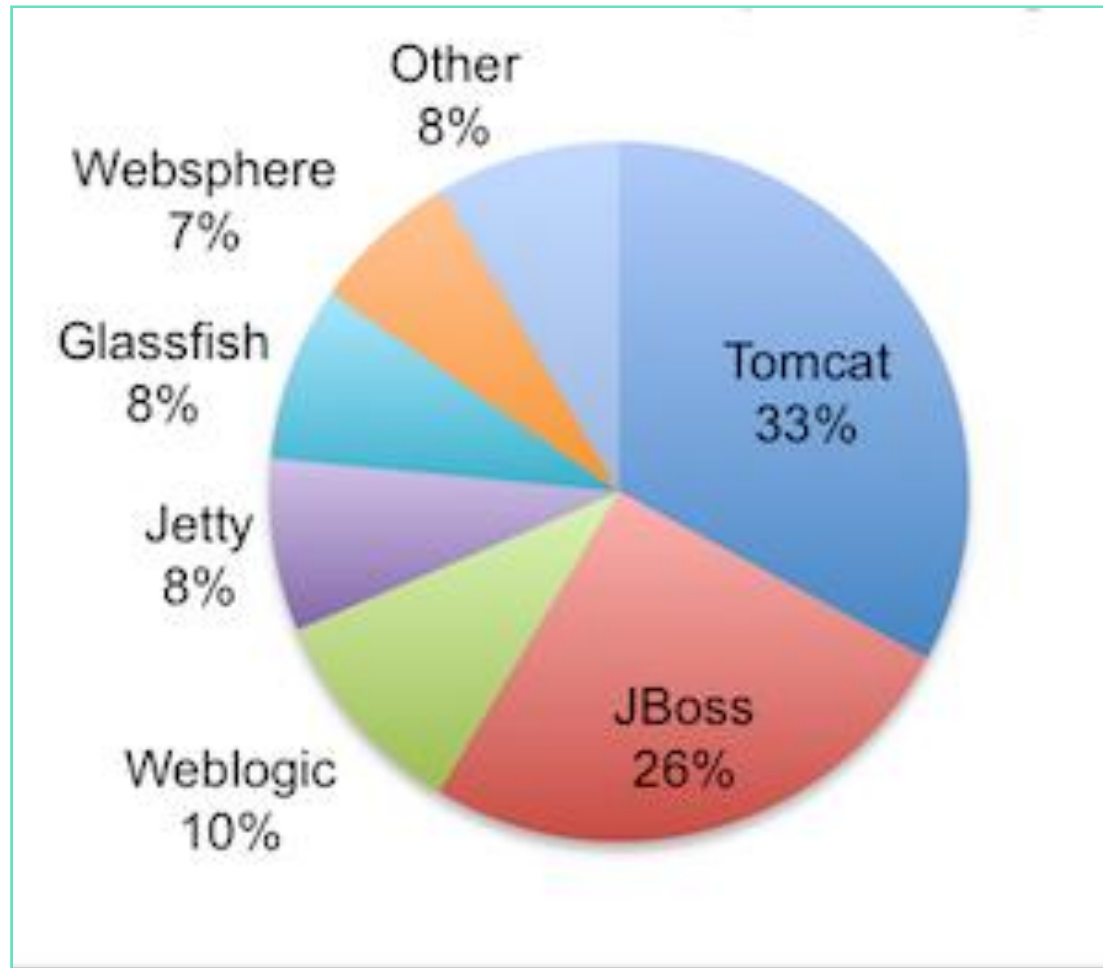
Java Market Position, 17 Sep 2011, W3Techs.com



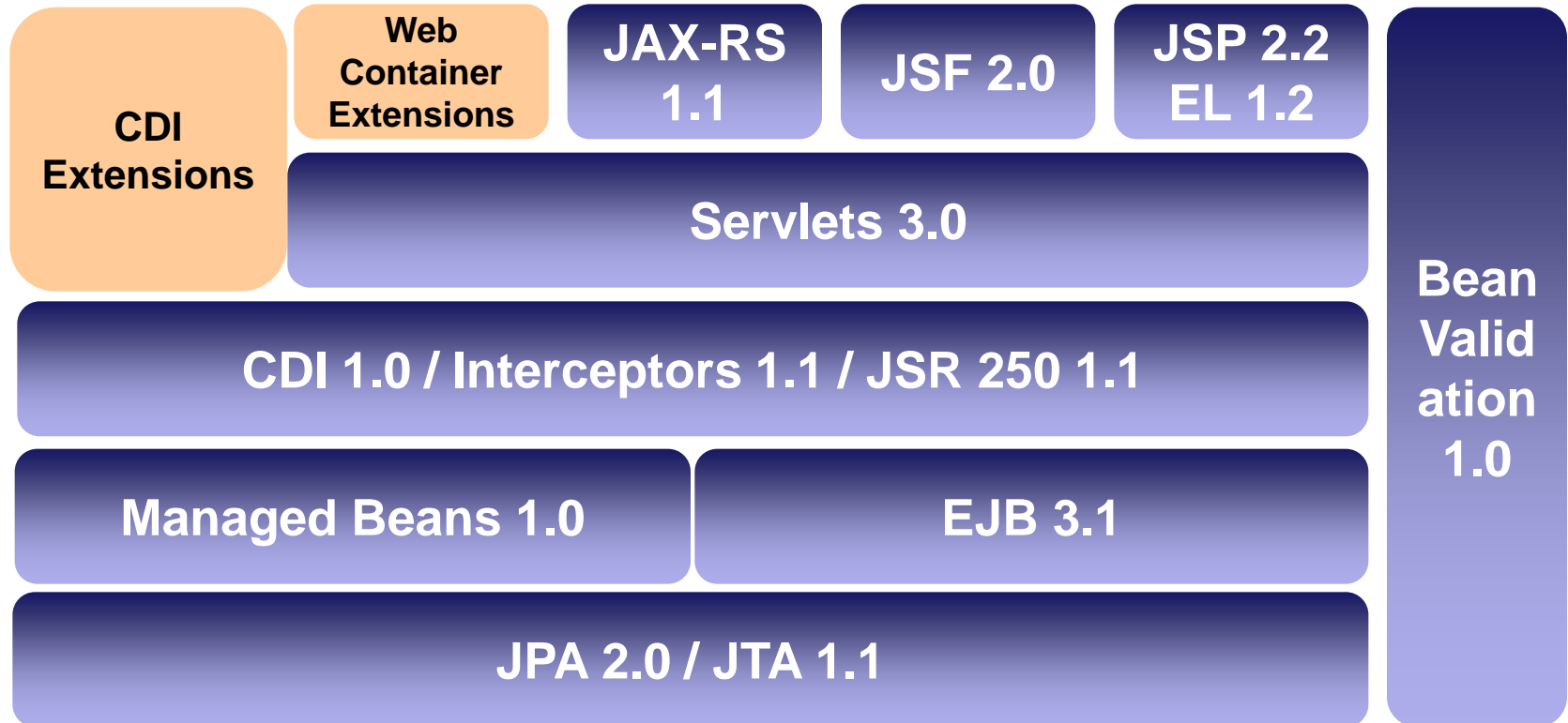
Why Java EE

- Java EE has been the first standardized platform for business application development
- Supported from majority of vendors
 - Except Microsoft

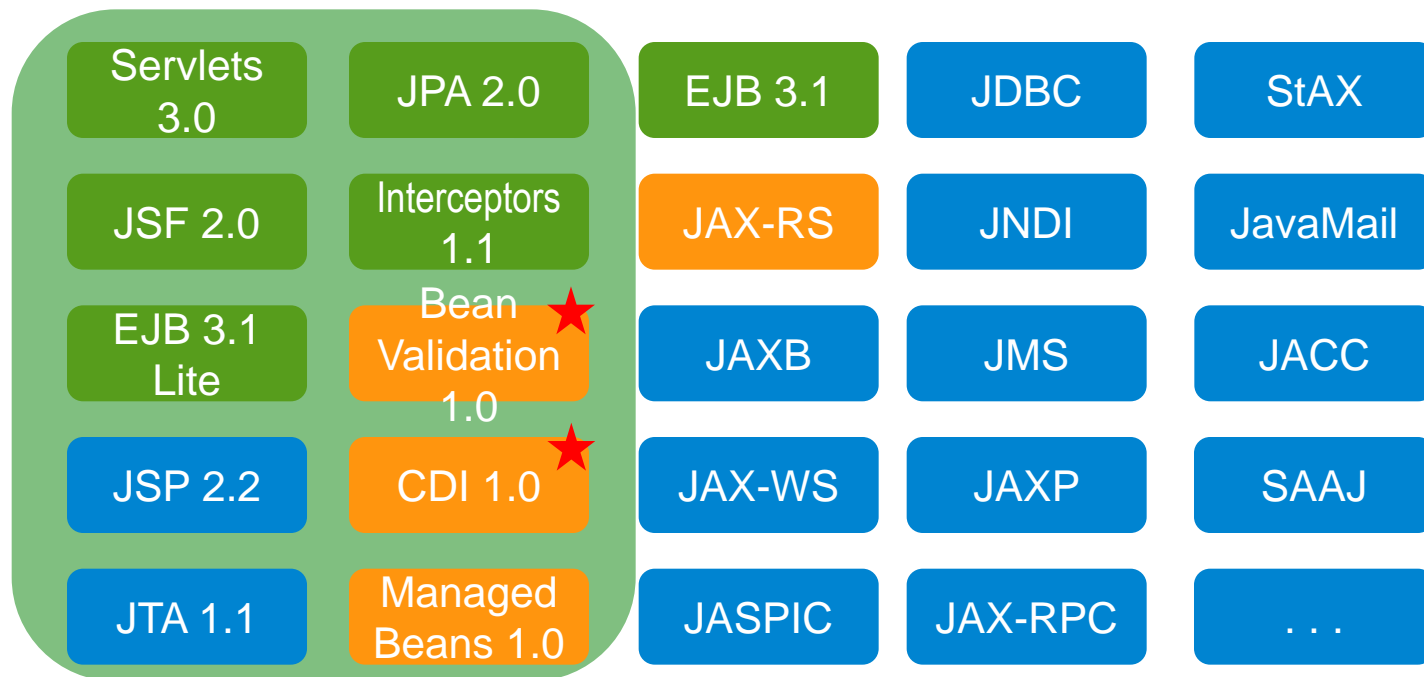
Java EE Applications Servers



Java EE 6 Programming Model



Java EE 6 Web Profile



Prispeval
RedHat

Novo

Posodobljeno

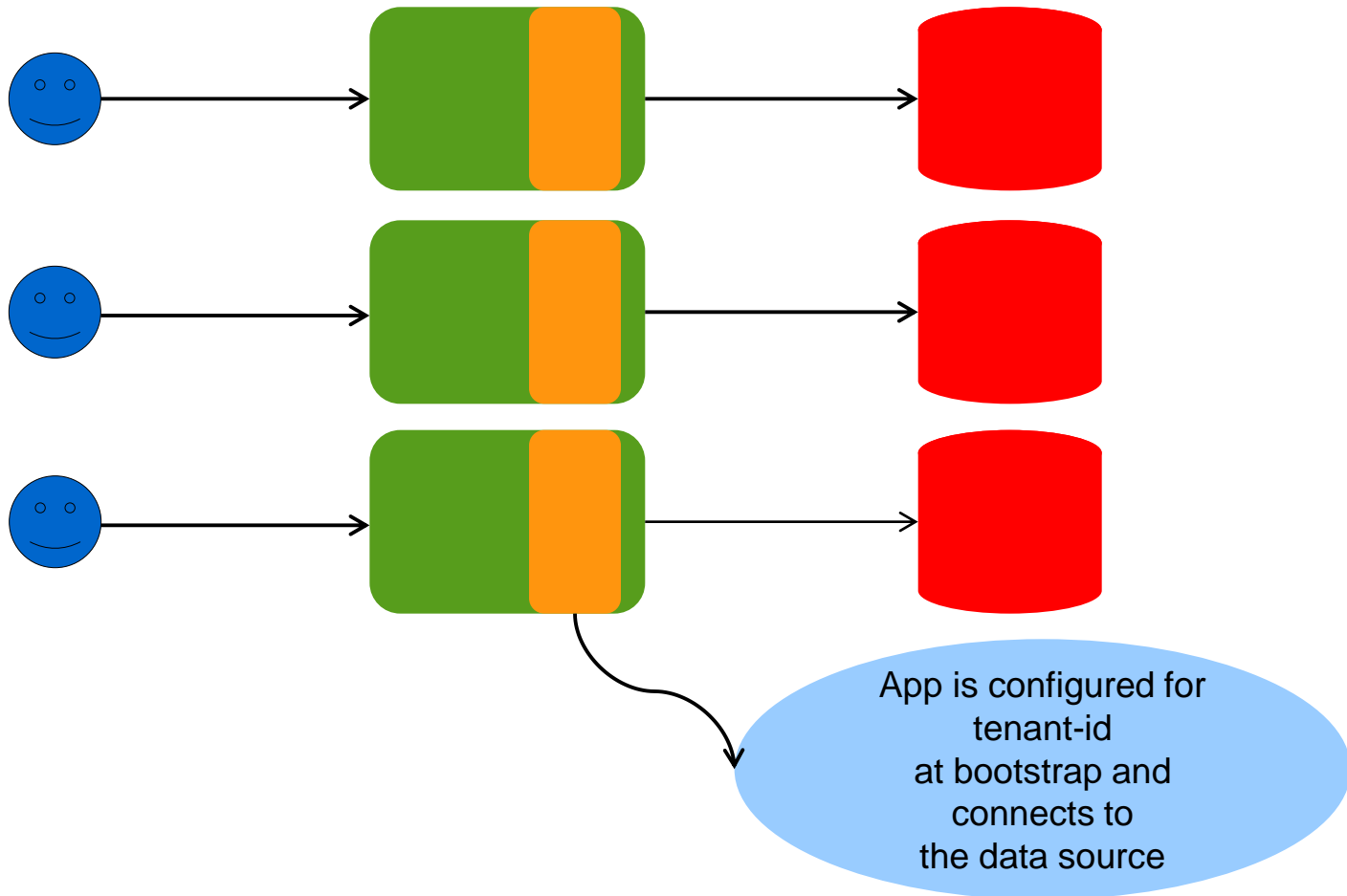
Java EE for the Cloud : JSR 342

- More easily operate on private/public clouds
 - Multi-tenancy
 - Elasticity
- Tighter requirements for resource and state management
- Better isolation between applications
- Potential standard APIs for NRDBMS, Caching, other
- Common management and monitoring interfaces
- Better packaging
- Evolution, not revolution

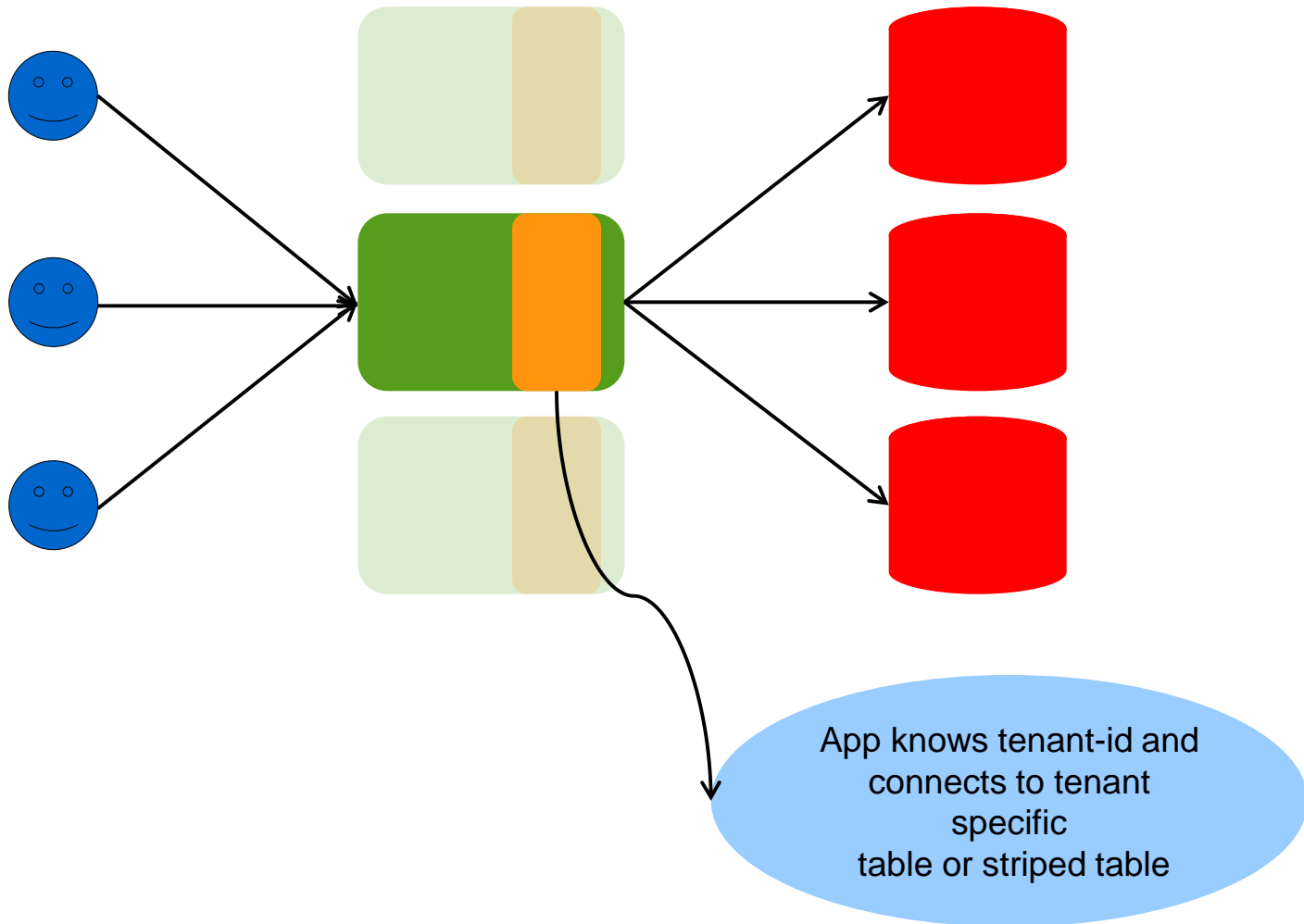
Multi-Tenant Taxonomies

- Dedicated App, Dedicated Database
- Shared App, Dedicated Database
- Dedicated App, Shared Database
- Shared App, Shared Database

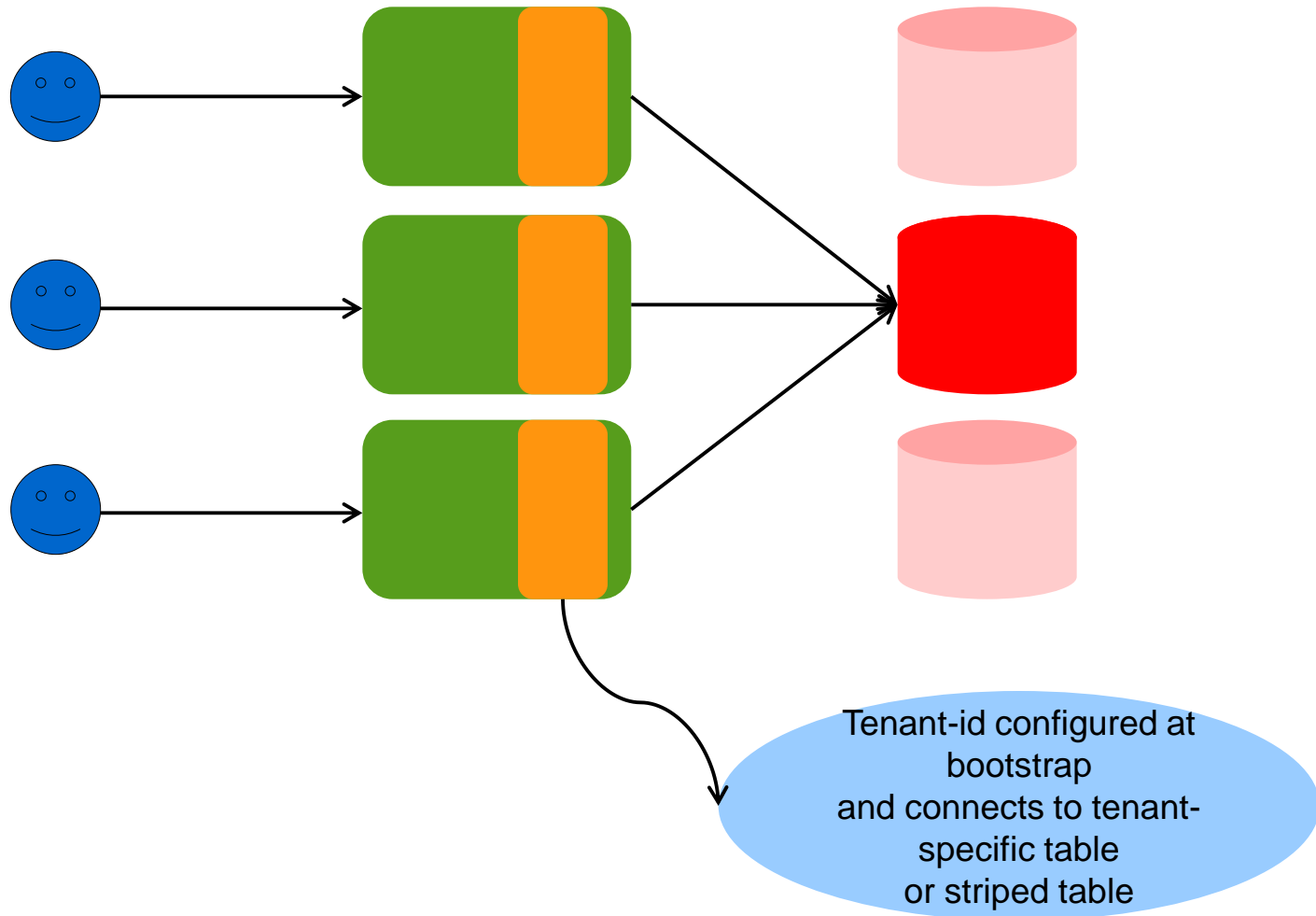
Dedicated App, Dedicated Database



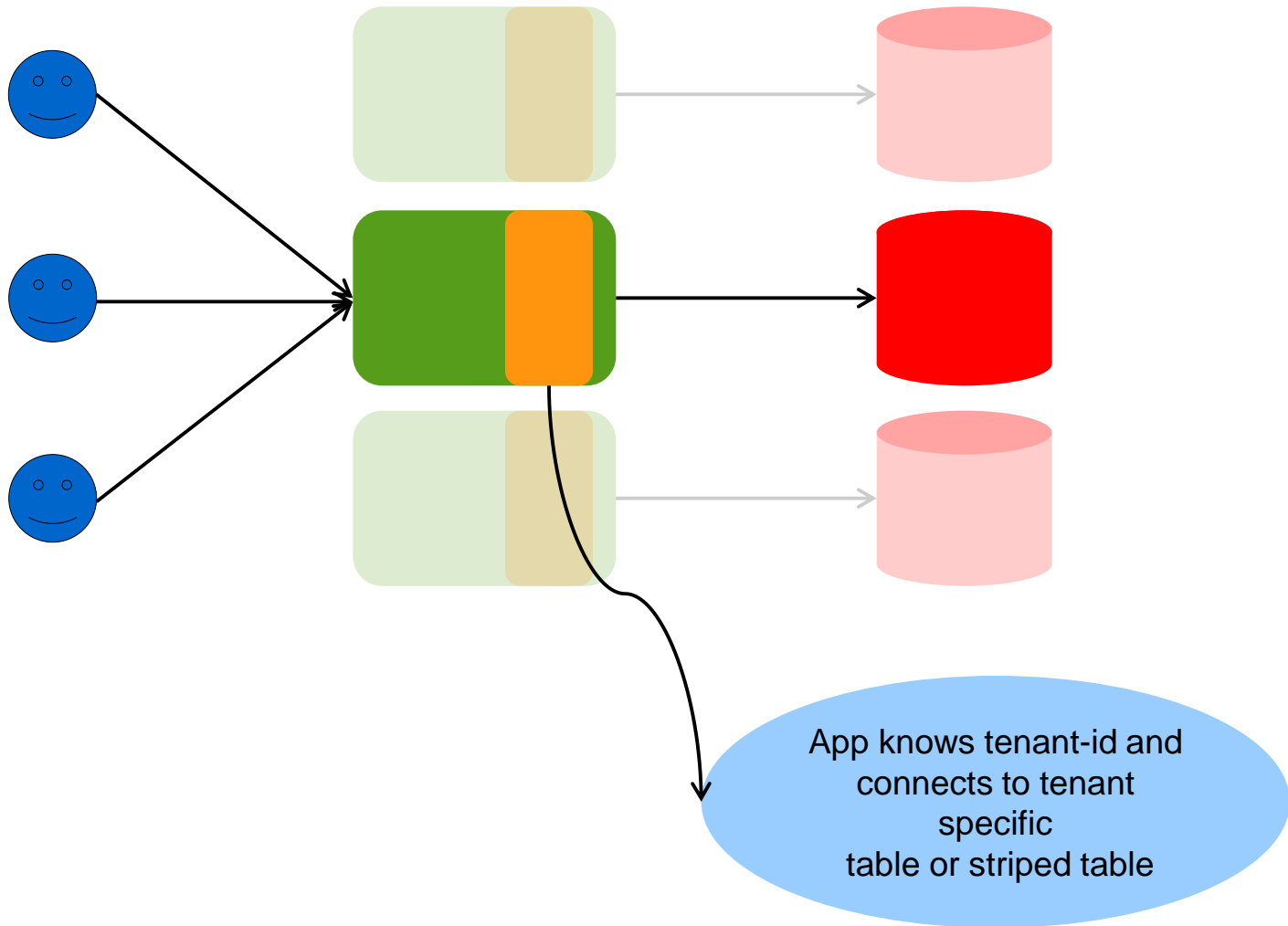
Shared App, Shared Database



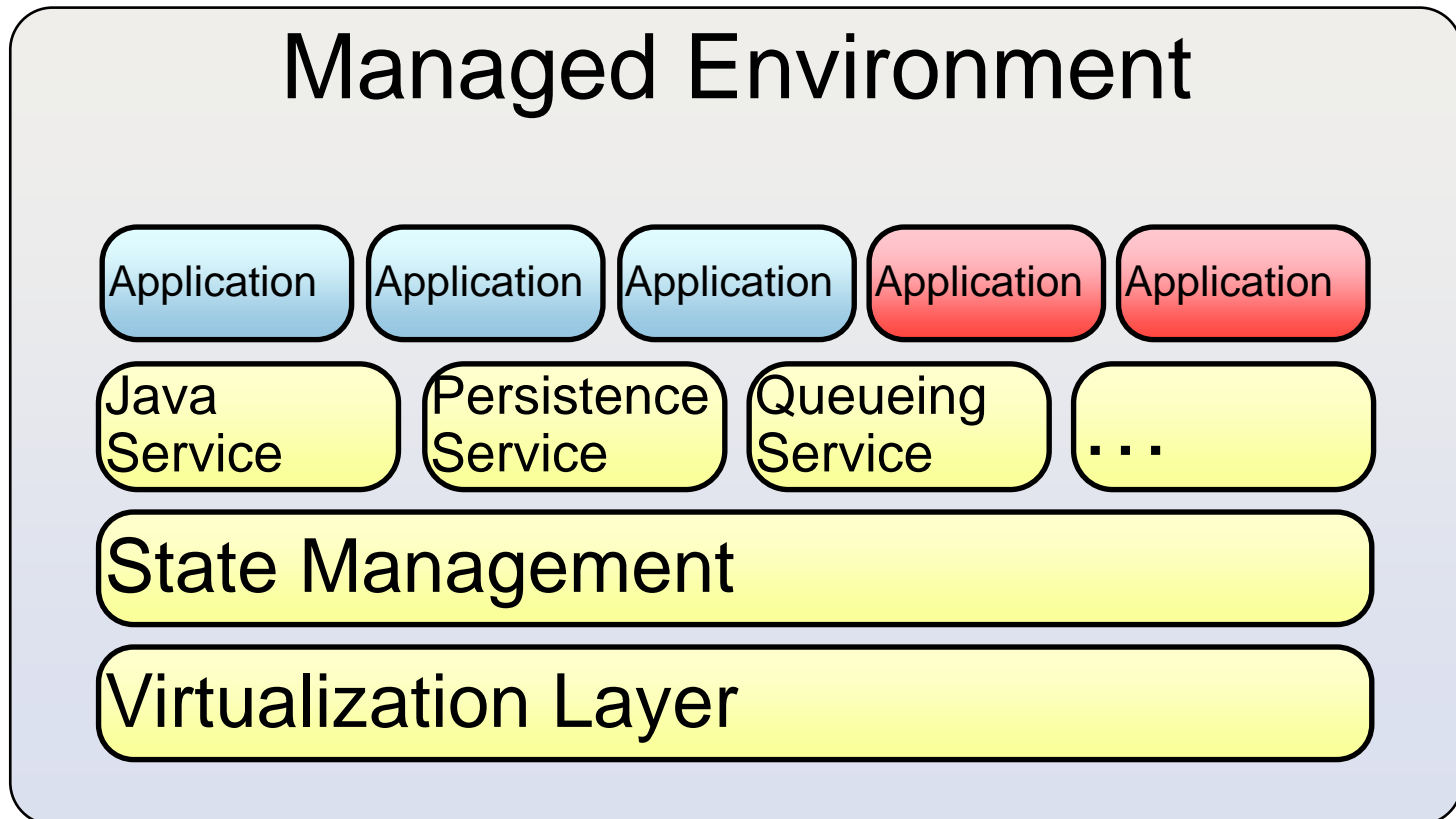
Dedicated App, Shared Database



Shared App, Shared Database



Java in the Cloud



The Java EE 7 Modularity

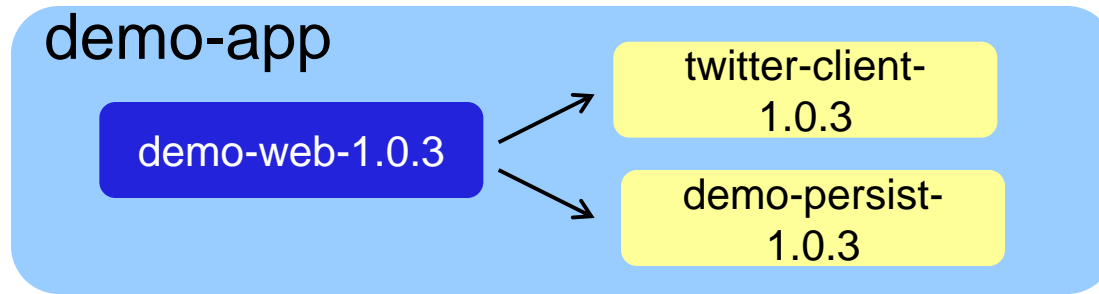
- Built on Java SE 8 work
- Applications made of modules
- Dependencies are explicit
- Versioning is built-in
- Classloaders are straightened

Modular Applications

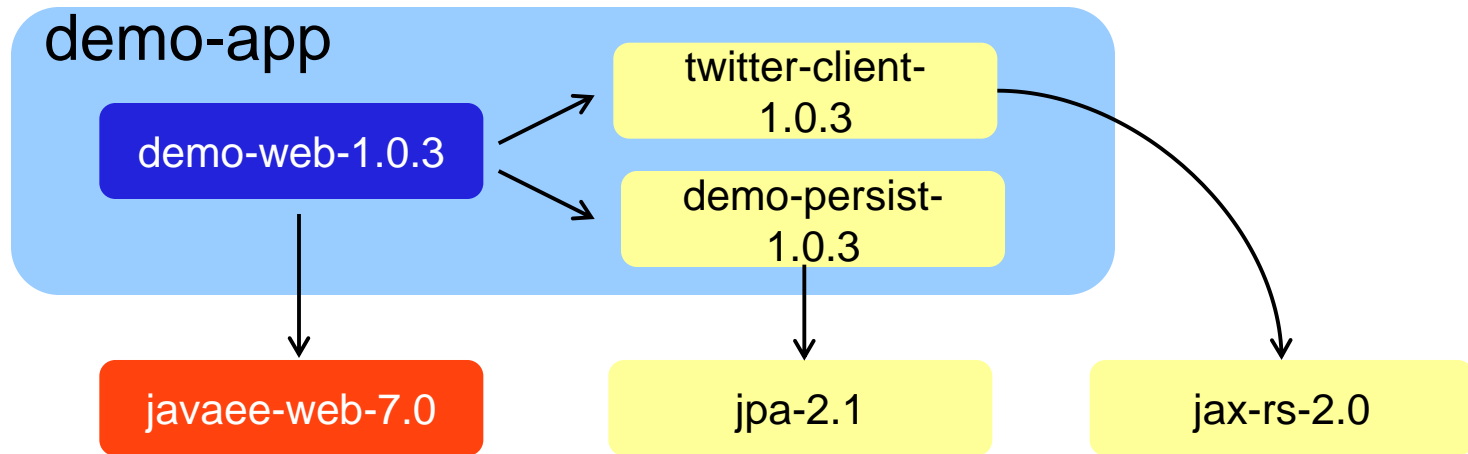
demo-app

demo-web-1.0.3

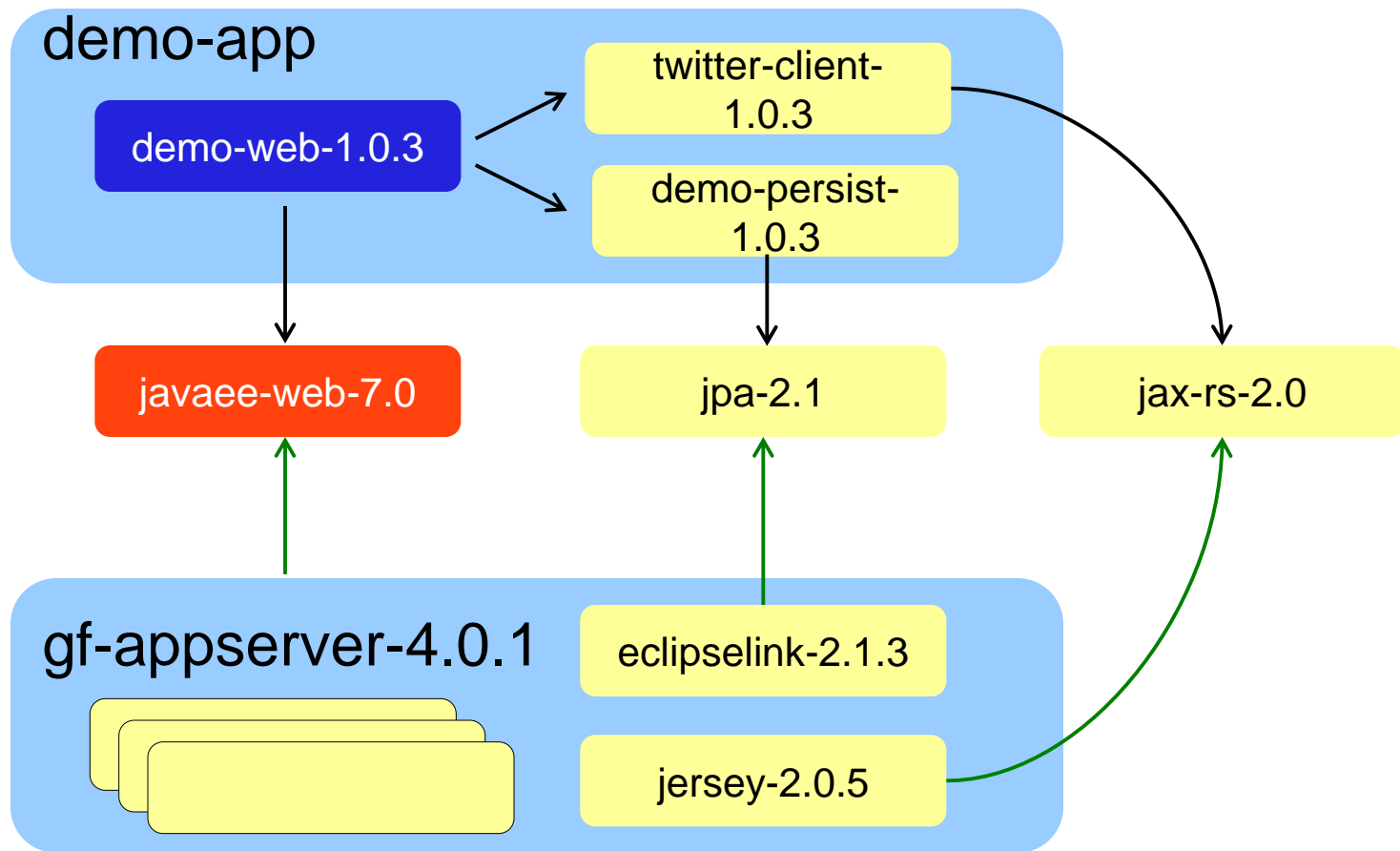
Modular Applications



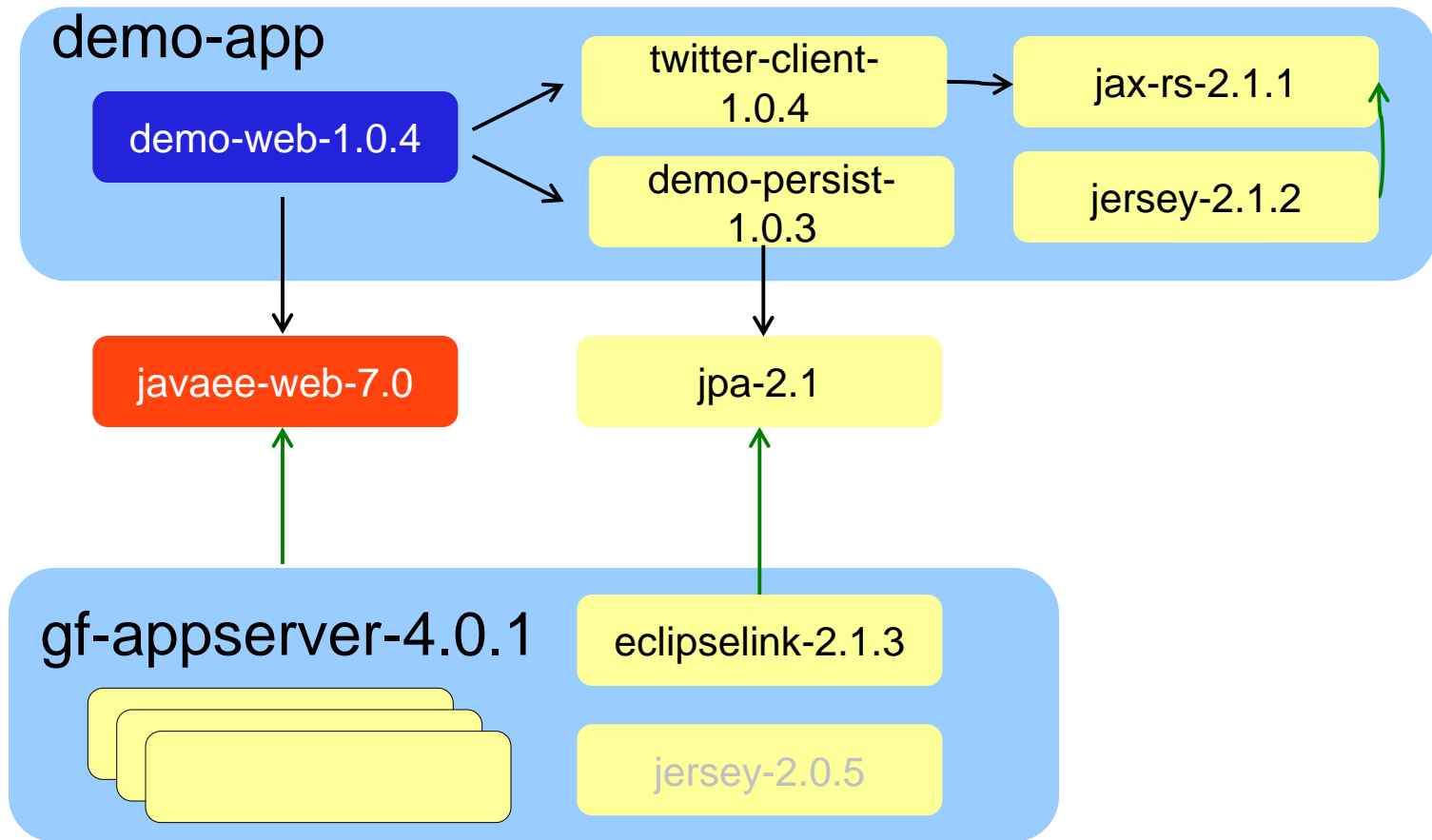
Modular Applications



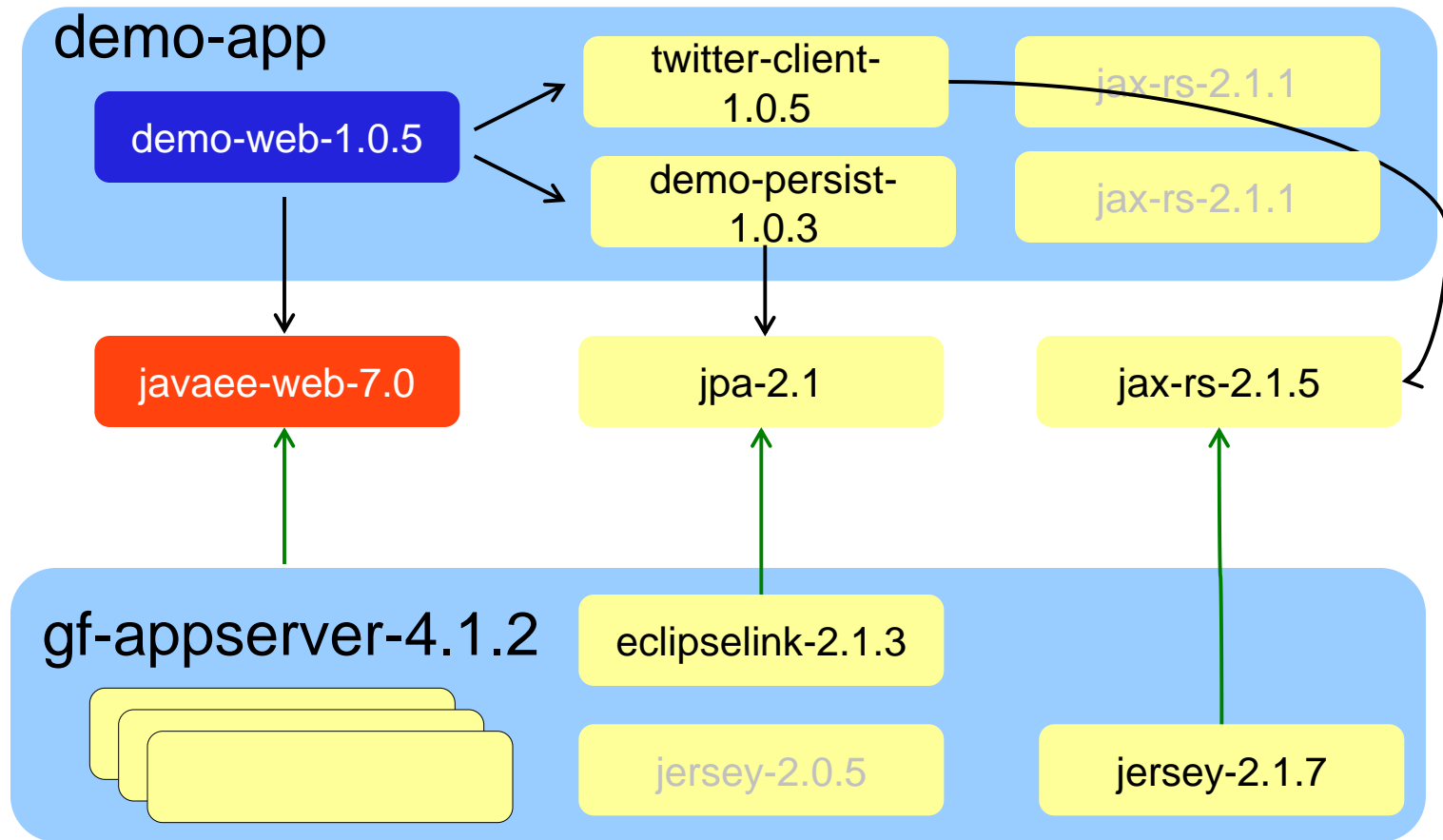
Modular Applications



Modular Applications



Modular Applications



Java EE 7 JSR Soup

- Java Persistence API 2.1 – JSR 338
- JAX-RS 2.0 – JSR 339
- Servlets 3.1 – JSR 340
- Expression Language 3.0 – JSR 341
- Java EE 7 – JSR 342
- Java Message Service 2.0 – JSR 343
- Java Server Faces 2.2 – JSR 344
- EJB 3.2 – JSR 345
- CDI 1.1 – JSR 346
- JCache – JSR 107
- Bean Validation 1.1 – JSR 349
- ...

Servlets 3.1 (JSR 340)

- Cloud support
- Multi-tenancy
 - Security / Session state / Resources isolation
- Asynchronous IO based on NIO2
- Simplified Asynchronous Servlets
- Utilize Java EE concurrency utilities
- Enable support for Web Sockets

JPA 2.1 (JSR 338)

- Multi-tenancy
- Support for stored procedures, vendor function
- Update and Delete Criteria queries, JPQL ↔ Criteria
- Query by Example
- Support for schema generation
- Persistence Context synchronization control
- Dynamic definition of PU
- Additional event listeners

EJB 3.2 (JSR 345)

- Enablement for use in cloud
- Factorization of the EJB technology
 - Interceptors was the first example
 - Container-managed transactions as target
- Alignment with other specifications
- Mark “pruned” technologies as optional
 - EJB 1.x and 2.x entity beans
 - Web service invocation using JAX-RPC

JAX-RS 2.0 (JSR 339)

- Client API
 - Low level using Builder pattern, Higher-level
- Hypermedia
- MVC Pattern
 - Resource controllers, Pluggable viewing technology
- Bean Validation
 - Form or Query parameter validation
- Closer integration with @Inject, etc.
- Server-side asynchronous request processing
- Server-side content negotiation

CDI 1.1 (JSR 346)

- Global ordering of interceptors and decorators
- API for managing built-in contexts
- Embedded mode to startup outside Java EE container
- Send Servlet events as CDI events

Expression Language 3.0 (JSR 341)

- A JSR by itself
- Make EL easier to use outside EE container
 - Simplified to use in Java SE
- EL Context is split into Parsing and Evaluation context
- Explicit coercion rules using API
- Criteria-based selection from Collection
- Operators: ==, concat, sizeof
- CDI events for expression evaluation

JMS 2.0 (JSR 343)

- Long overdue – after 9 years
- Modest scope, major extensions deferred to a subsequent revision
- Ease-of-development
- Clarification of relationship with other Java EE specs
- New mandatory API for pluggable JMS provider

Bean Validation 1.1 (JSR 349)

- Integration with other specs
- JAX-RS: Validate parameters on HTTP calls
- JAXB: convert into XML schema descriptor
- JPA: DDL generation
- Method level validation

```
public void izvediNarocilo(@Valid Narocilo n,  
                           @Min(0) @Max(30) int postavke) {  
}
```

- @Valid and group propagation
- Apply constraints on element collection

JSF 2.2 (JSR 344)

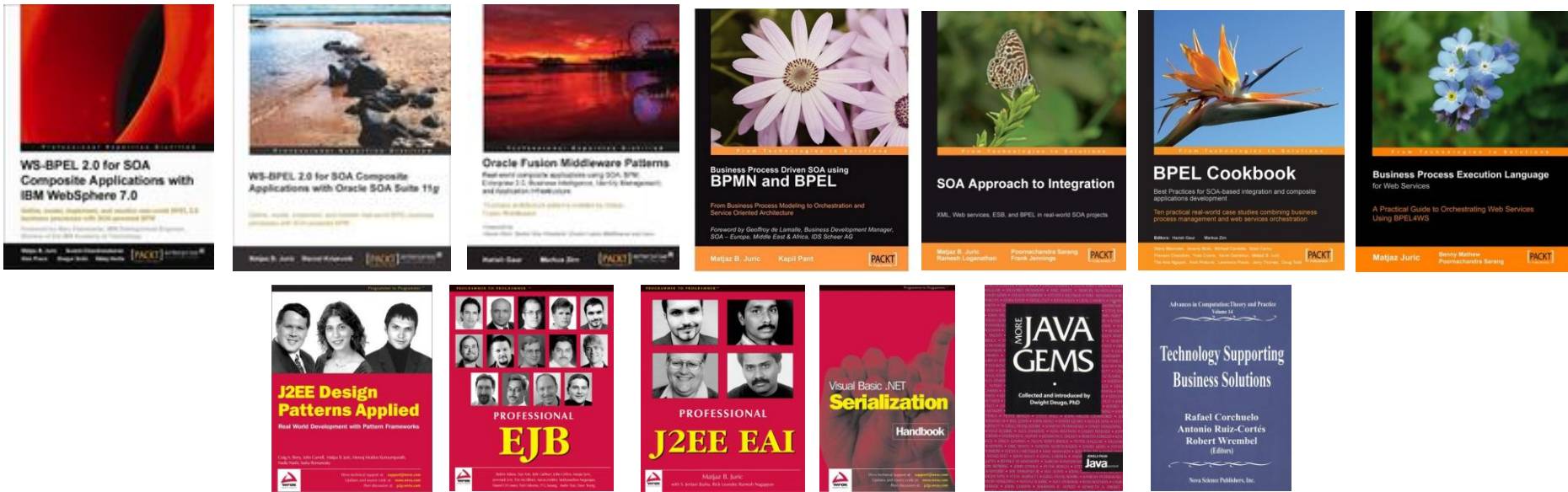
- Ease of development
 - cc:interface is optional
 - JSF lifecycle is CDI aware
 - Runtime configuration options change
- Support implementation of Portlet Bridge 2.0
- Support for HTML5 features
 - Forms, Heading/Section content model, ...
- New components like FileUpload and BackButton

Other Improvements

- Ease-of-development: JMS 2.0
- Latest web standards
- New JSRs: Web Sockets, Java JSON API
- HTTP Client API (JAX-RS 2.0)
- Possible JSRs inclusion
- Concurrency Utilities for Java EE (JSR 236)
- JCache (JSR 107)

Java EE 7- When?

- Late 2012
- Date-driven release
 - Anything not ready will be deferred to Java EE 8



QUESTIONS

e-naslov: <http://www.cloud.si>

e-naslov: <http://www.soa.si>

e-pošta: info@cloud.si



Univerza v Ljubljani
 Fakulteta za računalništvo
 in informatiko