

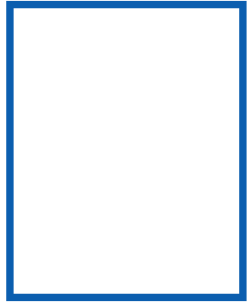
Understanding Java EE



Antonio Goncalves

@agoncal | www.antoniogoncalves.org

Previous Module



CD-BookStore web application

Java EE simplifies development

Java EE programming model

Metadata

Convention over configuration

Module Outline



Enterprise application

Java EE architecture

Standard

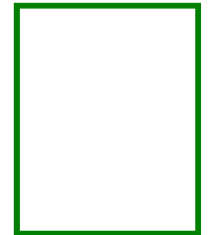
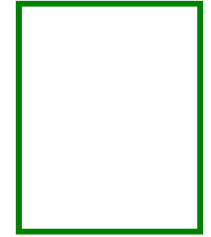
JCP

Java EE implementations

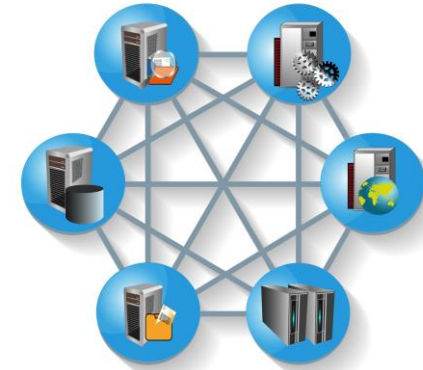
Java EE specifications

What Is an Enterprise Application?

- Multi-tiered
 - Scalable
 - Reliable
 - Secure
- 
- Enterprise application
- Solve the problems of large enterprises
 - For individual developers
 - Small organizations



Tiered Application



Client tier

Middle tier

EIS tier

What Is Java EE?

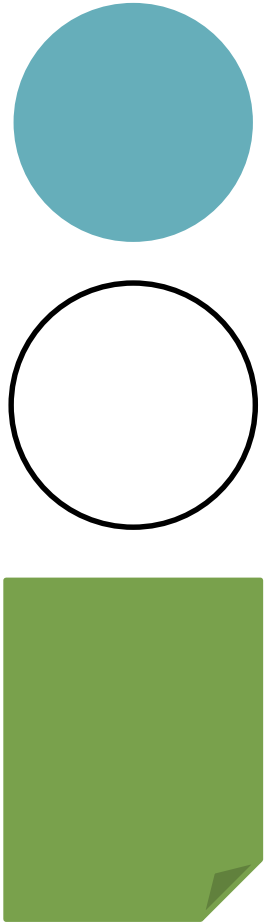
- Extension of Java SE
- Simplify enterprise applications development
- Simple programming model
- Standard
 - JCP
- Multiple implementations



Java
Community
Process

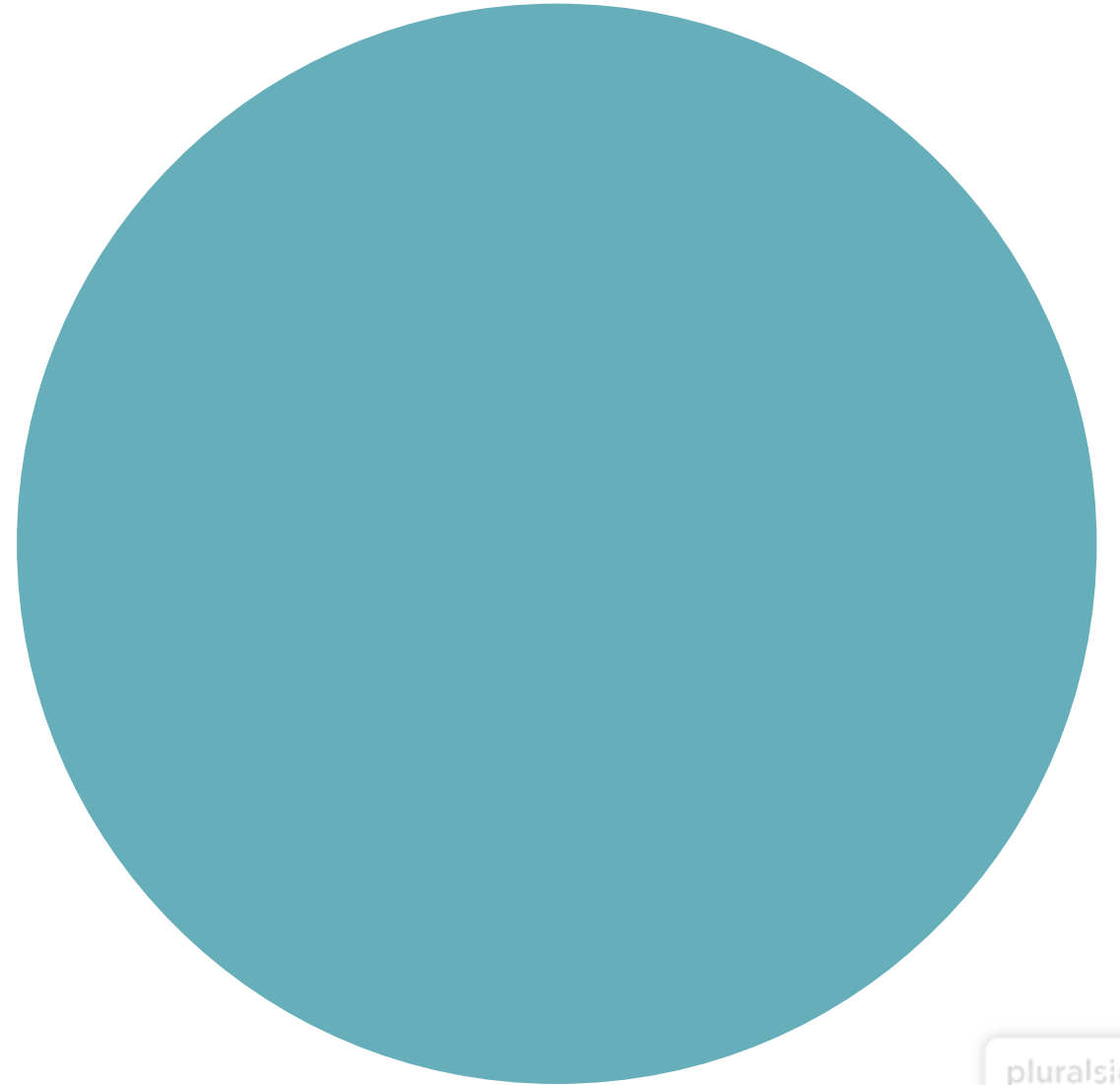
Java EE Architecture

- Container
- Services
- Components
- APIs
- Packaging
- Deployment
- Protocols
- Java SE APIs



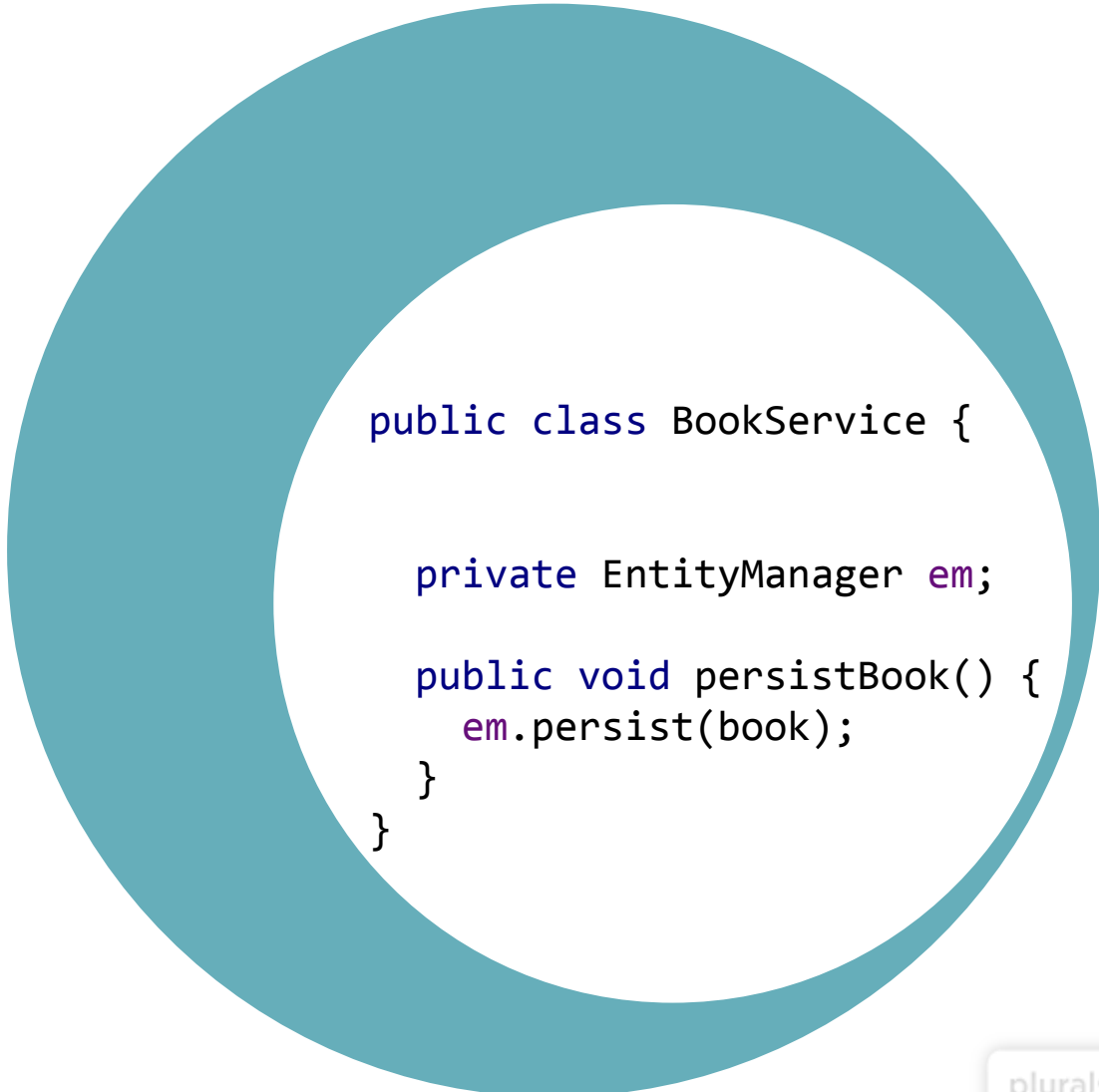
Container

- Runtime environment
- Hide technical complexity
- Enhance portability
- Host applications
- Handle complex low-level details
- Administrates the applications



Components

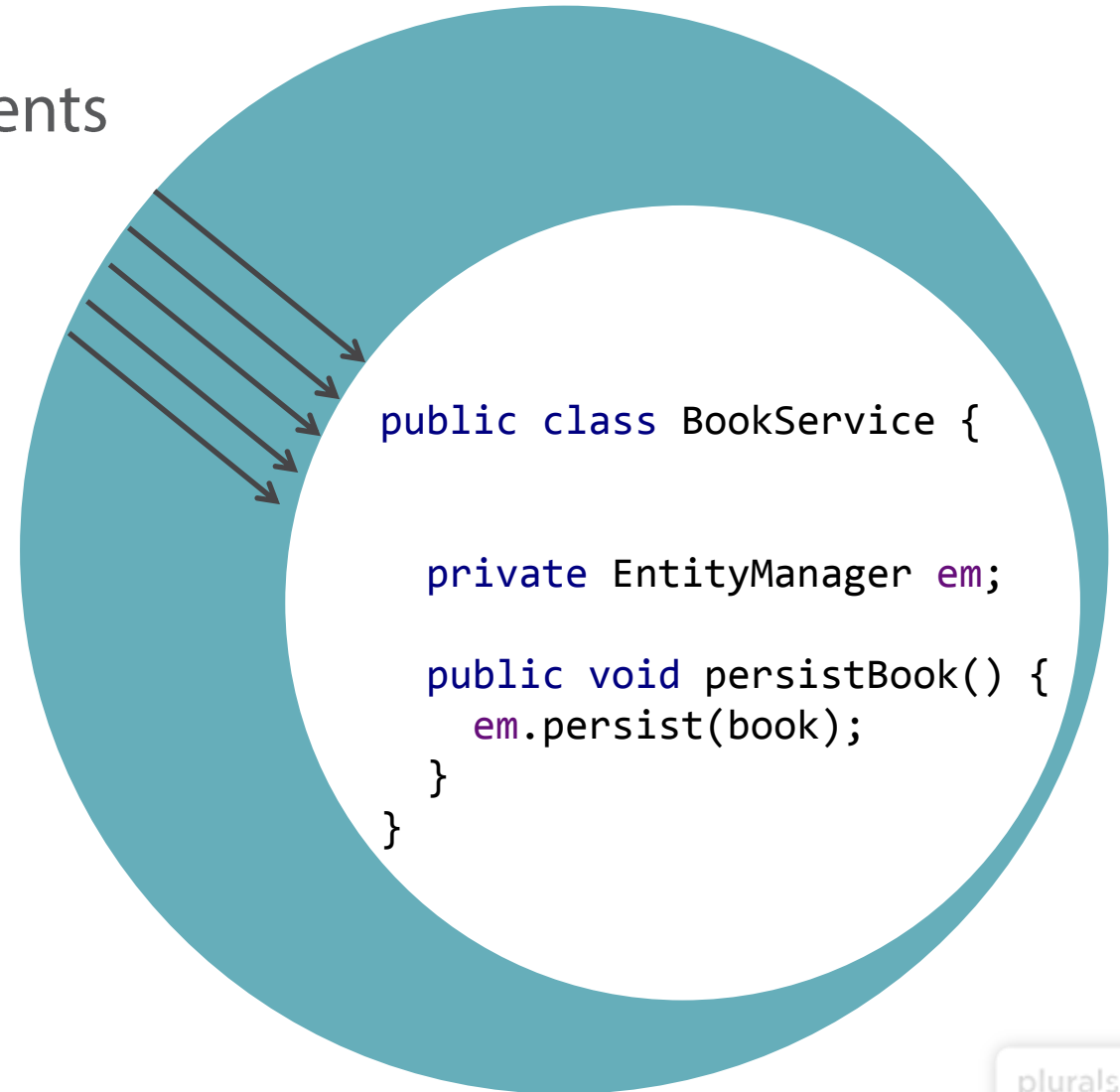
- Static or dynamic Web pages
- Server-side classes
- Handle business code
- Process data
- Access legacy systems



```
public class BookService {  
  
    private EntityManager em;  
  
    public void persistBook() {  
        em.persist(book);  
    }  
}
```

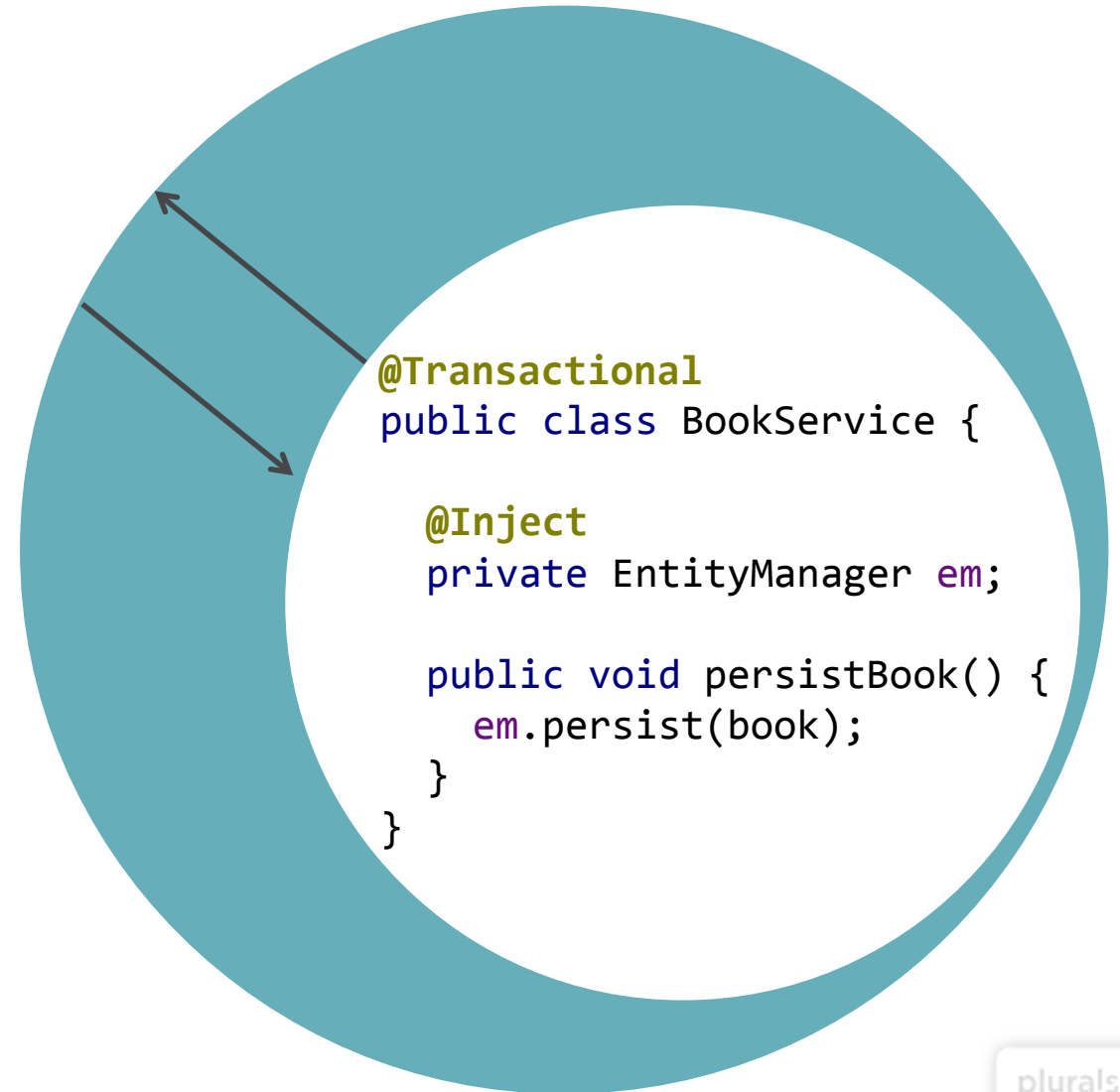
Services

- Container provides services to components
 - Security
 - Transaction management
 - Naming
 - Remote connectivity
 - ...
- Services are configurable
- Configuration is isolated



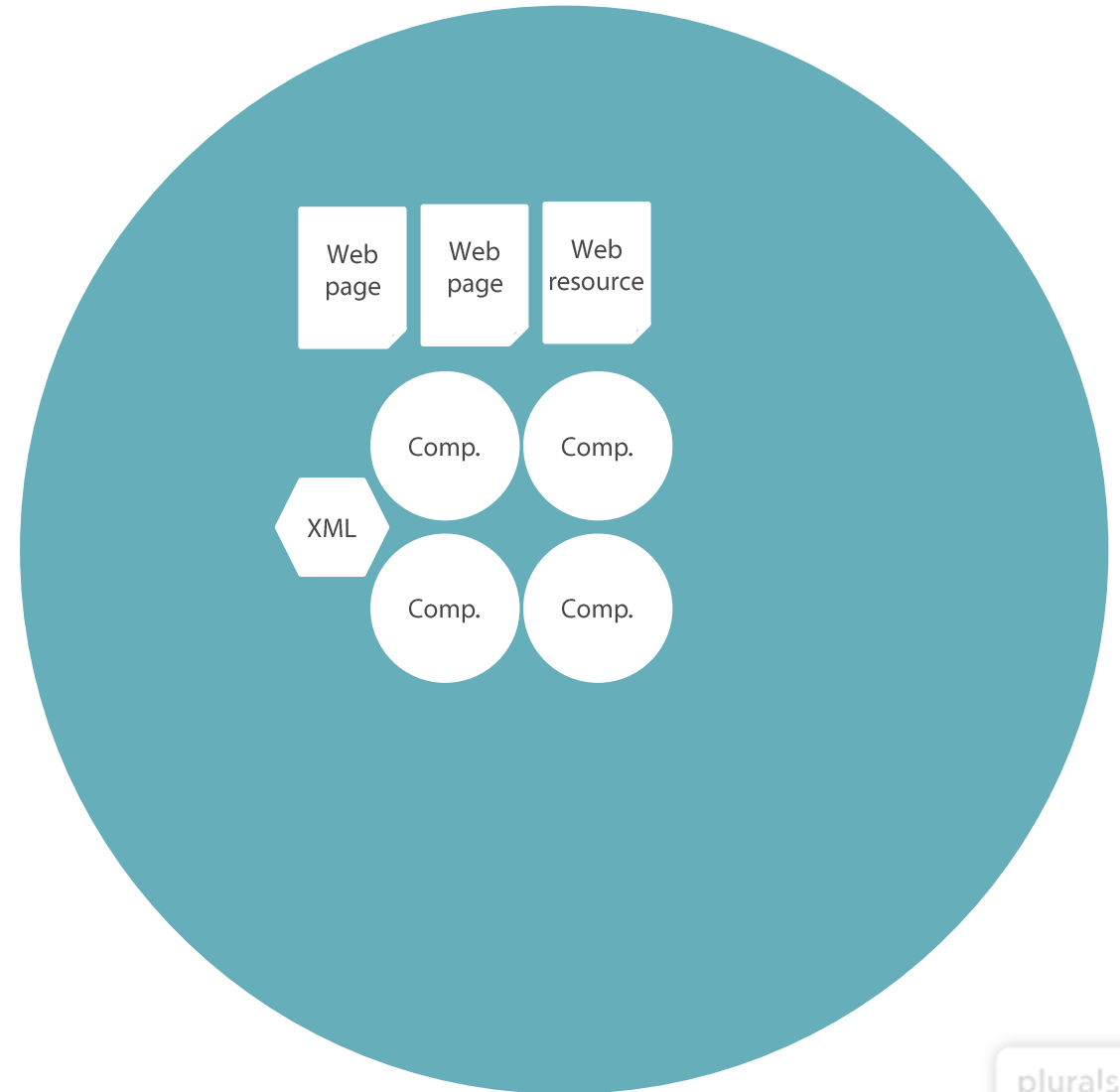
Metadata

- User code
- Metadata
- Annotation
- XML descriptor
- Inversion of control



Application

- Aggregation of components
- Web pages
- Web resources
- Business components
- Database access components
- Deployment descriptors



Packaging

- Assemble components together
- Archive
- Deployment
- Standard format



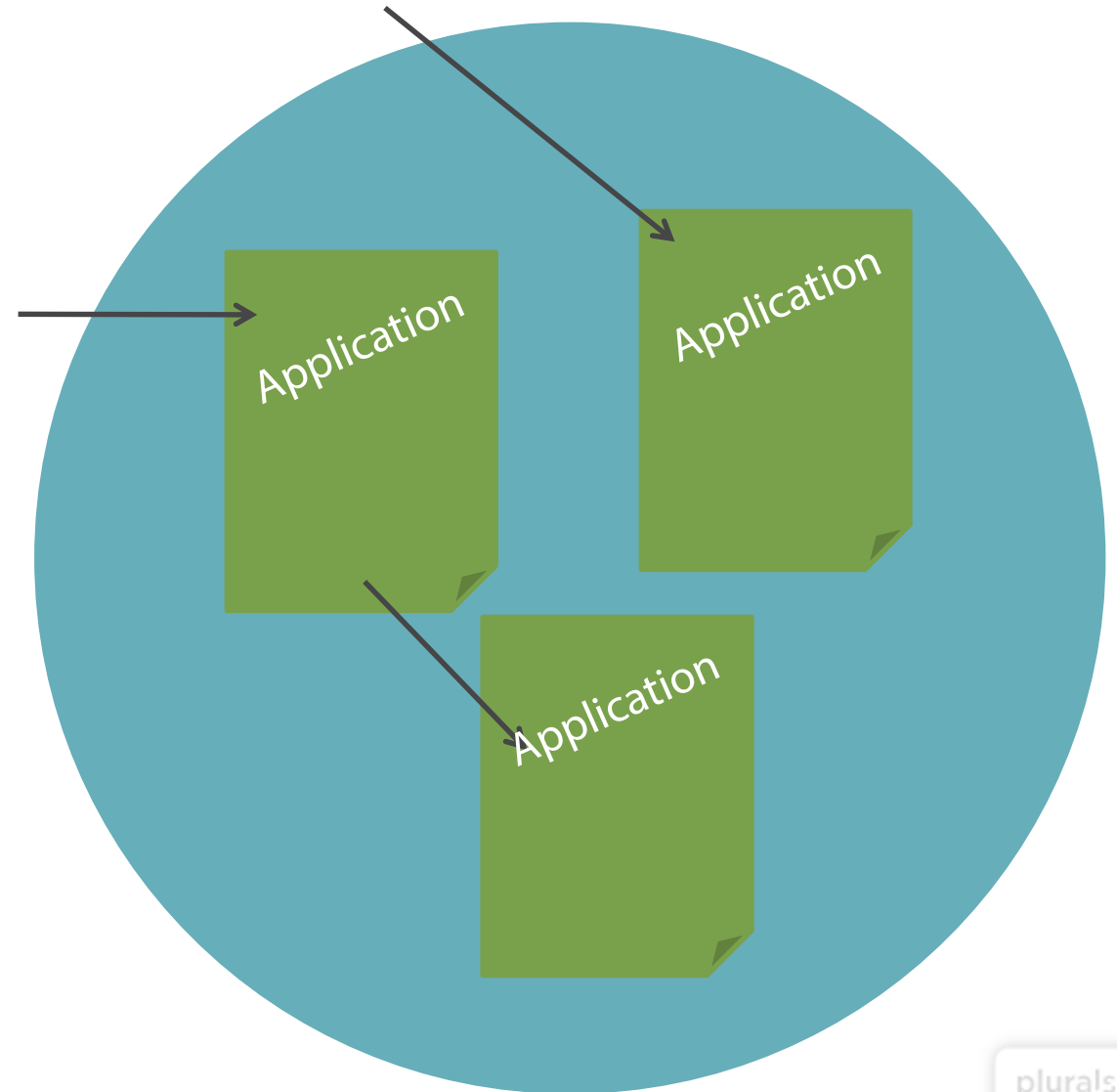
Applications

- Deploy several applications
- Isolation
 - Own resources
 - Own components
 - Own class-loader
- Administration



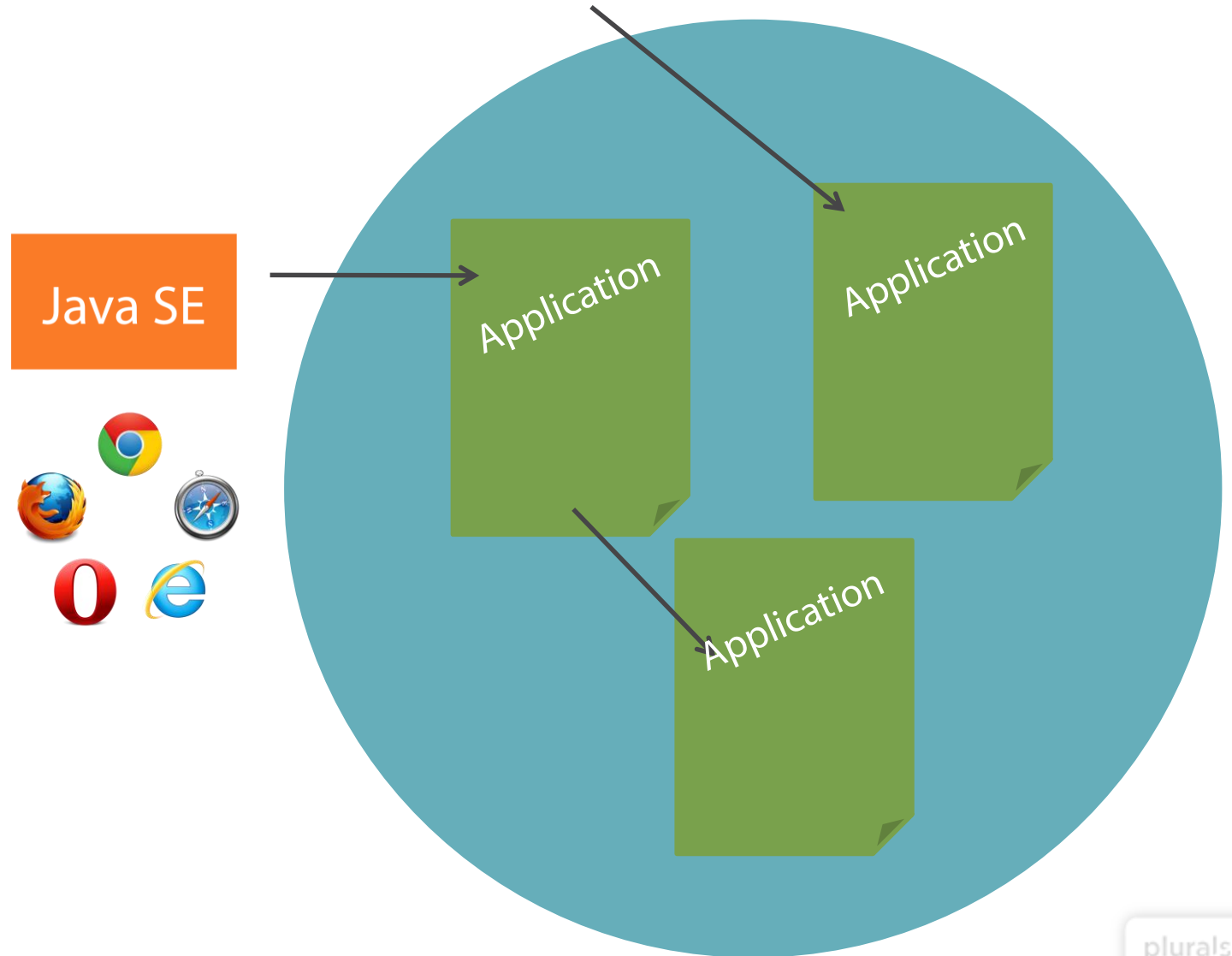
Protocols

- HTTP
- HTTPS (TLS)
- RMI/IIOP
 - Remote Method Invocation
 - Internet Inter-ORB Protocol
 - CORBA
 - Ada, C, C++, Cobol...



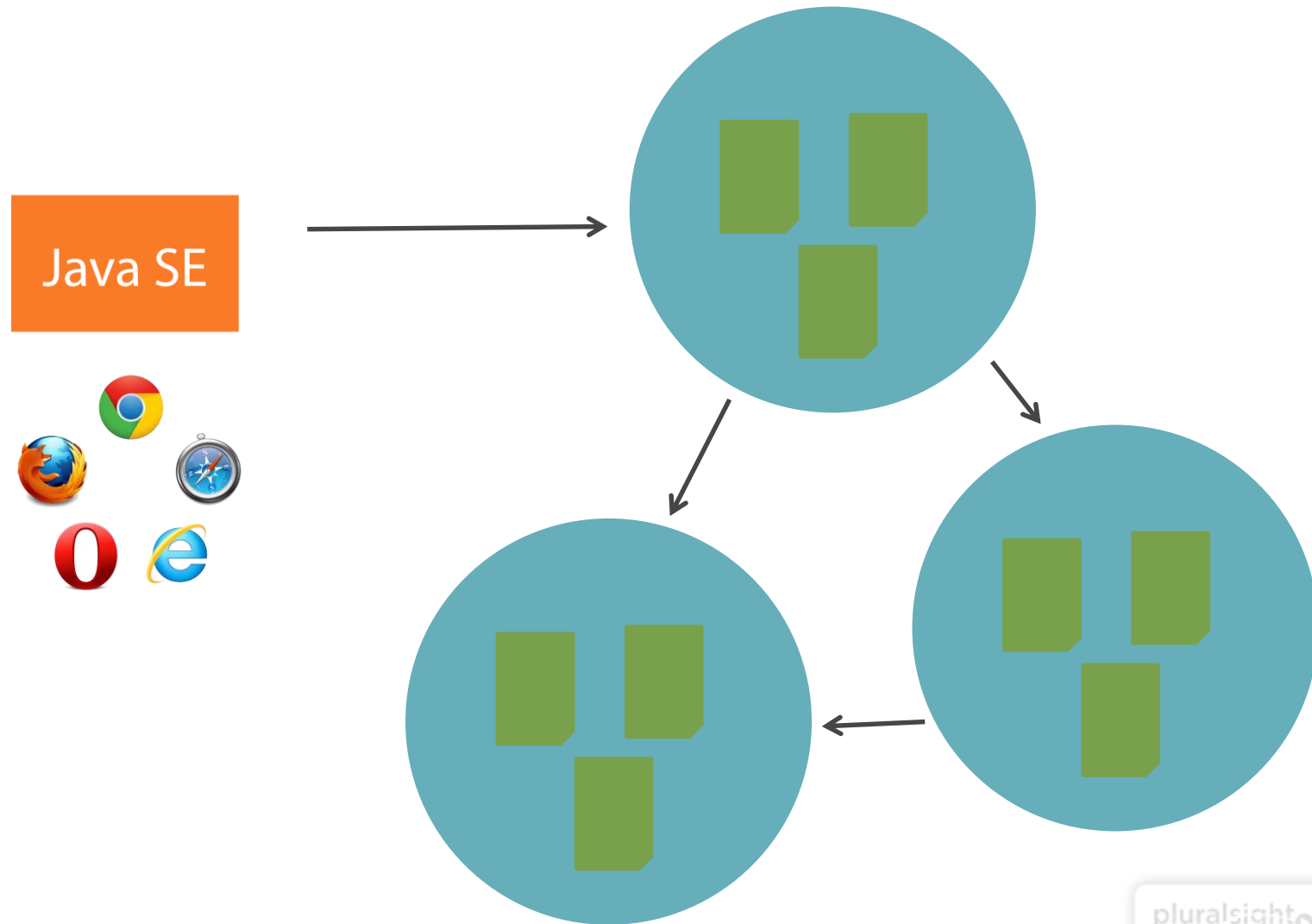
Clients

- Web clients
- Web applications
- REST / SOAP services
- Mobile apps
- B2B



Distribution

- Distributed application
- Load balancing
- Fail over
- Scalability
- Availability



Deploy CD-Book Store

Java EE components

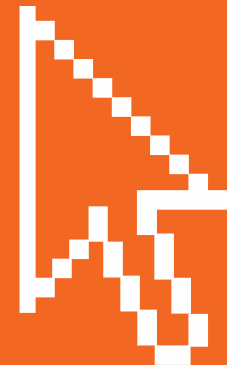
Metadata

Package

Deploy

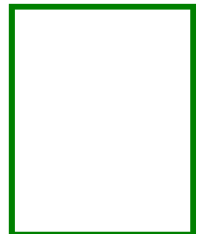
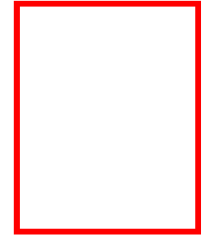
Container

Administration



Standard

- Locked to a proprietary solution
- Open source
 - Open but not standard
- Java EE is based on standards
- Standardization process of the JCP
- Described in a specification
- Portable



JCP

- Java Community Process
- Future of the Java platform
- Specification lead
- Group of experts
- Java Specification Request (JSR)
- Reference Implementation (RI)
- Technology Compatibility Kit (TCK)



Java EE Specification

- Umbrella specification
- Made of 32 specifications
 - Working together
- Java Enterprise Edition 7
- JSR 342
- <http://jcp.org/en/jsr/detail?id=342>

The screenshot shows the Java Community Process (JCP) website. The browser address bar displays <https://jcp.org/en/jsr/detail?id=342>. The page header includes the Java logo, the text "Java Community Process", and a diagram illustrating the "Community Development of Java Technology Specifications". Navigation links for "Press Room" and "Get Java Here" are present, along with a search bar labeled "Rechercher".

The main content area is titled "JSRs: Java Specification Requests" and "JSR 342: Java™ Platform, Enterprise Edition 7 (Java EE 7) Specification". It features a table with the following columns: Stage, Access, Start, and Finish.

| Stage | Access | Start | Finish |
|---------------------------|-------------------------------|--------------|--------------|
| Maintenance Release | Download page | 03 Jul, 2015 | |
| Maintenance Review Ballot | View results | 16 Jun, 2015 | 22 Jun, 2015 |
| Maintenance Draft Review | Download page | 13 May, 2015 | 12 Jun, 2015 |
| Final Release | Download page | 28 May, 2013 | |
| Final Approval Ballot | View results | 16 Apr, 2013 | 29 Apr, 2013 |
| Proposed Final Draft | Download page | 14 Mar, 2013 | |
| Public Review Ballot | View results | 12 Feb, 2013 | 25 Feb, 2013 |
| Public Review | Download page | 08 Jan, 2013 | 11 Feb, 2013 |
| Early Draft Review 2 | Download page | 31 Oct, 2012 | 30 Nov, 2012 |
| Early Draft Review | Download page | 23 Apr, 2012 | 23 May, 2012 |
| JSR Review Ballot | View results | 01 Mar, 2011 | 14 Mar, 2011 |

Below the table, the status is "Status: Active", the JCP version in use is "2.9", and the Java Specification Participation Agreement version in use is "2.0". A description states: "This JSR will develop Java EE 7, the next version of the Java Platform, Enterprise Edition." Expert Group Transparency is listed as "Public Communications".

The left sidebar contains navigation links for "JSRs" (by Platform, Technology, Stage, Committee, and List of All JSRs), "My JCP" (Sign-in, Register for Site), "JCP Info" (About JCP, Get Involved, Community Resources, Community News, FAQ, Contact Us), and "Search JSRs".

Java EE Implementations

- GlassFish
- Weblogic
- JBoss AS
- WildFly
- TomEE
- WebSphere



Apache TomEE



WildFly



Java EE Specifications

Java EE

Java SE

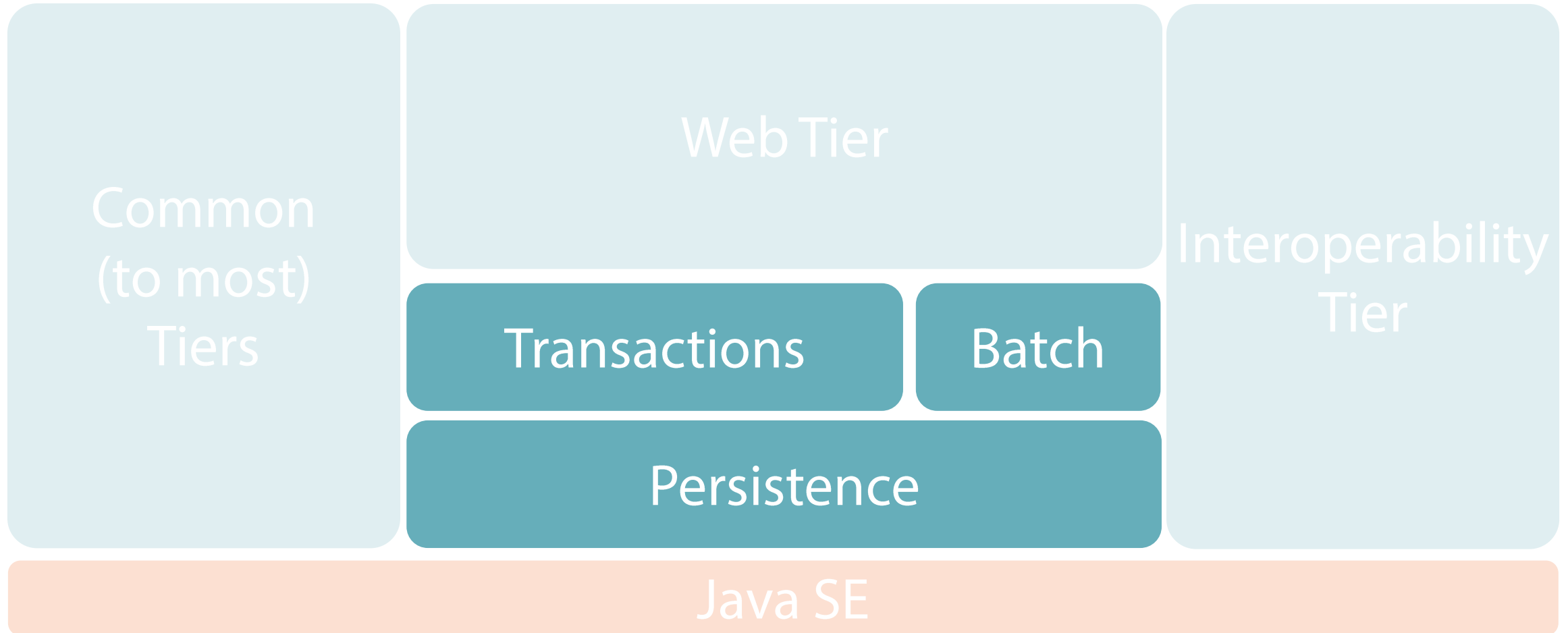
Java EE Specifications



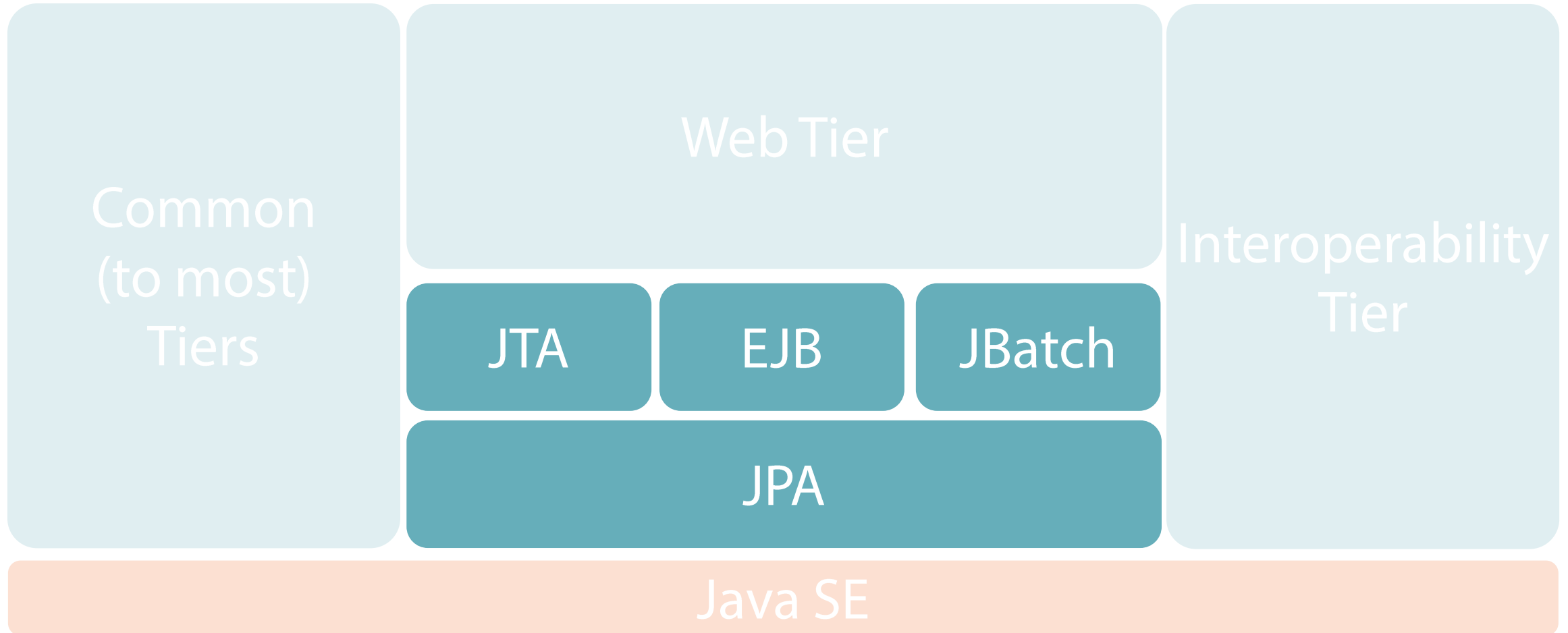
Business Tier Specifications



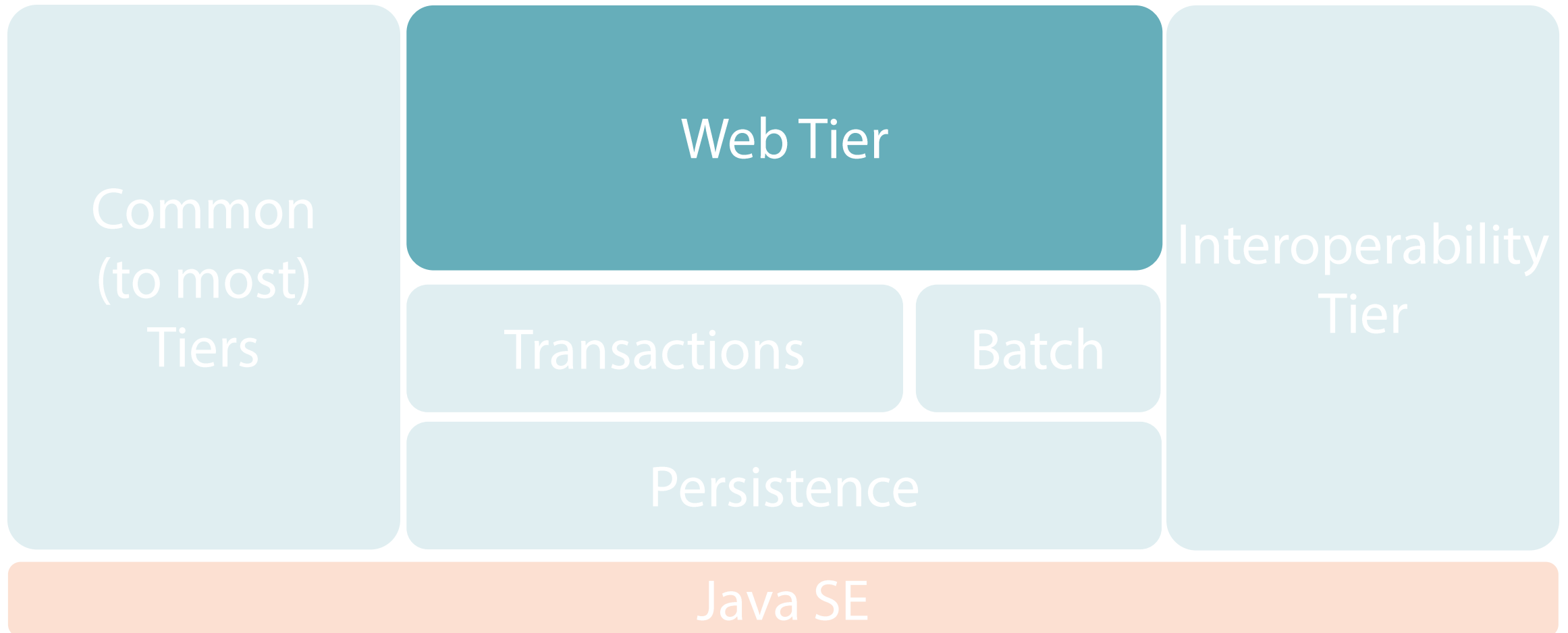
Business Tier Specifications



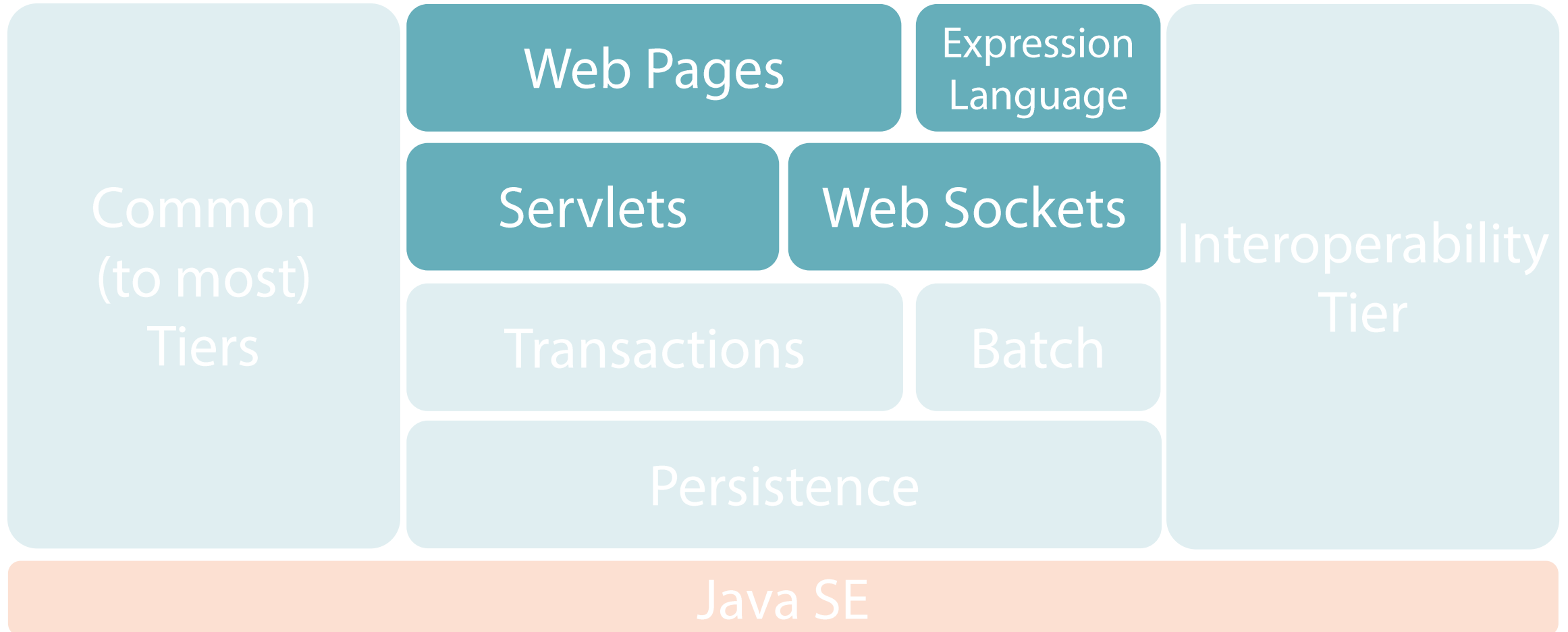
Business Tier Specifications



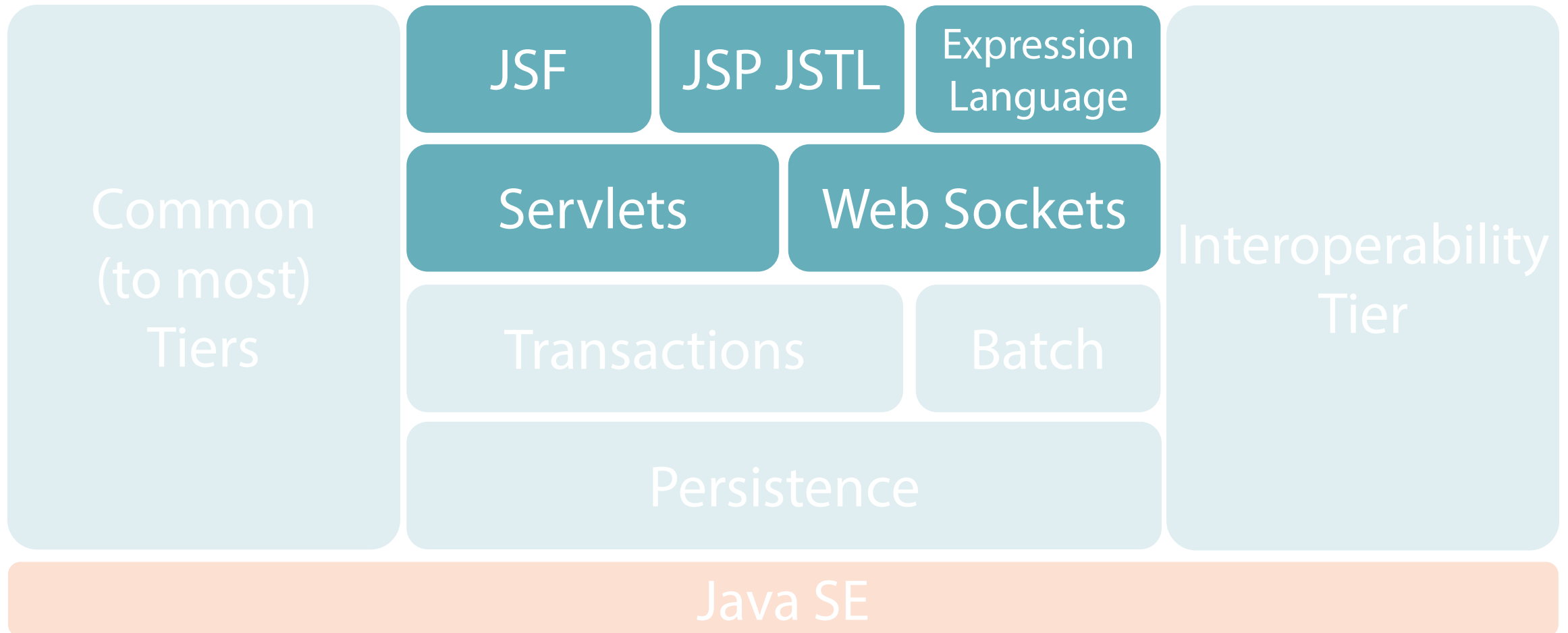
Web Tier Specifications



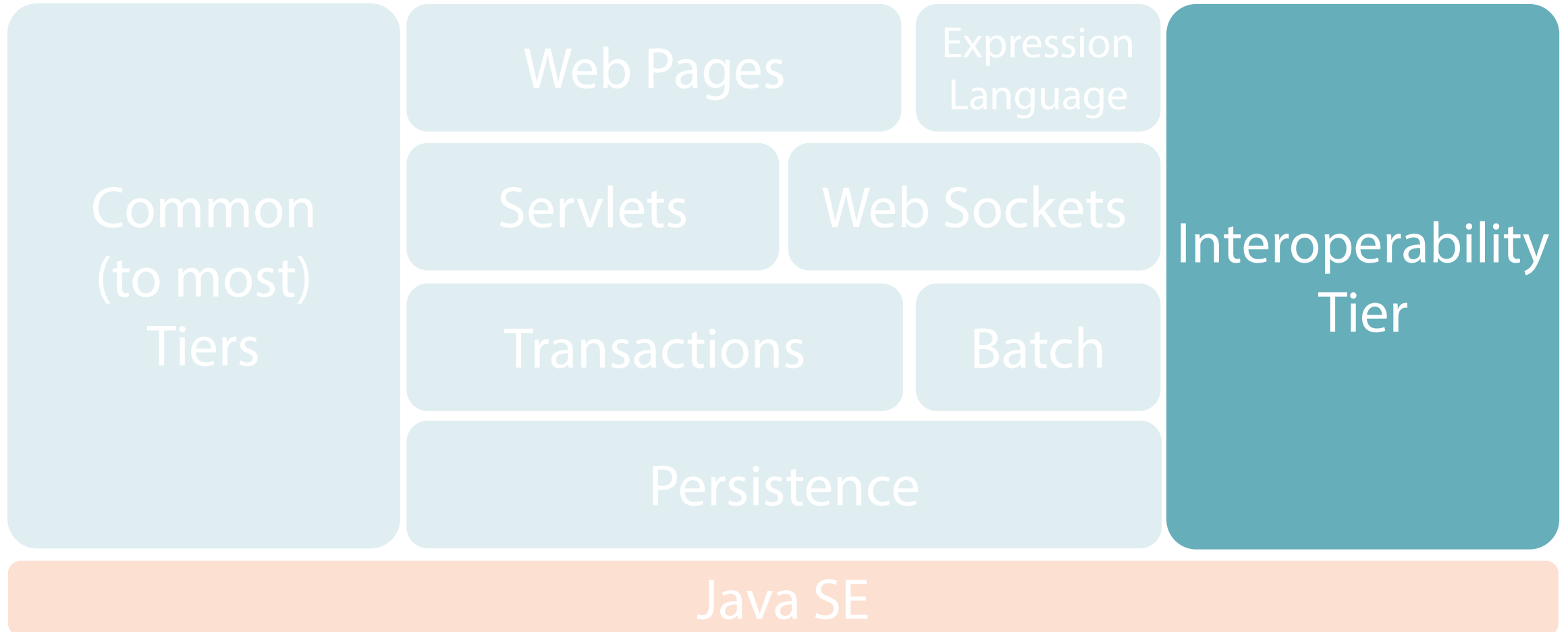
Web Tier Specifications



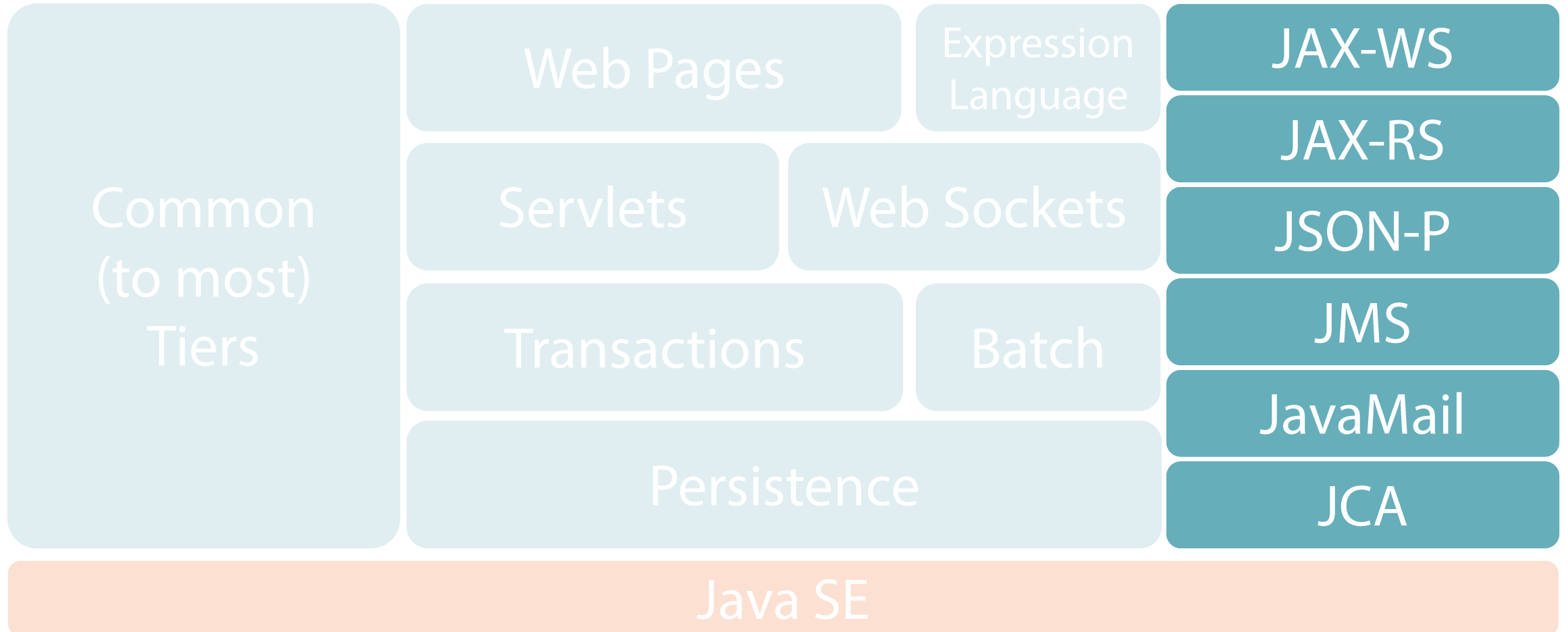
Web Tier Specifications



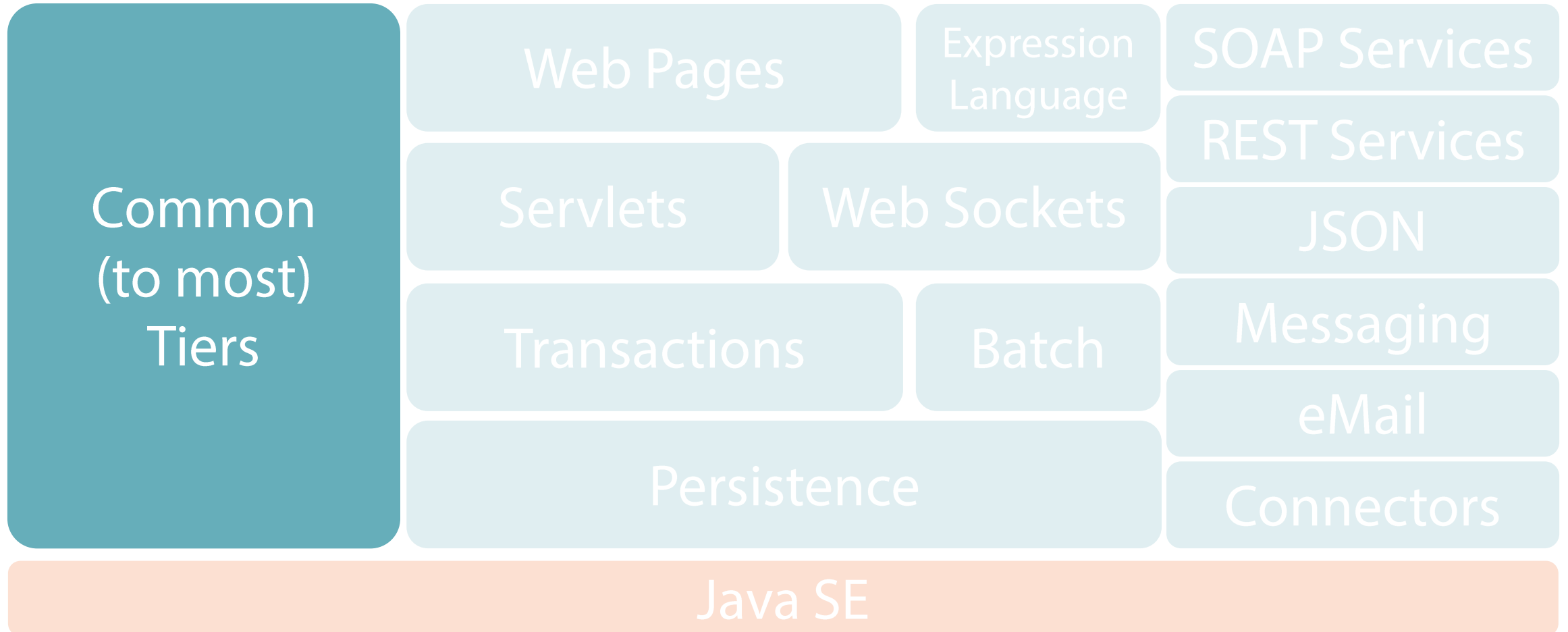
Interoperability Specifications



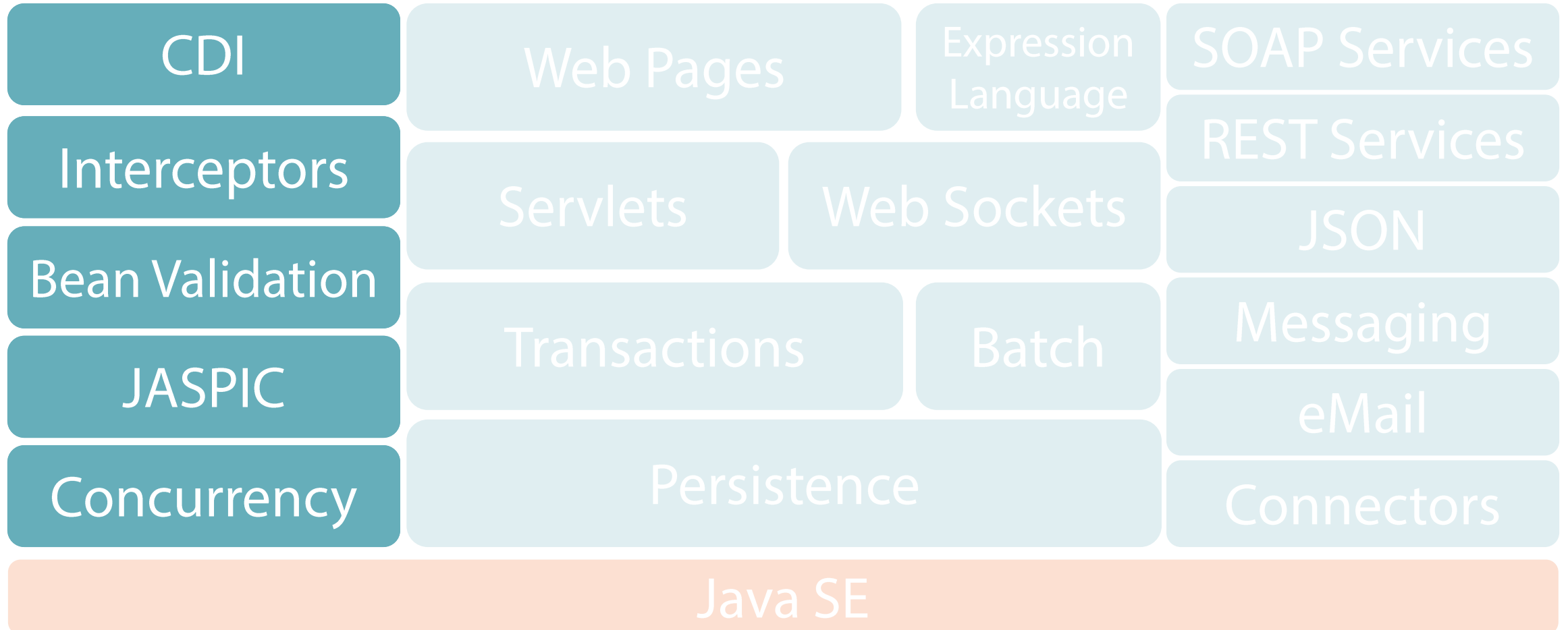
Interoperability Specifications



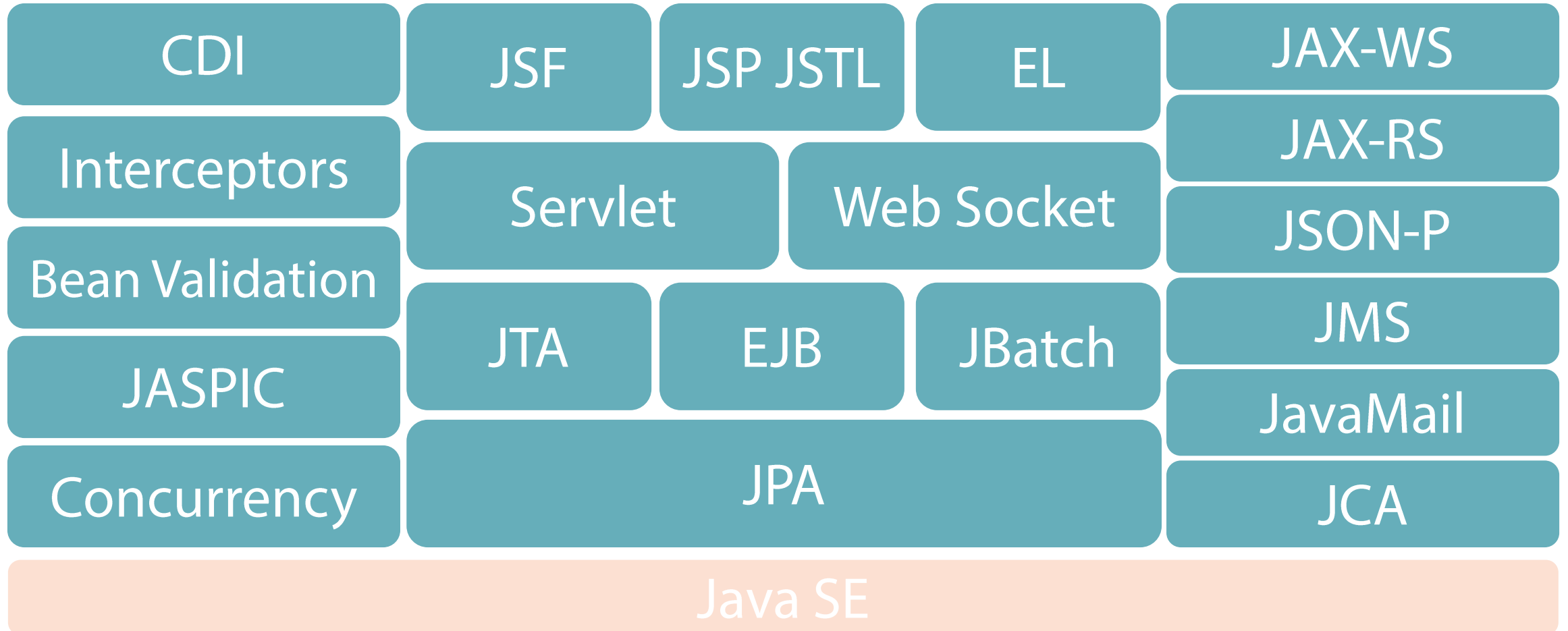
Common Specifications



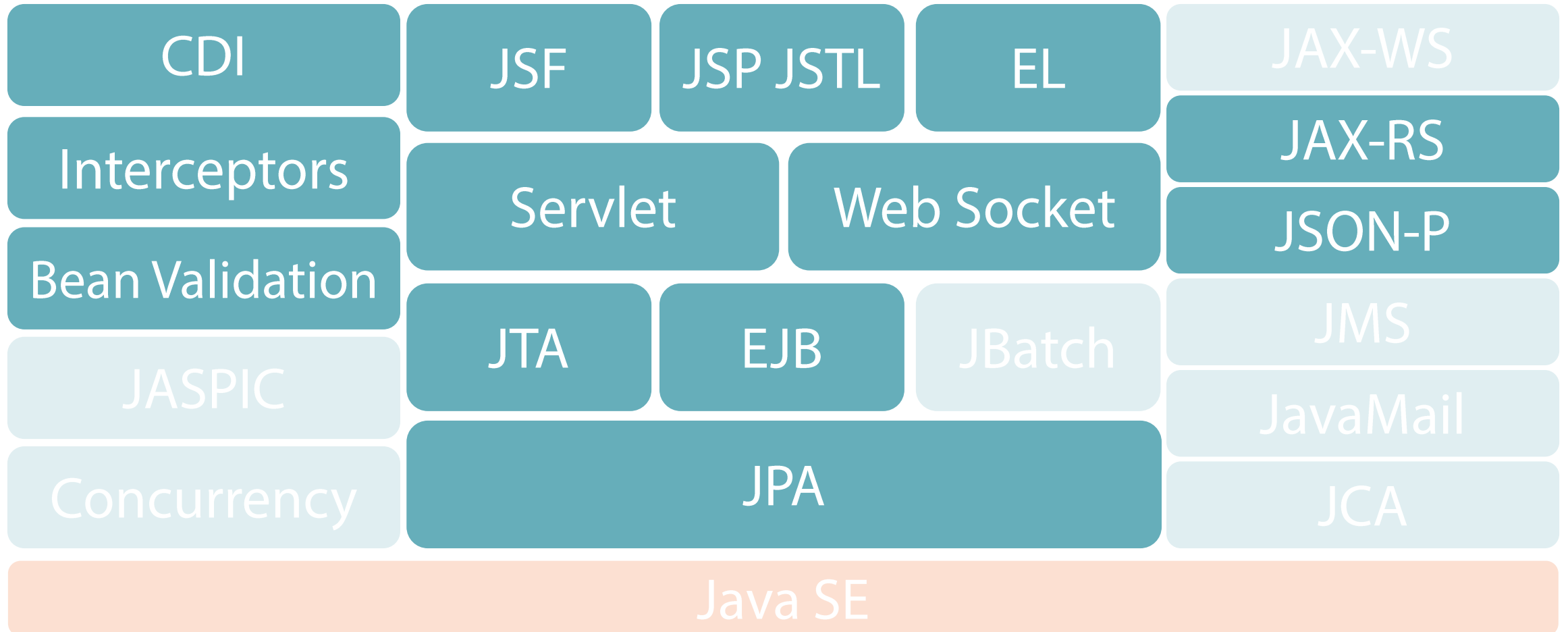
Common Specifications



Java EE Specifications



Web Profile



Summary



Java Enterprise Edition

Internal architecture

Tier enterprise applications

Standard

JCP

Made of specifications

What's Next



Common tier

CDI

Interceptors

Bean Validation