An Overview of Java EE

Mobile Web Services

Olivier Liechti & Yannick Iseli

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du Canton de Vaud

What is Java Enterprise Edition?

- It is a development platform: it provides high-level APIs to develop software components.

- It is an execution platform: it provides an environment to deploy and bring these components “to live”.

- It is an entreprise platform: it provides support for distributed transactions, security, integration, etc.

- Separation of concerns: "The developer takes care of the business logic. Java EE takes care of the systemic qualities".

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Java EE and standards

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- Java EE is a specification
  - Defined through the JCP, it is a specification that software editors can decide to implement. Java EE 5 is defined in JSR 244.
- Java EE is an “umbrella” specification
  - Java EE builds upon other specifications (servlets, EJBs, JDBC, etc.) and specifies which specifications (and which versions) need to be implemented by a Java EE certified application server.
  - Java EE also defines a programming model and defines several roles (developer, assembler, deployer, etc.).

Java Community Process

Specification Lead
Bill Shannon Sun Microsystems, Inc.

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J2EE or Java EE?

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- Java Enterprise Edition is **not** a recent specification.
- The SDK 1.2 was published in 1999.
- The specification is managed through the JCP since version 1.3
- We used to talk about "Java 2 Enterprise Edition 1.3", or J2EE 1.3
- We then moved from J2EE 1.3 to J2EE 1.4 to... **Java EE 5**
- Today, we should speak of Java EE, but J2EE is still sometimes used...
- Today, most application servers implement Java EE 6
- The early draft 2 for Java EE 7 has been submitted in November 2012; final spec expected for Q2 2013

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Architecture

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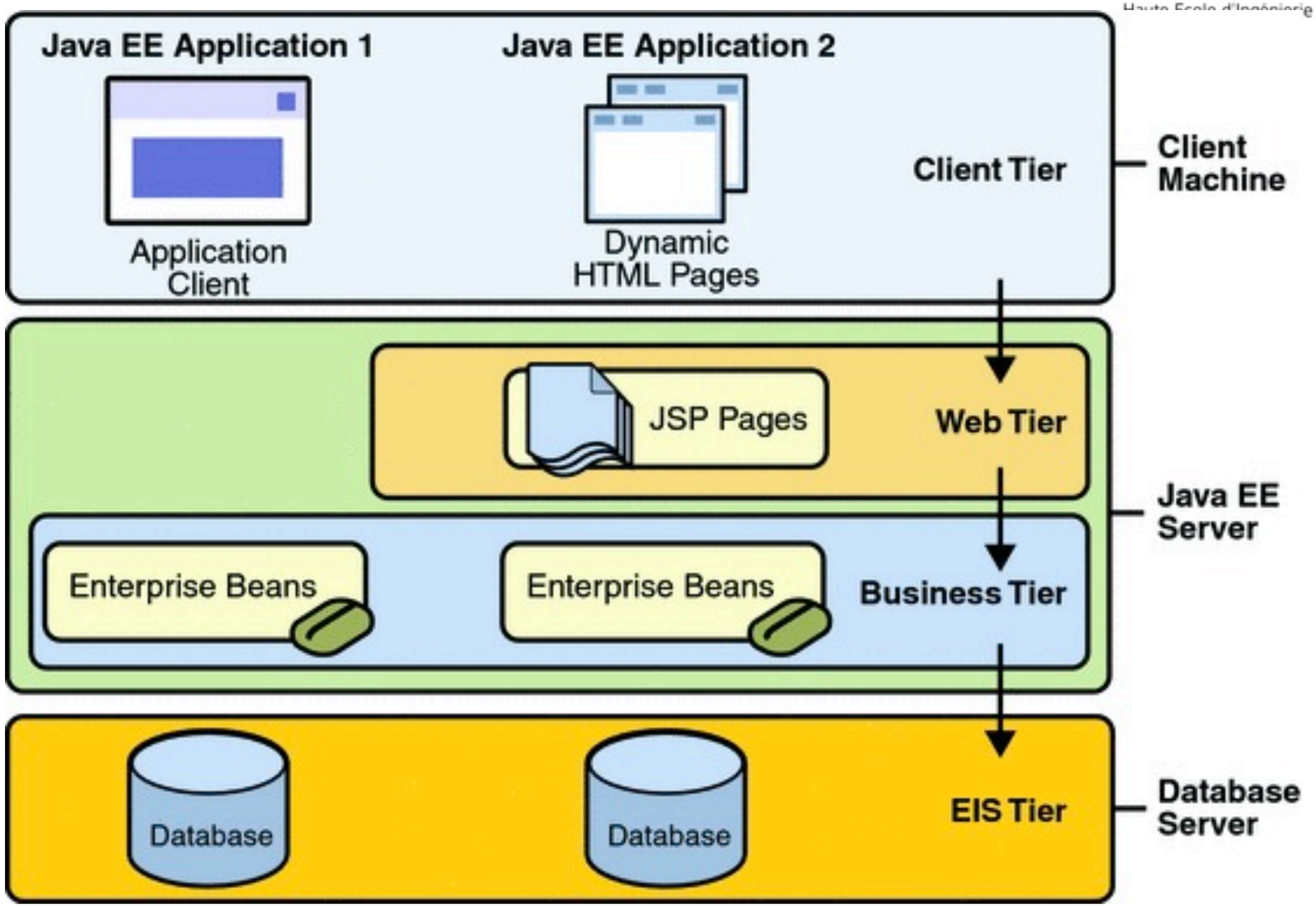
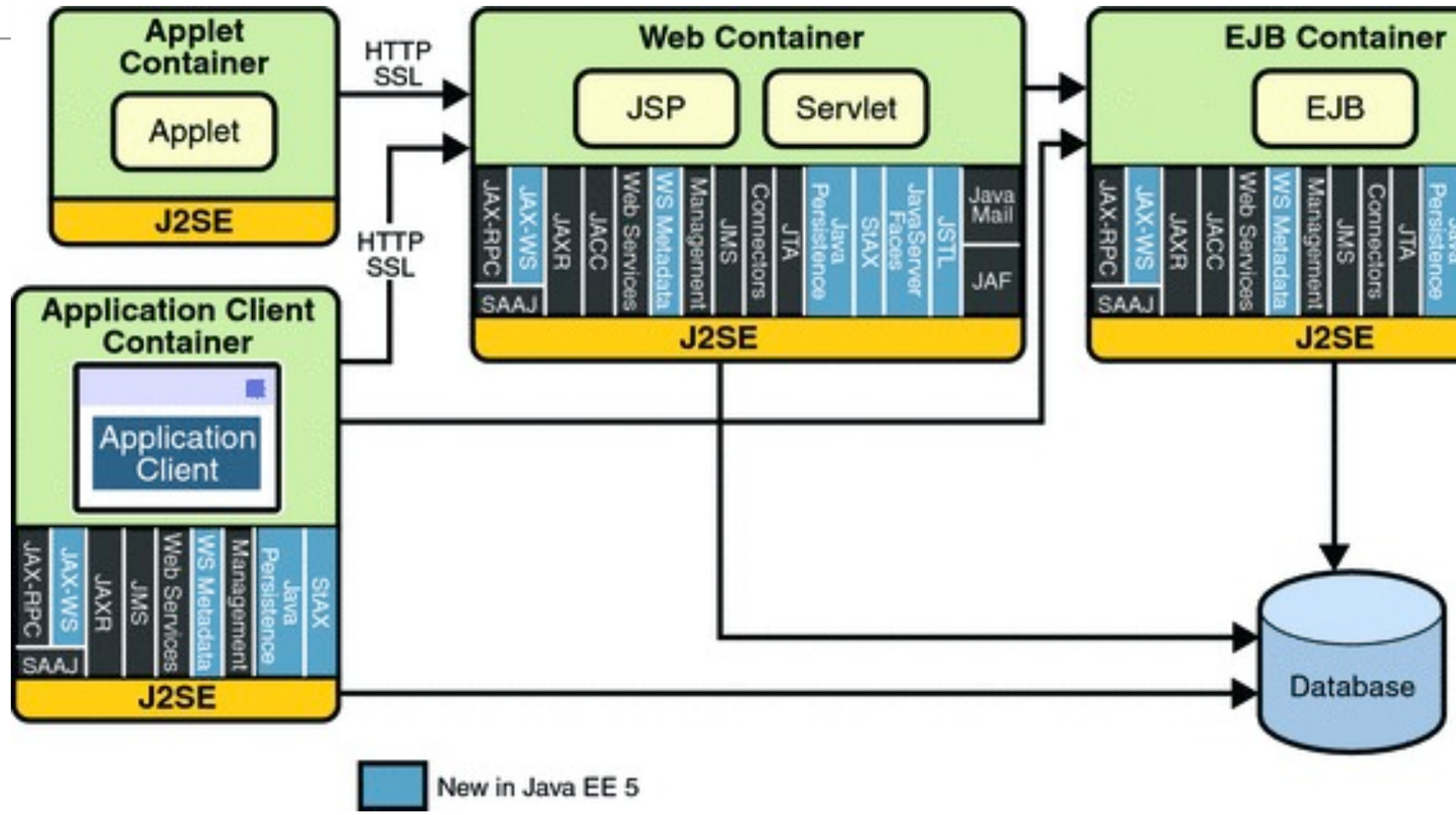
- The software that implements the Java EE specification is called an "**application server**"
  - There are **open source** and **proprietary** application servers.
  - Glassfish, JBoss, WebSphere, BEA WebLogic are examples of application servers.
    - Editors compete on aspects that are not defined the specification (clustering, administration, etc.).
- Key notion in the Java EE architecture: the **containers**
  - a container is an **environment** in which we deploy components;
  - a container **provides services** (transactions, security, etc.) through APIs;
  - there are different containers in Java EE: the "**web**" container, the "**ejb**" container and even a "**client**" container that can be used for rich clients.



http://java.sun.com/javaee/5/docs/tutorial/doc/bnaay.html

Java EE 5 APIs

- Enterprise JavaBeans Technology
- Java Servlet Technology
- JavaServer Pages Technology
- JavaServer Pages Standard Tag Library
- JavaServer Faces
- Java Message Service API
- Java Transaction API
- JavaMail API
- JavaBeans Activation Framework
- Java API for XML Processing
- Java API for XML Web Services (JAX-WS)
- Java Architecture for XML Binding (JAXB)
- SOAP with Attachments API for Java
- Java API for XML Registries
- J2EE Connector Architecture
- Java Database Connectivity API
- Java Persistence API
- Java Naming and Directory Interface
- Java Authentication and Authorization Service
- Simplified Systems Integration



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Components, packaging & deployment

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- The first version of J2EE put a lot of emphasis on the separation of roles:
  - **Component developer** builds self-contained, reusable **components** and focuses on business logic (“Here is a customer management brick”, “Here is a pricing brick”).
  - **Application assemblers** create **applications** by gluing together different components (“I connect the customer management and the pricing bricks in order to have an insurance application”).
  - **Deployers** have to take applications and to put them into production. Every application needs resources (DBs, user repositories, etc.). The deployer has to connect the application to the resources (declaratively!!).
- We also want to be able to manage the life-cycle of applications and to have control on the release of new versions. It really helps to create **packages**!

Components, packaging & deployment

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- Different types of components, different types of packages/archives:
  - Java libraries are useful in enterprise applications; we can bundle classes into **traditional .jar files (Java ARchives)** and integrate them in our applications.
  - Some applications do not require all the features provided by the Java EE platform; they are “lightweight” can live entirely in the web container. We package these applications in **.war files (Web ARchives)**.
  - Business services can be packaged and deployed independently from a presentation front-end. We can package **EJBs in .jar files**.
  - Full-blown Java EE applications bundle together web-tier components, service components, libraries. A Java EE application is packaged in a **.ear file (Enterprise ARchive)**. The .ear file contains a .war files and one or more .jar files.

The Business Tier

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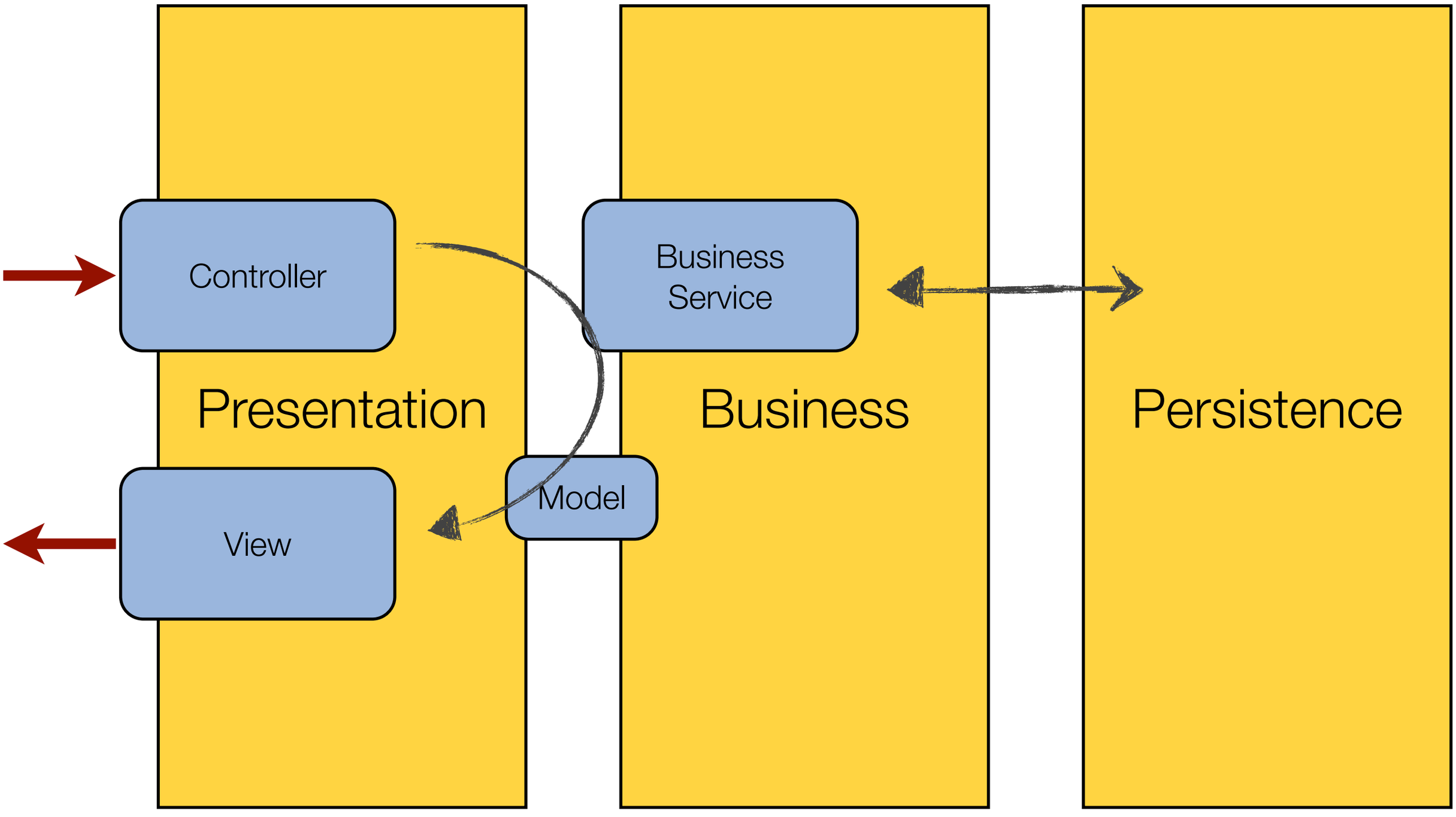

Containers and components

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- There are **different ways** to design, build and deploy the “business service” components.
- In the **simplest scenario**, think of a plain vanilla web application, where you create a “controllers”, a “services” and a “model” packages. Here, you implement services as POJOs and **do everything yourself**:
  - Instantiation of services, concurrency control, transactions, security, etc.
- When the application/system has some complexity (because of the functionality, because of the volume of transactions, because of the integration, etc.), it becomes interesting to use **“managed” components**.
- The idea is to let “something” in the **infrastructure** manage the life cycle of your service components. That “something” can take different shapes.
- In Java EE, that “something” is the Enterprise Java Bean **container**.

Containers and components

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- The **EJB container** is one sub-system of the Java EE container.
- It provides a **runtime environment** for the business services, implemented as Enterprise Java Beans.
- The **developer** knows that services will be “available” to its components, once they are deployed in the container. He can thus use these services through standard **APIs**.
- The **production manager** configures the EJB container and tunes it in different ways (this is implementation specific).
- With **some application servers**, the EJB container can be **distributed** over several physical nodes (for scalability and availability purposes). This distribution is **transparent to the clients** - they sill only see “one runtime environment”.

Mediated access

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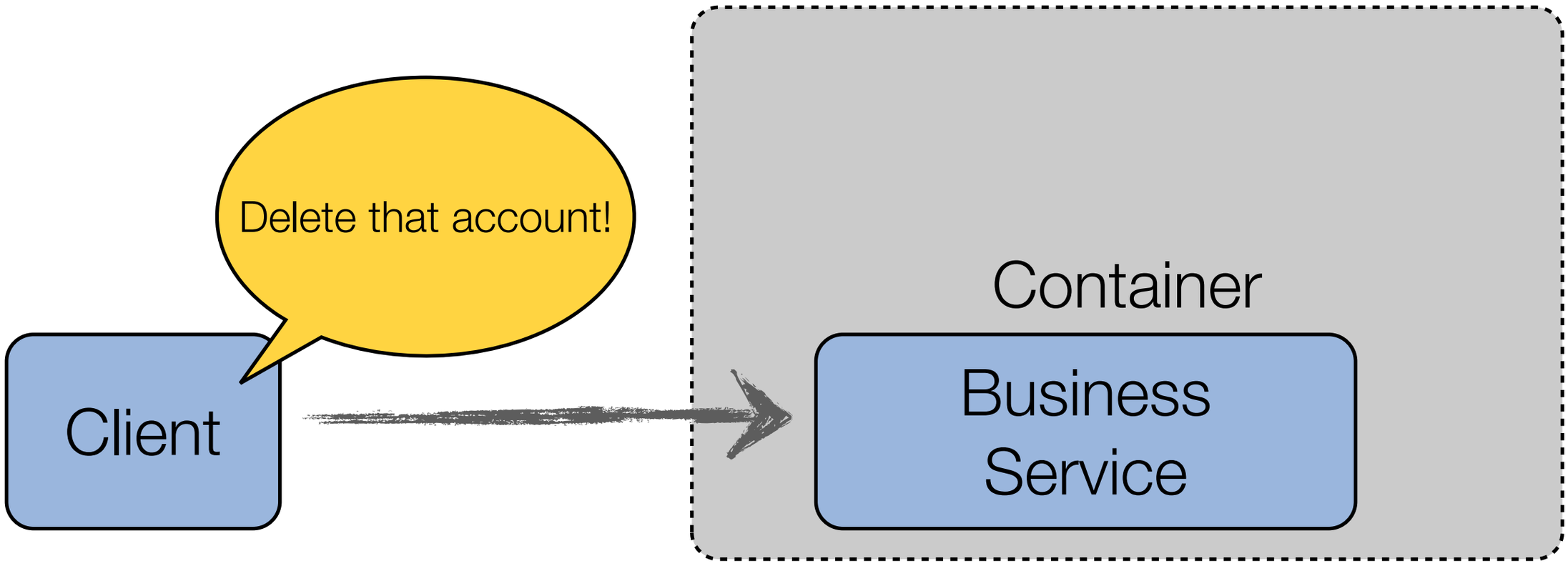


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deleteAccount();
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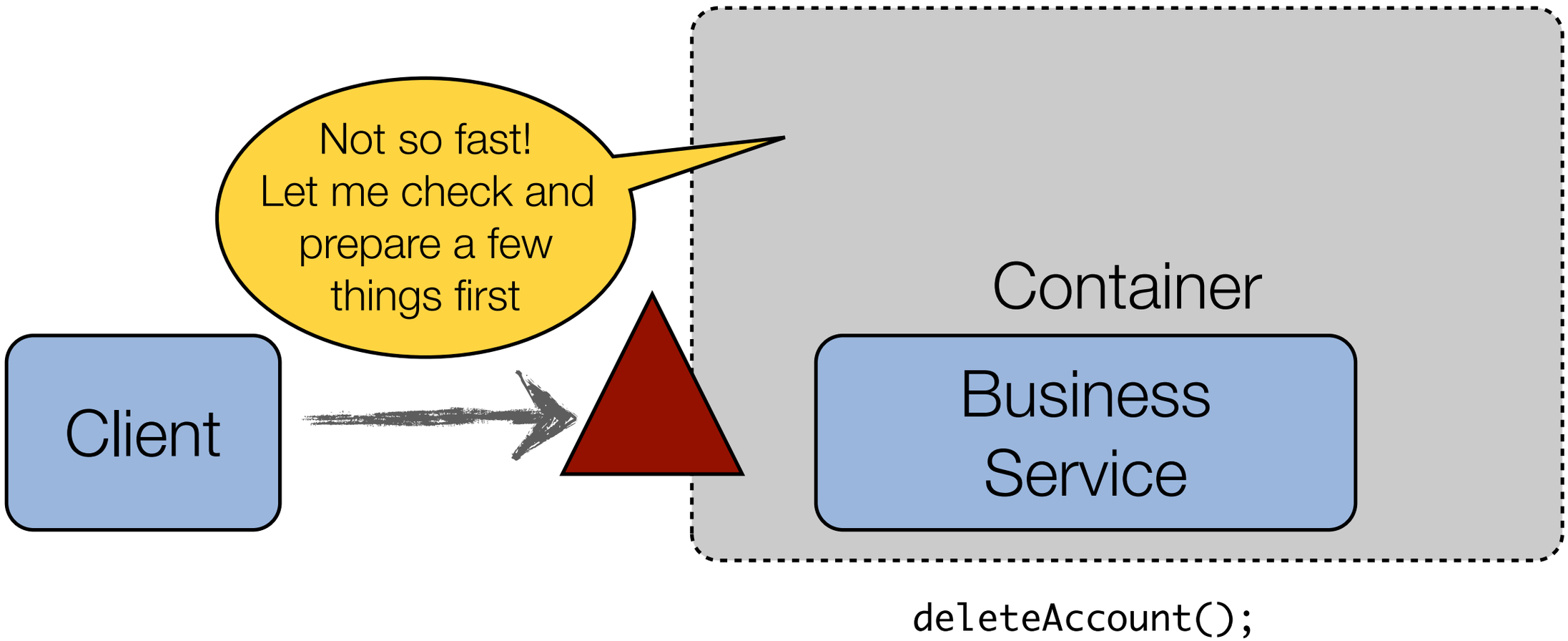


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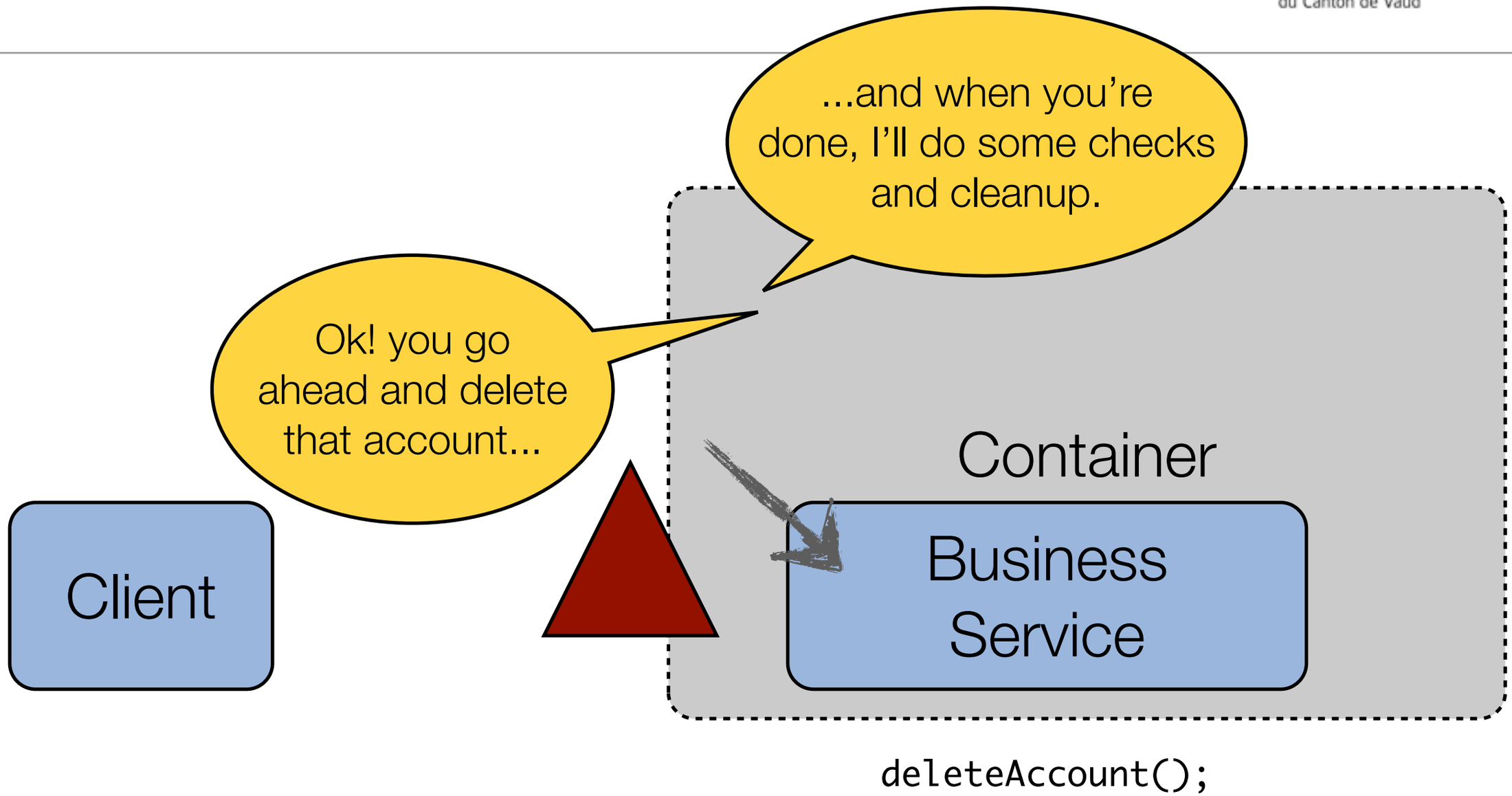


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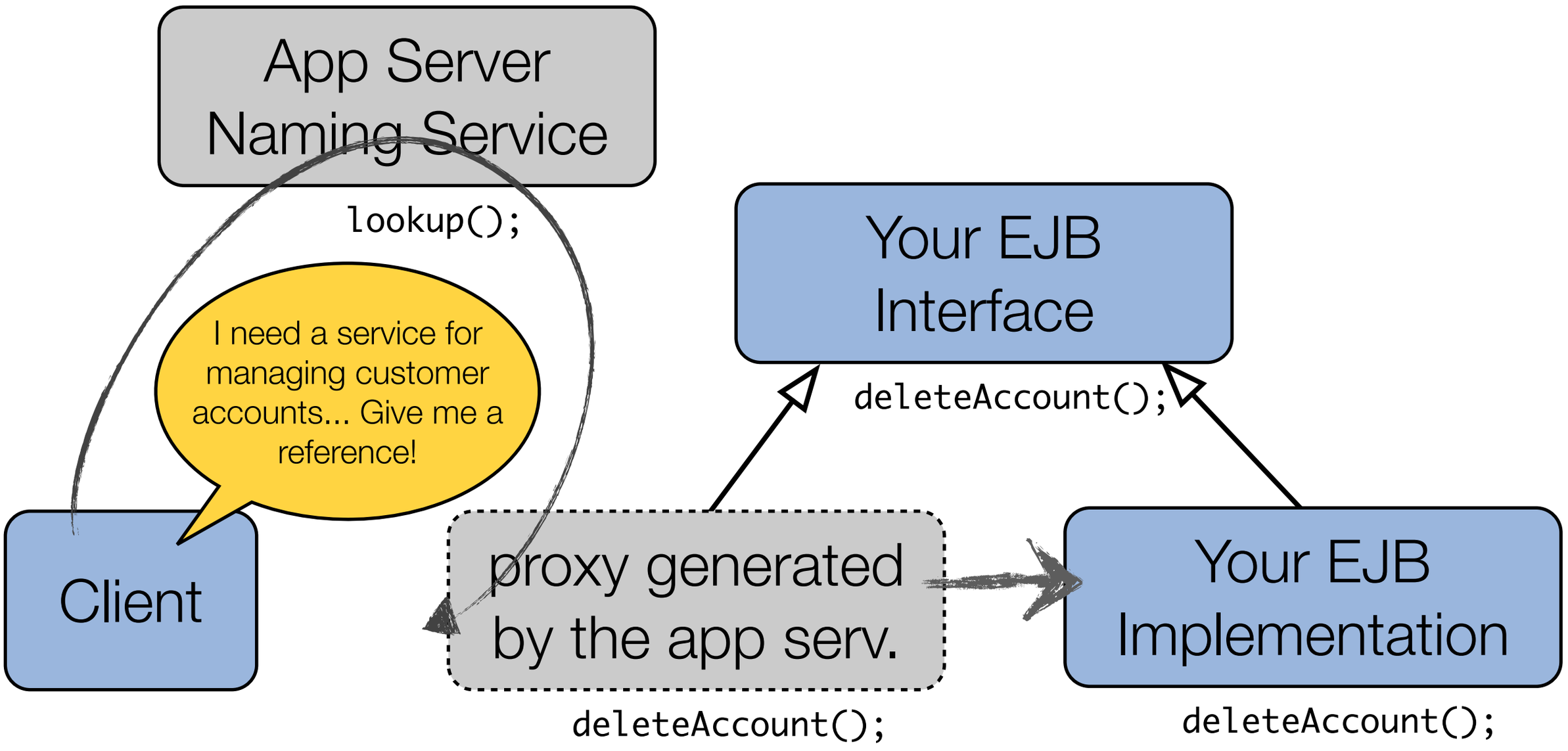

Reference: the Java EE 7 Tutorial

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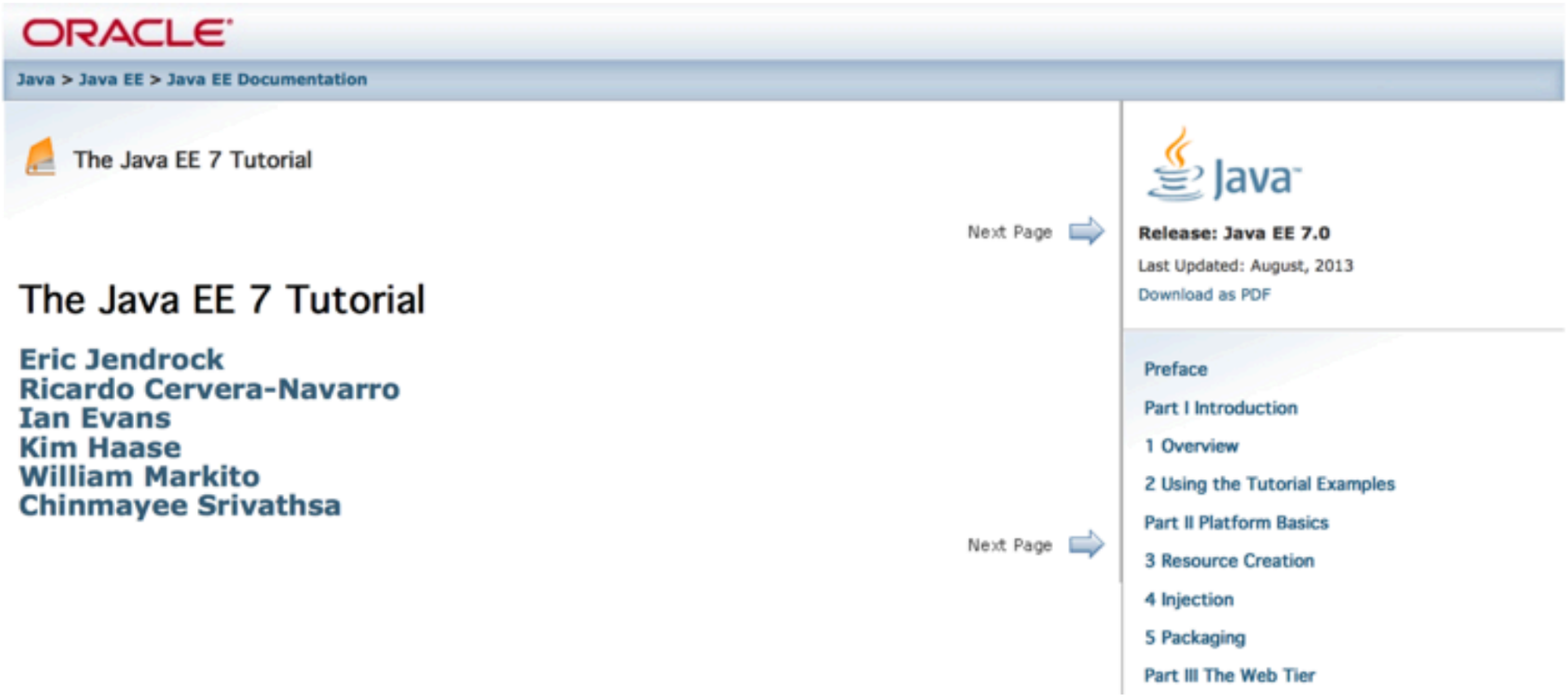
http://docs.oracle.com/javaee/7/tutorial/doc/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Next Page

Java

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Eric Jendrock
Ricardo Cervera-Navarro
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