Programming Advanced Java

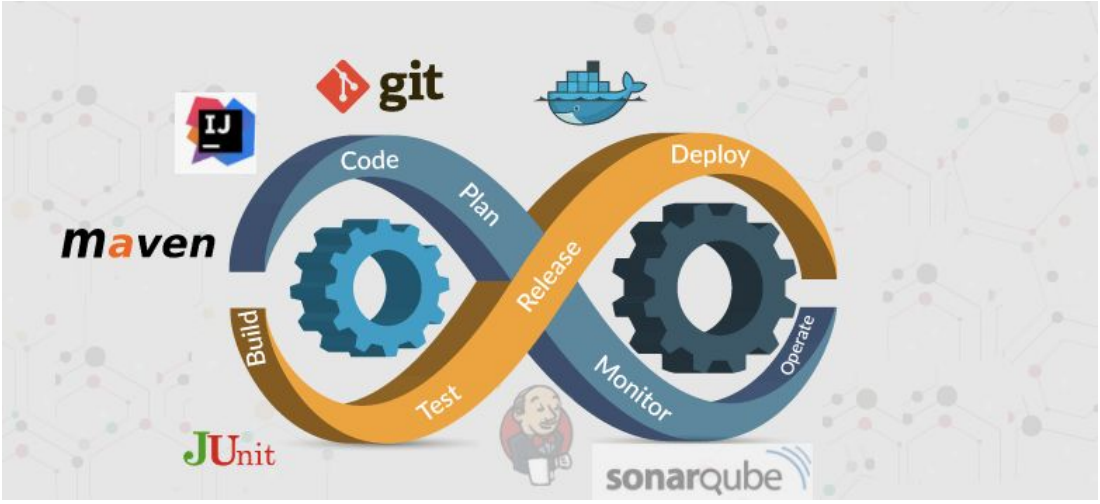
WEEK 1 - INTRODUCTION

Goals

The **junior-colleague**

- can describe the different Java Platforms Jakarta EE, JavaSE, JavaME.
- can describe REST.
- can explain what a RESTful web service is.
- can explain the 3-tier software architecture.
- can explain what JEE is.
- can build a RESTful API in Spring.
- can identify the different software layers in a 3-tier application.

Tools


git
IJ
maven
Code
Plan
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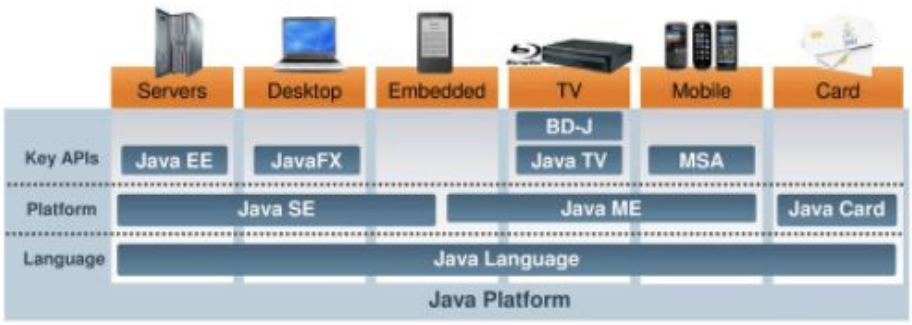
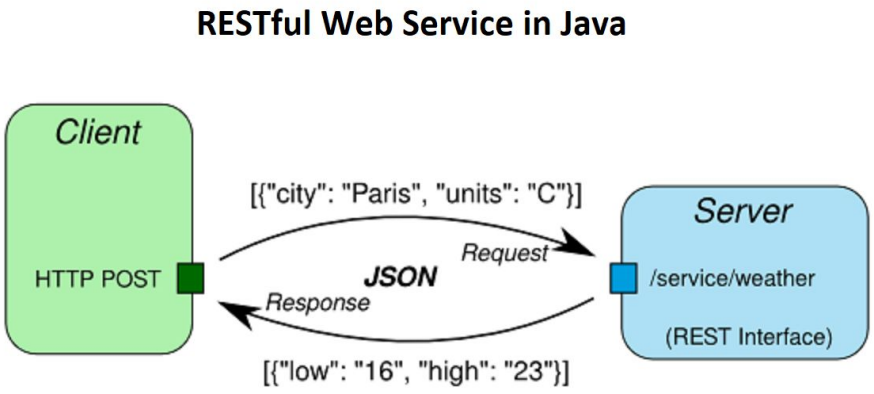
Java is everywhere

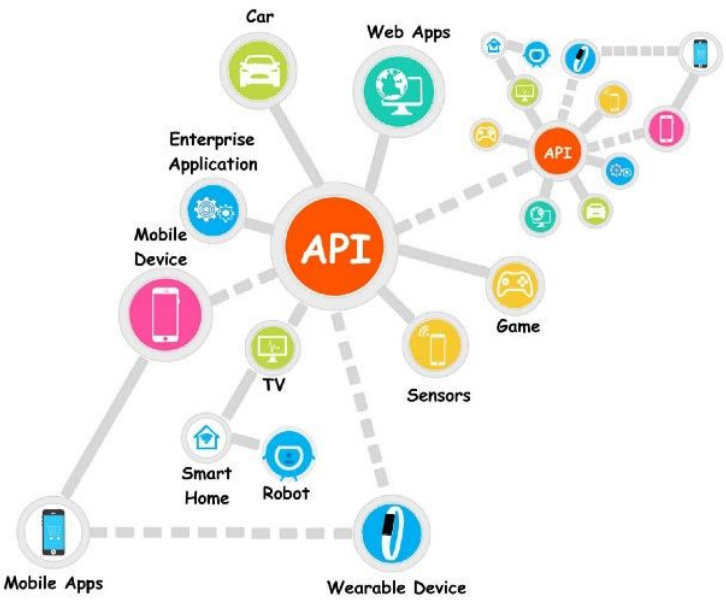


RESTful Web Service



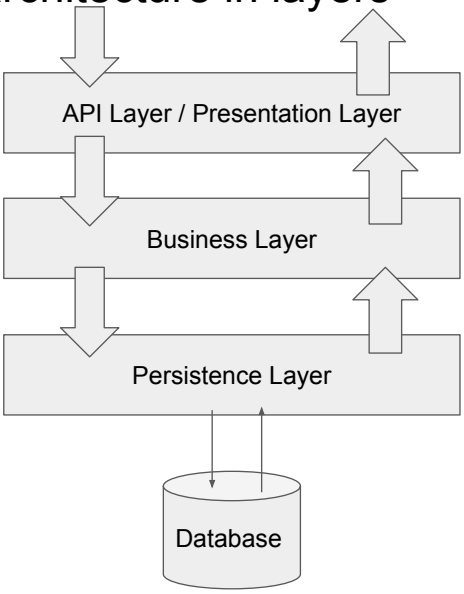
https://www.codecademy.com/articles/what-is-rest

RESTful API



Source:
https://medium.com/@lukabaramishvili/restful-api-for-beginners-cde12c8493a7

Software architecture in layers

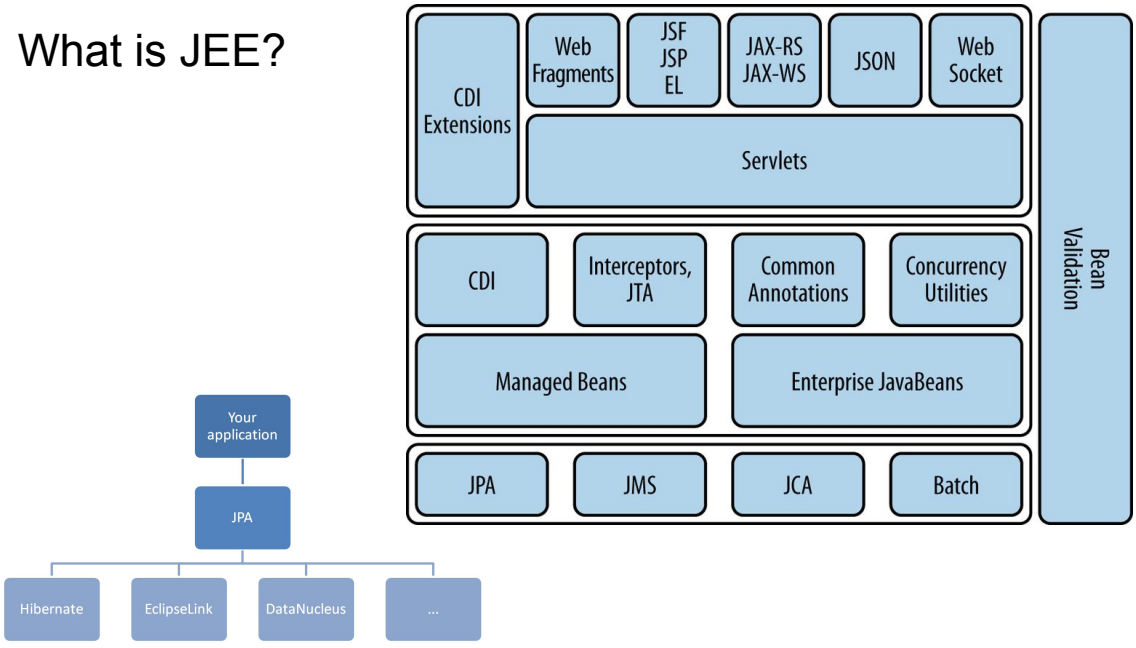


De presentation layer biedt mogelijkheden voor interactie met de gebruiker of andere systemen
De business layer bevat de logica / business regels van de applicatie
De persistence layer: hier wordt alle communicatie met de databank verzameld.

JEE (from Java EE to Jakarta EE)

- J2EE 1.2 (December 12, 1999)
- J2EE 1.3 (September 24, 2001)
- J2EE 1.4 (November 11, 2003)
- Java EE 5 (May 11, 2006)
- Java EE 6 (December 10, 2009)
- Java EE 7 (April 5, 2013)
- Java EE 8 (August 31, 2017)
- Jakarta EE 8 (September 10, 2019) - fully compatible with Java EE 8
- Jakarta EE 9 (November 22 2020)- javax.* to jakarta.* namespace change.

What is JEE?



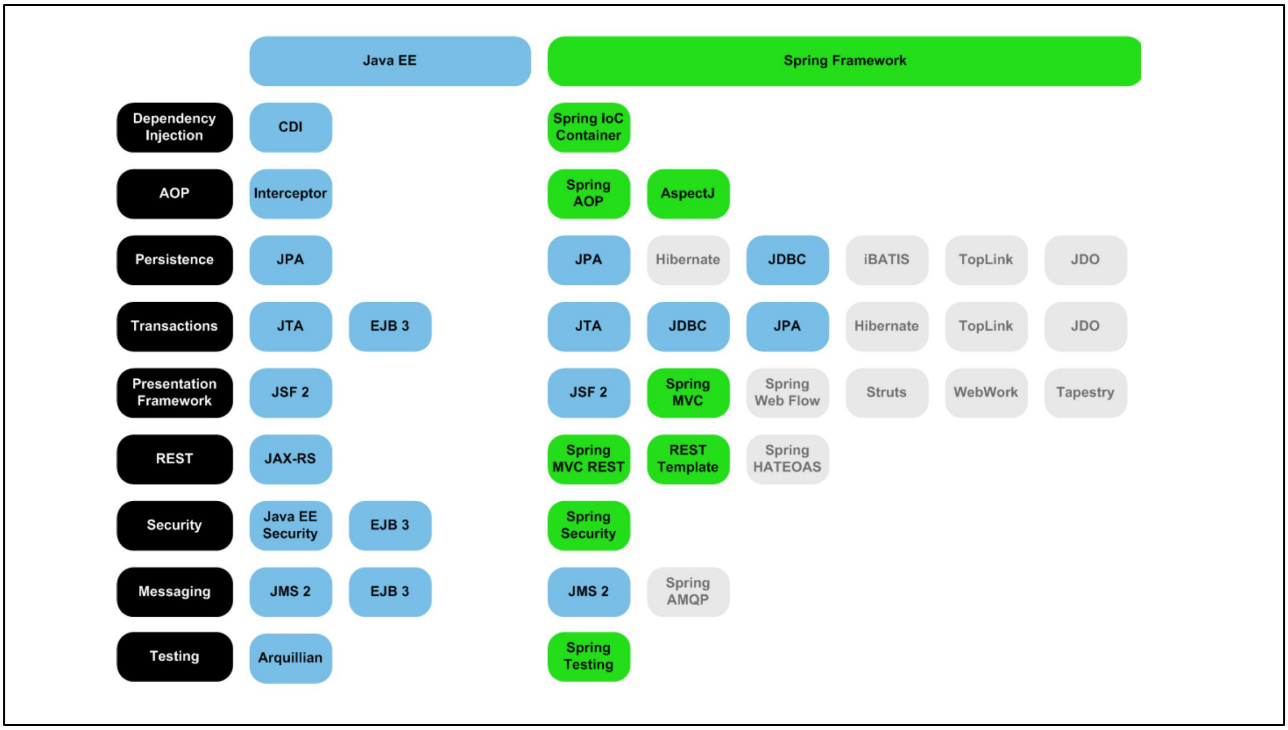
- Different components can be logically divided into three tiers: backend tier, middle tier, and web tier. This is only a logical representation, and the components can be restricted to a different tier based upon the application's requirements.
- JPA and JMS provide the basic services such as database access and messaging. JCA allows connection to legacy systems. Batch is used for performing noninteractive, bulk-oriented tasks.
- Managed Beans and EJB provide a simplified programming model using POJOs to use the basic services.
- CDI, Interceptors, and Common Annotations provide concepts that are applicable to a wide variety of components, such as type-safe dependency injection, addressing cross-cutting concerns using interceptors, and a common set of annotations. Concurrency Utilities can be used to run tasks in a managed thread. JTA enables Transactional Interceptors that can be applied to any POJO.
- CDI Extensions allow you to extend the platform beyond its existing capabilities in a standard way.
- Web Services using JAX-RS and JAX-WS, JSF, JSP, and EL define the programming model for web applications. Web Fragments allow automatic registration of third-party web frameworks in a very natural

- way. JSON provides a way to parse and generate JSON structures in the web tier. WebSocket allows the setup of a bidirectional, full-duplex communication channel over a single TCP connection.
- Bean Validation provides a standard means to declare constraints and validate them across different technologies.

Spring

Since 2003 as a response to the complexity of the early J2EE specifications.

The Spring programming model does not embrace the Java EE platform specification; rather, it integrates with carefully selected individual specifications from the EE umbrella.



AOP = aspect oriented programming

Spring REST Web Services