Reksoft

http://www.reksoft.com

Владимир Сергеевич Бегларян

# Java Enterprise Edition

http://www.oracle.com/technetwork/java/javaee

# Пример готового простого приложения как старт для работы на Java EE.

**https://netbeans.org/kb/docs/javaee/javaee-entapp-ejb_ru.html**

- **Веб-уровень.** Веб-уровень содержит логику представления приложения и запускается на сервере Java EE. В приложении NewsApp веб-уровень представлен веб-модулем и содержит сервлеты, через которые осуществляется доступ к бизнес-логике в модуле EJB.
- **Бизнес-уровень.** Приложения бизнес-уровня также выполняются на сервере Java EE и содержат бизнес-логику приложения. В приложении NewsApp бизнес-уровень представлен модулем EJB. Модуль EJB содержит код для обработки запросов от клиентов веб-уровня и для управления транзакциями и способами сохранения объектов в базе данных.
- **EIS-уровень.** EIS-уровень - это надежный уровень хранения приложения. В приложении NewsApp этот уровень представлен базой данных для сохранения сообщений.

| Версия | Полное имя | Дата публикации |
|---|---|---|
| 1.0 | Java 2 Platform Enterprise Edition, v 1.0 | декабрь 1999 |
| 1.2 | Java 2 Platform Enterprise Edition, v 1.2 | 2000 |
| 1.2.1 | Java 2 Platform Enterprise Edition, v 1.2.1 | 23 мая 2000 |
| 1.3 | Java 2 Platform Enterprise Edition, v 1.3 | 24 сентября 2001 |
| 1.4 | Java 2 Platform Enterprise Edition, v 1.4 | 24 ноября 2003 |
| 5.0 | Java Platform, Enterprise Edition, v 5 | 11 мая 2006 |
| 6.0 | Java Platform, Enterprise Edition, v 6 | 6 декабря 2009 |

# Зачем нужна Java EE?

# Java Platform, Enterprise Edition

**Java Platform, Enterprise Edition** or **Java EE** is Oracle's enterprise Java computing platform. The platform provides an API and runtime environment for developing and running enterprise software, including network and web services, and other large-scale, multi-tiered, scalable, reliable, and secure network applications. Java EE extends the Java Platform, Standard Edition (Java SE), providing an API for object-relational mapping, distributed and multi-tier architectures, and web services. The platform incorporates a design based largely on modular components running on an application server. Software for Java EE is primarily developed in the Java programming language. The platform emphasizes **convention over configuration** and **annotations for configuration**.

# Декларативность: annotation

```
import java.io.Serializable;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;

@Entity
public class Address implements Serializable {
  @Id
   protected  long id;
   String street1;
   String street2;
   String city;
   String province;
   …
}
```

# Декларативность: configuration

```
package logic;

import java.util.Set;
import java.util.HashSet;

public class Bus {

private Long id;
private String number;

public Bus() { }
public void setId(Long id) {
    this.id = id;
}
public void setNumber(String number) {
    this.number = number;
}
public Long getId() {
    return id;
}
public String getNumber() {
    return number;
}

}
```

```
<hibernate-mapping>
   <class name=«logic.Bus» table=«busses»>
        <id column=«bus_id» name=«id» type=«java.lang.Long»>
             <generator class=«increment»/>
        </id>
   <property column=«number» name=«number» type=«java.lang.String»/>

   <set name=«drivers» table=«busDriver» lazy=«false»>
      <key column=«bus_id»/>
      <many-to-many column=«driver_id» class=«logic.Driver»/>
   </set>

   </class>
</hibernate-mapping>
```

# Декларативность: dependency injection

http://www.ashep.org/2013/chto-takoe-dependency-injection/

```
public interface IOnlineBrokerageService {
   String[] getStockSymbols();
   double getAskingPrice(String stockSymbol);
   double getOfferPrice(String stockSymbol);
   void putBuyOrder(String stockSymbol, int shares, double bidPrice);
   void putSellOrder(String stockSymbol, int shares, double offerPrice);
}

public interface IStockAnalysisService {
double getEstimatedValue(String stockSymbol);
}

public interface IAutomatedStockTrader { void executeTrades(); }
```

# Декларативность: dependency injection

```
public class VerySimpleStockTraderImpl implements IAutomatedStockTrader {
private IStockAnalysisService analysisService = new
StockAnalysisServiceImpl();

private IOnlineBrokerageService brokerageService = new
NewYorkStockExchangeBrokerageServiceImpl();

public void executeTrades() { … }
}

public class MyApplication {
public static void main(String[] args) {
IAutomatedStockTrader stockTrader = new VerySimpleStockTraderImpl();
stockTrader.executeTrades();
}
}
```

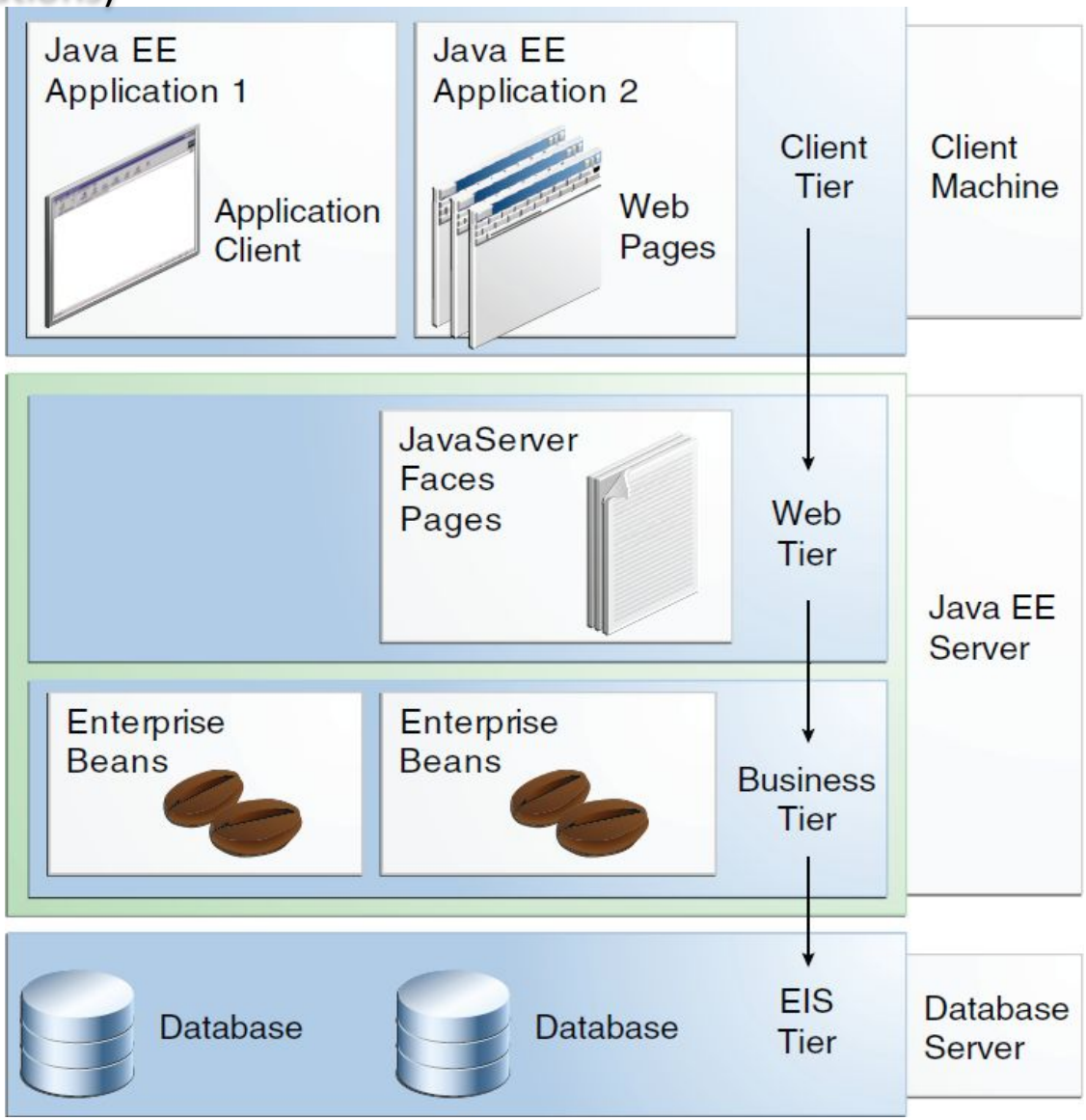
# Декларативность: dependency injection

```
<contract id="IAutomatedStockTrader">
<implementation>VerySimpleStockTraderImpl</implementation>
</contract>

<contract id="IStockAnalysisService" singleton="true">
<implementation>StockAnalysisServiceImpl</implementation>
</contract>

<contract id="IOnlineBrokerageService" singleton="true">
<implementation> NewYorkStockExchangeBrokerageServiceImpl
</implementation>
</contract>
```

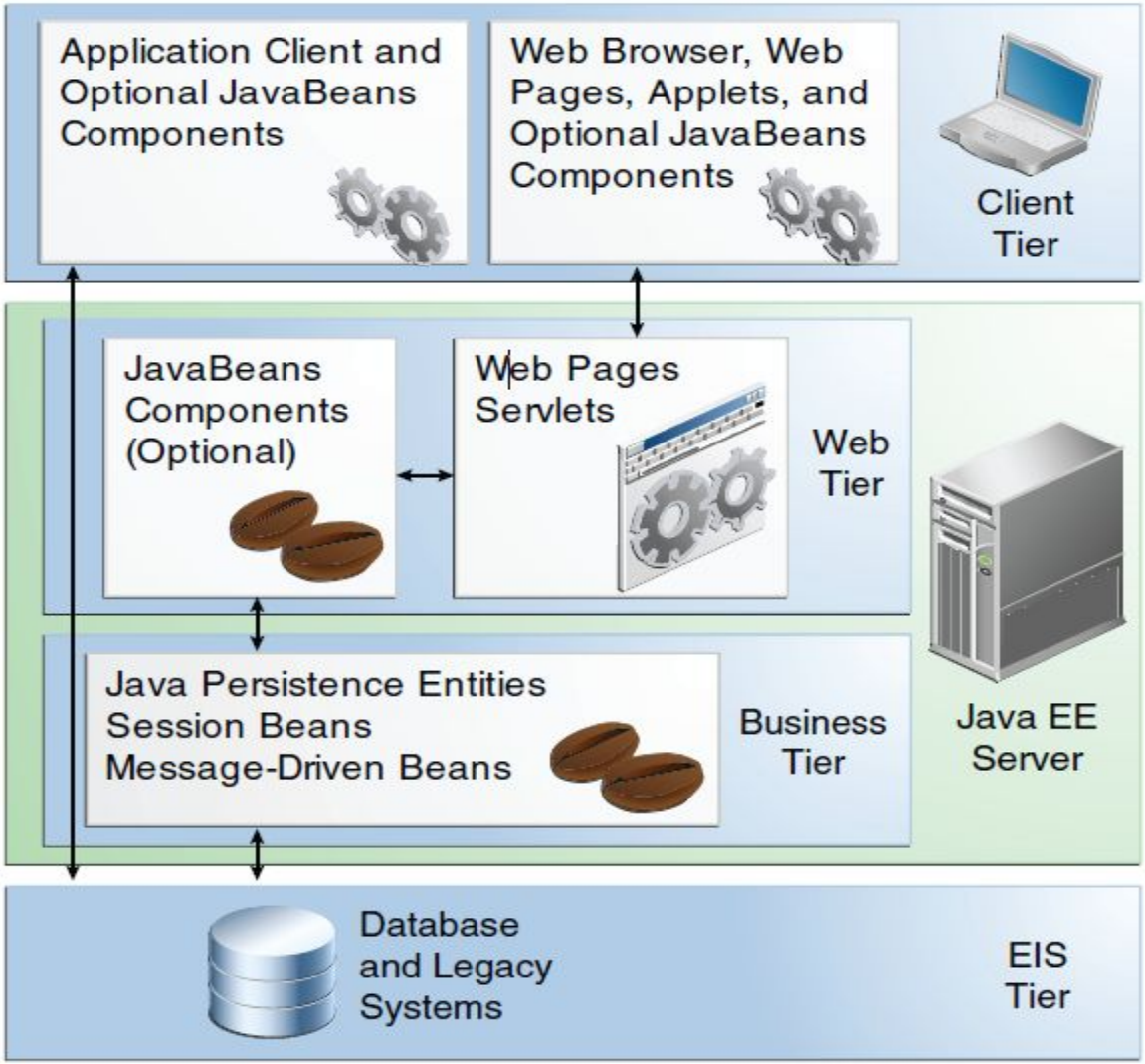
# Декларативность: dependency injection

```
public class VerySimpleStockTraderImpl implements IAutomatedStockTrader {
private IStockAnalysisService analysisService;
private IOnlineBrokerageService brokerageService;

public VerySimpleStockTraderImpl(
IStockAnalysisService analysisService, IOnlineBrokerageService brokerageService) {
this.analysisService = analysisService;
this.brokerageService = brokerageService;
}
public void executeTrades() { … }
}
public class MyApplication {
public static void main(String[] args) {
IAutomatedStockTrader stockTrader =
(IAutomatedStockTrader) DependencyManager.create(IAutomatedStockTrader.class);
 stockTrader.executeTrades();
}
}
```

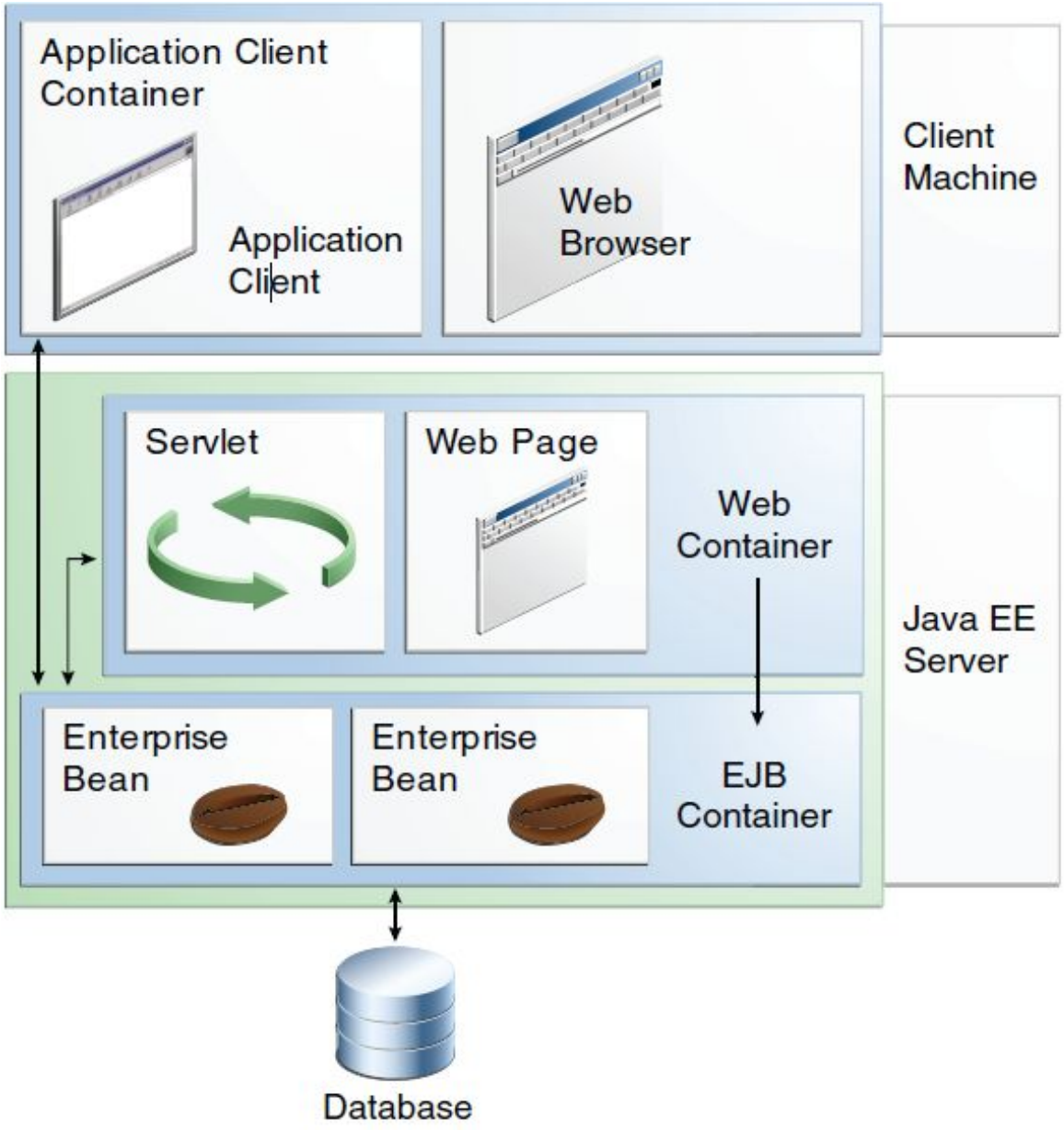
# Многоуровневая архитектура приложений (Multitiered Applications)



# Основные компоненты в архитектуре JEE приложения



# JEE Server и контейнеры (containers)



# Container сервис

■ The Java EE security model lets you configure a web component or enterprise bean so that system resources are accessed only by authorized users.

■ The Java EE transaction model lets you specify relationships among methods that make up a single transaction so that all methods in one transaction are treated as a single unit.

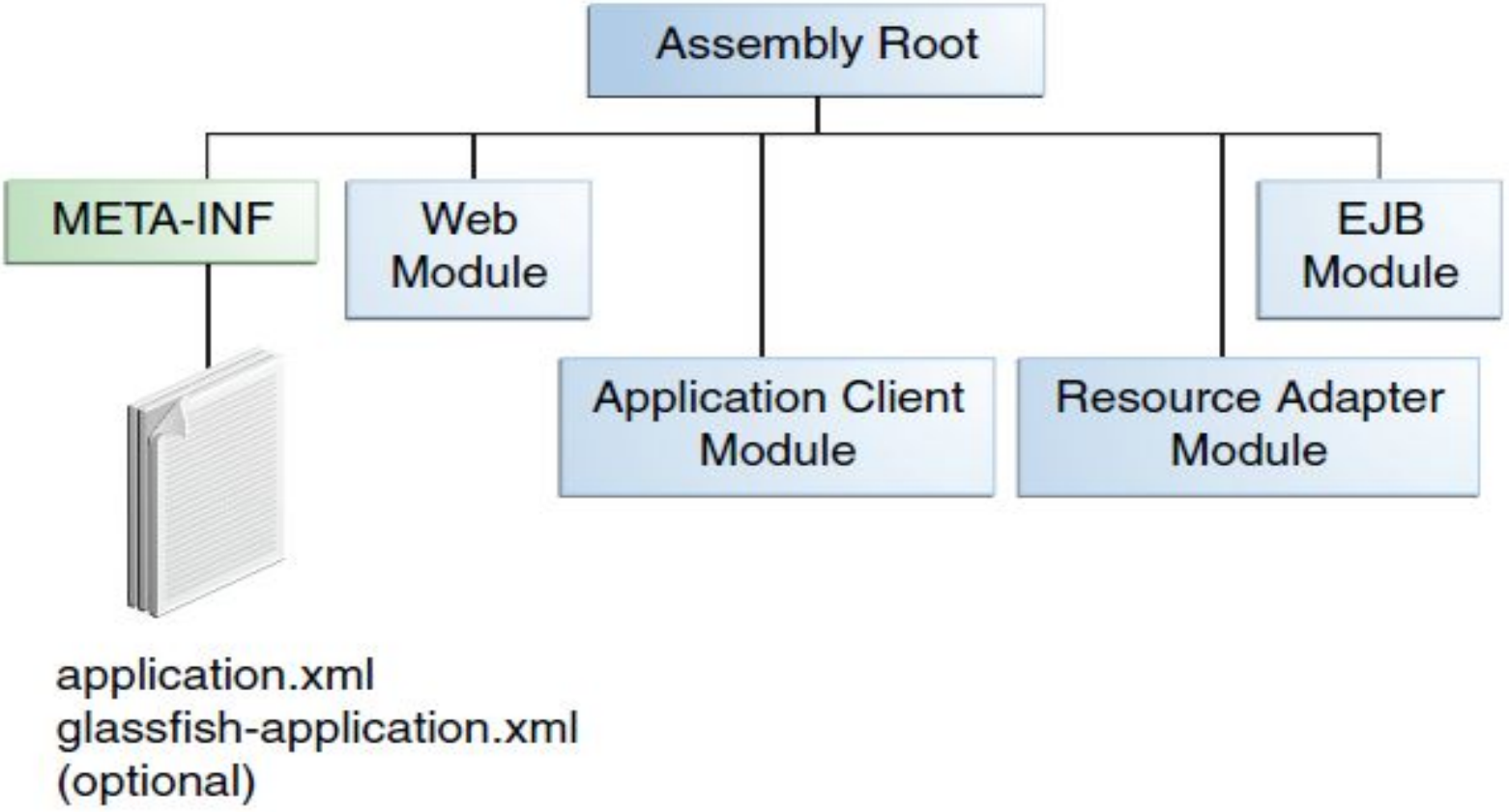
■ JNDI lookup services provide a unified interface to multiple naming and directory services in the enterprise so that application components can access these services.

■ The Java EE remote connectivity model manages low-level communications between clients and enterprise beans. After an enterprise bean is created, a client invokes methods on it as if it were in the same virtual machine.

# Java App Server, сертифицированные для Java EE 6

- GlassFish server Open Source Edition
- Oracle GlassFish Server
- Oracle WebLogic Server
- JBoss Application Server
- Joss Enterprise Application Platform
- OW2 JOnAS
- IBM WebSphere Application Server
- IBM WebSphere Application Server Community Edition
- Apache Geronimo
- Fujitsu Interstage Application Server[16]
- TmaxSoft JEUS

# Структура EAR файла



# Типы Java EE модулей

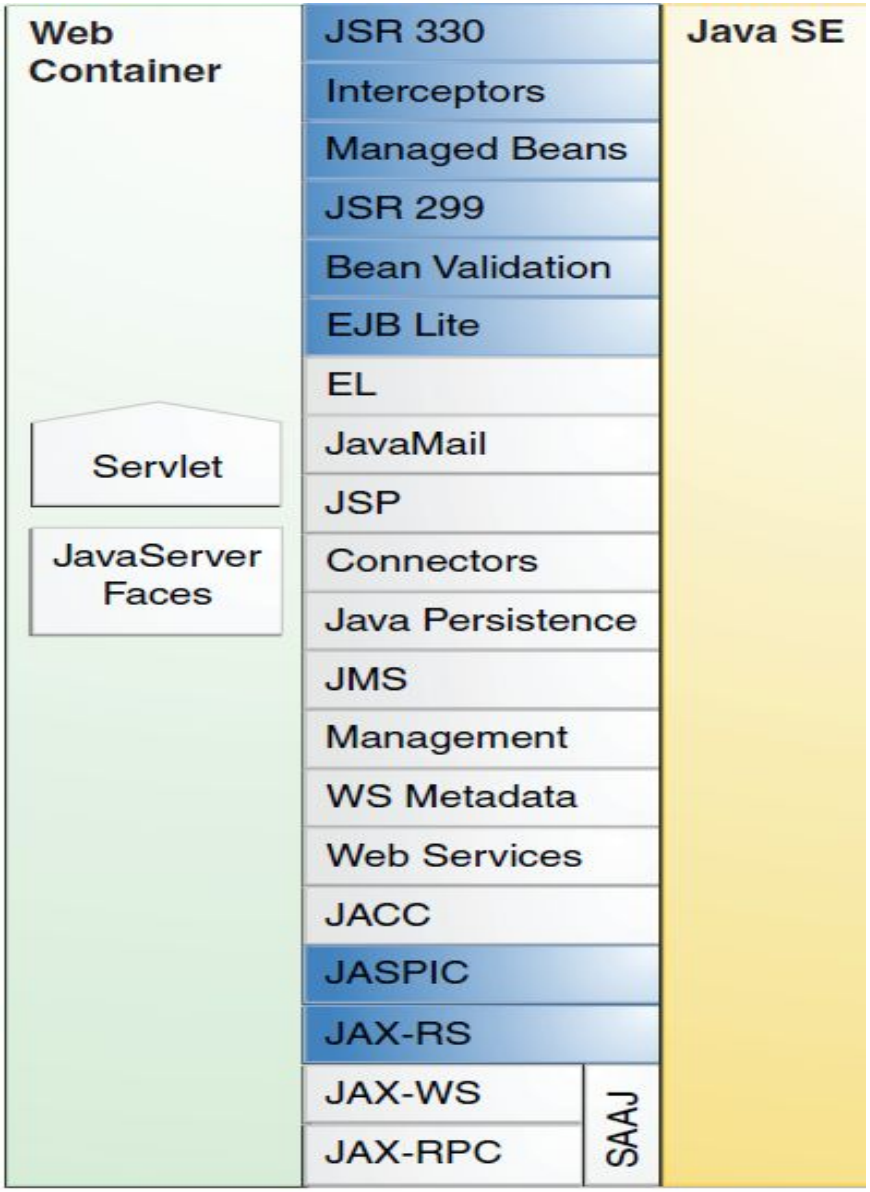
■ EJB modules, which contain class files for enterprise beans and, optionally, an EJB deployment descriptor. EJB modules are packaged as JAR files with a .jar extension.

■ Web modules, which contain servlet class files, web files, supporting class files, image and HTML files, and, optionally, a web application deployment descriptor. Web modules are packaged as JAR files with a .war (web archive) extension.

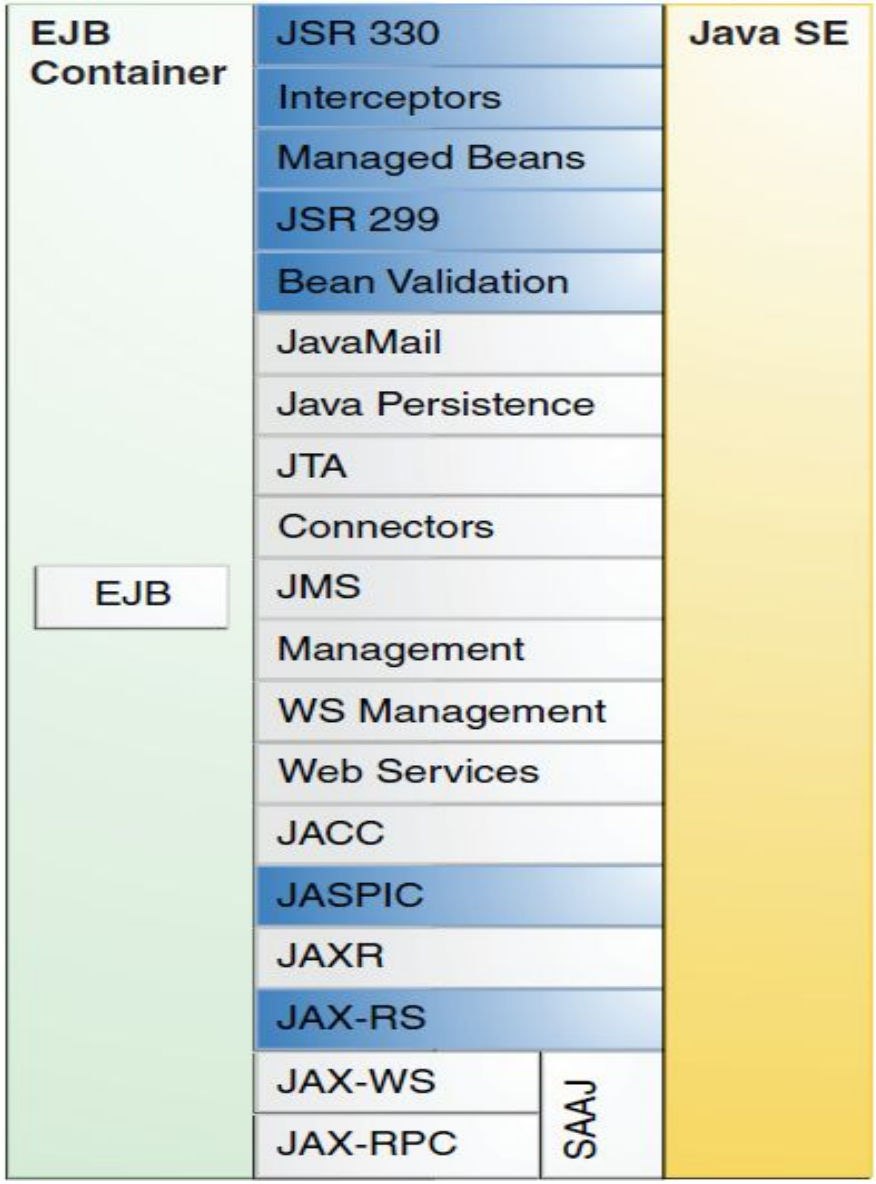
■ Application client modules, which contain class files and, optionally, an application client deployment descriptor. Application client modules are packaged as JAR files with a .jar extension.

■ Resource adapter modules, which contain all Java interfaces, classes, native libraries, and, optionally, a resource adapter deployment descriptor. Together, these implement the Connector architecture for a particular EIS. Resource adapter modules are packaged as JAR files with an .rar (resource adapter archive) extension.

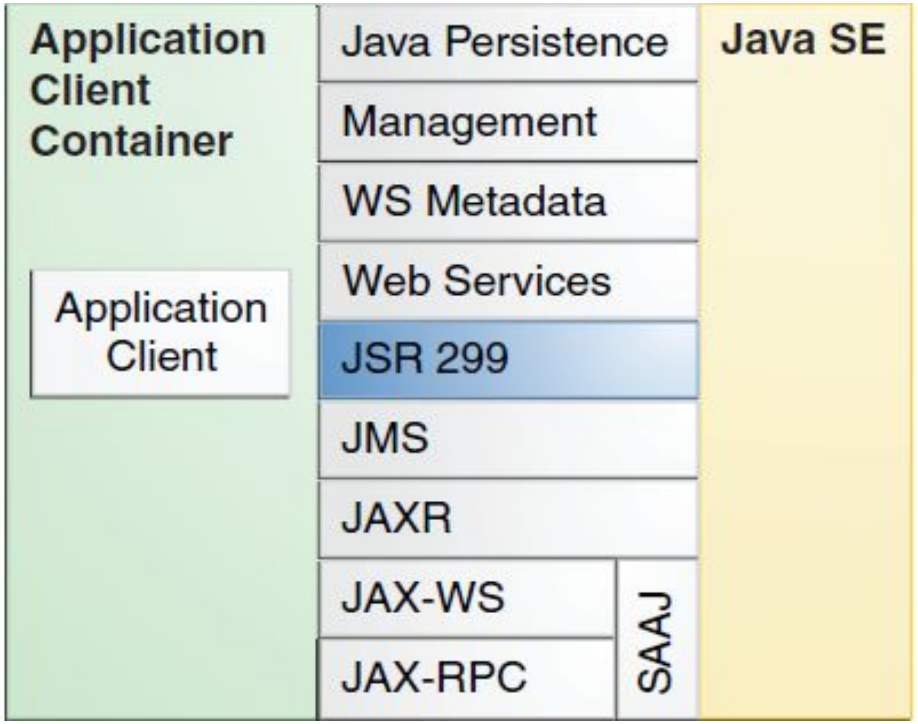
# Java EE API для Web Container



# Java EE API для EJB Container



# Java EE API для Application Client Container



# Основные Java EE интерфейсы

JavaServer Faces

Servlet, включая JavaServer Pages

contexts and Dependency Injection

Enterprise JavaBean

Java Persistence

Java Transaction (X/Open XA)

Java Message Service

Java Connector Architecture (лучше ESB)

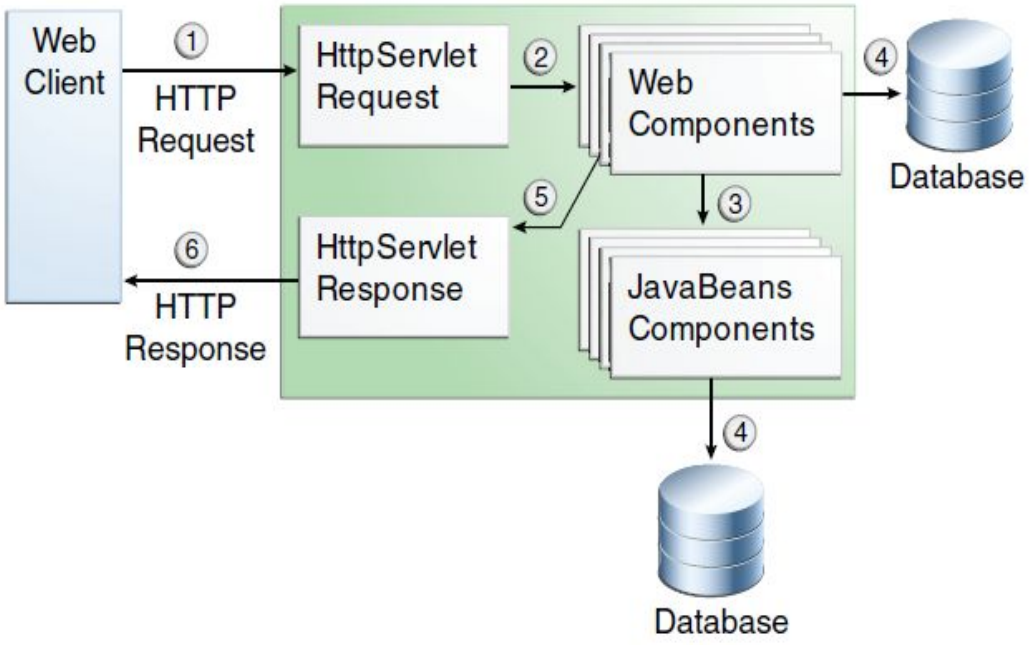
# Web Tier

A *web application* is a dynamic extension of a web or application server. Web applications are of the following types:

- **Presentation-oriented**: A *presentation-oriented web application* generates interactive web pages containing various types of markup language (HTML, XHTML, XML, and so on) and dynamic content in response to requests.
- **Service-oriented**: A *service-oriented web application* implements the endpoint of a web service.

Presentation-oriented applications are often clients of service-oriented web applications.

# Обработка HTTP запросов




**Web components**: Java servlets, web pages implemented with JavaServer Faces technology, JSP pages, web service (WS) endpoints.

**Web Services**: SOAP – based WS, RESTful WS

# Enterprise Bean

**Что даёт EJB:**

1. Разработчик концентрируется на бизнес – логике.
2. Разработка клиентской части (Web) отделена от разработки бизнес – логики и работой с БД. Это особенно важно для малых устройств (смартфоны, планшеты).
3. Повторное использование кода.

# Enterprise Bean

**Когда особенно следует использовать EJB:**

1. Масштабирование.
2. Транзакционность.
3. Разнообразие типов клиентов.

# Enterprise Bean

- **Session Bean: stateful, stateless, singleton (синхронный вызов).**
- **Message-driven Bean (асинхронный вызов)**
- **Entity Bean (Persistence классы)**

**Statefull:**

■ The bean's state represents the interaction between the bean and a specific client.
■ The bean needs to hold information about the client across method invocations.
■ The bean mediates between the client and the other components of the application, presenting a simplified view to the client.

**Stateless:**

■ The bean's state has no data for a specific client.
■ In a single method invocation, the bean performs a generic task for all clients. For example,you might use a stateless session bean to send an email that confirms an online order.
■ The bean implements a web service.

**Singletone:**

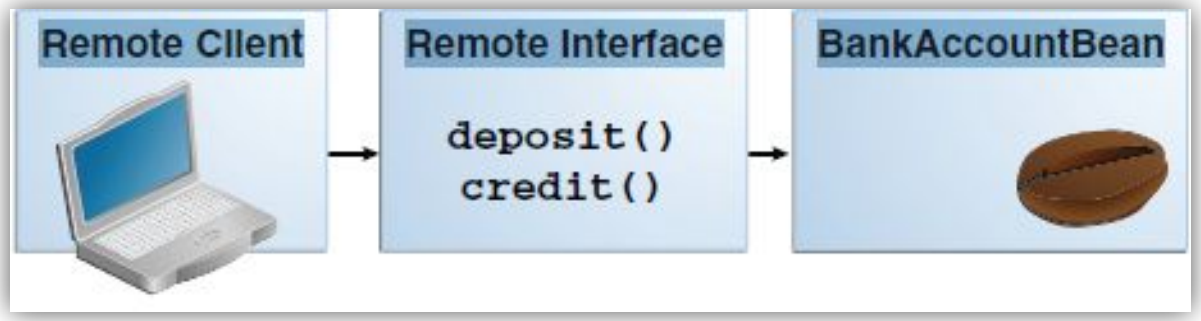
■ State needs to be shared across the application.
■ A single enterprise bean needs to be accessed by multiple threads concurrently.
■ The application needs an enterprise bean to perform tasks upon application startup and shutdown.
■ The bean implements a web service.

**Message-driven (like stateless):**

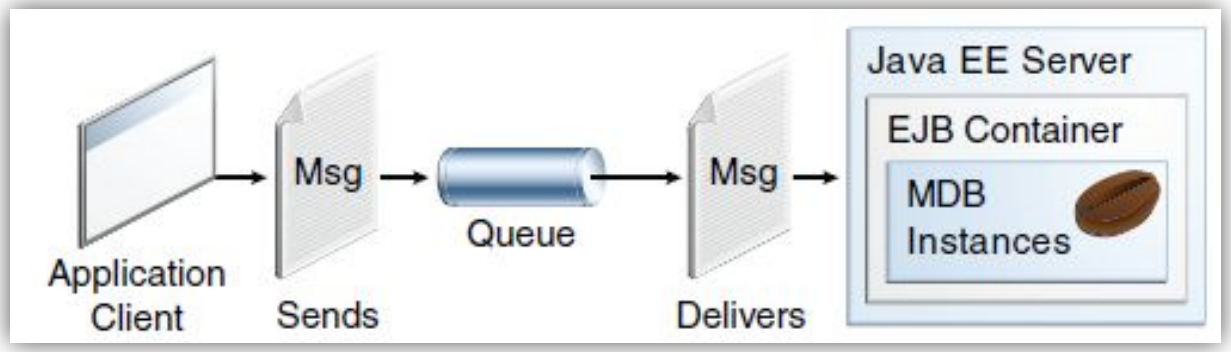
■ To avoid tying up server resources, do not to use blocking synchronous; receives in a server-side component

# Enterprise Bean

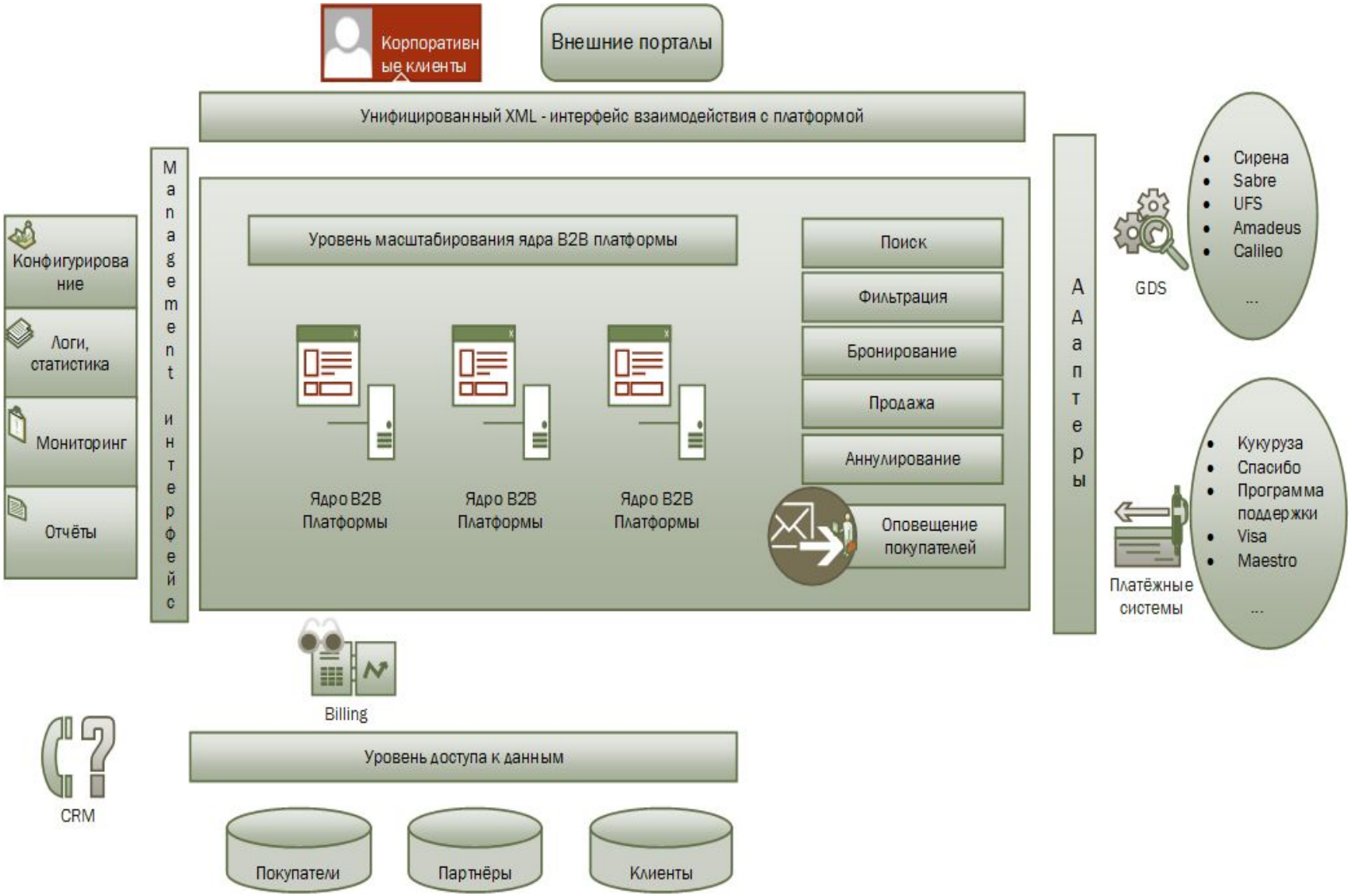
Session Bean




Message-Driven Bean



# Бизнес – архитектура одной системы online бронирования билетов



Поиск и фильтрация
Бронирование
Аннуляция бронирования
Пользователь
Администратор
Сотрудник компании

**Спасибо за внимание !**