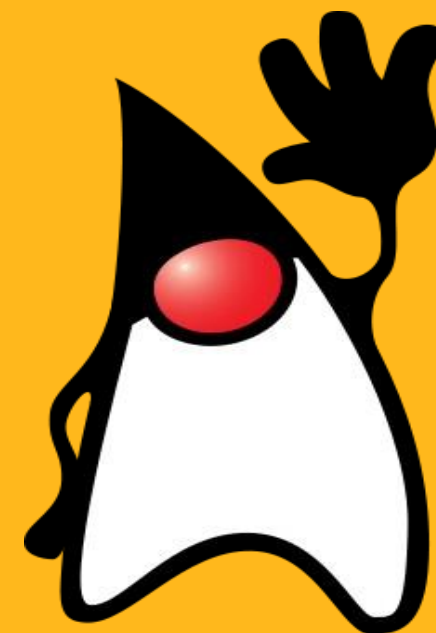# Vývoj pokročilých aplikácií

Platforma Jakarta EE (Java EE)

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Java Platform, Enterprise Edition

- Pre vývoj komponentovo-orientovaných mnohovrstvových podnikových aplikácií
- Špecifikácia definovaná Java Community Process (JCP)
- Rôzne implementácie rovnakého API
  - JPA nájdeme v Eclipselink, OpenJPA, Hibernate
- Certifikácia
- Návrhové vzory:
  - Viacúrovňovosť – prezenčná,logika, business logika,...
  - Väčšie rozmery aplikácií
  - Škálovateľnosť
  - Spoľahlivosť
  - Bezpečnosť

Java Enterprise Edition

Vývoj:

- **webových aplikácií** – Java Servlety, JSP, JSF
- **prístupu k relačným DB** – Java persistence API
- **zdieľanej podnikovej logiky** – Enterprise Java Beans (EJB)
- **vkladania závislostí** - Context and Dependency Injection
- **prístupu k ukladacím systémom** – Java Conector Architecture (JCA)
- **prístupu a správy strednej vrstvy** – Java Messaging Service (JMS)
- **Komponentov zabezpečujúcu integráciu webových aplikácií** – Portlety

- **webových služieb**

Verzie

- Java EE 6 (December 10, 2009)
- Java EE 7 (June 12, 2013)
- Java EE 8 (September 21, **2017**)
- Ďalší vývoj ???

Java EE 7

Java EE 7 témy

Vývojárska produktivita

Java EE 7

Dôraz na Podnikové požiadavky

- Viac anotácií POJOs
- Menej štandardizovaného kódu
- Integrovane koherentné platformy

- WebSockets
- JSON
- Servlet 3.1 NIO
- REST

- Batch
- Concurrency
- Zjednodušenie JMS
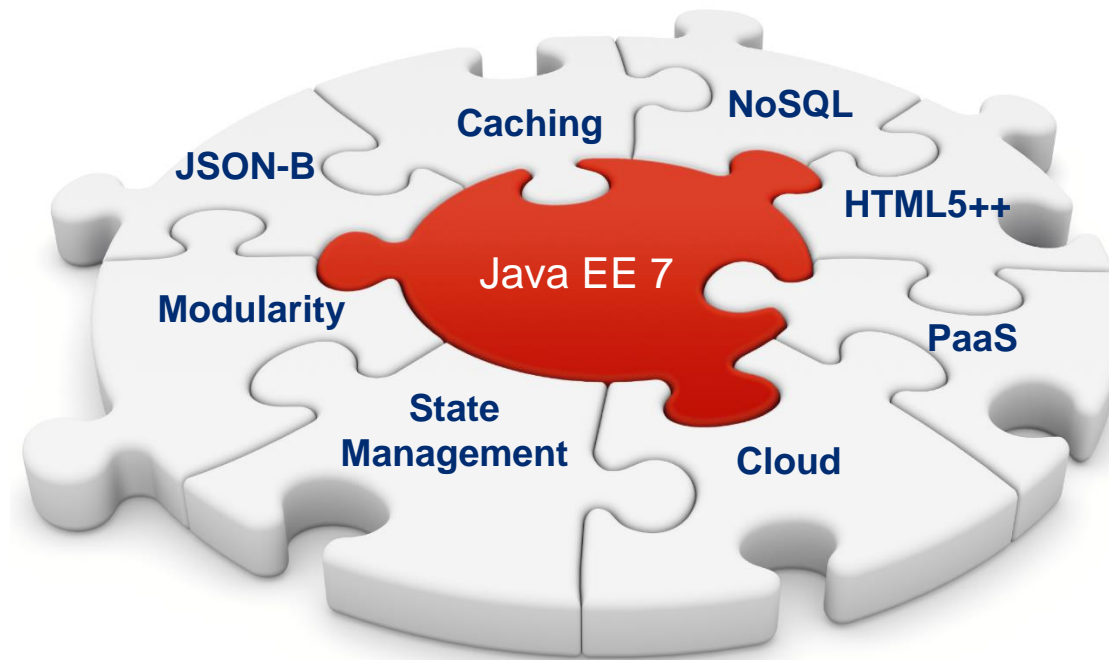
Java EE 8

Java EE 8 - Prehľad

- Pokračujúce vylepšenia skladanie webových štandartov
  - HTTP/2, JSON Binding, JSON-P, MVC

- Vylepšenie práce s Cloudom
  - bezpečnosť, RESTful Management API

- CDI Programming Model
  - Jendnoduchšie použitie, EJB cez CDI

- Menší – ale s dôležitými funkciami
  - Caching, lepšia správa Správ - Messaging
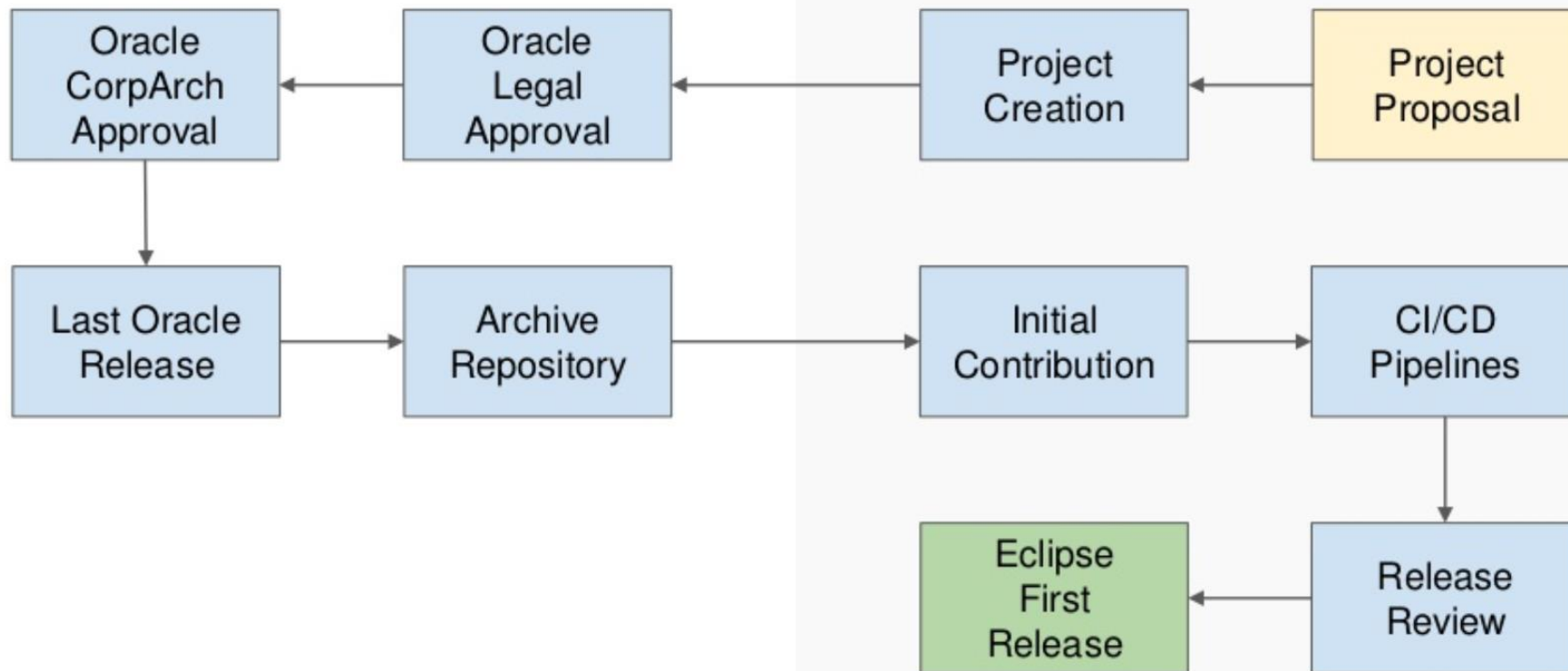
- Zosúladenie sa s Java SE 8

Eclipse Enterprise for Java – EE4J

Čo sa prenieslo?

- Java EE – špecifikácia
- Java EE API
- Java EE – referenčná implementácia
- Java - Technology Compatibility Kit
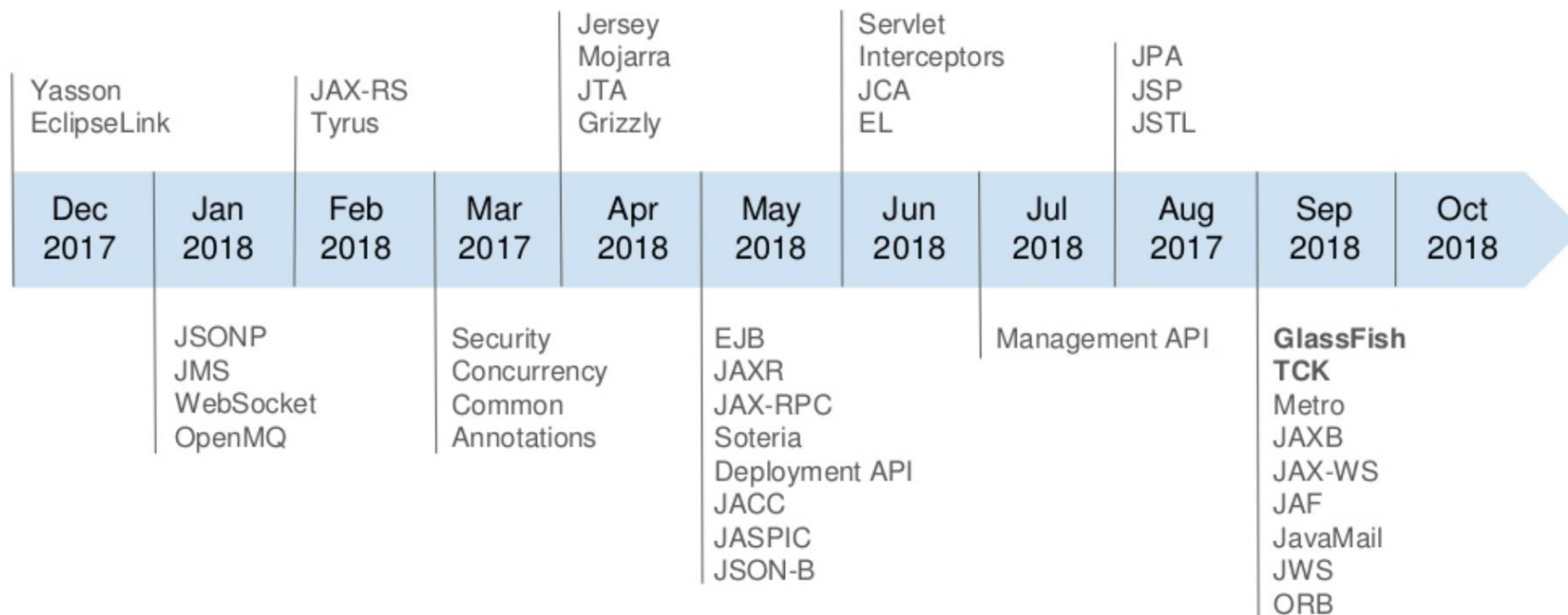- Návody, dokumentácia, príklady

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Časový harmonogram príspevkov

Contribution Timeline

	Dec 2017	Jan 2018	Feb 2018	Mar 2017	Apr 2018	May 2018	Jun 2018	Jul 2018	Aug 2017	Sep 2018	Oct 2018
Above	Yasson EclipseLink		JAX-RS Tyrus		Jersey Mojarra JTA Grizzly		Servlet Interceptors JCA EL		JPA JSP JSTL		
Below		JSONP JMS WebSocket OpenMQ		Security Concurrency Common Annotations		EJB JAXR JAX-RPC Soteria Deployment API JACC JASPIC JSON-B		Management API		**GlassFish TCK** Metro JAXB JAX-WS JAF JavaMail JWS ORB	

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Evolúcia Jakarty EE
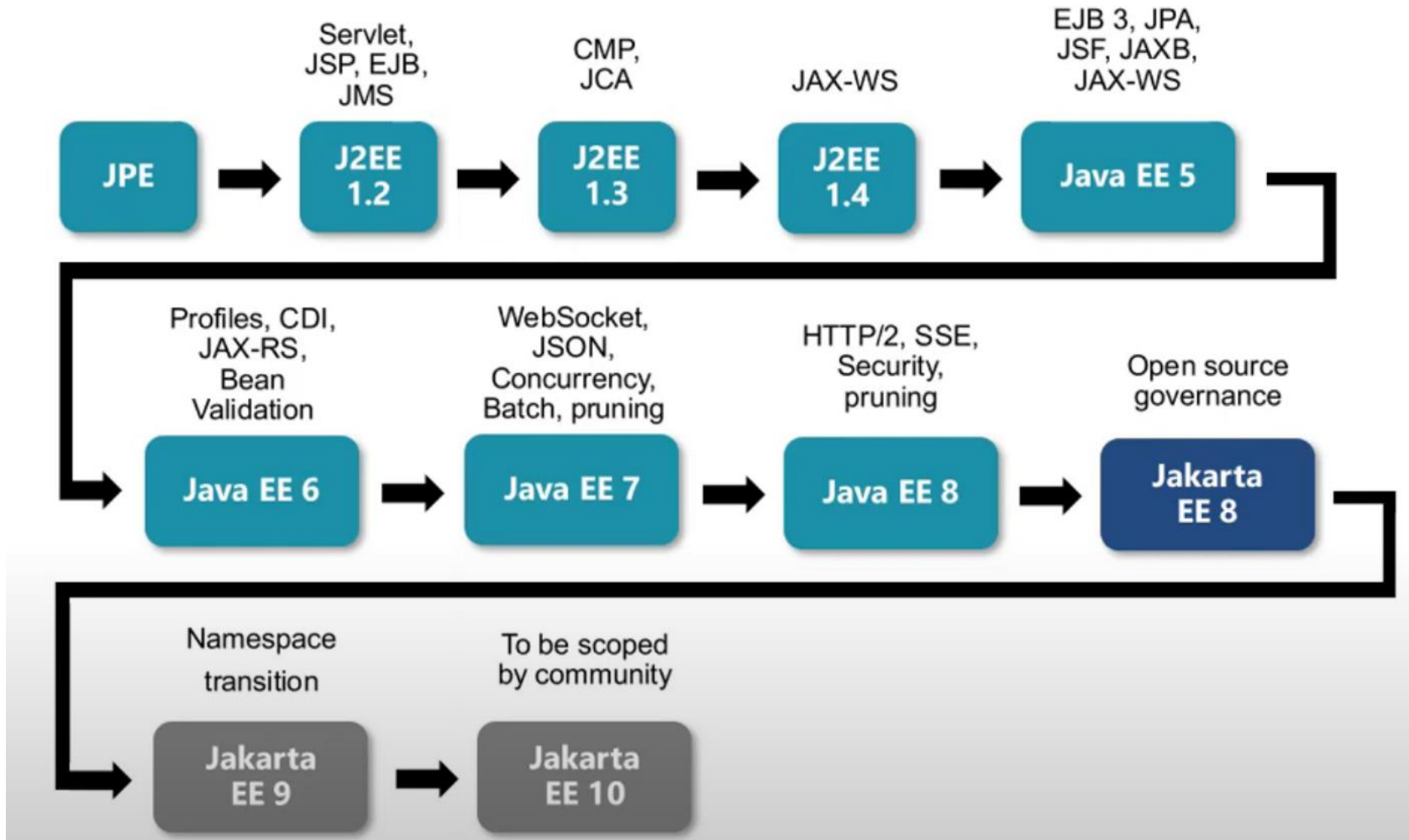
Prečo Jakarta EE?

- **9/2017** - Oracle prevádza práva Java EE na Eclipse Foundation – nie prava na Java jazyk
- Java je registrovaná na Oracle
- Vznik **Jakarta EE** - JEE

- Nemôžu sa vytvárať nové balíčky v **javax**
- Možnosť dopĺňania nových do existujúcich

Version	Date
J2EE 1.2	December 1999
J2EE 1.3	September 2001
J2EE 1.4	November 2003
Java EE 5	May 2006
Java EE 6	December 2009
Java EE 7	April 2013
Java EE 8	August 2017
Jakarta EE	February 2018*

JAKARTA EE

THE FUTURE OF JAVA EE

Zmena?

Pôvodné pomenovanie	Nové označenie
Java EE	Jakarta EE
Glassfish	Eclipse GlassFish
Java Community Process (JCP)	Jakarte EE Working Group
Oracle Development Management	Eclipse Enterprise for Java (EE4J) Project Management Committee (PMC)
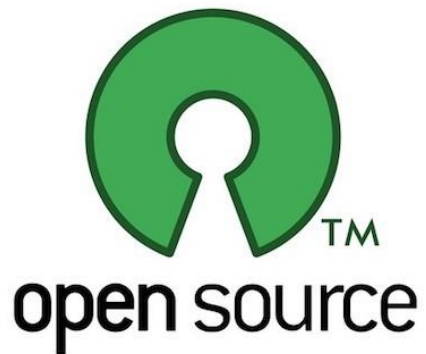
Java EE architektúra

- Prezenčná vrstva
- Vrstva business logiky
- Dátová vrstva
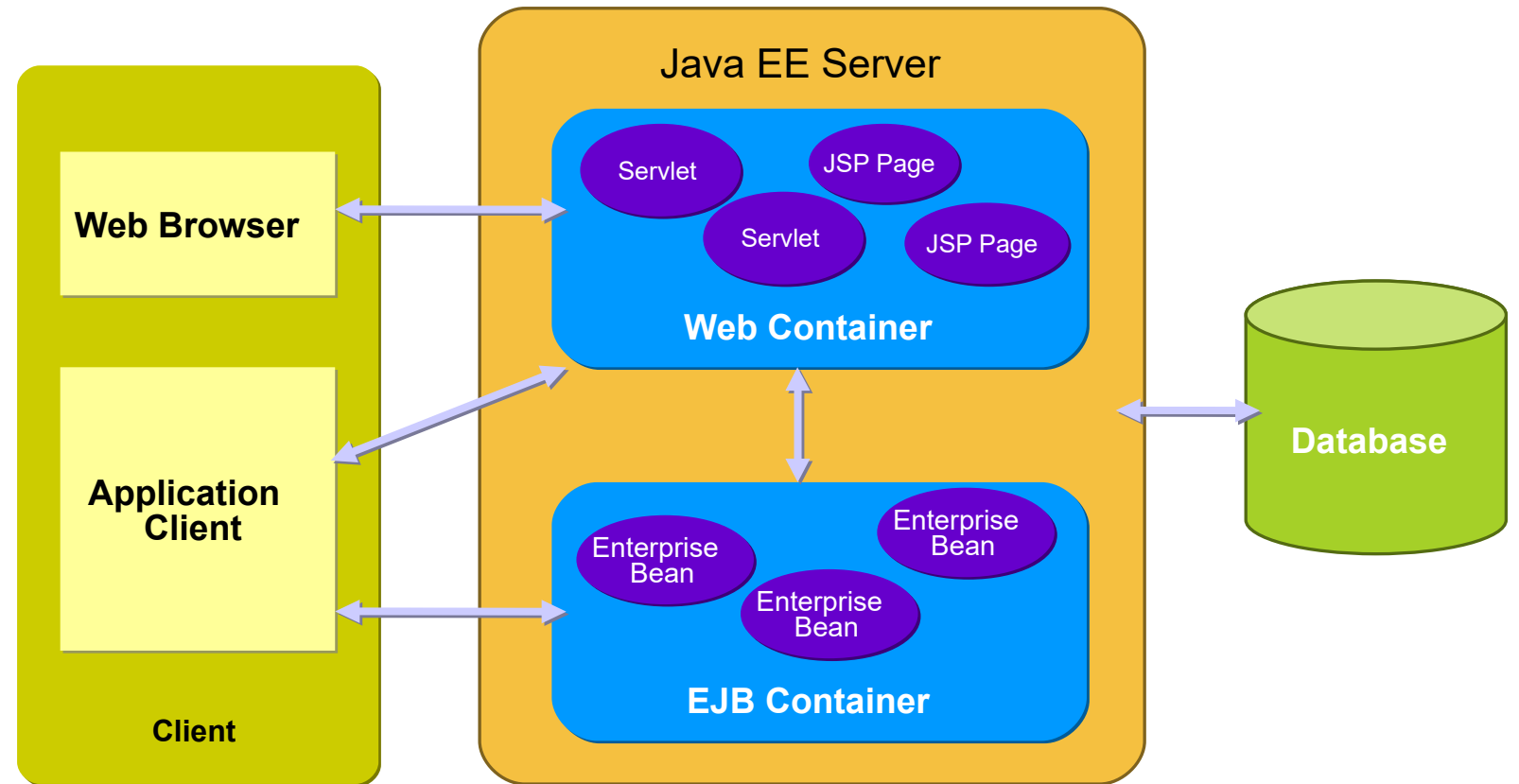
Java EE server

„Java EE is a set of specifications implemented by different **containers**. Containers are Java EE runtime environment that provides certain **services** to the **component** they host…“

Antonio Goncalves, Beginning Java EE 6 Platform with GlassFish 3

Java 2 Platform, Enterprise Edition -> J2EE

J2EE server
- Web kontajner + implementácia J2EE

Certified application servers [edit]

App Server	Java EE 7 certified - Full	Java EE 7 certified - Web	Java EE 6 certified - Full Official Oracle page for Java EE Compatibility.	Java EE 6 certified - Web	Java EE 5 certified	J2EE 1.4 certified	Licensing
GlassFish server Open Source Edition	Yes v4.0[7]	Yes v4.0[7]	Yes v3.x and upward[8]	Yes v3.x Web Profile	Yes v2.1.x[8]		Free software
Oracle GlassFish Server			Yes v3[9] based on the open source GlassFish application server		Yes Sun Java System Application Server v9.0	Yes Sun Java System Application Server v8.2	Proprietary software
Oracle WebLogic Server			Yes v12c[10]		Yes v10.3.5.0	Yes v9	Proprietary software
WildFly	Yes v8.0.0.Final[11][12][13]	Yes v8.0.0.Final	Yes v7.1[14]	Yes v6.0[15] and v7.0[16]	Yes v5.1[17][18]	Yes v4.x	Free software
JBoss Enterprise Application Platform			Yes v6.0[19]		Yes v5		Source is Free software
IBM WebSphere Application Server			Yes v8[20]		Yes v7	Yes	Proprietary software
IBM WebSphere Application Server Liberty	Yes v8.5.5.6 [21] [22]			Yes v8.5.5[23]			Proprietary software
IBM WebSphere Application Server Community Edition			Yes v3.0		Yes v2.1		Proprietary software
Apache Geronimo			Yes v3.0-beta-1 [3] ⧉[24]		Yes v2.0	Yes v1.0	Free software
TmaxSoft JEUS	Yes v8[25][26][27]		Yes v7[28][29]		Yes v6	Yes v5	Proprietary software
Hitachi Application Server	Yes v10[30][31]		Yes v9[32]				Proprietary software
Fujitsu Interstage Application Server[33]			Yes v1 Azure/v10.1[34] [35]		Yes		Proprietary software
NEC WebOTX			Yes[36]		Yes		Proprietary software
Caucho Resin Server				Yes v4.0.[37]		Yes	Proprietary software
Apache TomEE[38][39]				Yes			Free software
OW2 JOnAS				Yes v5.3 rc1[40]	Yes	Yes	Free software
SAP NetWeaver				Yes v2.x[41]	Yes	Yes	Proprietary software
Oracle Containers for Java EE					Yes		Proprietary software
Oracle iPlanet Web Server						Yes Sun Java System Web Server	Proprietary software
Oracle Application Server 10g						Yes	Proprietary software
Pramati Server						Yes v5.0	Proprietary software
Trifork T4						Yes	Proprietary software
Sybase Enterprise Application Server[42]						Yes	Proprietary software

Referencing runtime	Developer	Jakarta EE 10 Platform	Jakarta EE 9/9.1 Platform Compatible Products	Jakarta EE 9/9.1 Web Profile Compatible Products	Jakarta EE 8 Platform Compatible Products	Jakarta EE 8 Web Profile Compatible Products	Licensing
GlassFish	Eclipse	Yes 7.0.0	Yes 6.0.0/ 6.1.0	Yes 6.0.0/ 6.1.0	Yes 5.1.0	Yes 5.1.0	Free software
Open Liberty	IBM	Yes 22.0.0.13-beta[25]	Yes 21.0.0.12	Yes 21.0.0.12	Yes 19.0.0.6, 20.0.0.3	Yes 19.0.0.6, 20.0.0.3	Free software
WebSphere Liberty	IBM	No	Yes 21.0.0.12	Yes 21.0.0.12	Yes 20.0.0.3	Yes 20.0.0.3	Proprietary software
WildFly	Red Hat	Yes 27.0.0.Alpha5	Yes 23.0.1-Preview/25.0.0-Preview	Yes 23.0.1-Preview/25.0.0-Preview	Yes 18.0.0	Yes 18.0.0	Free software
JBoss EAP	Red Hat	No	No	No	Yes 7.3.0	Yes 7.3.0	Free software
TomEE	Apache	No	No	Yes 9.0.0-M7	No	Yes 8.0.x	Free software
Payara Server	Payara Services Limited	Yes 6.2022.1 Alpha 4	Yes 6.2021.1 Alpha 1	No	Yes 5.22.0, 5.23.0	Yes 5.23.0	Free software
Thunisoft Application Server	Beijing Thunisoft Information Technology	No	Yes 3.0	No	Yes 2.8	No	Proprietary software
JEUS	TmaxSoft	No	No	No	Yes 8.5	No	Proprietary software
InforSuite Application Server	Shandong Cvicse Middleware	No	Yes 11	No	Yes 10	No	Proprietary software

J2EE API
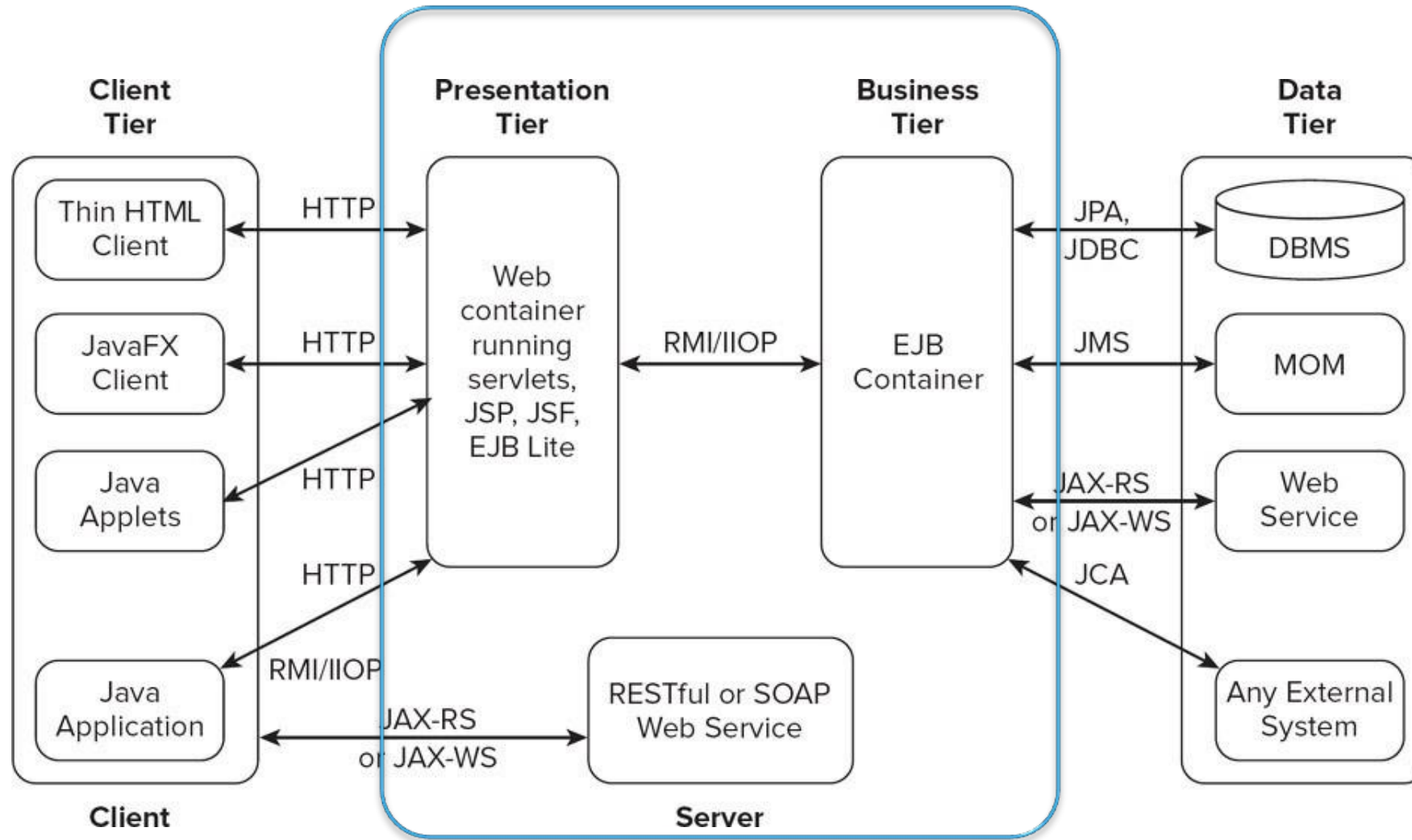
Java EE - Frameworky

Webové technológie

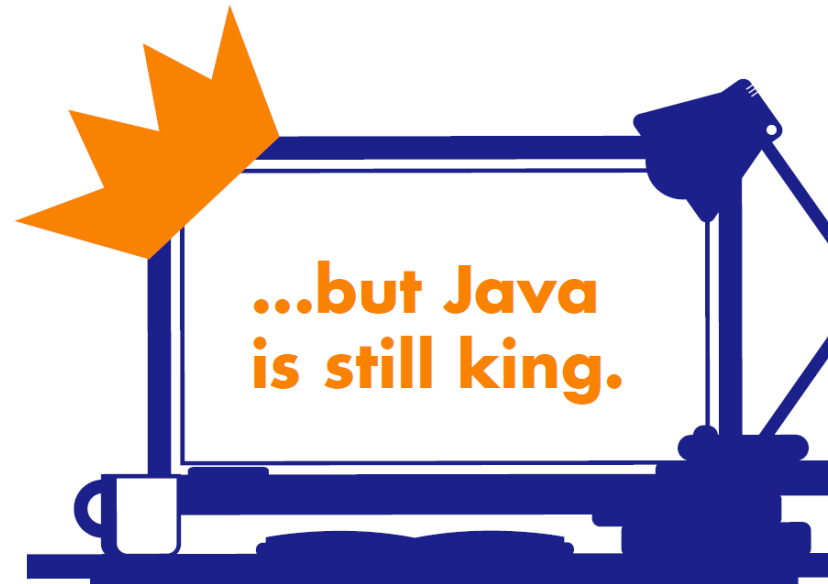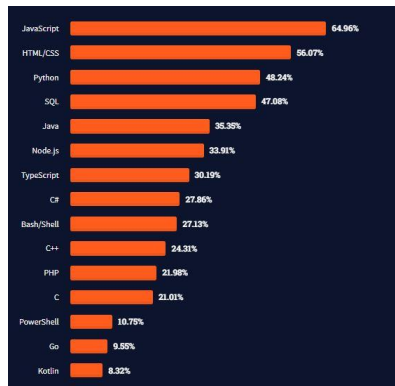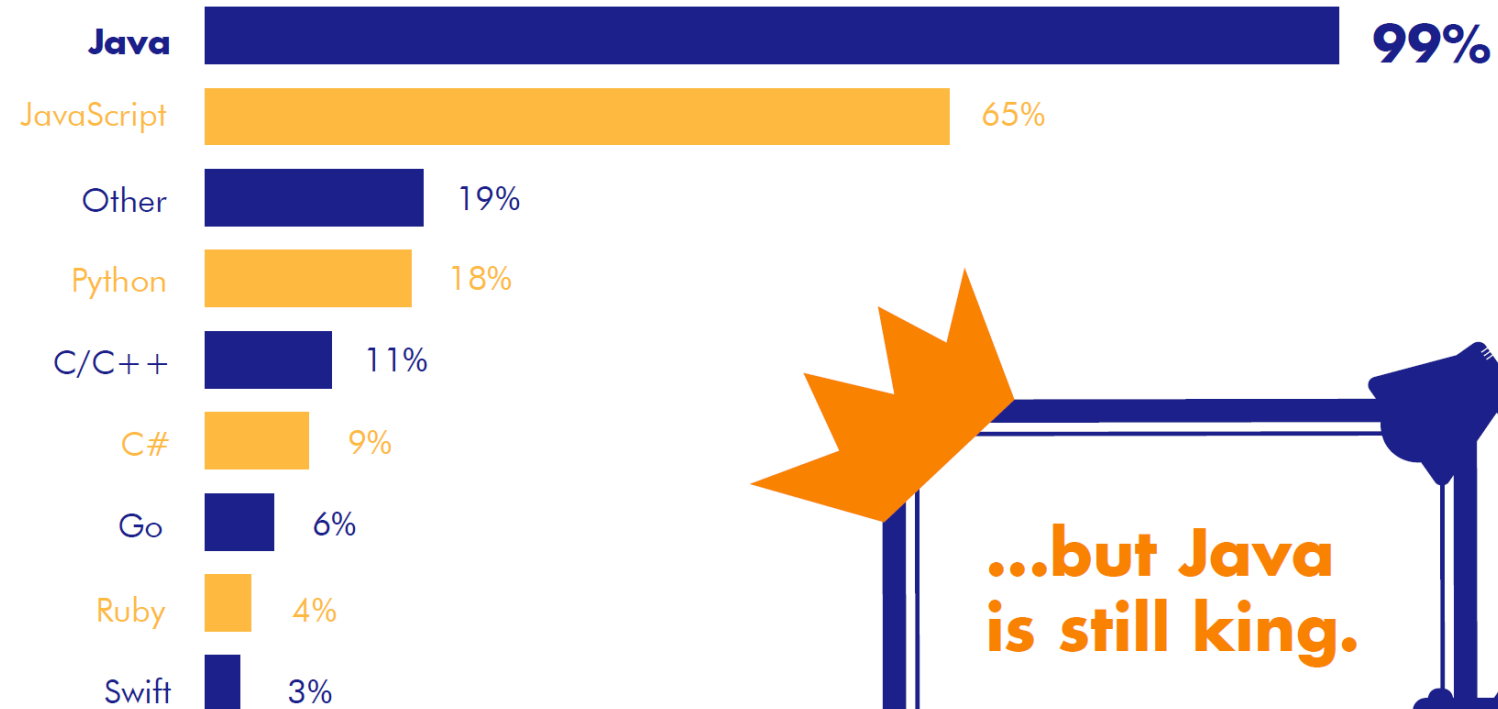# Web - Administračné témy

Jakarta EE 10

- vydaná 13.9.2022
- predchádzajúce verzie:
  - Jakarta EE 9.1 - 2021
  - Jakarta EE 9 - 2020
  - Jakarta EE 8 - 2019
  - Java EE 8 - 2017
- podpora:
  - Java SE 17
  - Java SE 11
- označené ako „deprecated":
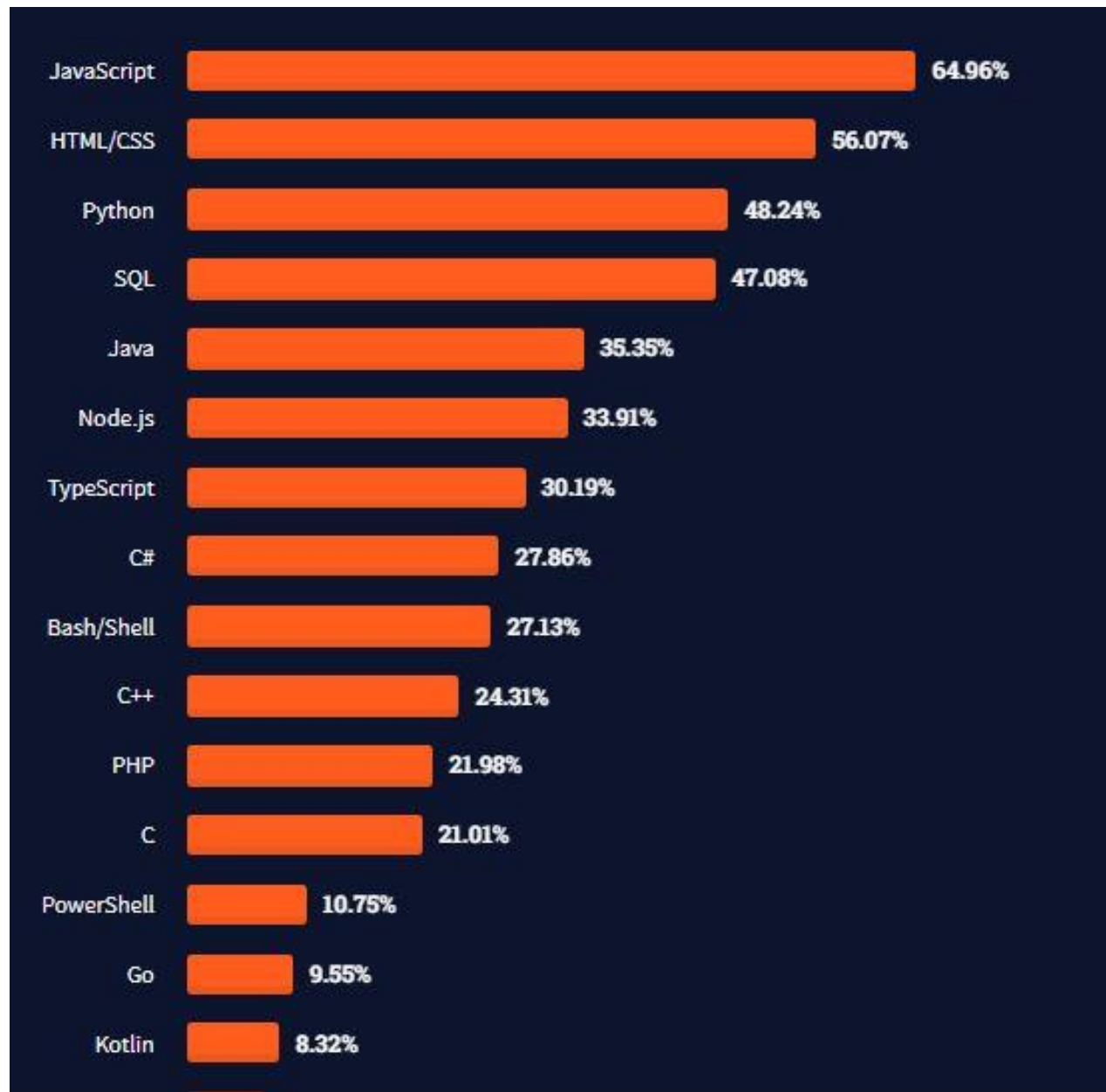 - Servlet, Faces, CDI and EJB (Entity Beans and Embeddable Container)

Too late...

What programming languages are you using at work?

Language	Percentage
Java	99%
JavaScript	65%
Other	19%
Python	18%
C/C++	11%
C#	9%
Go	6%
Ruby	4%
Swift	3%

...but Java is still king.

Language	Percentage
JavaScript	64.96%
HTML/CSS	56.07%
Python	48.24%
SQL	47.08%
Java	35.35%
Node.js	33.91%
TypeScript	30.19%
C#	27.86%
Bash/Shell	27.13%
C++	24.31%
PHP	21.98%
C	21.01%
PowerShell	10.75%
Go	9.55%
Kotlin	8.32%

New order

Language	Percentage
JavaScript	64.96%
HTML/CSS	56.07%
Python	48.24%
SQL	47.08%
Java	35.35%
Node.js	33.91%
TypeScript	30.19%
C#	27.86%
Bash/Shell	27.13%
C++	24.31%
PHP	21.98%
C	21.01%
PowerShell	10.75%
Go	9.55%
Kotlin	8.32%

JAKARTA EE 10
FEATURES AND BENEFITS

Jakarta EE 10 is packed with new features for building modernized, simplified, and lightweight cloud native Java applications. This new innovative community-driven release is designed for organizations looking to start developing new enterprise Java applications or advancing their existing ones.

MODERNIZED

The Jakarta EE 10 release provides new functionality in over 20 component specifications.

Learn more

SIMPLIFIED

With Jakarta EE 10, application development is made simpler by supporting the broader use of additional annotations

Learn more

LIGHTWEIGHT

Jakarta EE 10 defines a new profile specification with Jakarta EE Core Profile 10. The "Core Profile" which defines a multi-vendor platform for modernized and lightweight Java applications and microservices.
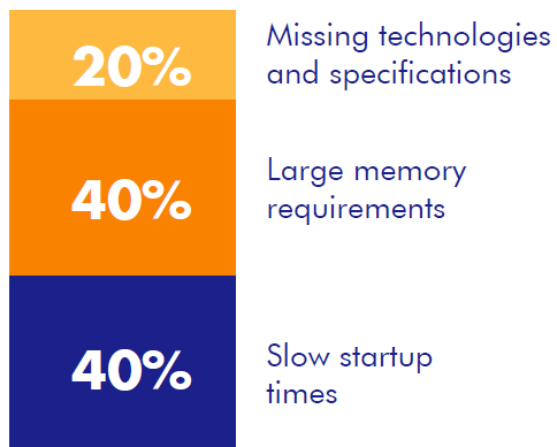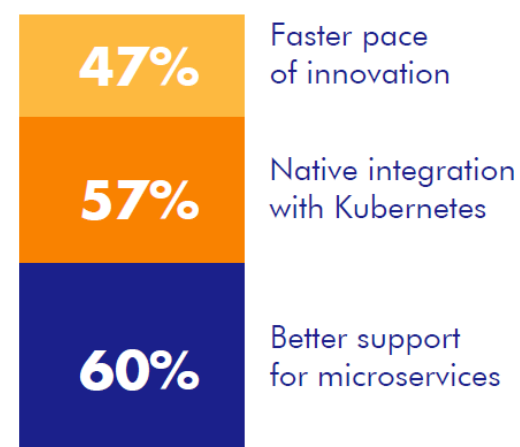
Learn more

Building on Java EE success

Sometimes it's easy to take for granted a technology that most enterprise IT organizations rely on to run their most critical applications.
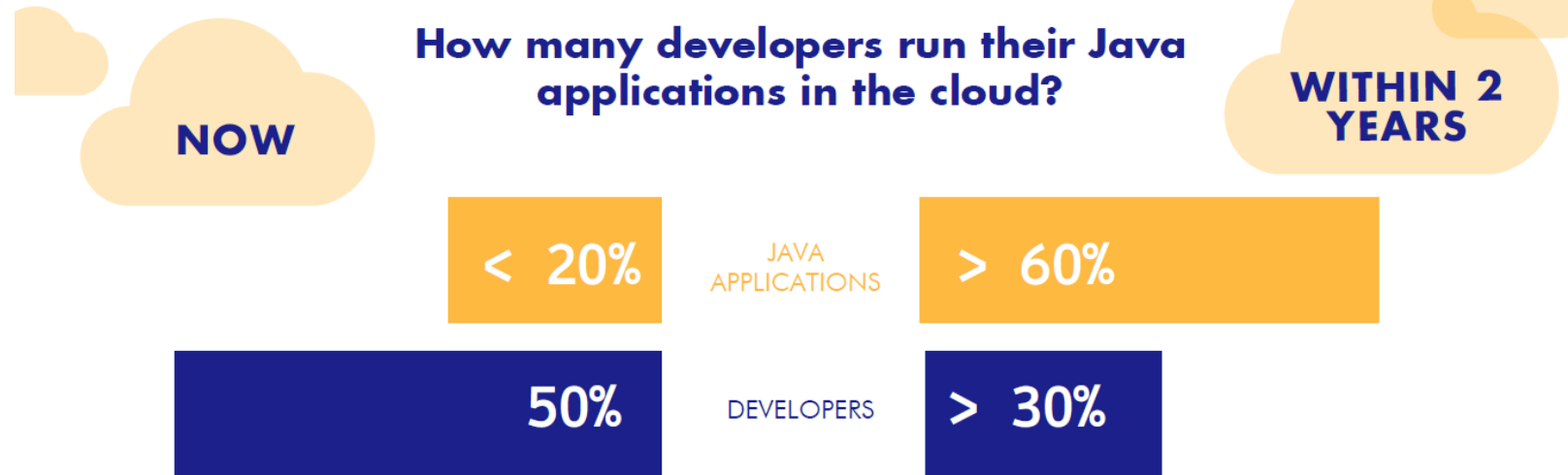
The most challenging aspects of working with Java EE

20%	Missing technologies and specifications
40%	Large memory requirements
40%	Slow startup times

How can the Eclipse Foundation evolve Jakarta EE to meet your cloud needs?

47%	Faster pace of innovation
57%	Native integration with Kubernetes
60%	Better support for microservices

The cloud native Java imperative

Organizations are becoming more comfortable deploying mission critical Java applications beyond the data center.

How many developers run their Java applications in the cloud?

NOW

WITHIN 2 YEARS

	JAVA APPLICATIONS	
< 20%		> 60%
50%	DEVELOPERS	> 30%

Today: 50% of developers run less than 20% of their Java applications in the cloud.

By 2020, over 30% of developers expect to run more than 60% of their Java applications in the cloud.

Jakarta EE 10 – Novinky, úpravy

- Jakarta Contexts and Dependency Injection (CDI) 4.0, including CDI-Lite that enables build time extensions
- Jakarta Security 3.0 supporting OpenID Connect
- Jakarta Servlet 6.0 for simplified programming and improved security
- Jakarta Faces (JSF) 4.0 with a modernized API using CDI
- Jakarta JSON Binding (JSON-B) 3.0 with new support for polymorphic types
- Jakarta RESTful Web Services standardizes a Java SE Bootstrap API and standard support for multipart/form-data
- Jakarta Persistence standardizing UUID as Basic Type and extending Query language and Query API
- Jakarta Concurrency 3.0 is moved to the Web Profile and enhances parallel and reactive programming models available to applications

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Jakarta EE 10 - bezpečnosť

- nový autentifikačný mechanizmus:
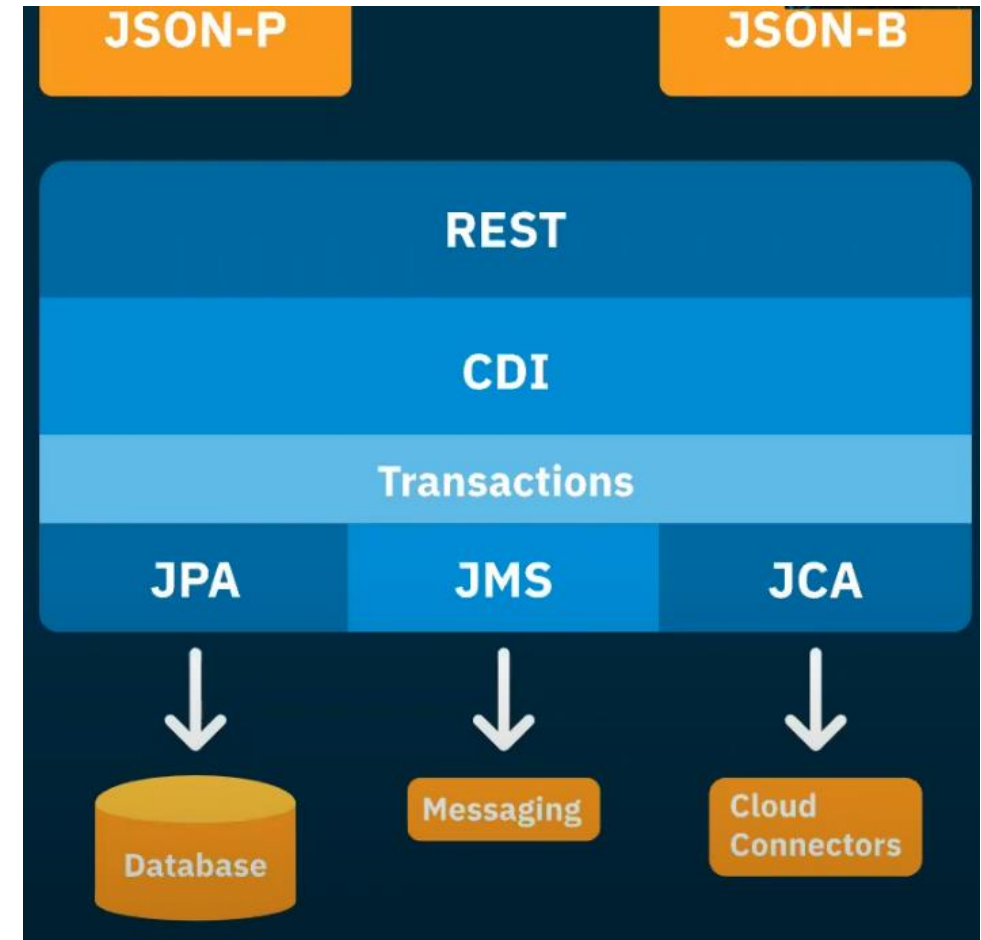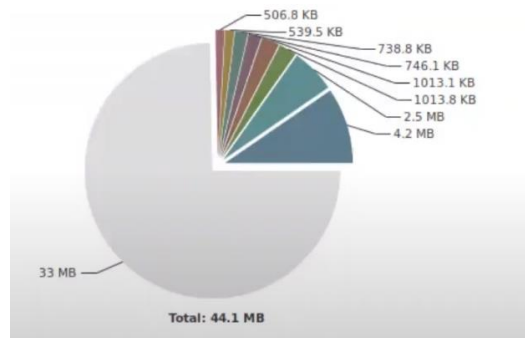 - OpenID Connect

```
@OpenIdAuthenticationMechanismDefinition(
    providerURI =   "http://oidc-provider",
    clientId =      "client",
    clientSecret = "secret",
    redirectURI =   "${baseURL}/Callback",
    redirectToOriginalResource = true
)
```

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Jakarta RESTfull Web Services 3.1

Jakarta EE 10 - mikroservisy

- možnosť vytvárať mikrosevisy menšie

- napr. Payara Cloud Connectors
- https://payara.fish/products/ecosystem-catalog
- JCA adapter:
  - Apache Kafka
  - Amazon SQS
  - Azure Service Bus
  - MQTT

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Jakarta EE 10 - mikroservisy

- možn

- napr.
- https:
- JCA a
  - A
  - A
  - A
  - N

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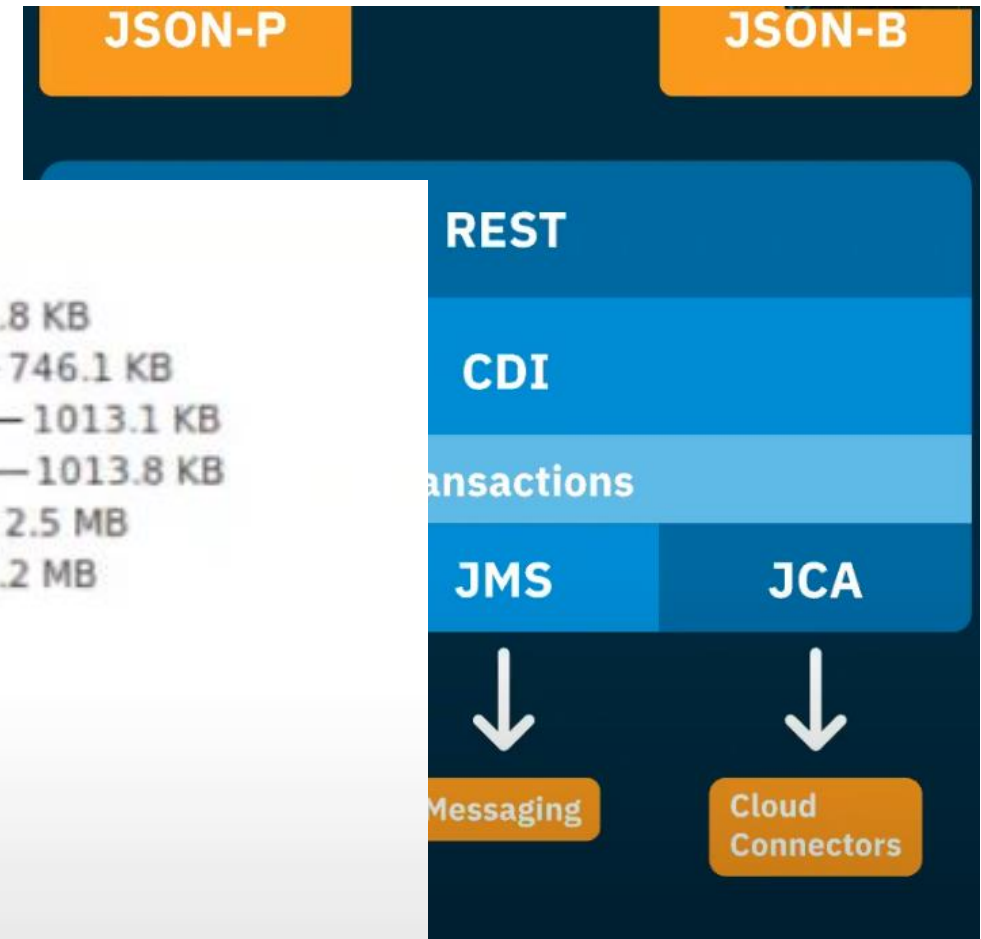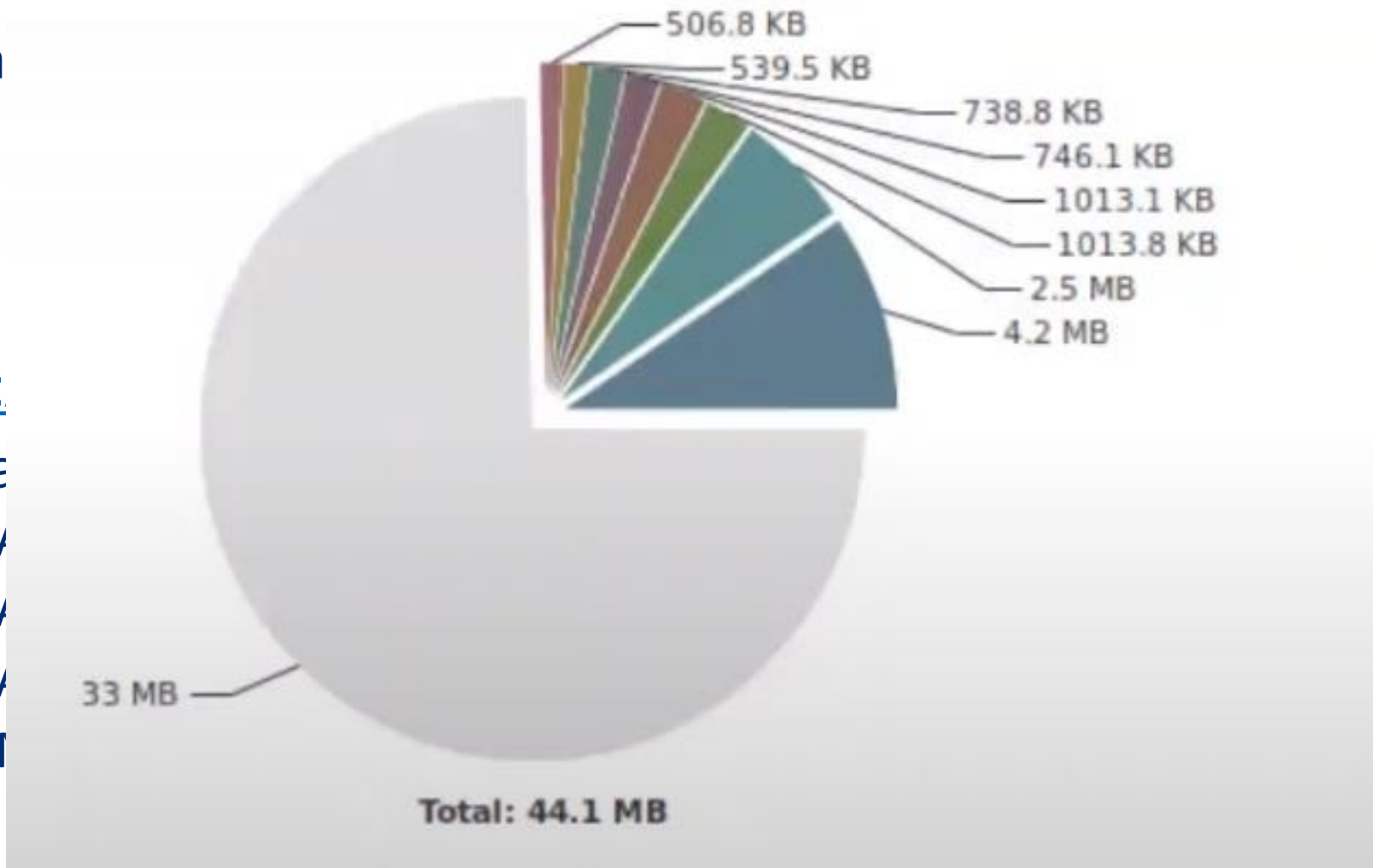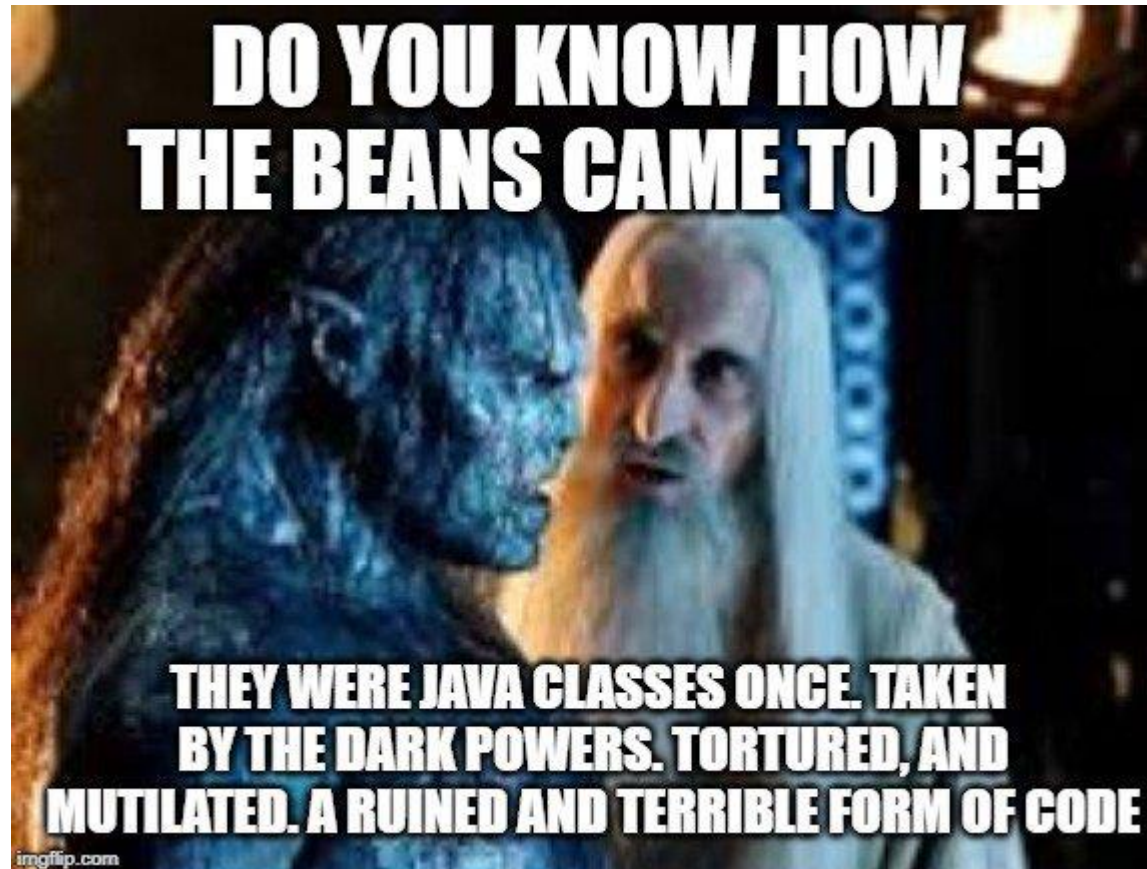
Jakarta EE Platform 11 (vo vývoji)

- očakávané vydanie: jún/júl 2024
- podporovaná Java SE 21, minimálne od Java SE 17

- Nové funkcionality:
  - Java Records
  - JDK Runtime pre virtuálne vlákna
  - Jakarta Data 1.0 – jednoduchší prístup k údajom
- Odstránené:
  - ManagedBeans
  - Security Manager
  - volitelné špecifikácie

https://jakarta.ee/specifications/platform/11/

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Ďakujem za pozornosť

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