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EAP 7 tradičně i v cloudu (EAP 7 on-premise & cloud deployment)

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Red Hat JBoss Middleware



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WHAT'S NEW IN RED HAT JBOSS ENTERPRISE APPLICATION PLATFORM 7 ?

What is Red Hat JBoss EAP 7?

Leading Open Source Java EE Application Server

- Supporting the latest version Java EE 7
- Support for Java SE 8
- Red Hat supported, stable, secure and innovative
- 100% open-source
- Equally comfortable on premise or in the cloud
- Based on Wildfly 10 with millions of downloads

Major Release Objectives for EAP 7

- Support of Java EE 7 web profile and full platform
- Enhanced management
- Enhanced modularity
- Better web console user interface
- Interoperability and compatibility



Version cadence - Java EE / community / product

Java EE specification		Community project		Product
J2EE 1.4	→	JBoss AS 4	→	JBoss EAP 4
Java EE 5	→	JBoss AS 5	→	JBoss EAP 5
Java EE 6	→	JBoss AS 7	→	JBoss EAP 6
Java EE 7	→	WildFly 8,9,10	→	JBoss EAP 7



JBoss EAP Components / Standards Evolution

EAP 5	EAP 6	EAP 7
Java EE 5	Java EE 6	Java EE 7
JDK 6 & 7	JDK 6, 7 & 8	JDK 8
JBoss Web (Servlet 2.5, JSP 2.1, JSF 1.2)	JBoss Web (Servlet 3.0, JSP 2.2, JSF 2.0)	Undertow (Servlet 3.1, JSP 2.3, JSF 2.2)
EJB 2x / 3x	CDI 1.0 + EJB 3.1	CDI 1.1 + EJB 3.2
Hibernate 3.3 (JPA 1.0)	Hibernate 4 (JPA 2.0)	Hibernate 5 (JPA 2.1)
JBoss Messaging 1.4 (JMS 1.1)	HornetQ 2.2 (JMS 1.1)	Apache Active MQ Artemis (JMS 2.0)
-	RESTEasy (JAX-RS 1.1)	RESTEasy (JAX-RS 2.0)
JBoss WS (JAX-WS 2.0)	JBoss WS/CXF (JAX-WS 2.2)	JBoss WS/CXF (JAX-WS 2.2)
JCA 1.5	IronJacamar (JCA 1.6)	IronJacamar (JCA 1.7)

JBoss EAP 7 - Overview (1)

Minimal and flexible architecture

- cloud and container ready
- operating modes
- compatibility

Lightning fast!

- services started on-demand and concurrently
- unneeded services remain passive

Single configuration file

- all configuration details are viewed in a single central file
- user-focused configuration with default values



JBoss EAP 7 - Overview (2)

True modularity

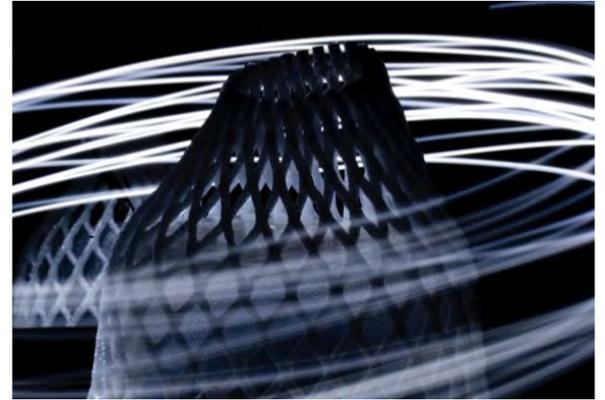
- Small core with most of its features and capabilities contained in modules
- Application isolation with smarter class loading
- Can be introduced and configured as needed

Lightweight style

- Small memory and CPU footprint
- Reduced port usage and network traffic

Management flexibility

- Command Line Interface (CLI)
- User-friendly, powerful web console
- Comprehensive, highly automatable and elegant management API



Cloud-ready architecture

- High degree of automation
- Flexible management
- Frugal use of resources
- Lean, agile development
- Open platform
- High isolation and security (containers)



Red Hat JBoss Middleware



Physical



Virtual



Private



Hybrid



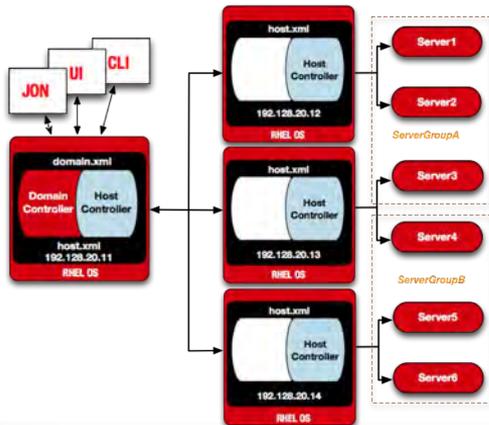
Public



OPERATIONAL MODES

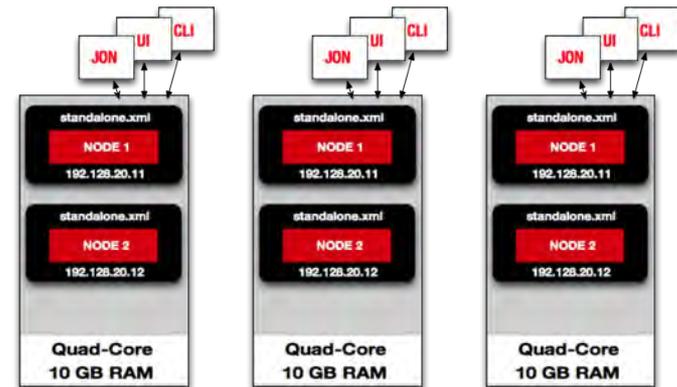
Domain Mode

- Manage all or part of your EAP servers from one single domain controller.
- Almost all configuration in one single configuration file (domain.xml)
- Servers in a server group can be clustered for HA and load balancing



Standalone Mode

- Each node are managed individually.
- Everything runs in a single JVM, ideal for containers.
- Servers can still be configured to form a cluster for HA and load balancing.



The Themes in

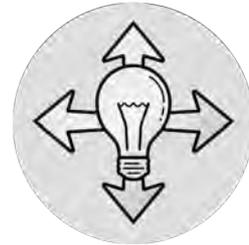
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OPERATIONAL
EFFICIENCY



DEVELOPER
PRODUCTIVITY



TECHNOLOGY
TRENDS



Operational Efficiency - Overview

- UX/Console Enhancements
- Management Enhancements
- HA/Performance
- Batch Utilities beyond Java EE 7
- Security Enhancements
- Graceful Shutdown





Operational Efficiency - Management

- Same profile based foundation as JBoss EAP 6
 - Standalone and domain mode
 - Management API available via HTTP, Java, REST
 - Single XML file centralizing configuration
- Same management clients available
 - CLI
 - Web console



Operational Efficiency - Management

- Offline CLI
 - Configure a server without the server “running”
 - Similar to admin-only mode, without any ports bound
 - Implemented by embedding the server in the CLI (!)

```
$ bin/jboss-cli.sh
[disconnected /] embed-server --std-out=echo
12:10:15,300 INFO [org.jboss.modules] (main) JBoss Modules version 1.4.1.Final
...
```



Graceful Shutdown

- Essentially `suspend(timeout) / resume()`
 - Allow active sessions/requests/in-flight-txs to complete
 - After suspend the server may be restarted
- Action per subsystem may vary
 - Reject new requests (HTTP Error 503 – Service unavailable) – Clustering could fail-over sessions
 - `mod_cluster` could notify load balancer



Operational Efficiency - Management

- Server suspend / graceful shutdown
 - Web
 - Cluster aware
 - EJB
 - Batch
 - EE concurrency
- Next
 - Messaging
 - Transactions



Operational Efficiency - UX

- UX/console enhancements
 - Web console (GUI) new information architecture
 - GUI improved task flows
 - Large domain views
 - GUI support for the new Java EE 7 subsystems configuration
 - Improved installer experience

Red Hat JBoss Enterprise Application Platform

New to JBoss EAP? [Take a Tour](#)



Deployments

Add and manage deployments

[Deploy an Application](#) | [Start](#)

Deploy an application to a server group.

1. Add a new deployment to the content repository
2. Assign the deployment to one or more server groups
3. Enable the deployment



Runtime

Monitor server status, configure servers and server groups

[Create a Server Group](#) | [Start](#)

Define a server group to manage and configure a set of servers as one.

1. Add a new server group
2. Use the 'Create Server Group' wizard to configure the server group settings

[Create a Server](#) | [Start](#)

[Monitor a Server](#) | [Start](#)



Patching

Manage JBoss EAP patches

[Apply a Patch](#) | [Start](#)

Apply a JBoss EAP patch to the selected host.

1. Download the patch file to the local machine
2. Select the target host
3. Use the 'Apply Patch' wizard to select and apply the patch



Configuration

Configure profiles and subsystem settings

[Create a Datasource](#) | [Start](#)

Define a datasource to be used by deployed applications. The proper JDBC driver must be deployed and registered.

1. Select the Datasources subsystem for the appropriate profile
2. Add a Non-XA or XA datasource
3. Use the 'Create Datasource' wizard to configure the datasource settings

[Create a JMS Queue](#) | [Start](#)



Access Control

Manage user and group permissions for management operations

[Assign User Roles](#) | [Start](#)

Assign roles to users or groups to determine access to system resources.

1. Add a new user or group
2. Assign one or more roles to that user or group



Need Help?

General Resources

- [Read JBoss EAP Documentation](#)
- [Learn more about JBoss EAP](#)
- [Get help or submit a trouble ticket](#)
- [Sign up for Red Hat training courses](#)

Get Help

- [Access tutorials and quickstarts](#)
- [Ask questions to the development community](#)
- [View supported configurations for JBoss EAP](#)
- [Search the Red Hat knowledgebase for solutions to issues you encounter](#)
- [Reach out to Red Hat consulting for further help from experts](#)



Operational Efficiency - Port Reduction

- HTTP Upgrade^[1] allows us to reduce the number of ports in the default installation to just 2:
 - 8080 – for applications with JNDI and EJB multiplexed
 - 9990 – for management, for both HTTP/JSON & native API

Subsystem	Service	Interface (default port)
Management	Admin console, CLI, Native API, JMX	management (9990)
Undertow, JAX-RS, JAX-WS	HTTP, WebSockets, HTTP/2 (TP)	public (8080)
Naming, Remoting	Remote JNDI & EJB Invocations	public (8080)
Messaging	ActiveMQ Artemis	public (8080)

^[1] = https://en.wikipedia.org/wiki/HTTP/1.1_Upgrade_header



High Availability (HA) & Performance

- NIO web container – Undertow
- New/optimized clustering implementation
 - Web session implementation for Undertow
 - Clustered single-sign on for Undertow
 - SFSB implementation for Undertow
- HA singleton deployments
- Datasource capacity policies

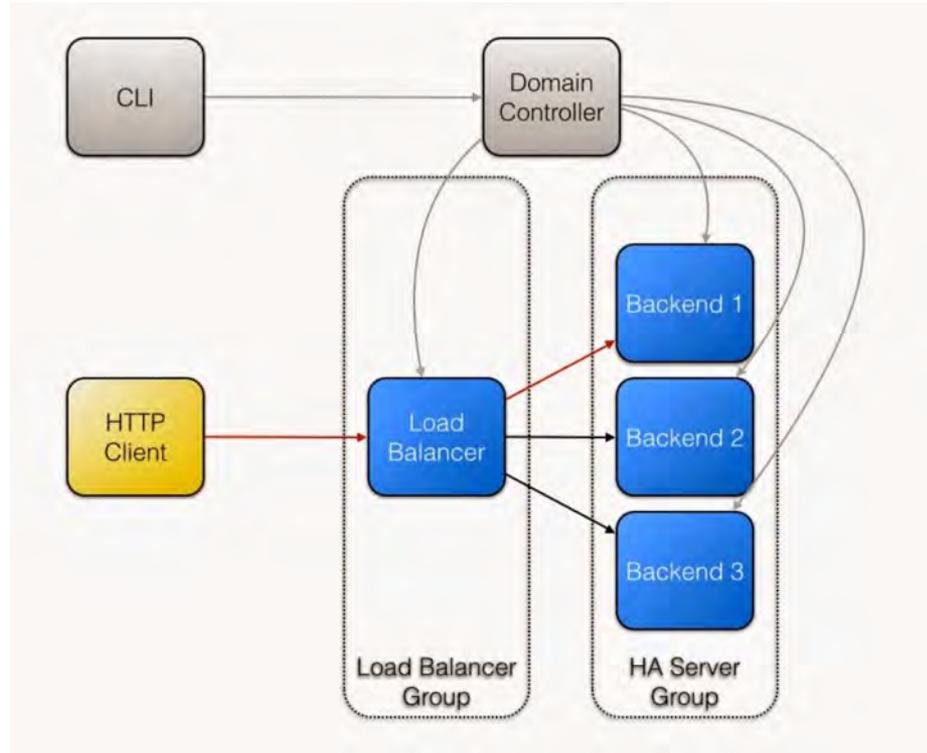


HA & Performance

EAP 7 (Undertow)

as the load balancer

- A full Java solution managed centrally
- Implements mod_cluster
- HTTP, AJP, HTTP/2
(Technology Preview)





Security Enhancements

- SSO – PicketLink + KeyCloak
 - PicketLink Federation – SAML
 - OAuth 2.0/SAML via the “standalone” “KeyCloak Authentication Server” and EAP Client Adapters
- Container and Java EE Security – Elytron
 - Post JBoss EAP 7.0 (i.e. version 7.1 or later)
 - More Standards Support (Kerberos/GSSAPI, JASPIC, JACC)
 - Better Interoperability Support (Context Propagation)
 - Unified and consistent SSL configuration
 - Compatibility for JBoss EAP 6 user JAAS login modules
- Certification of leading LDAP products



IDE for Java EE 7

Supported through JBDS 10

- Batch Job Development
- WebSockets Development
- Java SE 8
- Quick Starts
- Maven repository
- Migration Tooling Integration

The screenshot displays the IDE interface with several components:

- Flowchart:** A process flow starting with 'import-file-chunk' (containing a 'Chunk' sub-step), followed by 'reportBatchlet' (containing a 'Batchlet' sub-step), and finally 'emailContacts' (containing a 'Batchlet' sub-step), ending with 'END'.
- Code Editor:** Shows a Java class `MyClientEndpoint` with an `@OnMessage` annotation. A tooltip for `@OnMessage` provides details: "Developers may implement this method to receive incoming binary messages. Parameters: message the whole message".
- Documentation:** A snippet of Java code showing `in-classes>` and `except/>` tags, with a list of related classes: `Exception`, `ExceptionHandler`, `ExceptionHandlerHelper`, and `ExceptionHandlerImpl`.
- Project Browser:** Shows a Maven repository for `jboss-developer / jboss-eap-quickstarts` with a list of quickstart projects and their versions.



Modularity and Composability

- Cloning of domain profiles and GUI support
- Hierarchical composition of domain profiles :

```
/profile=root-mail:add
```

```
/profile=root-mail-child:add
```

```
/profile=root-mail-child:list-add(name=includes, value=root-mail)
```

- New management ops for profile/subsystem management
- Programming simplification via annotations for JBoss modules



Compatibility and Interoperability

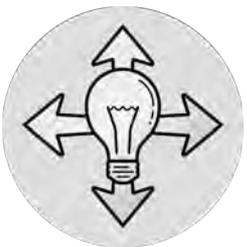
- Server upgrades
- Application upgrades and migrations
- Interoperability



Technology Trends - Overview

- Java EE 7, Java SE 8, Java SE 9 (when available)
- Cloud support - Red Hat xPaaS and Containers
- Modern Web-based Enterprise Applications
- Messaging Consolidation
- Microservices
- Post JBoss EAP 7.0





Cloud

- xPaaS – OpenShift v3.x
 - Red Hat OpenShift Container Platform (formerly OpenShift Enterprise)
 - Red Hat OpenShift Dedicated
 - Red Hat OpenShift Online
- AWS EC2
- Linux containers (technology preview, post JBoss EAP 7.0 GA)
- Microsoft Azure (post JBoss EAP 7.0 GA)



Messaging Consolidation

- Same broker technology in JBoss EAP 7 and Red Hat JBoss A-MQ 7 products
- HornetQ → Active MQ Artemis
- Can be set for backward compatibility with JBoss EAP 6

Useful Resources

- JBoss EAP 7 Documentation @ Red Hat Customer Portal

<https://access.redhat.com/documentation/en/jboss-enterprise-application-platform/>

- Get Started @ Red Hat Developers Web Site

<http://developers.redhat.com/products/eap/get-started/>

- JBoss EAP 7 Downloads @ Red Hat Developers

<http://developers.redhat.com/products/eap/download/>

- JBoss EAP 7 Migration Guide @ Red Hat Customer Portal

<https://access.redhat.com/documentation/en/red-hat-jboss-enterprise-application-platform/7.0/migration-guide/migration-guide>



Useful Resources, Con't.



- High Availability Servlets with EAP 7 and OpenShift

<http://developers.redhat.com/blog/2016/09/13/high-availability-servlets-with-eap-7-and-openshift/>

- Building microservices with JBoss EAP 7 - Reference Architecture Guide

<https://access.redhat.com/articles/2386641>

- Building JBoss EAP 7 microservices with OpenShift Enterprise v3 - Reference Architecture Guide

<https://access.redhat.com/articles/2407801>



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Q&A



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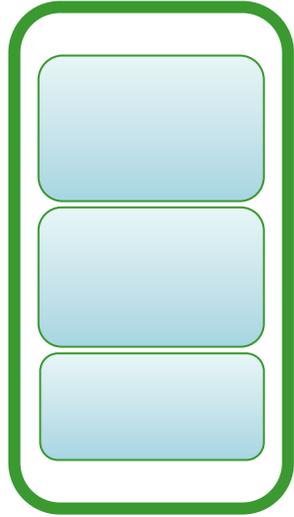
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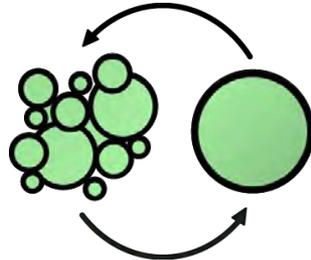
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TRENDS AND PRIORITIES IN APPLICATION DEVELOPMENT

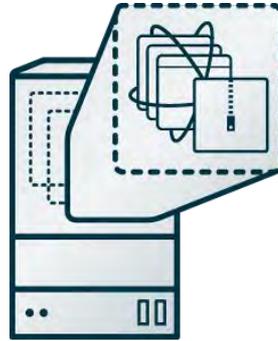
IT is struggling to evolve



MONOLITHIC



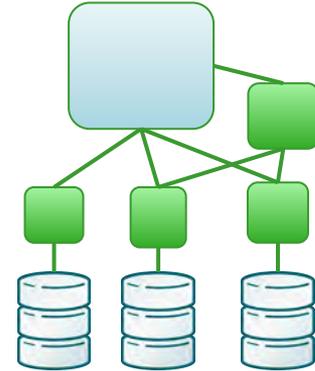
DEVOPS



CONTAINERS



CLOUD



MICROSERVICES



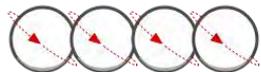
Meeting Demands

- Cost must be shifted from expensive legacy infrastructure to **innovation**
- IT must deliver new cloud services and help accelerate **self-service** and **new application delivery**
- A more agile application architecture is necessary to allow developers to use their **favorite languages and tools**, enabling them to **release early and often** without business/infrastructure risk
- Organizations require modern, secure, **cloud-native** applications that can be frequently updated to meet internal and external needs

IT Evolution

Development Process

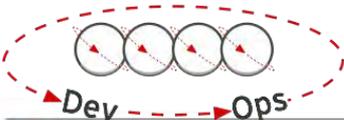
Waterfall



Agile



DevOps



Application Architecture

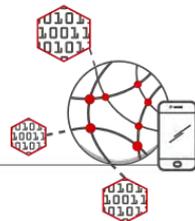
Monolithic



N-Tier

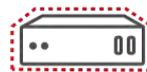


Microservices



Deployment & Packaging

Physical Servers



Virtual Servers

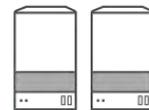


Containers



Application Infrastructure

Datacenter



Hosted



Cloud

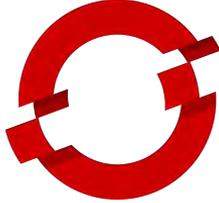




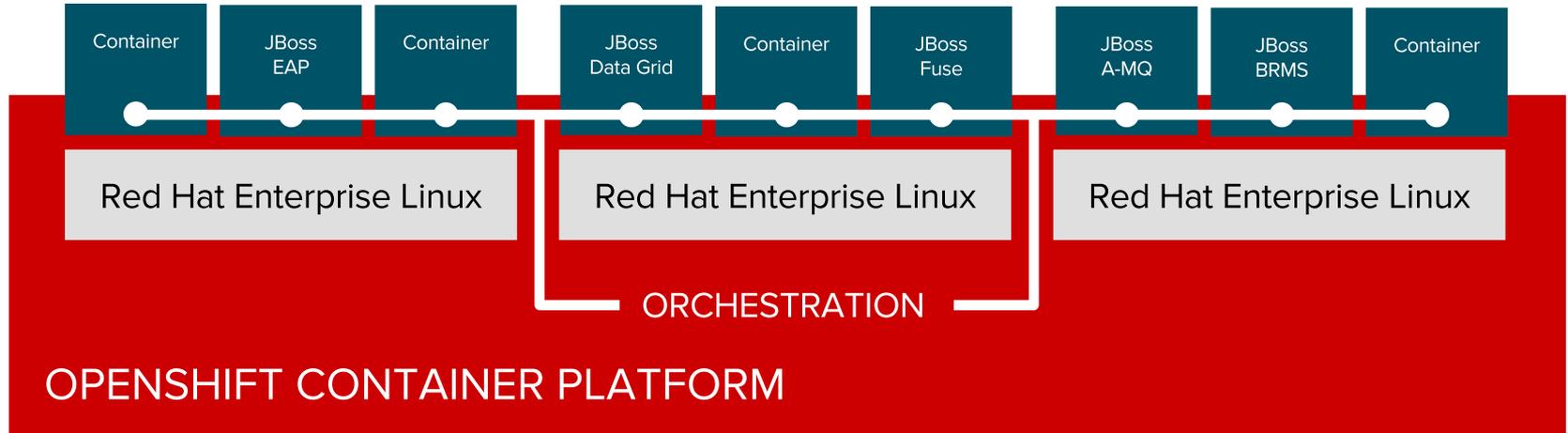
Java Apps, Evolved

- Java knowledge, maturity and existing expertise extended to the cloud
- Modernized for web-scale, transactional apps
- Container-based, microservice-oriented, dynamically managed





RED HAT® OPENSIFT Container Platform



JBoss ENTERPRISE APPLICATION PLATFORM



Application Container Services

JBoss Enterprise Application Platform

JBoss Web Server / Tomcat

JBoss Data Grid

JBoss Developer Studio

- The most popular open source Java EE application server
- Lightweight dynamic architecture
- Choice of programming models - Java EE, Spring
- Supports full spectrum of Java workloads
- Optimized for modern IT infrastructure

Architecture



SUBSYSTEMS



CORE INFRASTRUCTURE



JBoss EAP 7 Migration Considerations

CHANGES	CONSIDERATIONS and SUPPORT
Web container JBoss Web (deprecated)-> Undertow	CLI migration operations are provided Accepts jboss-web.xml Subsystem compatibility Some tc Valve API migration/compatibility
Messaging HornetQ (Deprecated) -> Active MQ Artemis	Active MQ Artemis ~ HornetQ (similar configuration) Interoperability to EAP 6 CLI migration operations are provided JMS 2.0
Remoting object request broker JacORB (Deprecated) -> JDK ORB	Users should not be impacted/unless poked into internals.

JBoss EAP 7 Migration Considerations

CHANGES	CONSIDERATIONS and SUPPORT
SAML support PicketLink federation (deprecated)	Maintained as-is (EAP 6.4) for existing customer applications that uses PicketLink federation
SAML support (post EAP 7.0 GA) PicketLink federation -> RH SSO (Red Hat SSO) client libraries for EAP 7 / RH SSO server	Use the New RH SSO client libraries for EAP (SAML Client SP) and RH SSO server (OOTB Solution for Auth* Server with SAML IdP/OpenID connect capabilities)
Web services JBoss Web Services Apache CXF Spring for endpoint setup (N/S)	Migration to CDI (standard) based support for endpoints
OSGi (TP in EAP 6) deprecated	OSGi enterprise spec is not complete (no EJB etc.), consider JBoss Fuse / JBoss A-MQ JBoss EAP 7 integrates with JBoss A-MQ 6 and 7
EJB 2 entity beans (CMP) deprecated	Use JPA instead Java EE 7 does not require CMP

JBoss EAP 7 Migration Considerations

CHANGES	CONSIDERATIONS and SUPPORT
JAX-RPC deprecated	Use JAX-WS instead (JBoss Web Services) Java EE 7 does not require JAX-RPC
JSR-88 (Deployments) implementation deprecated	No or very little adoption Java EE 7 does not require JSR-88
JDK 8	Requires JDK 8. JDK 9 community tests are already underway
Port reduction	Users can still use the old port if they wish