



Jakarta EE und Microprofile sind bei Azure zu Hause

Ed Burns @edburns
Principal Architect
Java on Azure

Professional Biography

• Client

- NCSA Mosaic (1994)
- SGI Cosmo Web Authoring
- Sun Netscape 6 OJI

Server

J2EE JSF (2002)

Oracle Java EE

Servlet, JSF, Bean Validation, etc.

Microsoft Azure Cloud (2019)

Books



Agenda

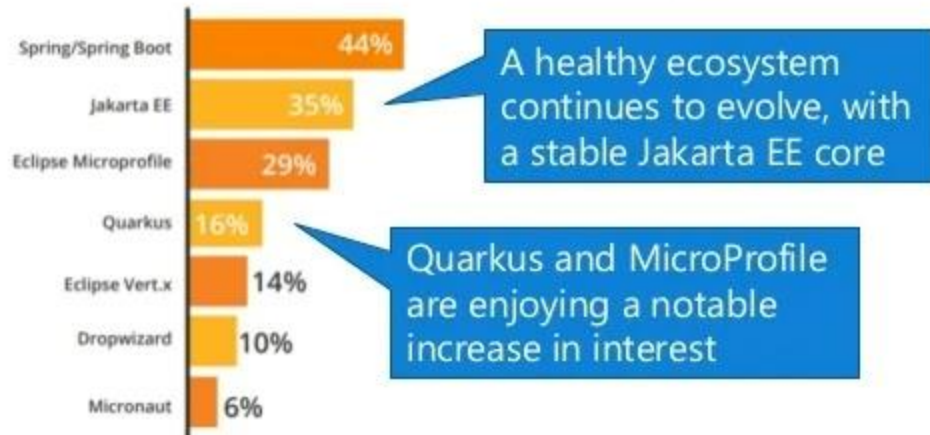
-
- Jakarta EE ecosystem context
 - Jakarta EE on Azure current capabilities and work
 - Jakarta EE on Azure future work

Ecosystem

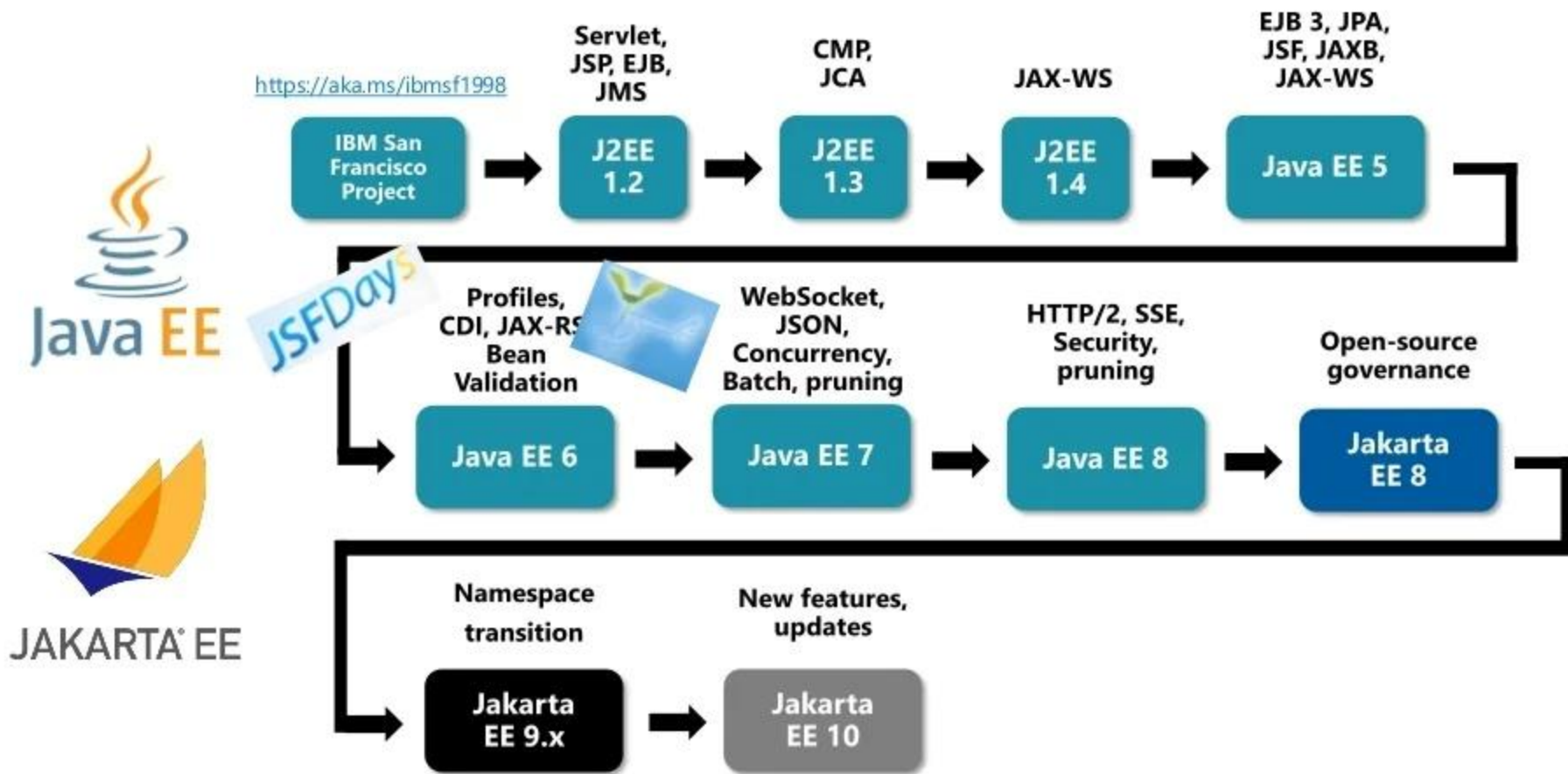
The Importance of Jakarta EE

- Jakarta EE is an important part of Java ecosystem and cloud
- 25-35% of new and existing Java applications run on Jakarta EE application servers
 - WebLogic, WebSphere/Liberty, JBoss EAP, WildFly, Payara
- 70-80% of Java applications depend on at least one or more Jakarta EE APIs
 - Tomcat, Hibernate, ActiveMQ, Jetty, Jersey, CXF, Quarkus, MicroProfile
- Many of these applications are moving to the cloud now and the near future

Which Java frameworks are you using for cloud native applications?



The Jakarta EE Transition



An Evolving Ecosystem

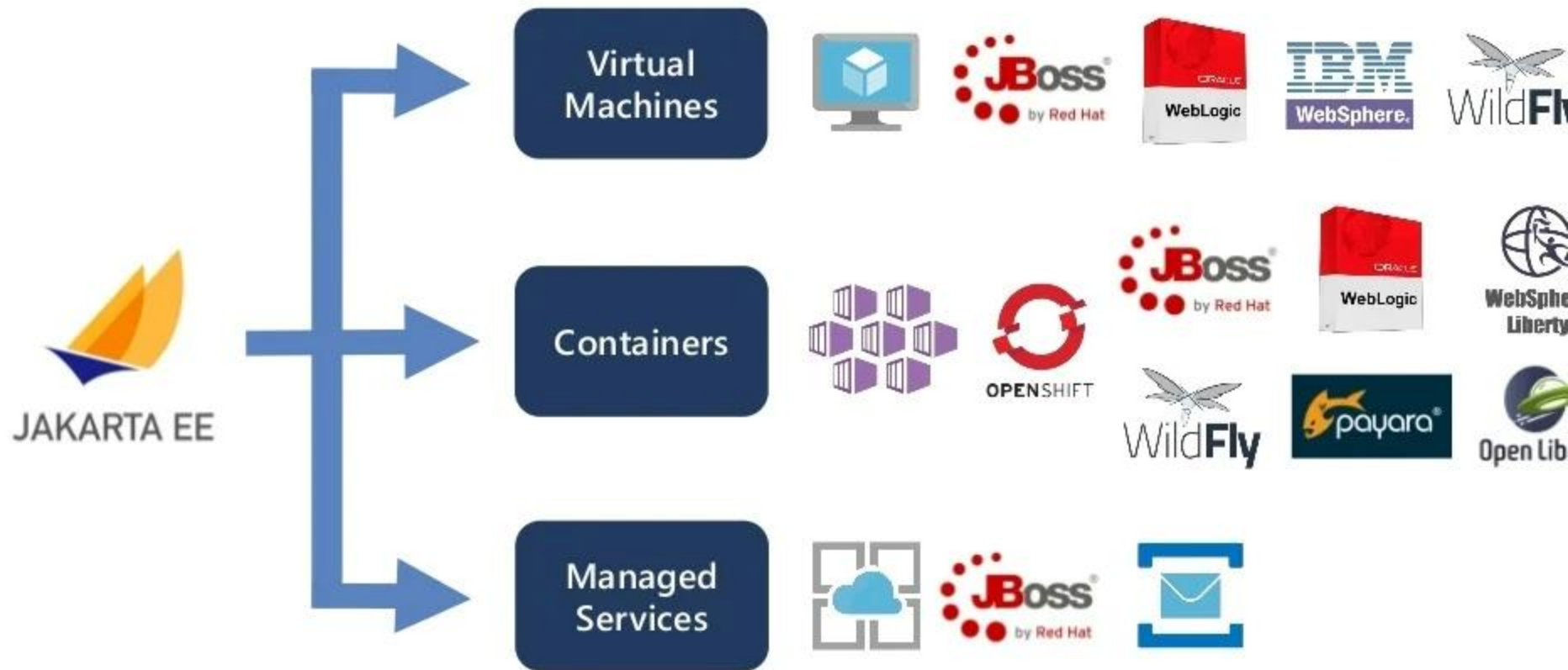
Software Development
Java and JVM 2020 Q3 Graph
<https://aka.ms/java2020>

InfoQ



Current State

Mapping the Pathways



Full Jakarta EE runtimes in Azure Marketplace and Portal

- Azure App Service
 - JBoss EAP
- Virtual Machines
 - IBM WebSphere Traditional ND and Base
 - Oracle WebLogic Server
 - JBoss EAP
- Azure Kubernetes Service
 - Oracle WebLogic Server
 - IBM WebSphere and Open Liberty
- Azure Red Hat OpenShift
 - IBM WebSphere and Open Liberty
 - JBoss EAP

Virtual Machines

- In addition to Windows, Azure has long supported Linux virtual machines essential for Jakarta EE customers
- Azure Marketplace includes Jakarta EE focused virtual machine images and templates
- More will be done to enhance the developer experience



WebLogic on Azure

- Robust, up-to-date Azure Marketplace images and solutions for WebLogic
 - Linux, Oracle JDK, WebLogic
- Jointly published, maintained and supported by Microsoft and Oracle, bring your own license
- Supports common use-cases such as base image, single instance, load-balancing and clustering
- Supports key integrations such as App Gateway, Azure SQL, Azure PostgreSQL, Oracle DB, Azure Active Directory, Oracle Coherence, ELK
- Mature offering, minor releases ongoing
- Similar support for WebLogic on AKS actively in the works

<https://aka.ms/weblogic-on-azure>

The screenshot shows the 'Create Oracle WebLogic Server Cluster' wizard in the Microsoft Azure portal. The 'Basics' tab is highlighted with a green box. The form includes the following sections:

- Project details:** Subscription (Java Demo 2), Resource group (Create new).
- Instance details:** Region (West US), Oracle WebLogic Image (WebLogic Server 14.1.1.0.0 and JDK8u251 on Oracle Linux 7.6), Virtual machine size (Change size).
- Credentials for Virtual Machines and WebLogic:** Username for admin account of VMs (weblogic), Password for admin account of VMs, Confirm password, Username for WebLogic Administrator (weblogic), Password for WebLogic Administrator, Confirm password.
- Number of VMs:** 4.

Navigation buttons at the bottom include 'Review > create', '< Previous', and 'Next: Azure Application Gateway >'.

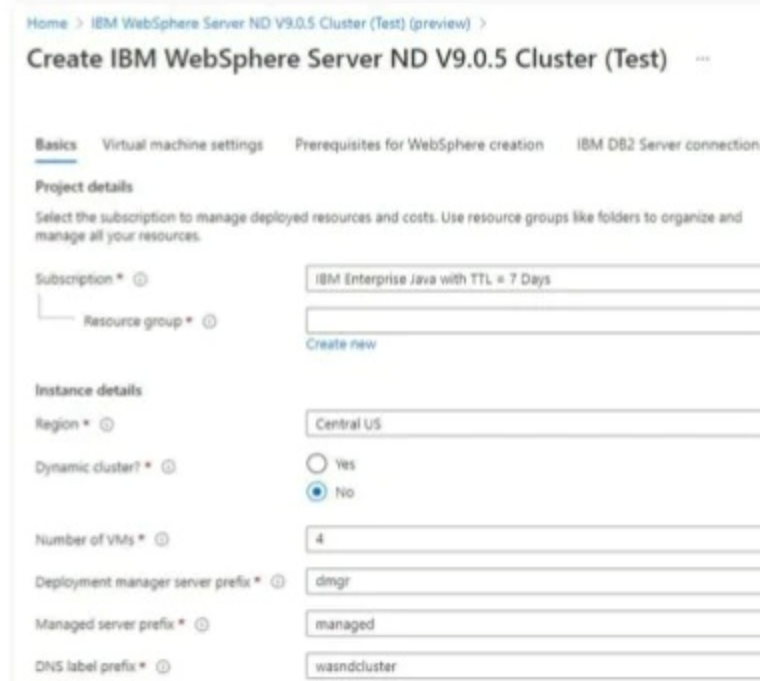
WebSphere on Azure

- Robust, up-to-date Azure Marketplace solutions for WebSphere Traditional
 - Red Hat Linux, IBM J9, WebSphere
- Jointly published, maintained and supported by Microsoft and IBM, bring your own license
- Targets easily deploying a highly available, fully functional WebSphere Network Deployment cluster with Admin Console enabled
- Enables key integrations such as App Gateway, Azure SQL, IBM Db2, Azure Active Directory, ELK
- Initial release available, more releases soon
- Similar support for Open/WebSphere Liberty on AKS/ARO in the works

<https://aka.ms/websphere-on-azure>



The screenshot shows the product page for 'IBM WebSphere Server ND V9.0.5 Cluster (Test)' in the Azure Marketplace. The page includes the Microsoft logo, a search bar, and navigation options. The product name is prominently displayed, along with the Microsoft Corporation logo and a 'See to my list' link. Below the product name, there are tabs for 'Overview', 'Plans', and 'Reviews'. A 'GET IT NOW' button is visible. A brief description states: 'Provisions an n-node IBM WebSphere Application Server ND Traditional V9.0.5 Cluster'. A 'Pricing information' section is partially visible at the bottom.



The screenshot shows the configuration page for creating an 'IBM WebSphere Server ND V9.0.5 Cluster (Test)'. The page has a breadcrumb trail: 'Home > IBM WebSphere Server ND V9.0.5 Cluster (Test) (preview) >'. The main heading is 'Create IBM WebSphere Server ND V9.0.5 Cluster (Test)'. There are four tabs: 'Basics', 'Virtual machine settings', 'Prerequisites for WebSphere creation', and 'IBM DB2 Server connection'. The 'Basics' tab is selected. Under 'Project details', there is a description: 'Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.' Below this are two dropdown menus: 'Subscription' (set to 'IBM Enterprise Java with TTL = 7 Days') and 'Resource group' (empty). A 'Create new' link is next to the resource group dropdown. Under 'Instance details', there are several configuration options: 'Region' (set to 'Central US'), 'Dynamic cluster?' (radio buttons for 'Yes' and 'No', with 'No' selected), 'Number of VMs' (set to '4'), 'Deployment manager server prefix' (set to 'dmgr'), 'Managed server prefix' (set to 'managed'), and 'DNS label prefix' (set to 'wasndcluster').

JBoss EAP on Azure

- Robust, up-to-date Azure Marketplace solutions for JBoss EAP
 - Red Hat Linux, OpenJDK, JBoss EAP
- Jointly published, maintained and supported by Microsoft and Red Hat
- Standalone and cluster configuration
- Virtual machines and virtual machine scale sets
- Bring your own license, pay as you go coming soon
- Enables key integrations such as App Gateway, Azure SQL, Azure Active Directory
- Initial release available, more releases soon

<https://aka.ms/jboss-on-vm>

Microsoft | Azure Marketplace | Search Marketplace | More

Products > Red Hat JBoss Enterprise Application Platform (JBoss EAP)

Red Hat JBoss Enterprise Application Platform (JBoss EAP)

Red Hat

★★★★☆ (0) Write a review

Overview Plans Reviews

Get it now

Pricing information
Cost of deployed template components

Gain enterprise-grade security, performance, and scalability for Java applications

Overview

Red Hat® JBoss® Enterprise Application Platform (JBoss EAP) delivers enterprise-grade security, performance, and scalability for Java applications. For more information, visit www.redhat.com/en/what-is-jboss-eap or www.redhat.com/en/what-is-jboss-eap.

Home > Red Hat JBoss Enterprise Application Platform (JBoss EAP) >

Create Red Hat JBoss Enterprise Application Platform (JBoss EAP)

Basics Virtual Machine Settings JBoss EAP Settings Review + create

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Visual Studio Enterprise Subscription

Resource group *

[Create new](#)

Instance details

Region *

West US

Virtual Machine name *

Username *

Authentication type *

Password

Containers

- Azure provides best of breed support for Docker and Kubernetes through the Azure Kubernetes Service (AKS) and the Azure Container Registry (ACR)
- Another options is App Service for Containers as an easier pathway of using Docker on Azure
- Application server vendors provide Docker images, Helm charts, and Kubernetes Operators
 - WebLogic, WebSphere/Open Liberty, WildFly, Payara
- More will be done to enhance the developer experience



Azure Kubernetes Service



App Service for Containers

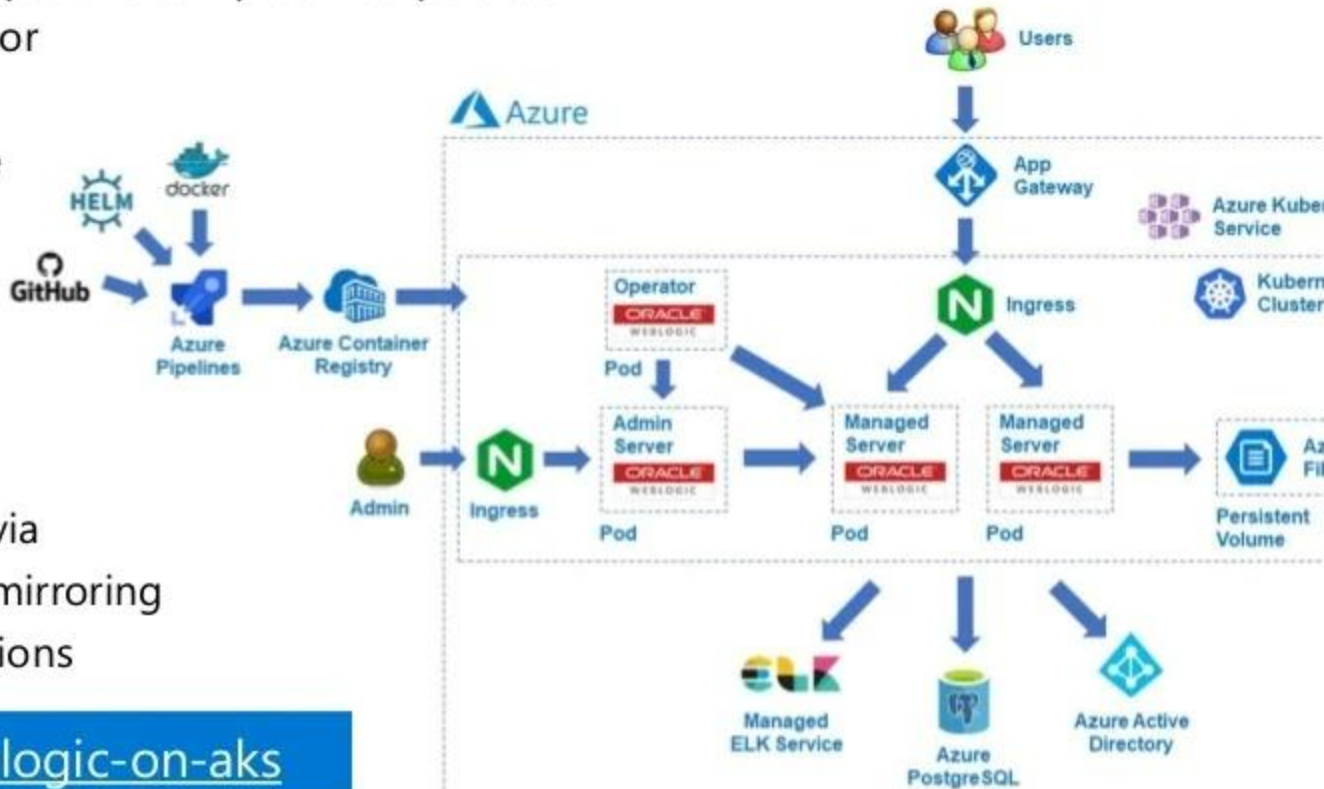


Azure Container Registry



WebLogic on AKS

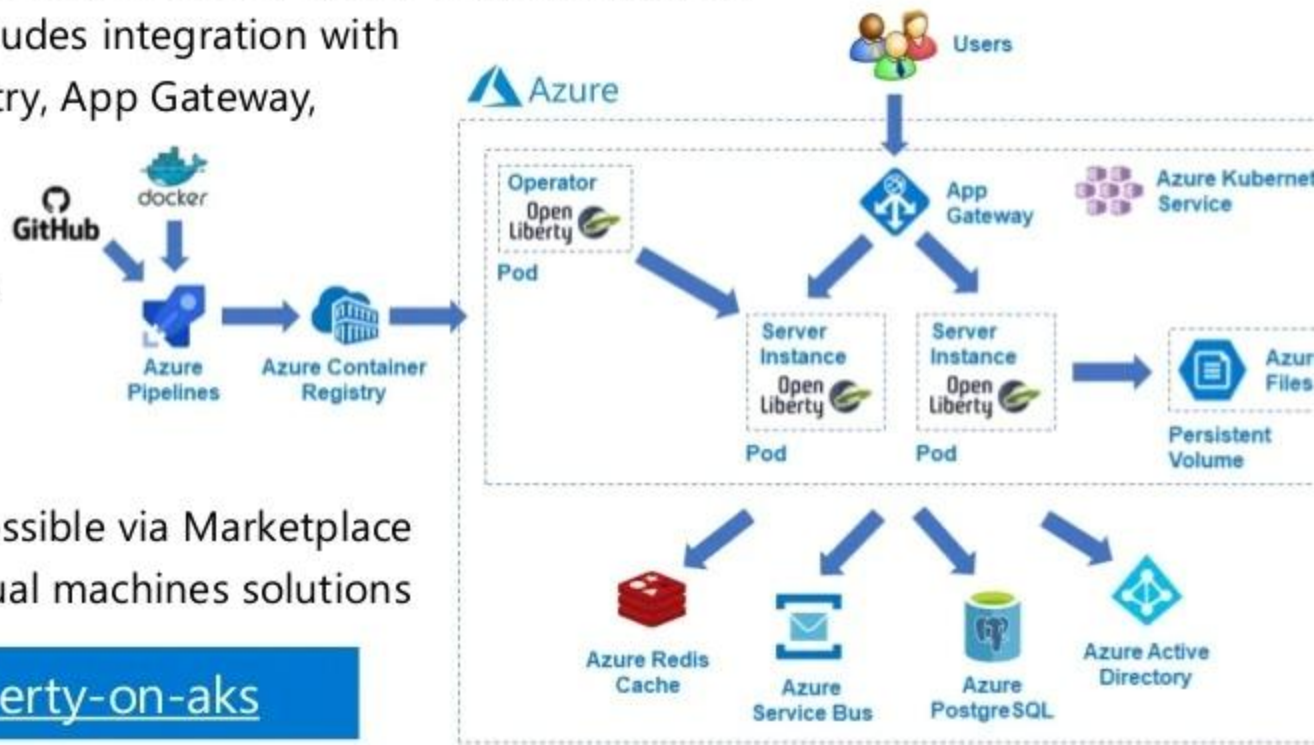
- WebLogic certified by Oracle and Microsoft to run well on AKS via WebLogic Operator
- Detailed guidance, scripts and samples incorporated into WebLogic Operator
- Guidance includes integration with Azure Files as persistence volumes and Azure load balancing
- Further ease-of-use and Azure service integrations possible via Marketplace offering mirroring virtual machines solutions



<https://aka.ms/weblogic-on-aks>

Open/WebSphere Liberty on AKS

- Open/WebSphere Liberty certified by IBM and Microsoft to run well on AKS via Liberty Operator
- Detailed guidance and samples provided and supported jointly
- Guidance portfolio includes integration with Azure Container Registry, App Gateway, Azure PostgreSQL, Azure Files, Azure Active Directory, Application Insights, Azure Key Vault, and Azure Redis
- Further ease-of-use possible via Marketplace offering mirroring virtual machines solutions



<https://aka.ms/liberty-on-aks>

OpenShift

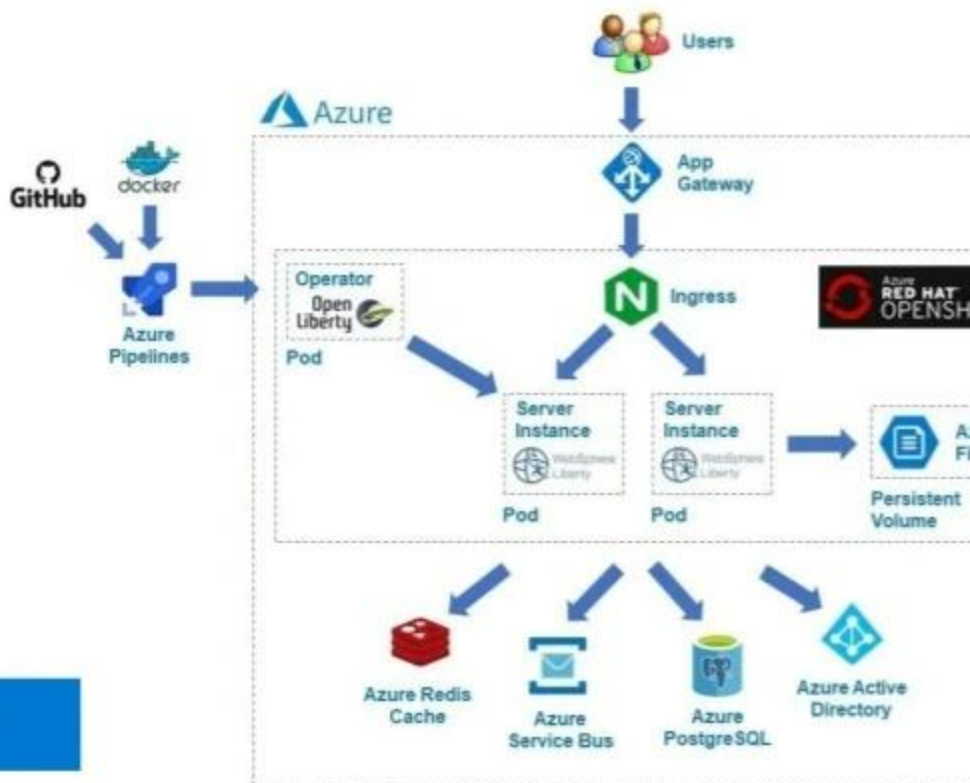
- OpenShift provides uniform higher-level API over Kubernetes that allows using multiple cloud providers, moving between cloud providers, hybrid cloud deployments and moving from on-premise to cloud
- Azure provides managed OpenShift offering through Red Hat partnership
- Application server support for OpenShift generally builds upon Kubernetes support
- More will be done to enhance the developer experience



Open/WebSphere Liberty on ARO

- Open/WebSphere Liberty certified by IBM and Microsoft to run well on Azure Red Hat OpenShift (ARO) via Liberty Operator
- Detailed guidance and samples provided and supported jointly
- Guidance includes integration with OpenShift Container Registry, and Azure Active Directory
- Further ease-of-use possible via Marketplace offering mirroring virtual machines solutions

<https://aka.ms/liberty-on-aro>



Managed Services

- Azure only top tier public cloud with managed Jakarta EE application server offering
- JBoss EAP on App Service
- Jointly developed and supported by Red Hat and Microsoft (integrated, pay-as-you-go commercial support for JBoss EAP)
- Stateless or stateful load-balanced, auto-deployed, auto-scaled, monitored, secure, update notifications
- Deployment APIs and integrations with Maven, GitHub Actions, and popular IDEs
- Standalone configuration by default, further customization via CLI possible



Azure App Service



Red Hat
JBoss Enterprise
Application Platform

Jakarta EE on Azure main landing page

<https://aka.ms/java/ee>

Azure Product documentation — Architecture — Learn Azure — Develop — Resources —

Portal

Azure / Developer / Java / Java EE, Jakarta EE, and MicroProfile

Edit

Filter by title

Java EE, Jakarta EE, and MicroProfile on Azure documentation

Java application servers on Azure

- Oracle WebLogic Server on Azure VMs
- Oracle WebLogic Server on AKS
- IBM WebSphere products on Azure
- Red Hat JBoss EAP on Azure

Deployment

- Helidon on Azure App Service
- WebSphere Liberty/Open Liberty on Azure Red Hat OpenShift (ARCO)
- WebSphere Liberty/Open Liberty on AKS
- Java app with PostgreSQL to WebSphere Liberty/Open Liberty on AKS
- Payara Micro on Azure App Service
- Traditional WebSphere on Azure VMs

Migrate WebLogic to Azure

- WebLogic to Azure Virtual Machines
- WebLogic with AAD via LDAP
- WebLogic with App Gateway
- WebLogic with Elastic on Azure
- WebLogic to JBoss EAP on Azure App Service

Migrate JBoss EAP to Azure

- JBoss EAP to Azure App Service
- JBoss EAP on Azure VMs

Java EE, Jakarta EE, and MicroProfile on Azure

Java EE, Jakarta EE, and MicroProfile are open specifications for Cloud Native Java. Learn how to use these technologies on Azure here.

Java application servers on Azure

OVERVIEW

- Oracle WebLogic Server on Azure VMs
- Oracle WebLogic Server on AKS
- IBM WebSphere products on Azure
- JBoss EAP on Azure
- Eclipse Microprofile on Azure

Migrate WebLogic to Azure

HOW-TO GUIDE

- WebLogic to Azure Virtual Machines
- WebLogic with AAD via LDAP
- WebLogic with App Gateway
- WebLogic with Elastic on Azure

Deployment

HOW-TO GUIDE

- Java app with Helidon to Azure App Service
- Java app with WebSphere Liberty/Open Liberty to Azure Red Hat OpenShift (ARCO)
- Java app with WebSphere Liberty/Open Liberty to AKS
- Java app with PostgreSQL to WebSphere Liberty/Open Liberty on AKS
- Java app with Payara Micro to Azure App Service
- Traditional WebSphere on Azure VMs

Migrate JBoss EAP to App Service

HOW-TO GUIDE

- JBoss EAP to Azure App Service

Code samples

SAMPLE

- PayaraMicro on MicroProfile 4
- Deploying a Java app with Payara on an AKS cluster 1
- Open/WebSphere Liberty on Azure Red Hat OpenShift samples 1
- Open Liberty/WebSphere Liberty on AKS samples 1

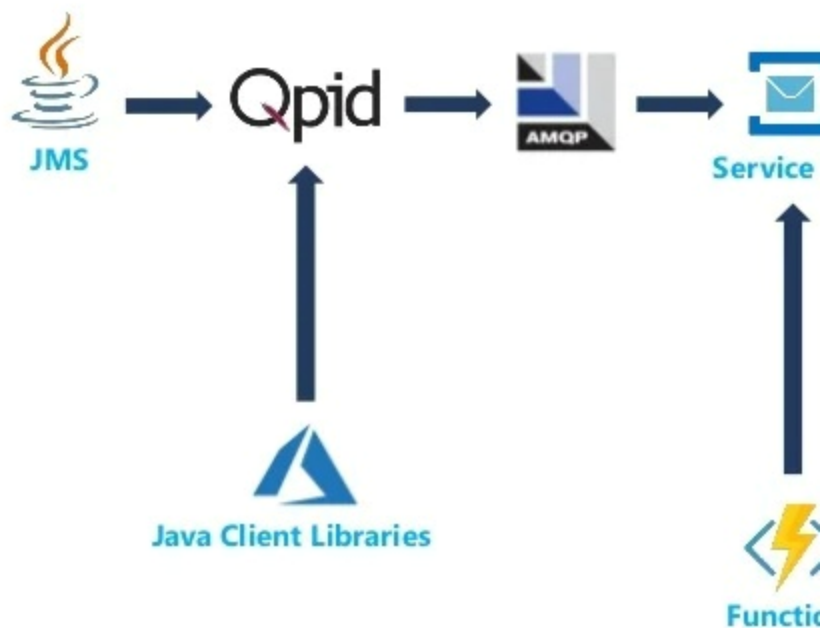
Reference

REFERENCE

- Java EE 8 JavaDocs 1
- Java EE 9 Specifications 1
- Jakarta EE 9 JavaDocs 1
- Jakarta EE 8 Specifications 1
- MicroProfile 4 JavaDocs 1
- MicroProfile 4 Specifications 1

JMS Support in Azure Service Bus

- JMS 2 support in Azure Service Bus via AMQP in public preview
- Partial support has been possible for some time via Apache Qpid JMS, but Azure Service Bus now targeting full JMS 2 compatibility
- Will go GA in a timely fashion
- JCA adapters make it possible to integrate with Java EE application servers
- Wide array of access options that also include full support for AMQP, Java client libraries (non-JMS), Spring/Boot libraries and Azure Functions integrations



<https://docs.microsoft.com/en-us/azure/service-bus-messaging/how-to-use-java-message-service-20>

Messaging is a very mature market space

- Java Messaging System (JMS) lowest common denominator in Java
- JMS is very mature within that market
 - 1.0 in 1998
 - 2.0 in 2013
 - 3.0 in 2022
- Many commercial and open-source implementations of JMS
 - TIBCO EMS
 - WebSphere MQ
 - Active MQ
 - Azure Service Bus
 - Others

Messaging and modernization

- Inherent properties enable non-disruptive modernization
- JMS Ubiquity in Java enterprises

One of the big eight Java EE APIs found in Spring apps

1. @Inject
 2. Servlet
 3. Bean Validation
 4. JSP
 5. JMS
 6. JPA
 7. JSTL
 8. @Resource
- Useful for interoperability

Azure Service Bus Messaging

- Fully managed enterprise message broker
- Well-Architected Framework compliant
- Idiomatic language support
 - .NET
 - Java
 - JMS 1.0 and 2.0
 - Azure SDK for Java
 - Python
 - Typescript
 - Go



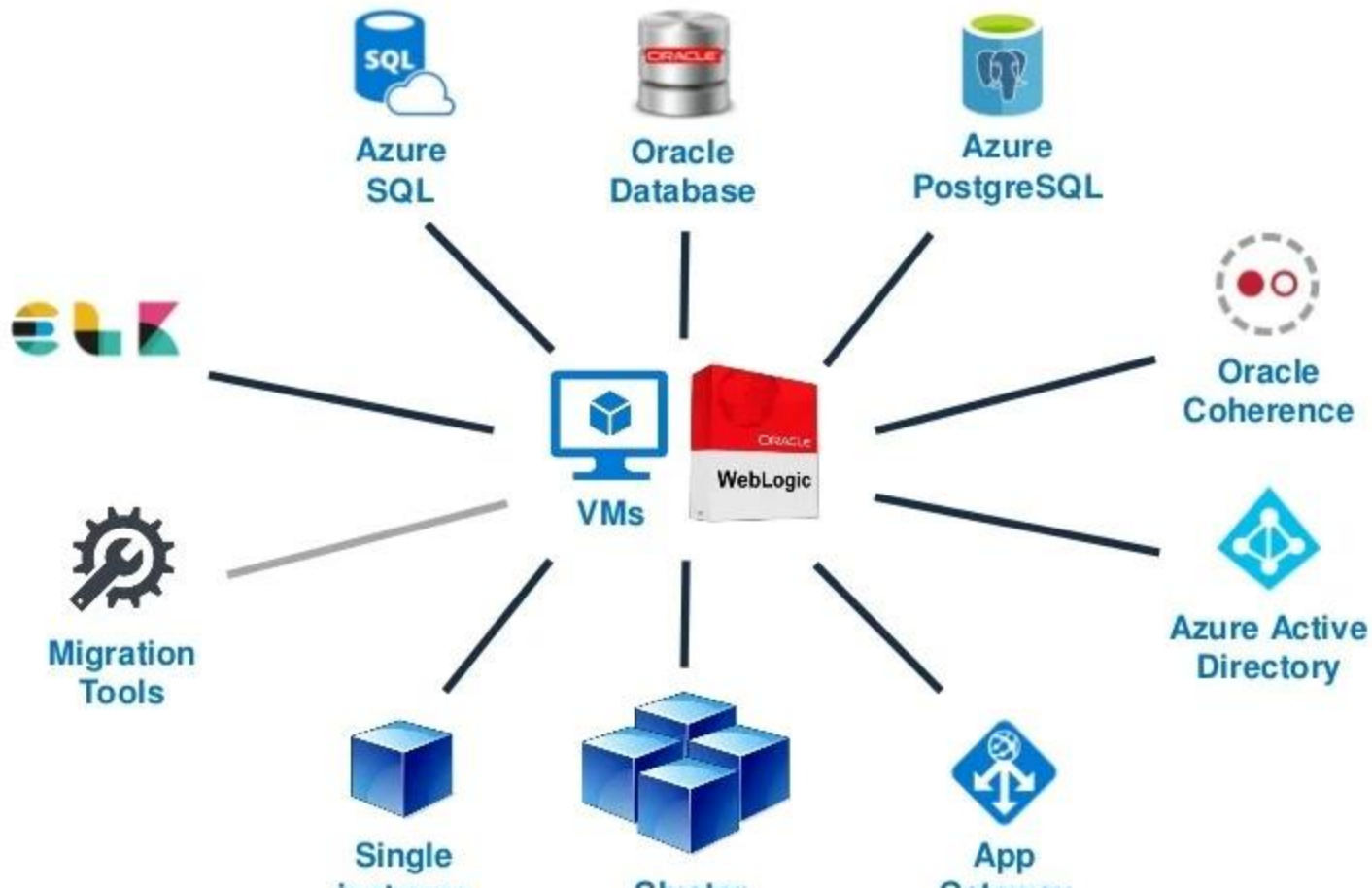
Azure Service Bus Messaging

- So much more than just JMS
 - Uses AMQP protocol
 - Integration with other Azure services
 - Event Grid
 - Logic Apps
 - Azure Functions
 - Power Platform
 - Dynamics 365
 - Stream Analytics

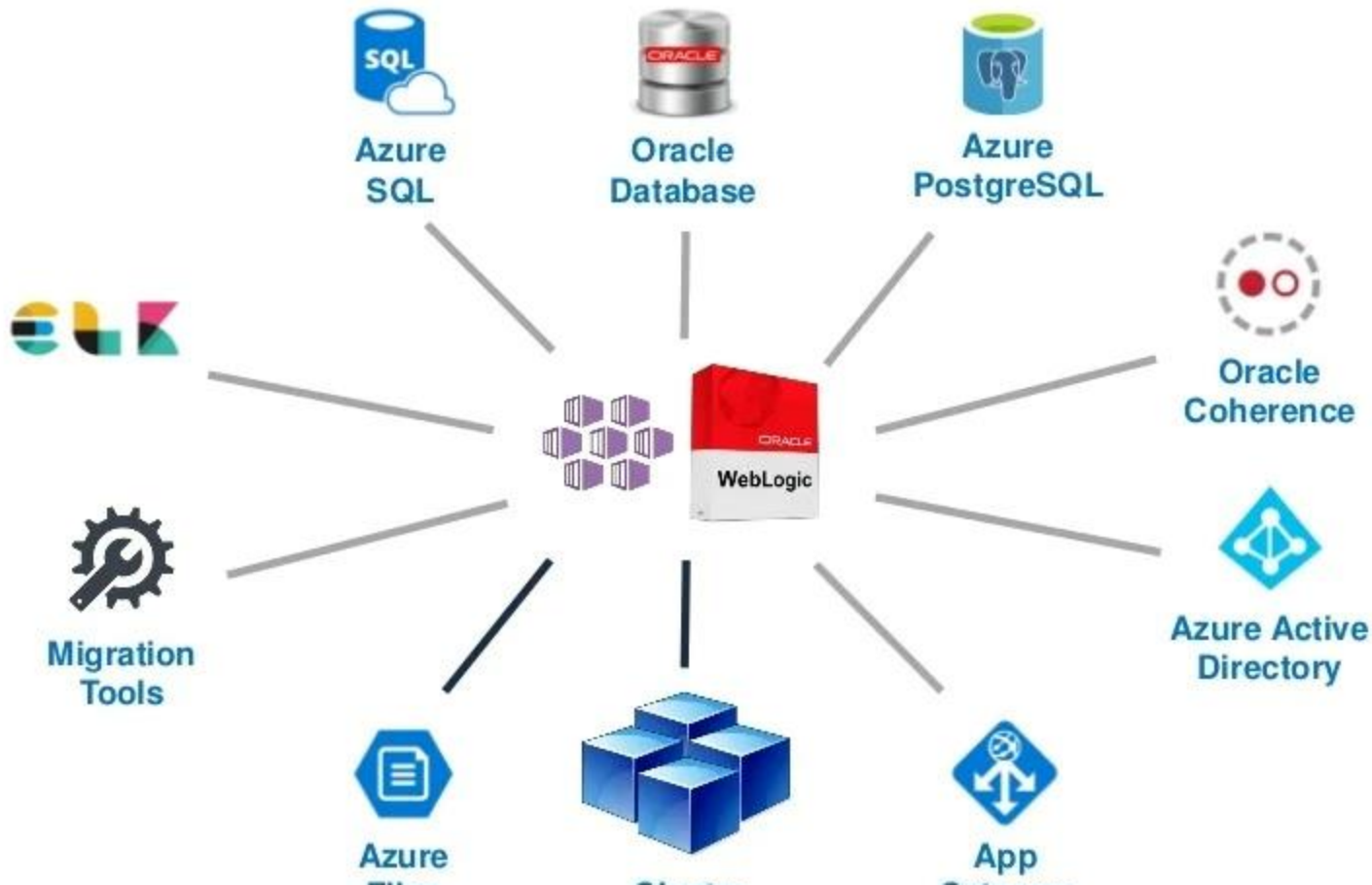


Roadmap

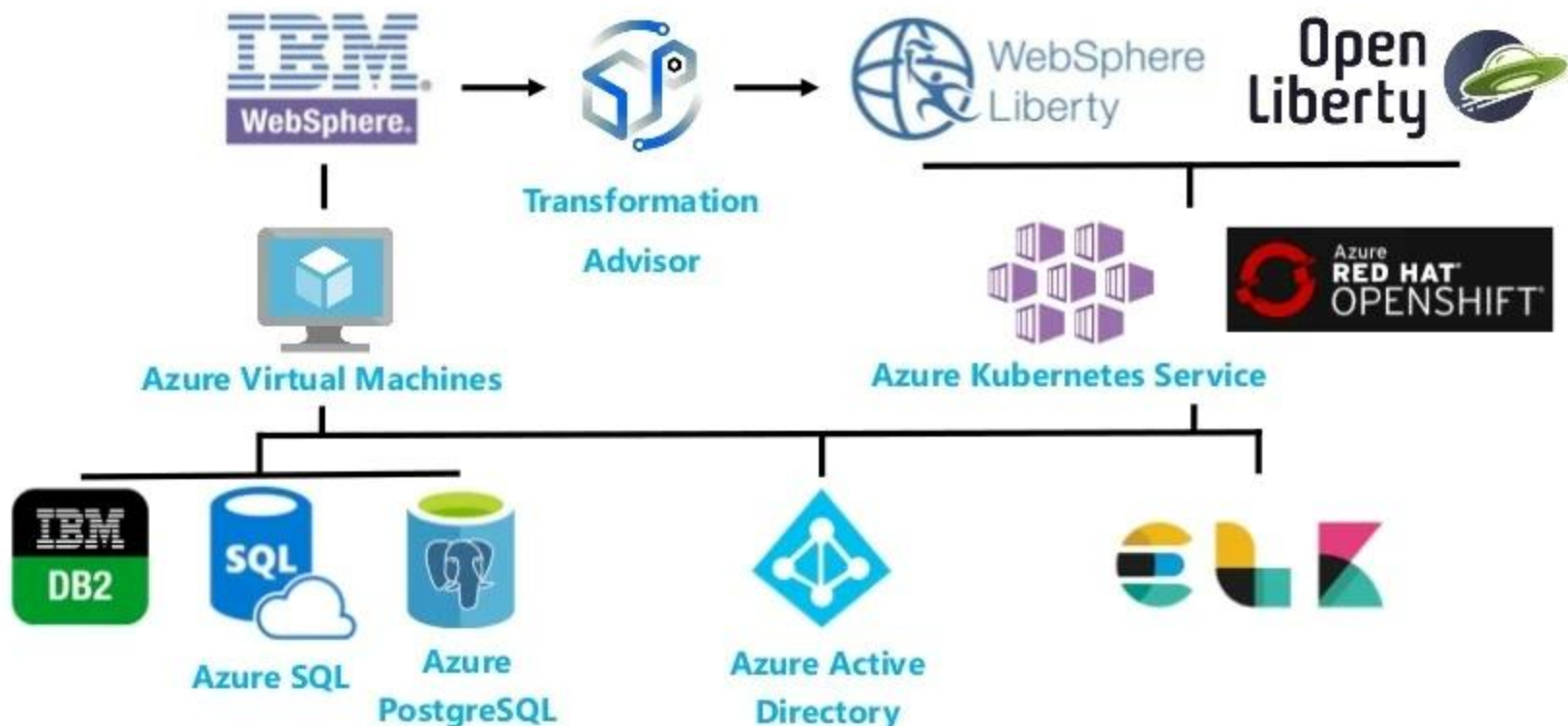
WebLogic on Azure Virtual Machines Roadmap



WebLogic on AKS Roadmap



WebSphere Product Family on Azure



Further potential areas of collaboration

- Identity

- OpenID Connect support in Jakarta EE 10 with Azure AD
 - Microsoft identity platform and OpenID Connect protocol <https://aka.ms/aadoidc>

- Security

- MicroProfile JWT auth
 - Microsoft Identity Platform <https://aka.ms/msidtokens>

- Application Performance Monitoring

- MicroProfile OpenTracing
 - Azure Monitor and OpenTelemetry overview <https://aka.ms/optel>

Summary

- There is a team dedicated to Jakarta EE on Azure success
 - We are eager to engage and aid your migration case directly, if desired
- Robust guidance and tooling for migrating Jakarta EE applications to Azure using containers and virtual machines well in the works
 - WebLogic, WebSphere/Liberty, JBoss EAP, WildFly
- Managed Jakarta EE application server on top tier public cloud
 - JBoss EAP on App Service
- Jakarta EE integrations with Azure services will continue to improve
 - Directory server, caching, logging, messaging

Please engage us!

<https://aka.ms/migration-survey>

Resources

- Announcement of JBoss EAP on Azure Virtual Machines and VM Scale Sets
 - <https://techcommunity.microsoft.com/t5/azure-marketplace/announcing-red-hat-jboss-eap-on-azure-virtual-machines-and-vm/ba-p/2374068>
- Announcement of WebSphere Application Server on Azure Virtual Machines
 - <https://techcommunity.microsoft.com/t5/azure-marketplace/run-websphere-application-server-on-azure-virtual-machines/ba-p/2370219>
- Announcement of WebLogic on Azure Virtual Machines
 - <https://azure.microsoft.com/en-us/blog/new-solutions-for-oracle-weblogic-on-azure-virtual-machines/>
- Announcement for WebLogic on Azure Kubernetes Service
 - <https://techcommunity.microsoft.com/t5/apps-on-azure/run-oracle-weblogic-server-on-azure-kubernetes-service/ba-p/1849719>
- Announcement for WebSphere/Open Liberty on Azure Kubernetes Service
 - <https://techcommunity.microsoft.com/t5/apps-on-azure/run-websphere-liberty-and-open-liberty-on-aks/ba-p/2156486>

