



North American

Hursley Summit 2017

9 – 12 October

#IBMhursum

Geoff Pirie – Offering Manager, WebSphere App Platform

Please note

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion.

Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract.

The development, release, and timing of any future features

or functionality described for our products remains at our sole discretion.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

WebSphere Recent History and Directions

✓ WAS V9 (Brings WAS traditional up to same Java EE7 as Liberty)

- ✓ WASaaS Single Tenant Offering (STO)
- ✓ WebSphere Connect
- ✓ ND management of Docker and within a collective
- ✓ Liberty App Accelerator for Cloud and On-premises microservices creation.
- ✓ WAS ND auto-scaling and health management for Node.js
- ✓ SQLJ for Liberty to support efficient dev and improve performance
- ✓ Automated generation of plugin-cfg.xml and simplified merge.

2H16

- ✓ Virtual Processor Core (VPC) monthly licensing option.
- ✓ Micro Profile- first release
- ✓ AdminCenter support for deploying Docker and Node.js (single mgmt interface)
- ✓ Hybrid Connect Registration (Beta)
- ✓ BluemixUtility for tWAS (Beta)
- ✓ JCache JSR 107
- ✓ Batch Job viewer in AdminCenter
- ✓ Routing Rules for ODRLIB

1H17

- ✓ WebSphere Connect:
 - Product Insights Registration
 - WebSphere Microservice Builder (Beta)
- ✓ IBM Voice Gateway (on Prem)
- ✓ WAS for Bluemix Dedicated
- ✓ WAS Migration Toolkit for automating config export to Bluemix.
- ✓ Java Batch Job Mgmt in Admin Center

2H17 and beyond

- ✓ Open Liberty and Open J9
 - ✓ Microservice Builder
 - ✓ IBM Cloud Private
 - ✓ MicroProfile 1.2
 - ✓ Reactive Platform
- Directions (proposed):
- ✓ IBM Cloud Private (ongoing)
 - ✓ Microservice Builder (ongoing)
 - ✓ Java EE 8, Open EE and MicroProfile
 - ✓ Liberty Spring Boot
 - ✓ IBM Voice Gateway

WebSphere operates across the hybrid cloud landscape

WebSphere traditional Speed of Operation

Manage & maintain stable, mission critical
transactional applications
Systems of Record

Plus

WebSphere Liberty Speed of Innovation

Explore, develop and deploy for growth opportunities
Systems of Engagement, DevOps, Continuous Delivery,
Microservices, Cloud



Enterprise
Apps



Servers



Enterprise
Assets

- Longer release cycles
- Cost savings with workload consolidation



Marathoner

- IT-centric user requirements
- Longer life cycles



**WebSphere
Application Server**

- 24 x7 availability
- Rock solid security
- Deployment flexibility



Sprinter

- Composable
- Continuous delivery
- Continuous integration
- Autonomic scaling
- Continuous monitoring

- Contextual contents
- Zero migration
- Cloud and Mobile friendly security



Cloud



IoT



Mobile



Data

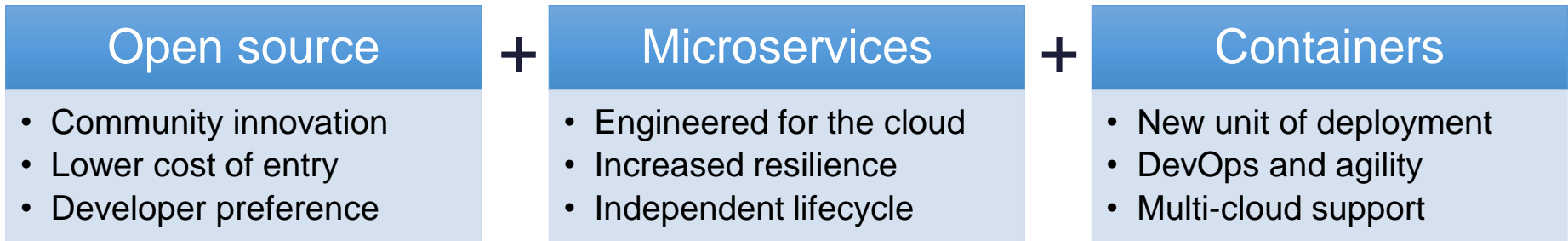
Business challenge: deliver innovation...

- ✓ that attracts and retains developer talent
- ✓ using short development cycles and DevOps processes
- ✓ that optimizes existing investments
- ✓ that fits seamlessly into a hybrid cloud model

“Through 2019, every USD1 enterprises invest in innovation will require an additional USD7 in core execution.”

Gartner 2019 prediction:
<http://www.gartner.com/newsroom/id/3482117>

The raw building blocks for innovation and disruption:



IBM WebSphere Liberty delivers the foundation of innovation

- Five years ago IBM reinvented the application server for the cloud with IBM® WebSphere® Liberty
At that time:
 - Open source was starting to receive widespread acceptance in business
 - Microservices were displaying future potential
 - Container technology was emerging

Key areas we are evolving with Liberty to bring more disruptive value to developers...

Open source

The essential Liberty runtime and IBM's JVM are now open source projects, still fully supported with commercial licenses

+

Microservices

WebSphere provides full Java™ EE, but cloud-native apps need new fault tolerant capabilities that are not yet available from the Java EE spec.

+

Containers

Available as pre-built containers from IBM, WebSphere Liberty is ready for production deployment into virtually any cloud environment.

Composable Features of Liberty

WebSphere
z/OS

WebSphere
ND

WebSphere
Base

WebSphere
Liberty Core

zosConnect-1.2

zosLocalAdapters-1.0

batchSMFLogging-1.0

zosTransaction-1.0

zosWlm-1.0

zosRequestLogging-1.0

zosSecurity-1.0

collectiveController-1.0

clusterMember-1.0

scalingController-1.0

healthAnalyzer-1.0

healthManager-1.0

scalingMember-1.0

dynamicRouting-1.0

Java EE 6
subset

sipServlet-1.0

rtcomm-1.0

mediaServerControl-1.0

couchdb-1.0

rtcommGateway-1.0

javaee-7.0

cloudant-1.0

batchManagement-1.0

mongodb-2.0

wsAtomicTransaction-1.2

wsSecurity-1.1

wsSecuritySaml-1.1

webProfile-6.0

osgiAppIntegration-1.0

bells-1.0

httpWhiteboard-1.0

restConnector-2.0

sessionDatabase-1.0

collectiveMember-1.0

eventLogging-1.0

requestTiming-1.0

adminCenter-1.0

oauth-2.0

scim-1.0

ldapRegistry-3.0

webProfile-7.0

concurrent-1.0

osgiConsole-1.0

osgiBundle-1.0

timedOperations-1.0

webCache-1.0

distributedMap-1.0

apiDiscovery-1.0

bluemixUtility-1.0

serverStatus-1.0

openid-2.0

openidConnectClient-1.0

openidConnectServer-1.0

microProfile-1.2

blueprint-1.0

json-1.0

javaMail-1.5

wab-1.0

logstashCollector-1.0

productInsights-1.0

monitor-1.0

spnego-1.0

federatedRegistry-1.0

constrainedDelegation-1.0

passwordUtilities-1.0

transportSecurity-1.0

jwt-1.0

samlWeb-2.0

Programming Model

Production

Security

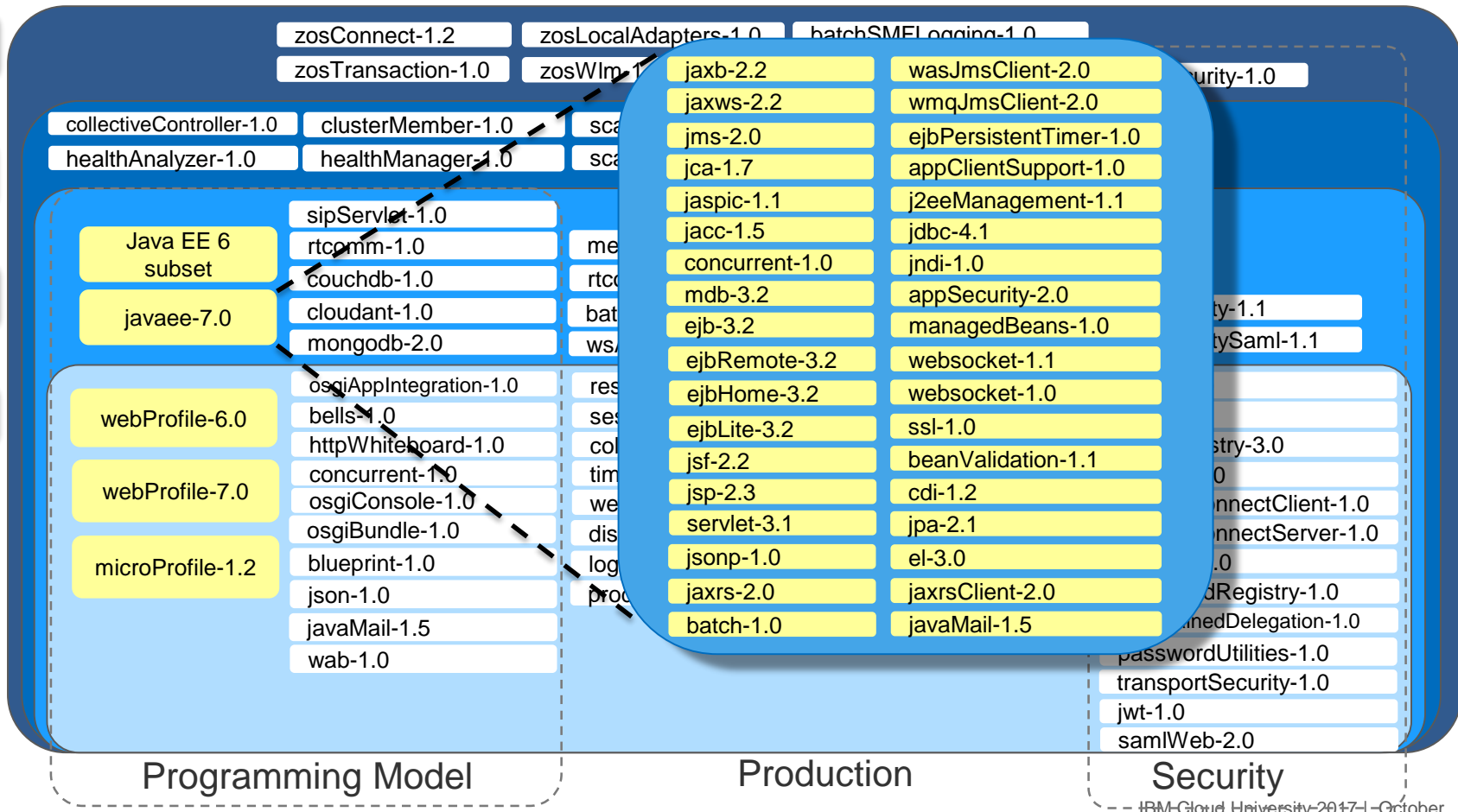
Composable Features of Liberty

WebSphere
z/OS

WebSphere
ND

WebSphere
Base

WebSphere
Liberty Core



Eclipse MICROPROFILE™ : Microservice innovation

OPTIMIZING ENTERPRISE JAVA

- Vendor-neutral programming model, designed in the open, for Java microservices
- Provide core capabilities for building fault tolerant, scalable, microservices
- Increasing the rate and pace of innovation beyond Java EE



Standardizing microservices in enterprise Java via the MicroProfile community

Config

externalize
configuration to
improve portability

Fault Tolerance

build robust behavior
to cope with
unexpected failures

Health Check

common format to
determine service
availability

Health Metrics

common REST
endpoints for
monitoring service
health

JWT Propagation

interoperable
authentication and
role-based access
control

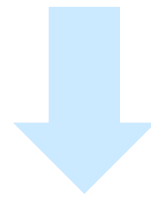
MicroProfile v1.2 – Released September 2017

<http://microprofile.io/>

microProfile-1.2

New in Liberty 17.0.0.3

WebSphere and Docker Containers



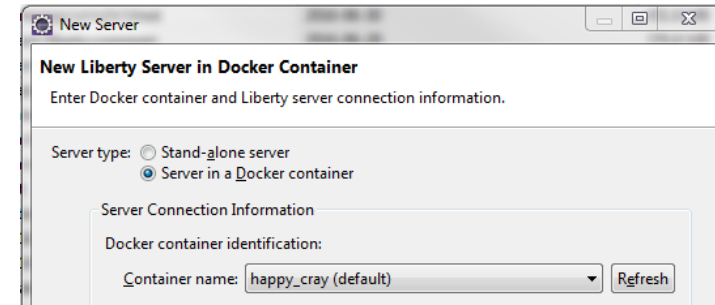
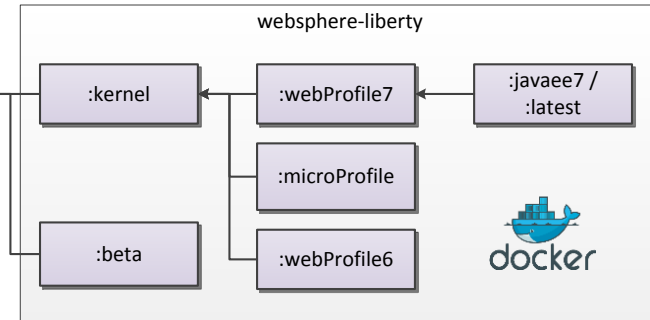
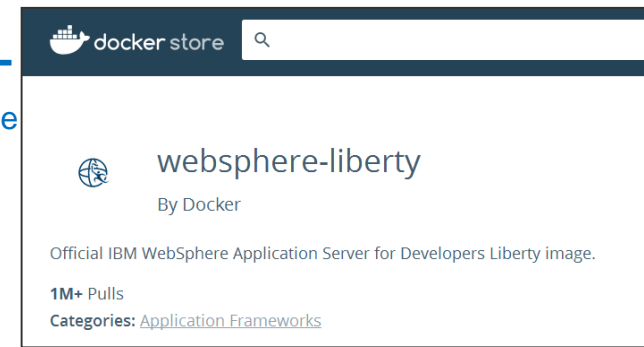
1,000,000+
Liberty Docker image
downloads

- All WAS versions 8.5.5 onwards supported
- Official WAS images for x86, zSeries, and Power systems
- Official IBM HTTP Server Docker image
- Official WebSphere eXtreme Scale Docker image
- Download official Liberty images from Docker Hub
http://hub.docker.com/_/websphere-liberty

- Supported with standard WAS licenses
- Sub-capacity supported



WDT & Admin Center
Docker Support



Easily create 'right-size' Docker images with Liberty...

```
FROM websphere-liberty:kernel
COPY server.xml /config
RUN installUtility install defaultServer
```

dockerfile

3. Add only the required features

2. Identify required features

1. Want image for this

www.wasdev.net

Liberty Repository
On www.wasdev.net

Java EE7 Web profile and Full platform: Additional components:

- ✓ Individual features
- ✓ Convenience features for EE6 EE7 web and full platform
- ✓ Zip archive product images
- ✓ Add-ons to bring an existing install up to Java EE7 web or full platform
- ✓ Beta drivers
- ✓ Deployable Samples with source in Github repo
- ✓ Config snippets

```
<server description="BlogServer">

  <!-- Enable features -->
  <featureManager>
    <feature>servlet-3.1</feature>
    <feature>jdbc-4.1</feature>
  </featureManager>

  ...
</server>
```

/config/server.xml

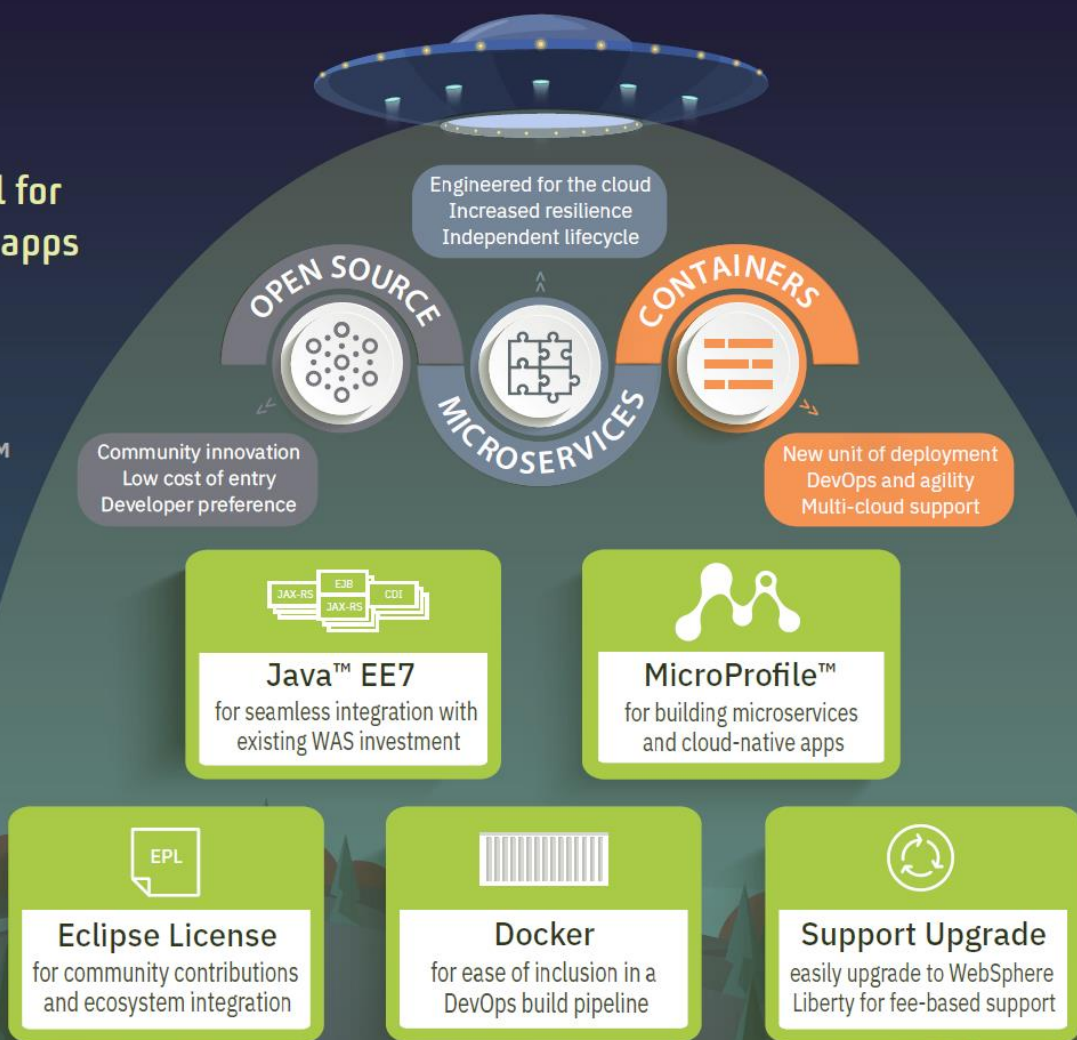


Open Liberty

A lightweight open source server runtime ideal for building Java™ microservices and cloud-native apps

- Easy to consume
- Deploy on any cloud for Java™
- Seamlessly transition to WebSphere

<https://openliberty.io/>



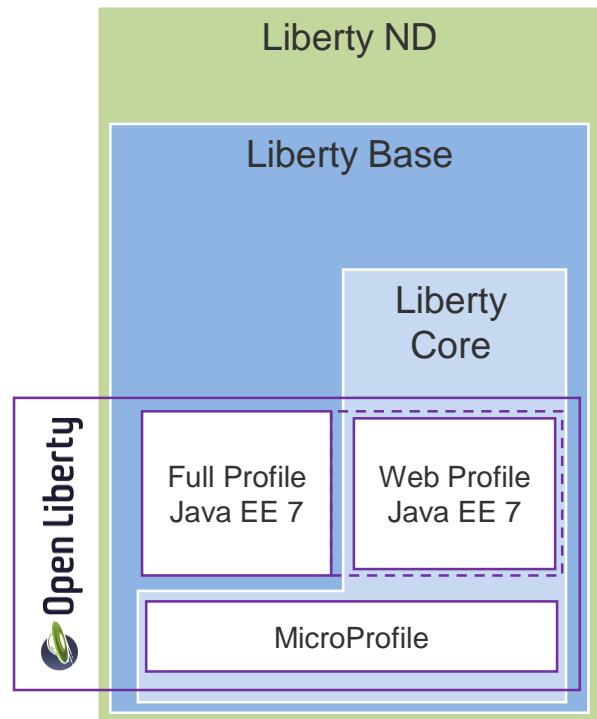
Open Liberty and WebSphere

Open Liberty is the essential Java EE and MicroProfile runtime that WebSphere Liberty extends

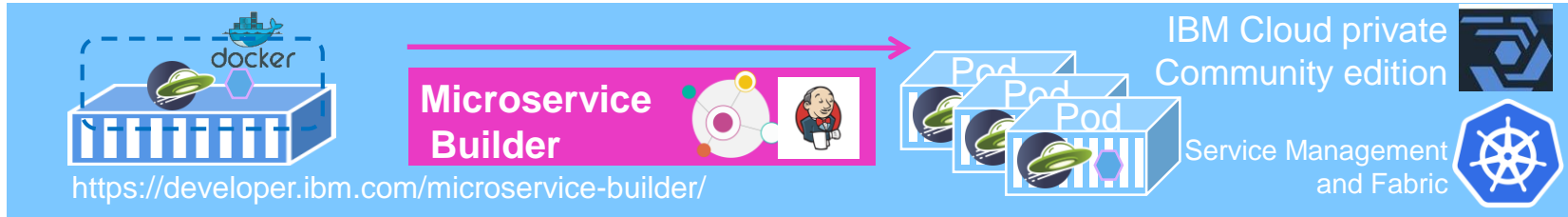
- WebSphere Liberty Core offers supported Java EE Web Profile
- Liberty Base offers supported Java EE Full Profile
- Liberty ND offers supported Java EE Full Profile and advanced management capabilities

All 3 commercial editions provide additional capabilities:

- ✓ Programming model extensions
- ✓ Production quality of service extensions
- ✓ Security extensions
- ✓ *And IBM's full support*



Innovation On An Open Cloud Java Stack



<https://openliberty.io>

WebSphere Liberty's open source Java EE and MicroProfile runtime for Java microservices



Eclipse OpenJ9

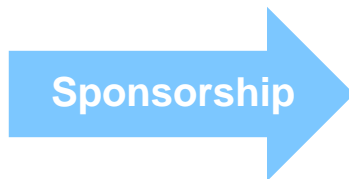
<http://www.eclipse.org/openj9/>

The contribution of IBM's enterprise grade, open source, JVM Prebuilt OpenJDK 9 with OpenJ9 VM from AdoptOpenJDK



Eclipse Enterprise for Java (EE4J)

Moving Java EE to Eclipse Foundation




Community
and
Vendors




Optimize *How* You Use WebSphere

Choose the level of **infrastructure abstraction** and **fine-tuned control** that suits the apps and services.

Instant Runtimes




CLOUD FOUNDRY
The highest level of infrastructure abstraction. Focus on the app.




Bluemix Cloud Foundry app runtimes


Deploy and scale apps without manually configuring and managing servers

[Get started free](#) [Deploy a container](#)

- ✓ Based on Bluemix Cloud Foundry
- ✓ Focus on apps, not servers
- ✓ Get to market fast

Containers




docker
Powerful, but less resource intensive than VMs. Key to supporting hybrid portability.





IBM Containers on Bluemix


Create and deploy Docker applications that will run anywhere

[Get started free](#)



- ✓ Fully managed, scalable hosted container service
- ✓ Built on open source Docker technology
- ✓ Security compliance insight, logging, and monitoring
- ✓ Container groups with fully qualified domain names, load balancer, auto-recovery, and auto-scaling

Virtual servers


Control all the way down to the operating system. Can be ideal for lift and shift of legacy apps.



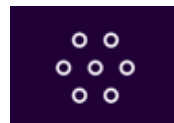
 IBM Bluemix Catalog
[View all](#)


WebSphere Application Server

This service gives you the WebSphere Application Server experience in Bluemix. Choose from traditional or Liberty installations of WebSphere Application Server, preconfigured and hosted on your own Red Hat Enterprise Linux guest.

- ✓ Bring your Traditional WAS & Liberty applications to pre-optimized off-premises managed cloud environment without change
- ✓ Leverage Pay-as-You-GO or Subscription to WAS workloads in repeatable and reliable deployments in the Cloud.
- ✓ Develop and deploy applications with identical interfaces & experience for Developers and Operations in the cloud and on-premises

Optimize *Where* You Use WebSphere



Choice with consistency



Hybrid integration



DevOps productivity



Powerful, accessible data and analytics



Cognitive solutions

1 | Public

Maximize on cloud economics and agility.

2 | Dedicated

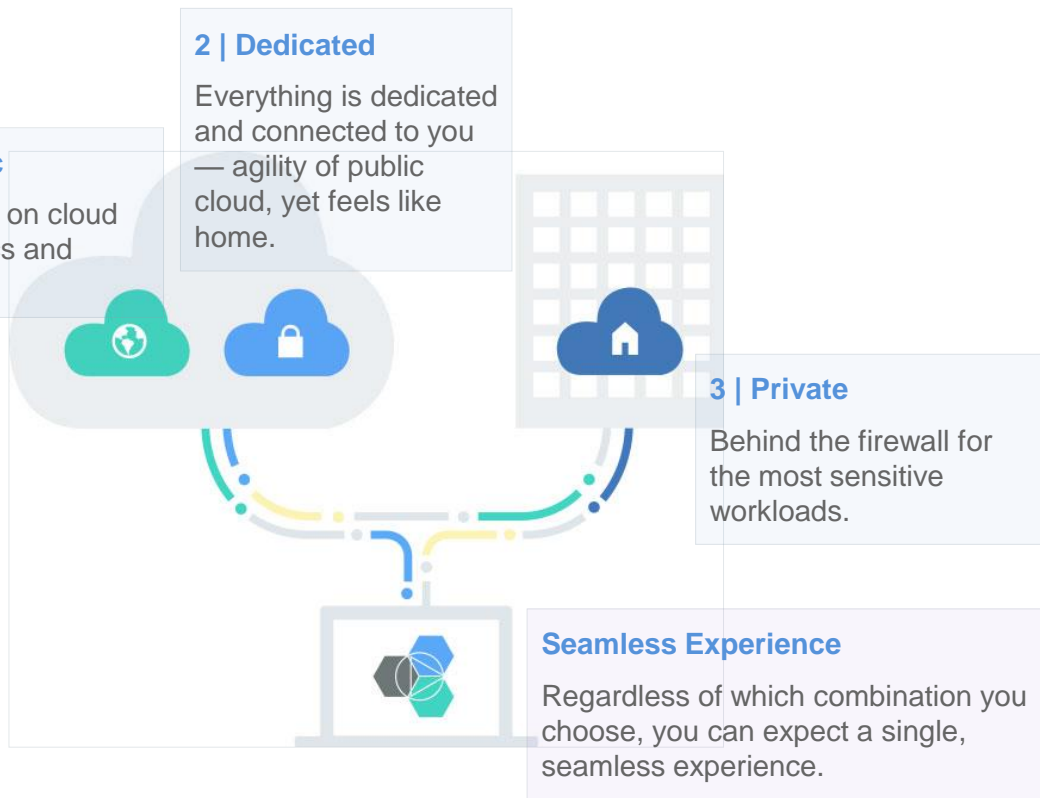
Everything is dedicated and connected to you — agility of public cloud, yet feels like home.

3 | Private

Behind the firewall for the most sensitive workloads.

Seamless Experience

Regardless of which combination you choose, you can expect a single, seamless experience.



Introducing IBM Cloud Private

<http://ibm.biz/IBMCloudPrivate>



DevOps



Hybrid Cloud Mgmt



Microservice Builder

Core Operational Services

Application Development, Integration, Operations & Management



Enterprise Content

Next Generation IBM Middleware, Data, Integration & Analytics

IBM Cloud Private Platform

- Kubernetes-based platform
- Multiple open compute models
- Software and policy-driven network storage
- Auto-scaling
- Multi-site HA/DR features

- Stateful and stateless application support
- Built-in monitoring and logging
- Integrated enterprise-grade security
- Vulnerability Advisor to prevent risk



Kubernetes



CLOUDFOUNDRY



Apache OpenWhisk



Terraform

Runs on Enterprise Infrastructure



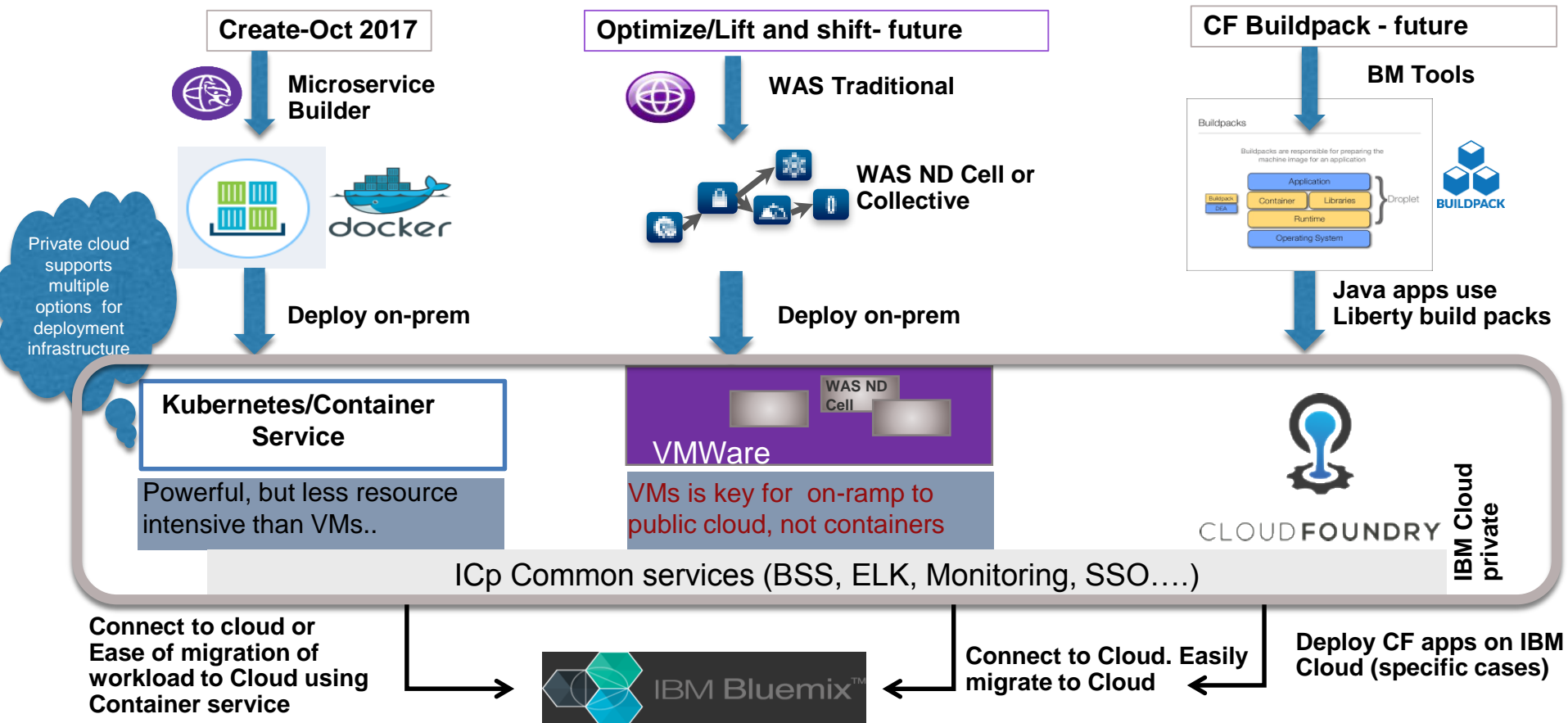
z Systems

vmware



openstack

WebSphere on IBM Cloud Private – a workload view



Container services-----WAS on Bluemix----- Buildpacks

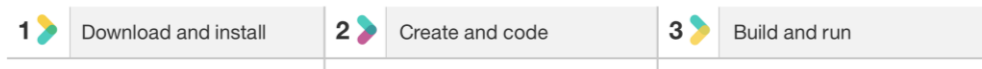
Microservice Builder:

Create, Configure and Deploy microservices for IBM Cloud



In 3 steps

Create and run your microservices, hybrid and containerized apps



Your team is looking for ways to shorten **development cycles**, **reduce complexity** and **minimize costs**. Microservice Builder can benefit your team in three ways:

Agile dev and test
Support rapid hybrid and cloud-native application development and testing cycles with greater agility, scalability and security

Lightning fast delivery
Leverage a continuous delivery pipeline to accelerate software delivery from weeks to days, and days to minutes

Cloud agnostic deploy
Reduce costs and complexity with portability across IBM and other cloud providers including public, private and hybrid clouds

Innovate with
SPEED

Set up your environment, fabric and DevOps pipeline in minutes using **Microservice Builder**.

Helm charts for fabric and pipeline

- **delivered** with IBM Cloud private
- **available** for any Kubernetes environment
- **support** entitled with WebSphere Application Server licenses.

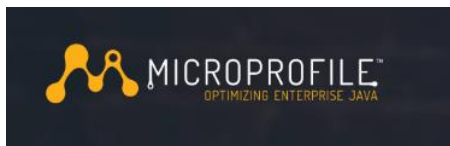
<https://developer.ibm.com/microservice-builder>

Microservice Builder: From development to production

Development

Free

MicroProfile Programming Model



Developer CLI

```
? Select a language:
1. Java - MicroProfile / Java EE
2. Node
3. Python
4. Java - Spring Framework
```

Liberty App Accelerator



Deployment

Entitled with WAS ND or IBM Cloud Private

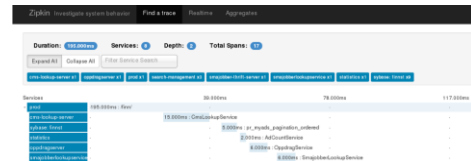


Jenkins Pipeline

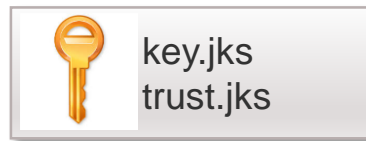
Extract	Maven Build	Docker Build	Deploy
10s	24s	27s	1s
10s	24s	27s	1s

Runtime

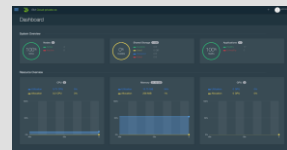
Zipkin Distributed Trace Server



Certificate key and trust store



IBM Cloud private









Developer CLI

Quickly create, build and run new services with minimal pre-reqs

Create and run your first project in 3 steps:

1 	Download and install	2 	Create and code	3 	Build and run
<ul style="list-style-type: none">Install prerequisites Docker and GitDownload and install Bluemix CLI Mac OS X Need a different platform?Install the developer plugin <div><code>bx plugin install -r bluemix dev</code> Copy</div> <p>Learn more about installing</p>		<ul style="list-style-type: none">Create a project <div><code>bx dev create</code> Copy</div><p>This generates a project to get you started</p>Code using your favorite editor or IDE <p>Learn more about creating a project</p>		<ul style="list-style-type: none">Build your project <div><code>bx dev build</code> Copy</div><p>Change to your project directory before building</p>Run your project <div><code>bx dev run</code> Copy</div><p>This will run your project inside a container on your local system. Verify Liberty is running in your browser: http://localhost:9080</p> <p>Learn more about building, running and testing a project</p>	
 Ready for the next step? Learn how to deploy your projects on-prem and try our sample project					

“create” walks developer through choice of a pattern (e.g. microservice) and language (Java, Node or Swift) and generates project

“build” uses a containerized set of tools to build the application and package it in a Docker image

“run” executes the Docker image locally

CLI and Docker are the only prerequisites

Microservice Builder pipeline

Automated build and deployment of microservices for rapid delivery



GitHub/GitHub Enterprise

- ▼ my-org
 - ▶ service-a
- ▼ service-b
 - ▶ src
 - Dockerfile
 - Jenkinsfile
 - ▼ manifests
 - deploy.yaml
 - pom.xml

Jenkins

▶ my-org ▶ service-b ▶ master

Extract	Maven Build	Docker Build	Deploy
10s	24s	27s	1s
10s	24s	27s	1s



IBM Cloud
private



Registry



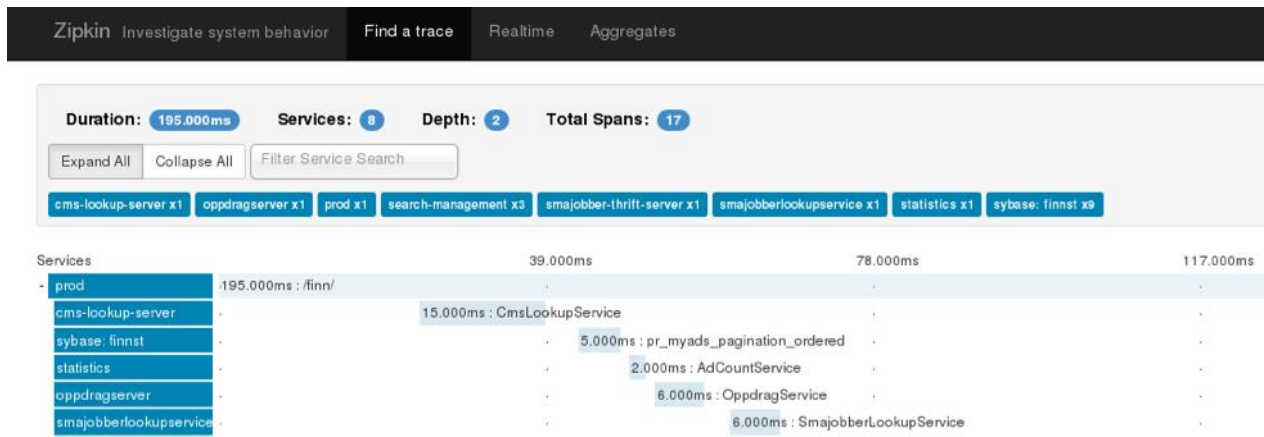
Kubernetes

Microservice Builder fabric

Runtime components to support microservice deployments



- Fabric provides shared Liberty key and trust stores to set up trust for inter-service communication
- Distributed tracing enables tracking of requests as they traverse microservices for problem determination and causal analysis
 - Applications use Open Tracing API to delineate trace spans
 - Fabric provides Zipkin server for collection and visualization of spans



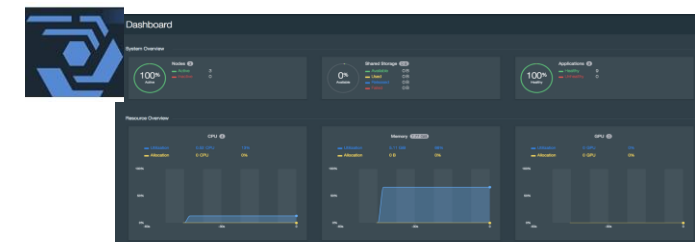
Istio service mesh for Kubernetes

Visibility and control of inter-service communication

- Currently optional extra fabric for IBM Cloud private
 - Roadmap: Out of the box integration
- Local proxy (Envoy) injected into pod and through which inbound and outbound traffic is routed
- Enables infrastructure features such as:
 - Authentication and authorization
 - Load balancing and fine-grained routing
 - Rate limiting
 - Fault tolerance
 - Fault injection for testing
 - Telemetry

Integrated Resilience

Application and Infrastructure working together



UI Management interface



Microservice
Builder

dev: create deployment yamI

pipeline: operates on deployment yamI

Kubernetes
Deployment
yamI

Specifies pod templates,
scaling and other operational policies

Cluster of pods



- Use Microservice Builder to create and deploy microservices projects to IBM Cloud private

- Develop the microservice applications using Liberty's MicroProfile technologies to simplify and encapsulate portable behaviour for fault tolerance, healthcheck and metrics endpoints

- Expose these application level capabilities to Kubernetes to enable the infrastructure to engage them

Externalizes /health and /metrics endpoints to Kubernetes



Config	Fault Tolerance	Health Check	Health Metrics
externalize configuration to improve portability	build robust behavior to cope with unexpected failures	ensure services are running and meeting SLAs	understand the interactions between services while running
Externalized App config	Environment-specific config		

Applications use Liberty MicroProfile features for health and resiliency

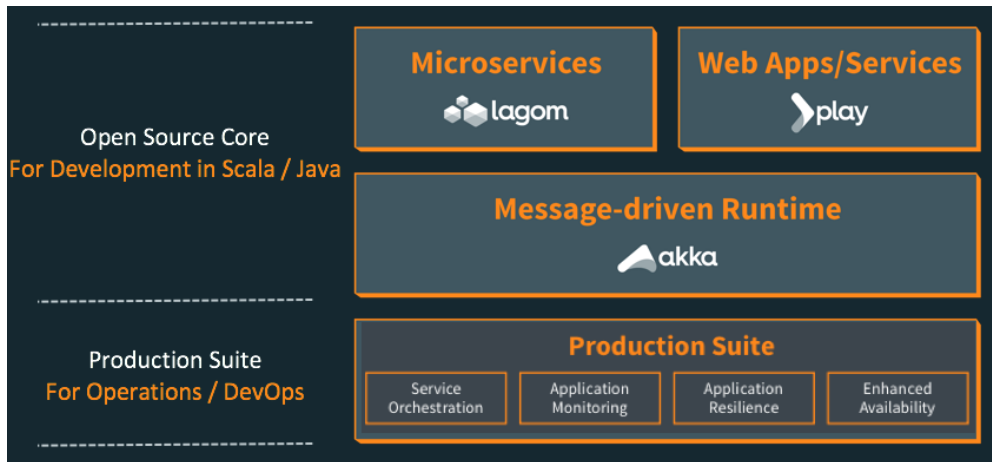
Introducing the Reactive Platform from IBM

IBM has delivered a Reactive Platform Offering to the market the provides an end to end environment for building and running reactive programs.

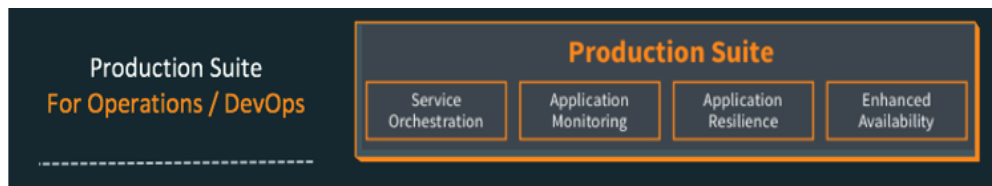
Download from developerWorks the [Reactive Platform Developer edition](#)

For runtime service orchestration, monitoring, resilience and enhanced availability, the Reactive Platform V1.2 is available for purchase.

Reactive Platform Developer edition (ILAN):



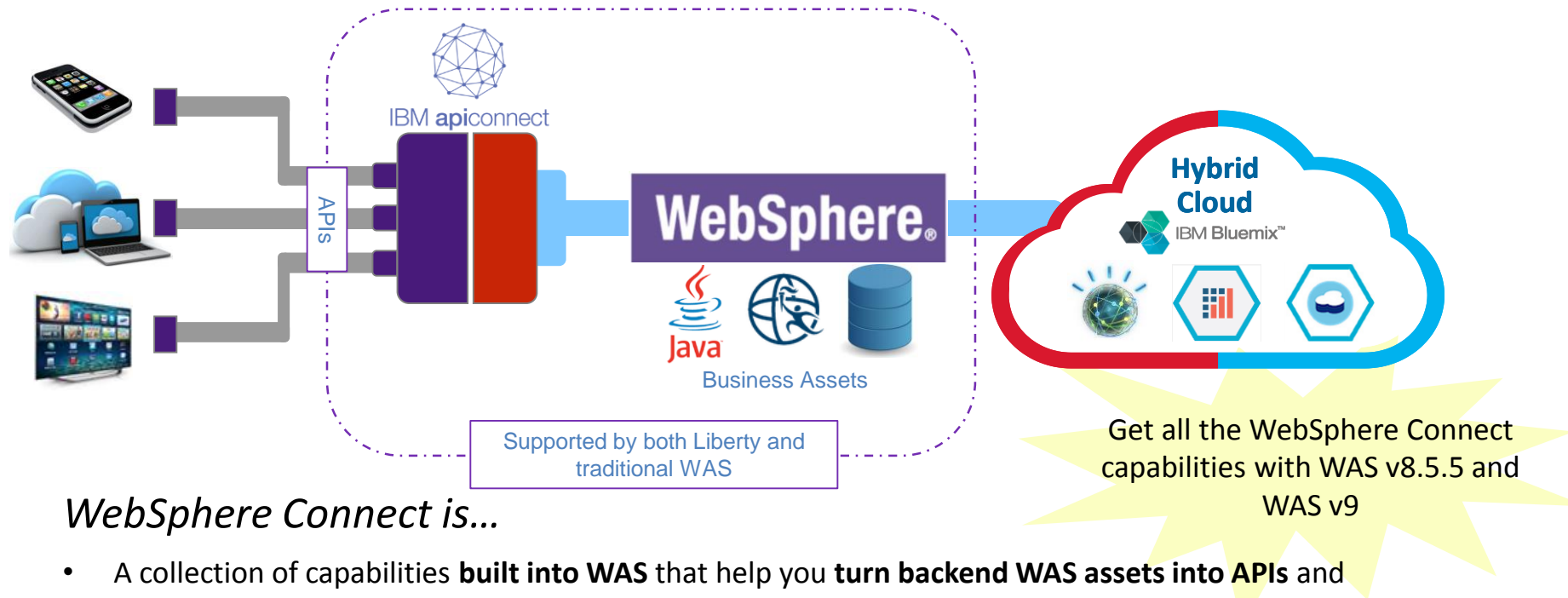
Reactive Platform v1.2 (IPLA):



Support for Developer Edition if customer has Reactive Platform v1.2 entitlement

WebSphere Connect - Integrate Enterprise Services through APIs

On-ramp to API Economy and Hybrid Cloud

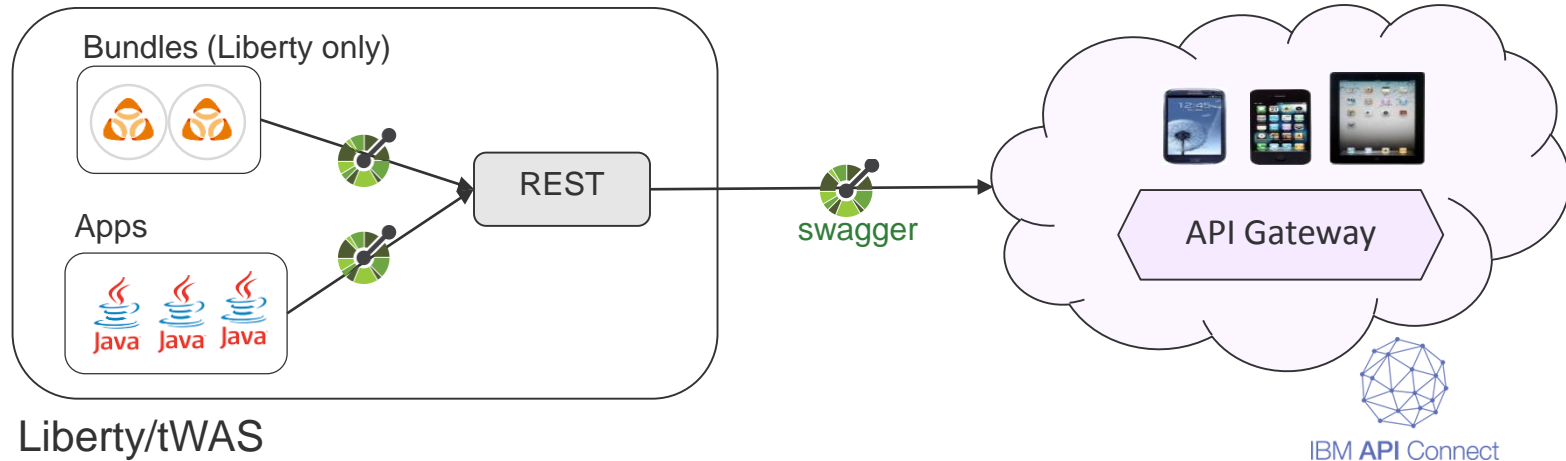


WebSphere Connect is...

- A collection of capabilities **built into WAS** that help you **turn backend WAS assets into APIs** and **connect to and from the hybrid cloud** to rapidly extend the value of their application investments
- WebSphere Application Server v8.5.5 and v9 includes API Connect Essentials as a Supporting Program, adding IBM Support and extra API calls per month

WebSphere API Discovery

- Auto-generates and aggregates Swagger documents
- Merged Swagger document available at /api/docs
 - Query parameter allows filtering based on context root.
 - Support both JSON and YAML.
- Available for traditional WebSphere and Liberty (through **apiDiscovery-1.0** feature).



Easily Connect to IBM Cloud - Extending On-Prem Value...

WebSphere
Connect
capabilities



Any cloud
service

Backup

Backup

Monitoring

Log Mgmt.

Analytics



1

Expose with API based platform

- Expose apps & data as APIs
- Manage full API lifecycle
- Enable plug and play services

Extend with Bluemix Services

- Enhance on prem apps & data
- From Bluemix or any cloud
- Tiered pricing 'free to paid'

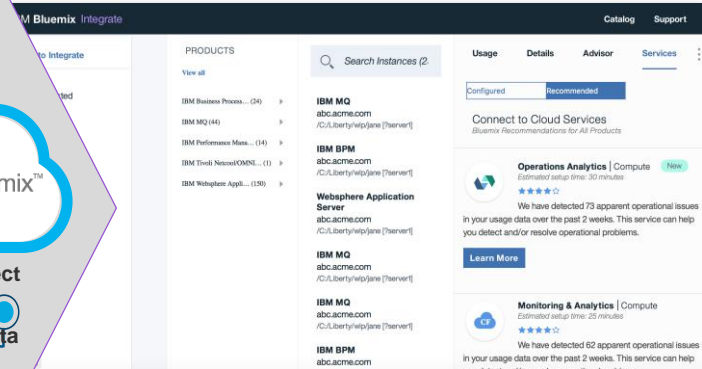
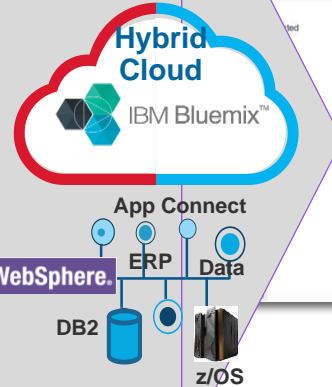
Registration &
Usage

2

Enhance with C2C Services

- Central and secure connection to IBM Cloud
- View registered licenses and usage analytics
- Advise on value added services, architectures, tools

Cognitive
Advisement



4

Manage from Product Insights Service

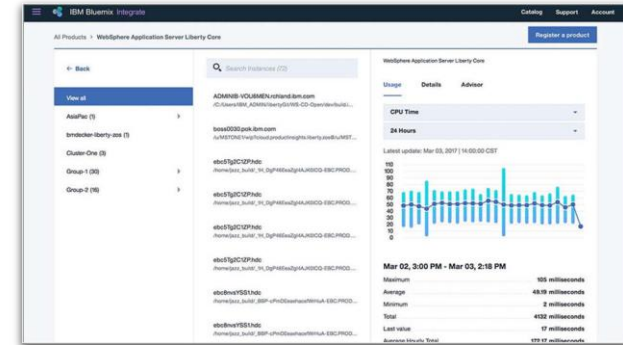
- Common User Experience
- Launchpad to IBM Cloud
- View entitlements & usage
- App Store experience
- Links to support, community
- Advise & Cognitive Interaction

...and take advantage of Product Insights service...

Use Case: IT Administrator needs visibility into the products and versions that are deployed across the organization's environment, and how those investments are being leveraged.

Capabilities

- Quick, easy registration of supported products into the IBM Cloud
- Insight into which products and versions are deployed – management from a single console
- Visibility into product usage to aid with capacity planning



...and integrate your Call Center with IBM Voice Gateway..

Connect to Cloud

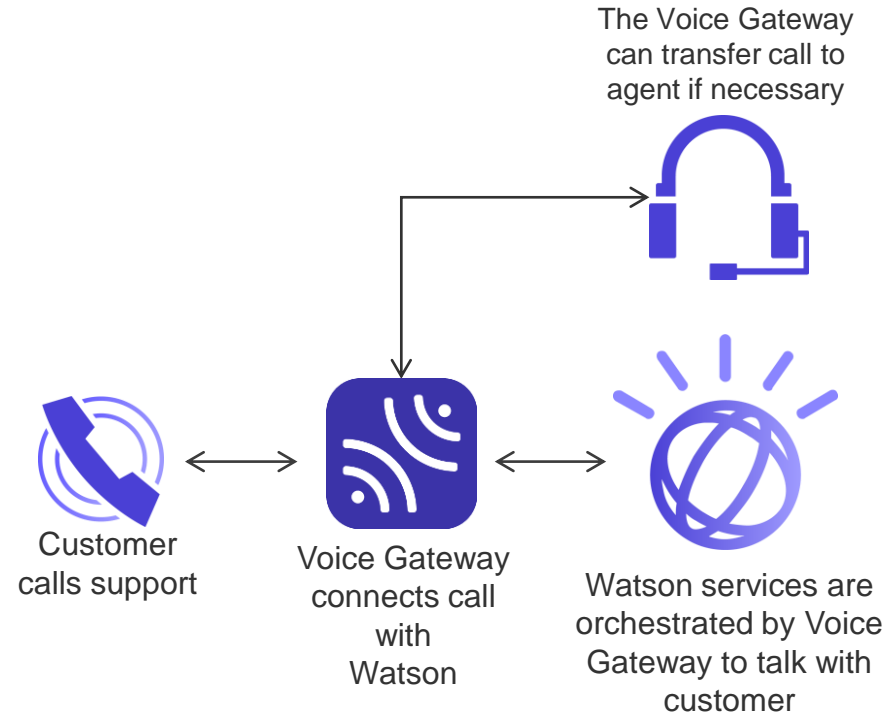
IBM Voice Gateway is a brand new connect to cloud offering that uses WebSphere Liberty to connect the telephone network to Watson's services in Bluemix

Bring Watson to your call center

Through connecting Watson Speech To Text, Conversation, and Text To Speech, to the phone network you can use Watson as a self-service customer service agent

Cloud native

The IBM Voice Gateway is a cloud native solution, comprising of two microservices delivered as Docker Images - this gives maximum flexibility in a cloud native world



WAS V7 & V8 EOS

WAS Release	WAS EOM	WAS EOS	WAS EOES
7.0 - all editions	Dec 16, 2016 ⁽²⁾	Apr 30, 2018	Apr 30, 2021 ⁽¹⁾
8.0 - all editions	Dec 16, 2016 ⁽²⁾	Apr 30, 2018	Apr 30, 2021 ⁽¹⁾
RFA 71777 on Sept 13, 2016 (Distributed) RFA 71843 on Sept 13, 2016 (z/OS)			

WAS Release	Java 6 EOS in WAS	Java 7 EOS in WAS	Java 8 EOS in WAS
7.0	April 2018	n/a	n/a
8.0	April 2018	n/a	n/a
8.5	April 2018 ⁽¹⁾⁽³⁾	Sept 2019	March 2025

Migration Links

WebSphere Migration Strategy - <https://www-01.ibm.com/support/docview.wss?uid=swg27008724>

Migration Decision Support Tool - <http://whichwas.mybluemix.net>

WebSphere Application Server Migration Discovery Tool - https://www-01.ibm.com/marketing/iwm/dre/signup?source=mrs-form-3089&S_PKG=ov50193

WAS Migration Toolkit overview: <http://www.ibm.com/developerworks/websphere/downloads/migtoolkit/>

WAS 8.5 WebSphere Migration Guide - <http://www.redbooks.ibm.com/redpieces/abstracts/sg248048.html>

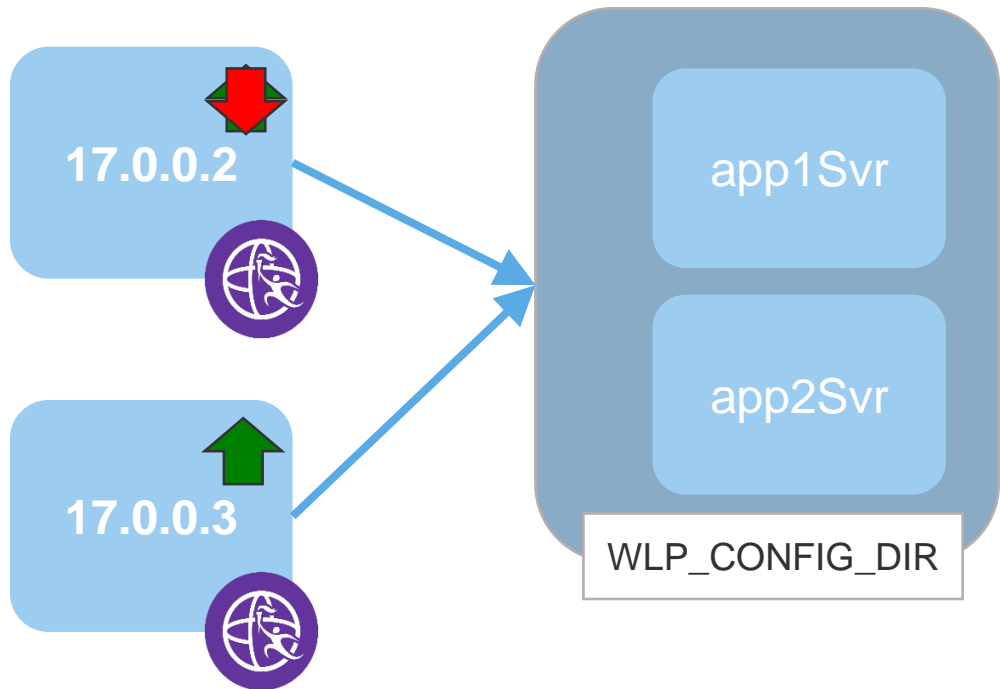
(1) After December 2018, Java SDK 6 support is limited to 'usage & known defects'

(2) WAS on z/OS EOM will be Feb 2017. Announcement occurred in June 2016.

(3) WebSphere Application Server Liberty has a single support stream for all product versions. Support for Java SE 6 with Liberty will end in September 2017 to allow the Liberty code and included open source packages to move forward.

Eliminate Future Migration Costs

- Zero config migration
 - Write once, run forever
- Zero migration for apps
 - No behavior changes in existing features
 - New behaviors in new features
- Choose your Java
 - IBM, Oracle, Open JDK+OpenJ9, Open JDK+Hotspot





North American Hursley Summit 2017

9 – 12 October

#IBMhursum

Notices and disclaimers

Copyright © 2017 by International Business Machines Corporation (IBM). No part of this document may be reproduced or transmitted in any form without written permission from IBM.

U.S. Government Users Restricted Rights — use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM.

Information in these presentations (including information relating to products that have not yet been announced by IBM) has been reviewed for accuracy as of the date of initial publication and could include unintentional technical or typographical errors. IBM shall have no responsibility to update this information. **This document is distributed “as is” without any warranty, either express or implied. In no event shall IBM be liable for any damage arising from the use of this information, including but not limited to, loss of data, business interruption, loss of profit or loss of opportunity.** IBM products and services are warranted according to the terms and conditions of the agreements under which they are provided.

IBM products are manufactured from new parts or new and used parts. In some cases, a product may not be new and may have been previously installed. Regardless, our warranty terms apply.”

Any statements regarding IBM's future direction, intent or product plans are subject to change or withdrawal without notice.

Performance data contained herein was generally obtained in a controlled, isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and

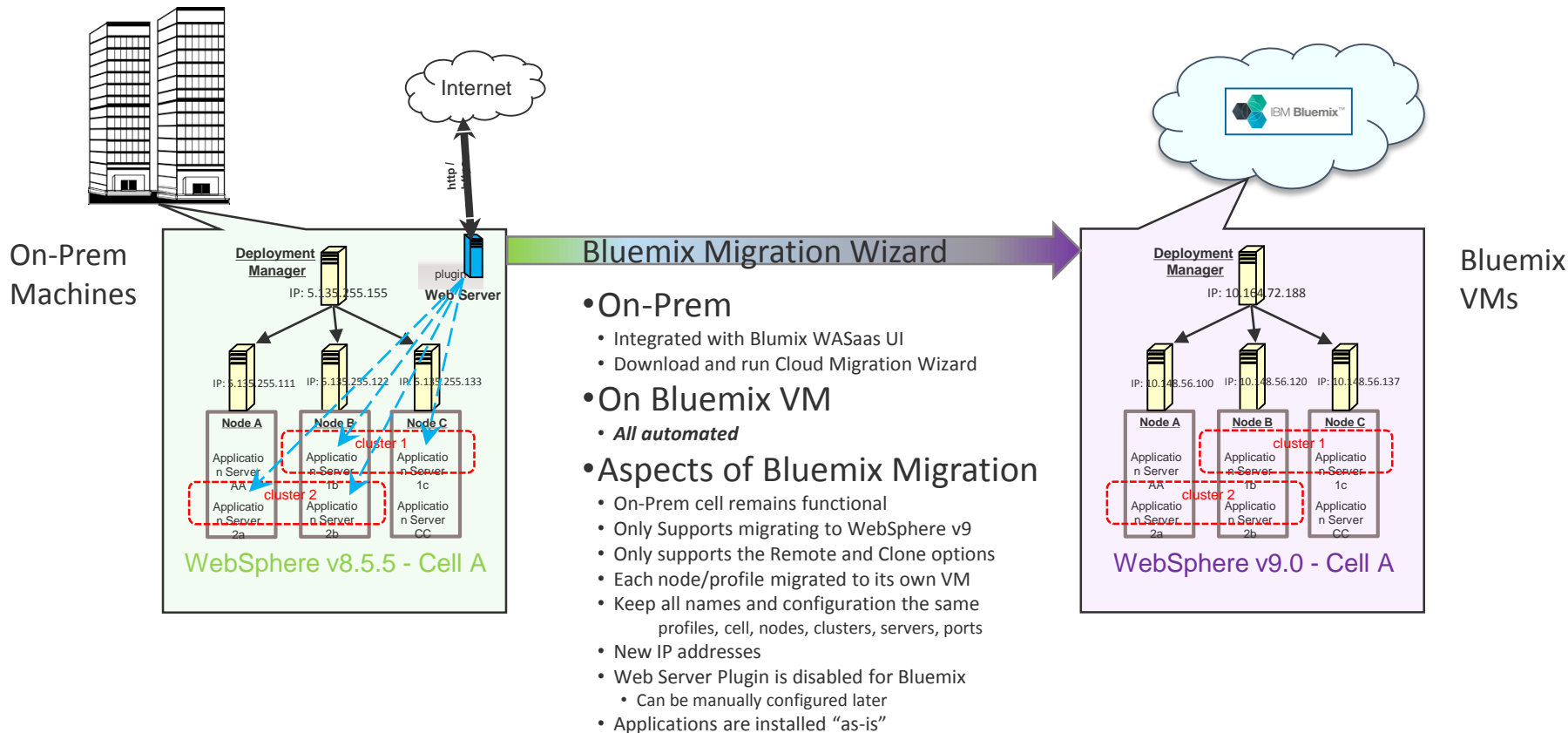
the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.

References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business.

Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall constitute legal or other guidance or advice to any individual participant or their specific situation.

It is the customer's responsibility to insure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer is in compliance with any law.

Preview: WebSphere On-Prem to Bluemix Cloud Migration



- Trial accounts are ok– no Bluemix charges

Notices and disclaimers continued

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM's products. **IBM expressly disclaims all warranties, expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a particular, purpose.**

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.

IBM, the IBM logo, ibm.com, Aspera®, Bluemix, Blueworks Live, CICS, Clearcase, Cognos®, DOORS®, Emptoris®, Enterprise Document Management System™, FASP®, FileNet®, Global Business Services®, Global Technology Services®, IBM ExperienceOne™, IBM SmartCloud®, IBM Social Business®, Information on Demand, ILOG, Maximo®, MQIntegrator®, MQSeries®, Netcool®, OMEGAMON, OpenPower, PureAnalytics™, PureApplication®, pureCluster™, PureCoverage®, PureData®, PureExperience®, PureFlex®, pureQuery®, pureScale®, PureSystems®, QRadar®, Rational®, Rhapsody®, Smarter Commerce®, SoDA, SPSS, Sterling Commerce®, StoredIQ, Tealeaf®, Tivoli® Trusteer®, Unica®, urban{code}®, Watson, WebSphere®, Worklight®, X-Force® and System z® Z/OS, are trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at: www.ibm.com/legal/copytrade.shtml.