

# Introduction to IBM Cloud

Lennart Frantzell

Developer Advocate with IBM in SF,  
Focusing on IBM Cloud, Blockchain, AI

8/30/2019

**IBM Developer**



## The platform for public, private and hybrid applications

IBM Cloud™ was designed to support the full range of applications: from modern, cloud-native apps and microservices to legacy, monolithic software and systems. Companies that choose IBM Cloud have the infrastructure they need to build new applications from scratch, modernize existing applications, or both.



### Public cloud

A broad range of compute choices: from bare metal and virtual servers, to serverless architectures, to Cloud Foundry apps, to Kubernetes containers.

- Support applications of any design
- Leverage Watson™ AI
- Power blockchain and IoT use cases



### Private cloud

The IBM Cloud Private platform includes a portfolio of containerized middleware offerings to extend cloud functionality throughout the enterprise.

- Build on a Kubernetes foundation
- Modernize enterprise software and apps
- Option to deploy on IBM Z® infrastructure



### Hybrid cloud

An integrated environment including public and private cloud, with supporting technologies for integration and multi-cloud management.

- Build, deploy and operate apps and services wherever they run best
- Get secure & seamless data portability

<https://www.ibm.com/cloud>

# IBM Cloud free tier

Get started for free with your Lite account. No credit card required. No time limits.

[Create your Lite account →](#)

## How it works

### Create a free Lite account

Lite accounts don't have an end date, don't require a credit card and provide limited access to a catalog of over 40 services, including IBM Watson® APIs.

### Upgrade to receive a USD 200 credit

When you upgrade to Pay-As-You-Go, you get access to the entire IBM Cloud™ catalog of over 190 services and a USD 200 credit, valid for 30 days, that can be applied to any service.

### Always free

After upgrading to Pay-As-You-Go, many IBM Cloud products have an ongoing free tier.

Kubernetes Service <span style="color: blue;">(1)</span>	Cloud Functions <span style="color: blue;">(1)</span>	Auto Scaling <span style="color: blue;">(1)</span>	Object Storage <span style="color: blue;">(1)</span>
<p><b>Free cluster</b> with 1 worker node</p> <p>Deploy secure, highly available apps in a native Kubernetes experience.</p> <p><a href="#">Learn more →</a></p>	<p><b>5 million</b> executions per month</p> <p>Execute functions in response to incoming events.</p> <p><a href="#">Learn more →</a></p>	<p>This is a free service.</p> <p>Automatically increase or decrease the compute capacity of your application.</p> <p><a href="#">Learn more →</a></p>	<p><b>25 GB</b> per month</p> <p>Provides flexible, cost-effective storage for unstructured data.</p> <p><a href="#">Learn more →</a></p>
Cloudant <span style="color: blue;">(1)</span>	Db2 <span style="color: blue;">(1)</span>	Apache Spark <span style="color: blue;">(1)</span>	Watson Assistant <span style="color: blue;">(1)</span>
<p><b>1 GB</b> of data storage</p> <p>A scalable JSON document database for web, mobile, IoT and serverless applications.</p> <p><a href="#">Learn more →</a></p>	<p><b>100 MB</b> of data storage</p> <p>A fully-managed cloud SQL database with a turbo-charged Db2® engine.</p> <p><a href="#">Learn more →</a></p>	<p><b>2</b> Spark executors</p> <p>Connect to your existing data sources or on-demand big data optimization of Object Storage for fast and large-scale data processing.</p> <p><a href="#">Learn more →</a></p>	<p><b>10,000</b> API calls per month</p> <p>Add a natural language interface to your application to automate interactions with your end users.</p> <p><a href="#">Learn more →</a></p>
Watson Discovery <span style="color: blue;">(1)</span>	Watson Speech to Text <span style="color: blue;">(1)</span>	Watson Text to Speech <span style="color: blue;">(1)</span>	API Connect <span style="color: blue;">(1)</span>
<p><b>1,000</b> documents per month</p> <p>Add a cognitive search and content analytics engine to applications.</p> <p><a href="#">Learn more →</a></p>	<p><b>100</b> minutes per month</p> <p>Converts the human voice into the written word using machine intelligence.</p> <p><a href="#">Learn more →</a></p>	<p><b>10,000</b> characters per month</p> <p>Synthesizes natural-sounding speech from text.</p> <p><a href="#">Learn more →</a></p>	<p><b>50,000</b> API calls per month</p> <p>Gain deep insights around API consumption from built-in analytics.</p> <p><a href="#">Learn more →</a></p>

# Why migrate applications to cloud?

## Why migrate applications to cloud?

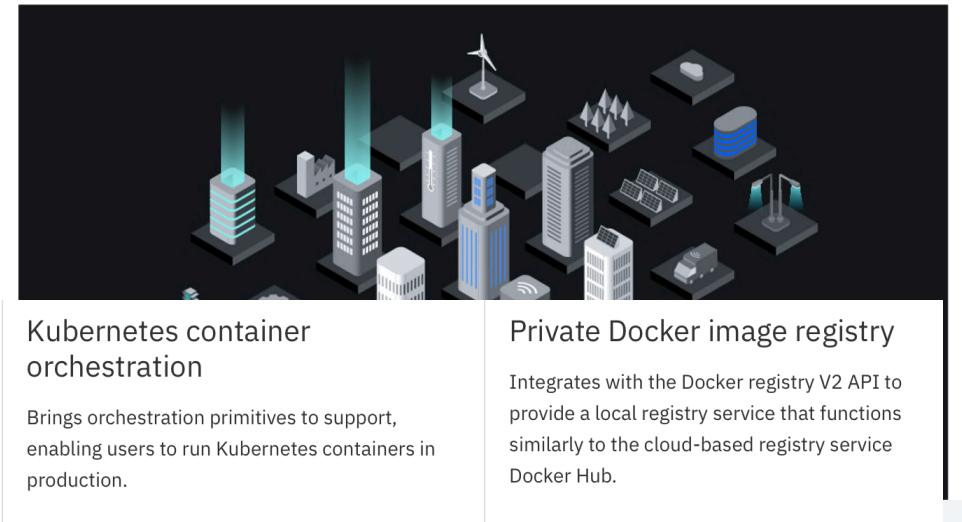
Cloud migration can modernize your workflows, improve performance and reduce work for your system administrators. If you're undecided about moving your applications to the cloud, consider these benefits:

- **Agility:** Offer IT resources on demand, providing users and business groups what they need rapidly, without having to acquire and deploy new hardware.
- **Scalability:** Why buy equipment to try to anticipate usage spikes? Cloud providers bill you only for the resources you use, so you can accommodate unexpected surges or seasonal usage patterns.
- **Ease of maintenance:** Pushing updates to individual computers, patching servers and provisioning new hardware are expensive and time-consuming tasks. Free your IT administrators to work on bigger projects and leave the infrastructure maintenance to your cloud provider.
- **Security:** Physical data center security together with state-of-the-art software security measures help safeguard your data. You gain the flexibility to manage security levels and select among a variety of security options.

# What is IBM Cloud Private?

IBM Cloud™ Private is a reliable and scalable cloud platform that runs on your infrastructure. It's built on open source frameworks, like containers, Kubernetes and Cloud Foundry. In addition, it offers common services for self-service deployment, monitoring, logging and security, and a portfolio of middleware, data and analytics.

To see the value IBM Cloud Private can bring you, read the [Forrester TEI Study](#).



## Key features and benefits

### Security

Helps ensure security for data in transit and data at rest across all platform services. All services expose network endpoints via TLS and encrypt data at rest.

### Kubernetes container orchestration

Brings orchestration primitives to support, enabling users to run Kubernetes containers in production.

### Private Docker image registry

Integrates with the Docker registry V2 API to provide a local registry service that functions similarly to the cloud-based registry service Docker Hub.

### A unified installer

Uses an Ansible-based installer to rapidly set up a Kubernetes-based cluster that contains master, worker, proxy, and optional management and Vulnerability Advisor nodes.

### Transformation advisor

Provides recommendations for your cloud journey by turning information about your environment and applications into insights.

### Monitoring and alerts

Configures Prometheus collectors for custom metrics. Custom metrics help provide insights and building blocks for customer alerts and dashboards.

# IBM Cloud Private

A range of deployment options, from private and public cloud to dedicated cloud, and a consistent experience across all of them

## Core operational services, including logging, monitoring and security

Flexibility to integrate with existing tools and processes

Containerized versions of IBM middleware provide prescriptive guidance to optimize workloads using your current apps, data, skills and infrastructure

Open Kubernetes-based container platform with Cloud Foundry for application development and deployment, along with DevOps toolchain integration

Integration capabilities to unlock your infrastructure and connect you with secure access to public cloud services like IBM Watson®, IBM Blockchain and more

# Unlock the power of AI with IBM Watson

Turn unstructured data into intelligence and competitive  
advantages

Take your first step

View all Watson offerings

<https://www.ibm.com/cloud/ai>

# Choose your Watson service

Use Watson for natural language processing, visual recognition and machine learning.

## Watson Studio

Build and train AI models, and prepare and analyze data, all in one integrated environment.

## Watson Discovery

Uncover connections in data by combining automated ingestion with advanced AI functions.

## Watson Text to Speech (TTS)

Convert written text into natural-sounding audio in a variety of languages and voices.

## Watson Natural Language Understanding

Analyze text to extract metadata from content such as concepts, entities and sentiment.

## Watson Personality Insights

Predict personality characteristics, needs and values through written text.

## Deep Learning

Design and deploy deep learning models using neural networks, easily scale to hundreds of training runs.

## Watson Knowledge Catalog

Intelligent data and analytic asset discovery, cataloging and governance to fuel AI apps.

## Watson IoT Platform

Leverage a fully managed, cloud-hosted service for device registration, connectivity, control, rapid visualization and data storage.

## Watson Language Translator

Dynamically translate news, patents or conversational documents.

## Watson Visual Recognition

Tag, classify and search visual content using machine learning.

## Data Refinery

A self-service data preparation tool for data scientists, engineers and business analysts.

## Watson Assistant

Build and deploy chatbots and virtual assistants.

## Watson Speech to Text (STT)

Easily convert audio and voice into written text.

## Watson Natural Language Classifier

Interpret and classify natural language with confidence.

## Watson Tone Analyzer

Analyze emotions and tones in written content.

## Watson Machine Learning

Create, train and deploy self-learning models using an automated, collaborative workflow.

# Run Watson APIs on any cloud!

IBM is excited to officially announce [Watson API Kit](#) on [IBM Cloud Pak for Data](#), which will allow clients to combine and utilize our Watson APIs anywhere – reaching data stored on-premises or in any private, public, hybrid or multi-cloud environment.

Our best-in-class Watson APIs, including [Watson Speech to Text](#), [Watson Text to Speech](#), [Watson Knowledge Studio](#) and [Watson Natural Language Understanding](#), are now available as add-ons for IBM Cloud Pak for Data.

[https://www.ibm.com/blogs/watson/2019/08/run-watson-apis-on-any-cloud/?cm\\_mmc=0Social\\_Twitter--HybridCloud\\_WatsonApplicationsandSolutions-\\_WW\\_WW-\\_RunWatsonAPIsonAnyCloud](https://www.ibm.com/blogs/watson/2019/08/run-watson-apis-on-any-cloud/?cm_mmc=0Social_Twitter--HybridCloud_WatsonApplicationsandSolutions-_WW_WW-_RunWatsonAPIsonAnyCloud)

# Blockchain in the Cloud



## BUILD

- Leverage our advanced Visual Studio (VS) Code extension for smooth integration between smart contract development and network management
- Transition seamlessly from development to test to production in a single environment with simplified DevOps
- Write smart contracts in JavaScript, Java, and Go languages



## OPERATE & GOVERN

- Manage all network components in one place, no matter where they are deployed
- No vendor lock-in: maintain complete control of your identities, ledger and smart contracts
- Deploy only the blockchain components you need (Peer, Ordering Service, Certificate Authority)



## GROW

- Start small, then pay as you grow for what you use – no upfront investment and upgrade easily through Kubernetes
- Connect a single peer to multiple industry networks with ease
- Connect to nodes running in any environment (on-premises, public, hybrid clouds)

# IBM Blockchain Platform in the IBM Cloud

The screenshot shows the IBM Blockchain Platform interface in the IBM Cloud. The top navigation bar includes 'Get started', a user icon, and a bell icon. The left sidebar has icons for Nodes, Peers, Certificate Authorities, and more.

**Nodes**

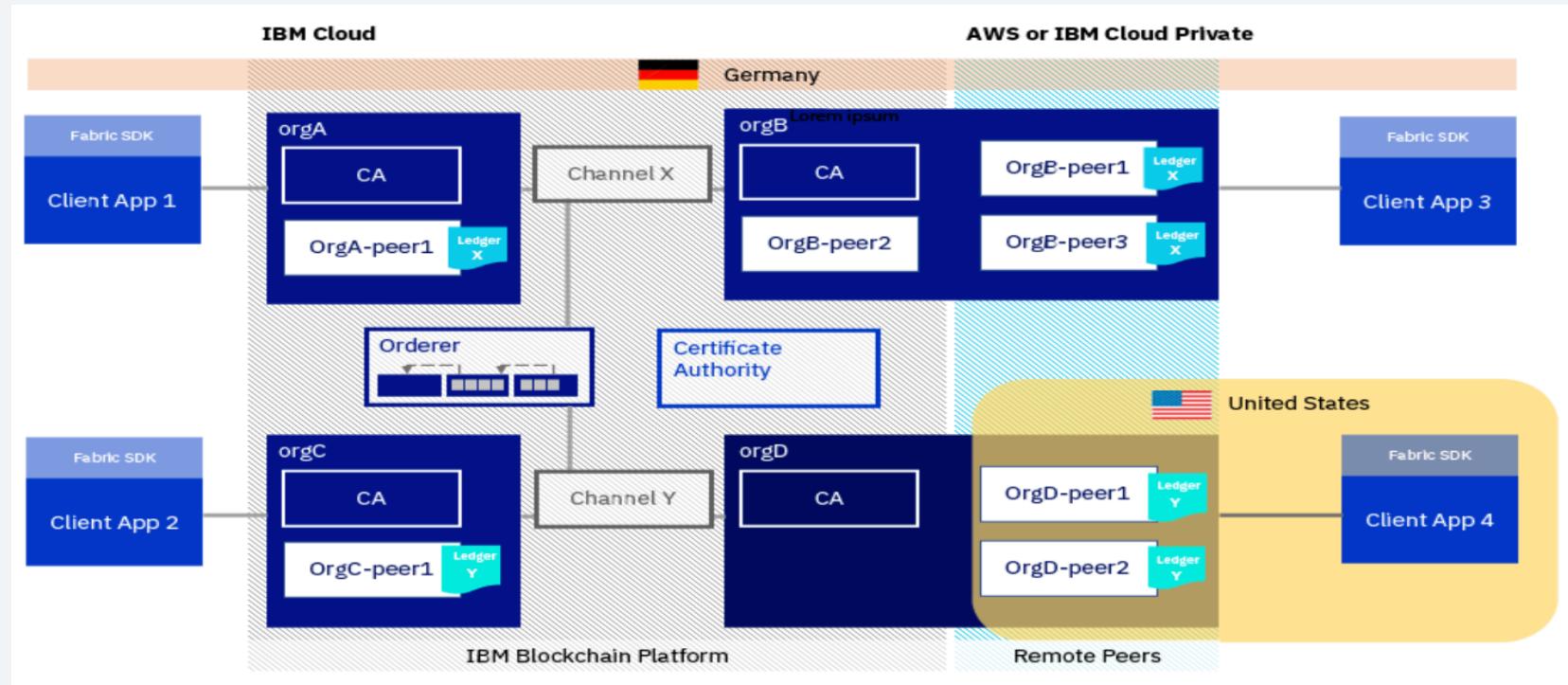
- DVI Euro - 1 Peer euroadmin Patch available IBM Cloud
- DVI Euro - 2 Peer euroadmin IBM Cloud
- DVI Euro - 3 Peer euroadmin IBM Cloud
- DVI Euro - Test Peer euroadmin IBM Cloud
- Add peer +

**Certificate Authorities**

- AP Credentials Certificate Authority Patch available IBM Cloud
- Dev Credentials Certificate Authority Patch available IBM Cloud
- Euro Credentials Certificate Authority Patch available IBM Cloud
- Staging Creden... Certificate Authority Patch available IBM Cloud
- Test Credentials Certificate Authority Patch available IBM Cloud
- US Credentials Certificate Authority Patch available
- Add Certificate Authority +

Cookie Preferences

# IBM Blockchain in Hybrid Cloud



# How many clouds will you use in the next three years? Hint: more than one.

Enterprises are adopting a hybrid, multicloud approach to enable greater flexibility and application modernization. This may **include the use of multiple cloud providers like IBM Cloud™, Amazon Web Services, Azure or Google Cloud, or traditional on-premises environments.**

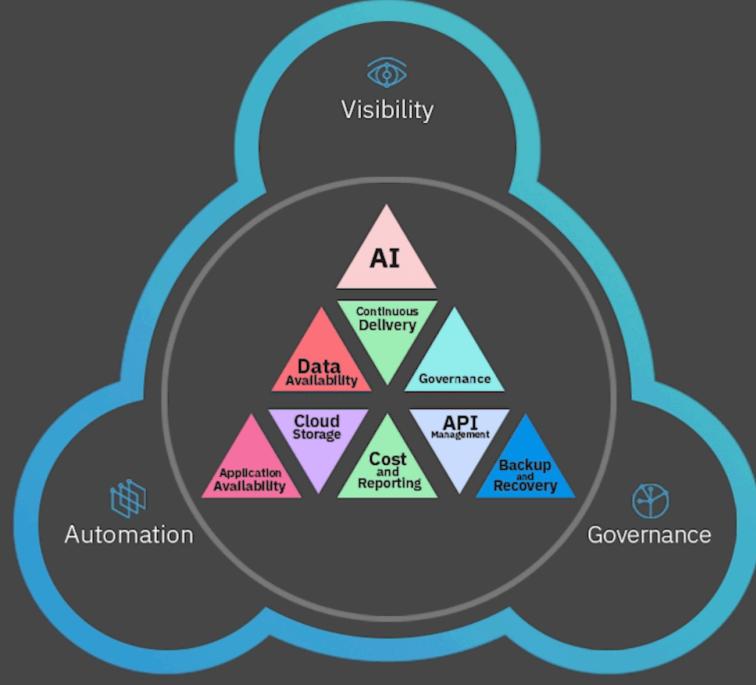
A hybrid, multicloud management framework can provide greater operational agility and power to identify, analyze and respond quickly to changes in these mixed environments.

# Manage traditional and multicloud environments across your enterprise

## Manage traditional and multicloud environments across your enterprise

The IBM Cloud management framework represents an open ecosystem supporting consistent management of a full application lifecycle.

This framework helps business leaders, developers, Site Reliability Engineers (SREs) and IT Operations to manage applications and resources across traditional and multicloud environments in ways that deliver visibility, automation and governance.



# The benefits of IBM hybrid cloud

Hybrid cloud improves on both public and private cloud by offering better flexibility and balance. With hybrid cloud, companies can more effectively manage speed and security, innovation with latency and performance. Every application and service can be deployed and managed where it makes the most sense.

[Sign up for IBM Cloud](#)

[Learn about IBM Cloud Private](#)

## Open platform

Build one Kubernetes container infrastructure for public and private cloud; place applications and workloads wherever they run best.

→ [Learn more about IBM Cloud Kubernetes Service](#)

## Integration solutions

Use cloud tools such as messaging, gateways and API management to bring together new applications with existing applications and workloads.

→ [Learn more about cloud integration](#)

## DevOps

Accelerate the development and deployment of hybrid applications with synchronous deployment of multiple components on public and private cloud.

→ [Learn more about IBM Cloud DevOps](#)

# IBM Agile Integration products



## IBM API Connect®

API creation and management with security-rich features and centralized governance.

→ [Learn more about managing and publishing your APIs](#)



## IBM App Connect

Integration solution with hundreds of built-in connectors for on-premises data systems and SaaS.

→ [Learn more about connecting cloud and on-premises applications](#)



## IBM MQ

Enterprise messaging that simplifies and accelerates the reliable and secure integration of data.

→ [Learn more about secure messaging](#)



## IBM DataPower® Gateway

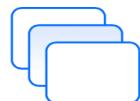
A single, multichannel gateway that helps integrate, manage and optimize mobile, web, APIs, SOAs and cloud workloads.

→ [Learn more about purpose-built gateways](#)



## IBM Secure Gateway Service

Create a persistent connection between on-premises or independent-party cloud environments and the IBM Cloud.



## IBM Event Streams

Empower real-time development with cloud-based messaging service built on Apache Kafka.



## IBM Aspera® on Cloud

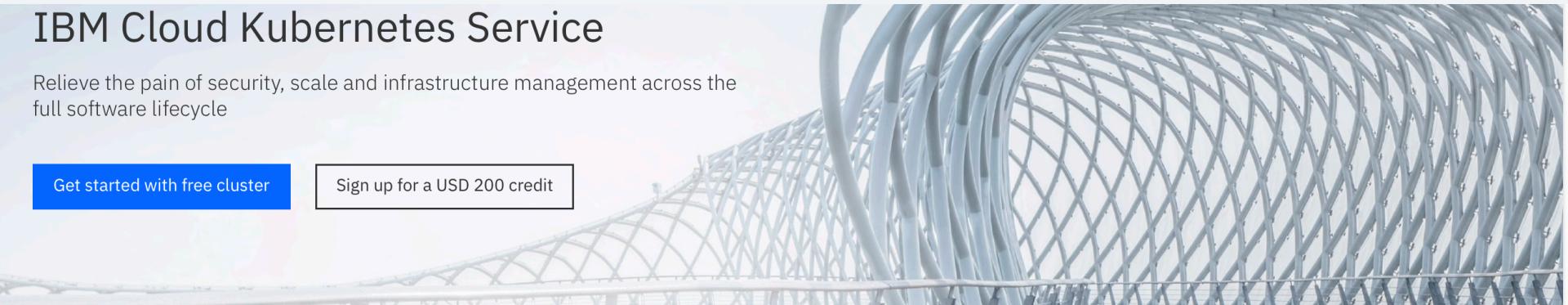
Transfer, exchange and automate the delivery of your large data across public, private and hybrid clouds at maximum speed.

# IBM Cloud Kubernetes Service

Relieve the pain of security, scale and infrastructure management across the full software lifecycle

[Get started with free cluster](#)

[Sign up for a USD 200 credit](#)



Managed Kubernetes

Deployment   Integration   Security

03:15

## What is IBM Cloud Kubernetes Service?

IBM Cloud™ Kubernetes Service is a managed container service for the rapid delivery of applications that can bind to advanced services like IBM Watson® and blockchain. As a certified K8s provider, IBM Cloud Kubernetes Service provides intelligent scheduling, self-healing, horizontal scaling, service discovery and load balancing, automated rollouts and rollbacks, and secret and configuration management. The Kubernetes service also has advanced capabilities around simplified cluster management, container security and isolation policies, the ability to design your own cluster, and integrated operational tools for consistency in deployment.

[→ Get the FAQs](#)

An overview of how a managed Kubernetes service can help you on your cloud journey

# IBM Cloud Integration

Create personalized customer experiences by easily connecting applications and data across multiple clouds

[Speak to an expert](#)

[Watch the webcast](#)



↓ Agile integration

↓ Cloud Pak for Integration

↓ Case studies

↓ Products

↓ Resources

# Typical scenarios of running IBM Cloud Private on Microsoft Azure

The following four “why” scenarios describe possible motivations for clients who are considering IBM Cloud Private for running on Azure infrastructure:

- 1) **Multi-cloud strategy.** Customers want to use the strength and unique offerings from different public cloud vendors....without cloud platform lock-in, **for example, running digital innovation on both IBM public cloud and Azure...**
- 2) **Cloud bursting.** ..... For example, certain Internet-facing applications may be more suited to be deployed to a public cloud....
- 3) **High Availability and Disaster recovery.** ...Using IBM Cloud Private as a consistent private cloud platform and provisioning it on Azure fits this use case nicely.
- 4) **Public cloud users with IBM Middleware workload.** IBM middleware investments are further extended with an application modernization strategy that can span public clouds.

# DevOps

Devops agile tools and practice: Ready for all clouds



## Continuous delivery

Release applications more often and with better quality.

## Software testing

Test earlier with production-like environments to help eliminate bottlenecks.

## Application performance management

Enhance application resilience and monitor application transformation from on premises to hybrid and multicloud deployments.

**UrbanCode** can enable continuous delivery for any combination of on-premises, cloud and mainframe applications by eliminating manual, error-prone processes.

## Benefits

Implementing a DevOps practice can add value to your organization through a number of benefits, including the following:

- Faster code delivery
- Faster time to market
- Higher-quality software
- Improved collaboration between developers and operations
- Decreased time to resolution for fixing bugs and vulnerabilities
- A culture that brings business, development, and operations together for improved responsiveness to market demands**

# Blue Green Deployment

## Blue Green Zero Downtime Continuous Deployment with IBM UrbanCode and IBM Cloud Private

Try out this lab to implement near zero downtime with a blue-green deployment strategy using IBM UrbanCode and deploying a sample application to a Kubernetes cluster. The duration of this lab is about 60 minutes.

Blue-green deployments provide a DevOps strategy for near zero downtime operations. It consists of a couple of load balanced environments labelled *blue* and *green*. When new versions of the application are deployed, the load balancer isolates traffic to one of the environments to allow the application upgrade minimizing impact with the live application. Canary testing can be conducted on the isolated environment and other verifications until it is ready to become live. Once it is live it can continue to be monitored. In case where the new version fails, this technique offers a convenient way to rollback by using the load balancer to redirect traffic to the previous version still running in the other environment.



## THE TWELVE-FACTOR APP

1. One codebase tracked in revision control, many deploys
2. Explicitly declare and isolate dependencies
3. Store config in the environment
4. Treat backing services as attached resources
5. Strictly separate build and run stages
6. Execute the app as one or more stateless processes
7. Export services via port binding
8. Scale out via the process model
9. Maximize robustness with fast startup and graceful shutdown
10. Keep development, staging and production as similar as possible
11. Treat logs as event streams
12. Run admin/management asks as one-off processes

# What are IBM Cloud Paks?

Beyond containers and Kubernetes, enterprises need to orchestrate their production topology, and to provide management, security and governance for their applications.

**IBM Cloud™ Paks are enterprise-ready, containerized software solutions that give clients an open, faster and more secure way to move core business applications to any cloud.**

Each IBM Cloud Pak™ runs on Red Hat® OpenShift® on IBM Cloud and Red Hat Enterprise Linux and includes containerized IBM middleware and common software services for development and management, on top of a common integration layer – designed to reduce development time by up to 84 percent and operational expenses by up to 75 percent.\*

# Cloud Paks

To help clients move more workloads, faster, to cloud and AI, IBM announces:

A family of Cloud Paks that give developers, data managers and administrators an open environment to quickly build new cloud-native applications, modernize/extend existing applications, and deploy middleware in a consistent manner across multiple clouds. Today, IBM introduces five new Cloud Paks: Cloud Pak for Applications, Cloud Pak for Data, Cloud Pak for Integration, Cloud Pak for Multicloud Management, and Cloud Pak for Automation that deliver IBM enterprise software and open source components in open and secure solutions that are easily consumable and can run anywhere.

based container orchestration platforms. In addition, these Cloud Paks provide resiliency, scalability, and integration with core platform services, like monitoring or identity management.

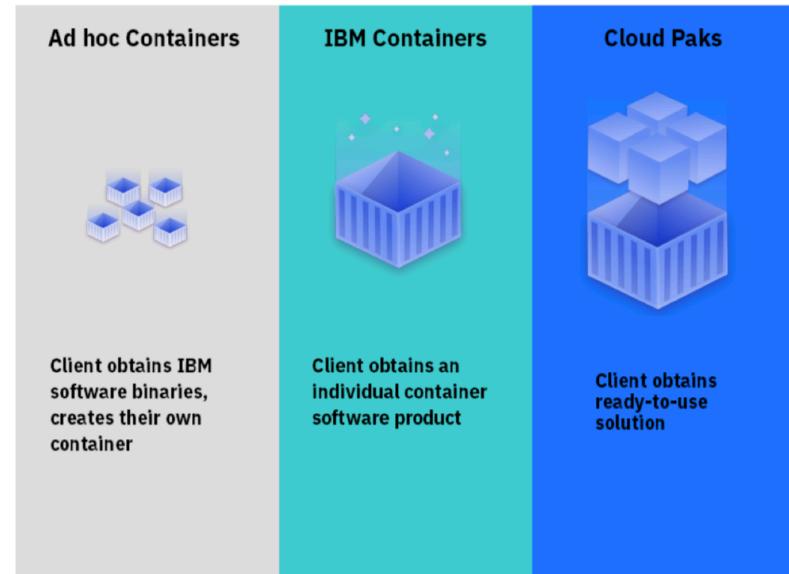


Figure 1. IBM software is supported and consumed as containers in 3 ways

# Red Hat OpenShift on IBM Cloud

Red Hat OpenShift  
on IBM Cloud

Sign up now for USD 200 credit

Sign up now for USD 200 credit

Get pricing

Red Hat  
OpenShift

## What is Red Hat OpenShift on IBM Cloud?

- Red Hat® OpenShift® on IBM Cloud™ is a comprehensive service that offers fully managed OpenShift clusters on the highly scalable and reliable IBM Cloud platform. It is directly integrated into the same Kubernetes service that maintains 250 billion on-demand forecasts daily at The Weather Company®.
- .....
- Move workloads and data more securely with Bring Your Own Key, Level 4 FIPS, and built-in industry compliance including PCI, HIPAA, GDPR, SOC1 and SOC2.
- Start fast and small using one-click provisioning and metered billing, with no long-term commitment.
- Red Hat OpenShift on IBM Cloud leverages IBM Cloud, so you can focus on developing and managing your applications. IBM handles the infrastructure, providing you with a highly-available, fully managed OpenShift cluster with the click of a button.

## Red Hat OpenShift

OpenShift is a family of containerization software developed by Red Hat.

Its flagship product is the [\*\*OpenShift Container Platform\*\*](#)—an on-premises platform as a service built around Docker containers orchestrated and managed by Kubernetes on a foundation of Red Hat Enterprise

# IBM transforms its software to run on any cloud with Red Hat

A few weeks after closing its landmark acquisition of Red Hat, IBM is delivering new cloud-native capabilities that will transform the way clients do business and accelerate their journey to the cloud.

## Overview

With Red Hat OpenShift on IBM Cloud, OpenShift developers have a fast and secure way to containerize and deploy enterprise workloads in Kubernetes clusters.

OpenShift clusters build on Kubernetes container orchestration that offers consistency and flexibility in operations. Because IBM manages OpenShift Container Platform (OCP), you'll have more time to focus on your core tasks.

# 1. IBM software products are now cloud-native for public and private clouds.

Working with clients, IBM has seen that a “one-cloud-fits-all” approach doesn’t work. Companies want the flexibility to run their workloads across any platform without having to rewrite everything as they go.

To meet this need, IBM has announced that it has transformed its software portfolio to be cloud-native, meaning an application that consists of discrete, reusable components that are designed to integrate into any cloud environment.

These new cloud-native capabilities will be delivered as pre-integrated solutions called **IBM Cloud Paks**—containerized software that is designed to offer a faster, more reliable way to build, move and manage on the cloud.

## 2. IBM's software portfolio can run anywhere Red Hat OpenShift runs.

IBM has also optimized its expansive software portfolio for Red Hat. This includes more than 100 products that can now run anywhere that OpenShift, Red Hat's container application platform, runs.

By making its software cloud-native and optimizing it for Red Hat, clients can now select the best architecture and approach to address the most critical application, data and workload requirements for their business.

To further propel IBM as a strategic hybrid cloud vendor, we also announced: Red Hat OpenShift on IBM Cloud; Red Hat OpenShift on IBM Z and LinuxOne; and Consulting and technology services for Red Hat.

All of the software and services will be delivered on IBM's hybrid multicloud platform, which is built on open source technologies, including OpenShift, as well as Red Hat Enterprise Linux, the world's leading enterprise Linux platform.

# The IBM Garage and Garage Methodology

The IBM Garage™ is IBM's center for high-impact, client-centric innovation. The IBM Garage engages diverse, empowered teams that partner with you to apply purposeful technologies to quickly create and scale new, innovative ideas that can dramatically evolve your business to its next chapter.

Foundational to the IBM Garage is a unique methodology that curates the best practices in the industry, layered with a depth of experience only IBM can bring. Combine that with the right people — from across IBM, your team and our ecosystem — useful data, applied technology and intentional spaces, the IBM Garage can drive unprecedented transformational change.

With an IBM Garage experience, you can move faster, work smarter, ideate more rapidly and fundamentally change the way you work.



© Copyright IBM Corporation 2019. All rights reserved. The information contained in these materials is provided for informational purposes only, and is provided AS IS without warranty of any kind, express or implied. Any statement of direction represents IBM's current intent, is subject to change or withdrawal, and represents only goals and objectives. IBM, the IBM logo, and other IBM products and services are trademarks of the International Business Machines Corporation, in the United States, other countries or both. Other company, product, or service names may be trademarks or service marks of others.