BPTrends ARTICLE

IBM Cloud: A Private Cloud Story
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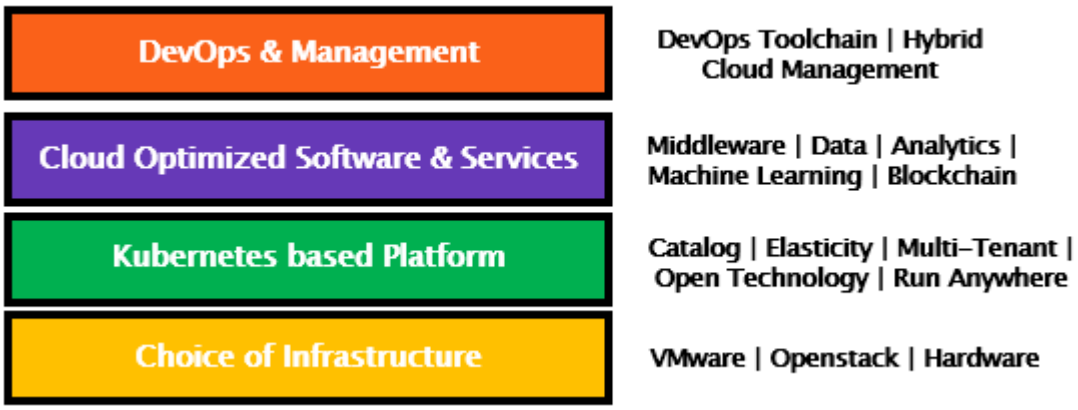
Overview

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, with common services for self-service deployment, monitoring, logging and security, as well as a IBM portfolio of middleware, data and analytics. With IBM Cloud Private platform, development and administrative teams share a flexible cloud environment behind their firewalls to create new microservices-based applications, modernize existing apps using cloud-enabled middleware and securely integrate between the two. IBM Cloud Private complements the IBM Cloud by providing consistent runtimes, services and management capabilities.

IBM Cloud Private has been certified for primary infrastructure (server, network & storage) providers, including Dell, NetApp, Cisco and Lenovo, as well as IBM Power Systems and IBM Z. With a consistent underlying Kuberentes-based platform, IBM has enabled key elements of its existing and new middleware, data and analytics portfolio to take advantage of the platform capabilities, including rapid provisioning and de-provisioning of applications, portability between the enterprise and the cloud, improved resource usage and simplified management. Additionally, IBM provides and supports several key open source technologies, including MongoDB and Postrges. Since the platform is based on open technologies, it allows enterprises to also take advantage of a growing ecosystem of software and services that have been enabled for Kubernetes.

IBM Cloud Private is offered in three pricing tiers: Community Edition, Cloud Native and Enterprise. All three tiers provide an integrated environment for managing containers that includes the Kubernetes container orchestrator platform, a private Docker image repository, a management console, and monitoring frameworks.

- Single Platform for new cloud native application development and optimization of existing applications
- Choice of application development models for cloud native development
- Accelerate application and middleware modernization with catalog of container based middleware, data & analytics
- Minimize risk by reducing changes to existing applications while leveraging platform and middleware for availability elasticity and cost.
- Integrate within the enterprise and public cloud using the API Connectivity management
- Runs on existing hardware on premise to address security, compliance, risk and cost.



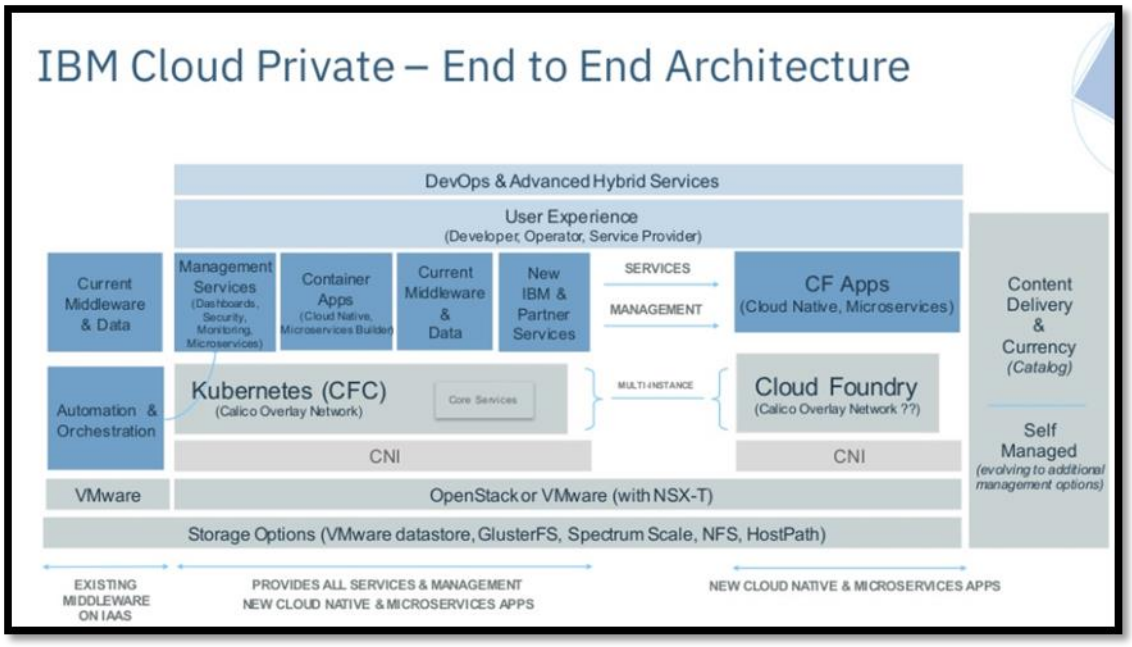
IBM ICPs Architecture Tiers

Platform Architecture

IBM, Cloud Private's key capabilities include:

1. **Infrastructure services**– Cloud Private is compatible with systems from manufacturers including Cisco, Dell EMC, Intel, Lenovo and NetApp. The solutions are also optimized for IBM Z Systems mainframes, IBM Power Systems, IBM Hyperconverged Systems powered by Nutanix software, and IBM Storage's Spectrum Access data management and infrastructure solutions. Cloud Private can be deployed via VMware, Canonical and other OpenStack distributions or on bare metal servers.
2. **Core cloud platform** – Leveraging the most common PaaS technologies and developer runtimes, the platform includes cloud-native features, including a container engine, Kubernetes orchestration, Cloud Foundry, and essential, fully integrated and automated management tools.
3. **Data and analytics** – IBM Cloud Private supports developer services for IBM Db2, IBM Db2 Warehouse, PostgreSQL and MongoDB advanced analytics capabilities.
4. **Differentiated application and integration services** – The platform is available on-premises and can be complemented with public cloud services, as well as new containerized versions of software and development frameworks. Those include IBM WebSphere, Open Liberty, MQ, and Microservice Builder which provide developers the tools to build, manage and support sophisticated applications. Also included are integration services for API and service interoperability spanning multiple public clouds.
5. **Developer tools** – Cloud Private enables access to management and DevOps tools, including APM, Netcool, Urban Code and Cloud Brokerage, that can be used to manage the lifecycle

across any cloud environment. The platform also supports popular open-source management tools, such as Jenkins, Prometheus, Grafana, and Elastic Search.



IBM Cloud Private Architecture

Platform Components

IBM Cloud Native Landscape is meant to provide enterprises, organizations, developers and sysadmins guidance on the tools for the Cloud-native products and projects.
Examples:

In a Cloud-native world, databases are meant to be consumed in a "as a Service" model and IBM has tons of enterprise-ready DBaaS such as Cloudant, Compose, and Db2-on-Cloud, all managed and supported with solid SLAs.
For monitoring, traceability and logging IBM supports the likes of ELK, Zipkin, and Prometheus stacks alongside IBM Application Performance Management.

For persistence and data consistency, IBM provides multiple Cloud-native Storage solutions such as IBM Cloud Object Storage and IBM Spectrum Scale. IBM also supports GlusterFS deployments.

For service discovery, ingress, load balancing and service mesh, IBM supports NGINX and more recently, Itsio, an effort led by Google, IBM and Lyft to provide management, security and traffic flow for microservices.

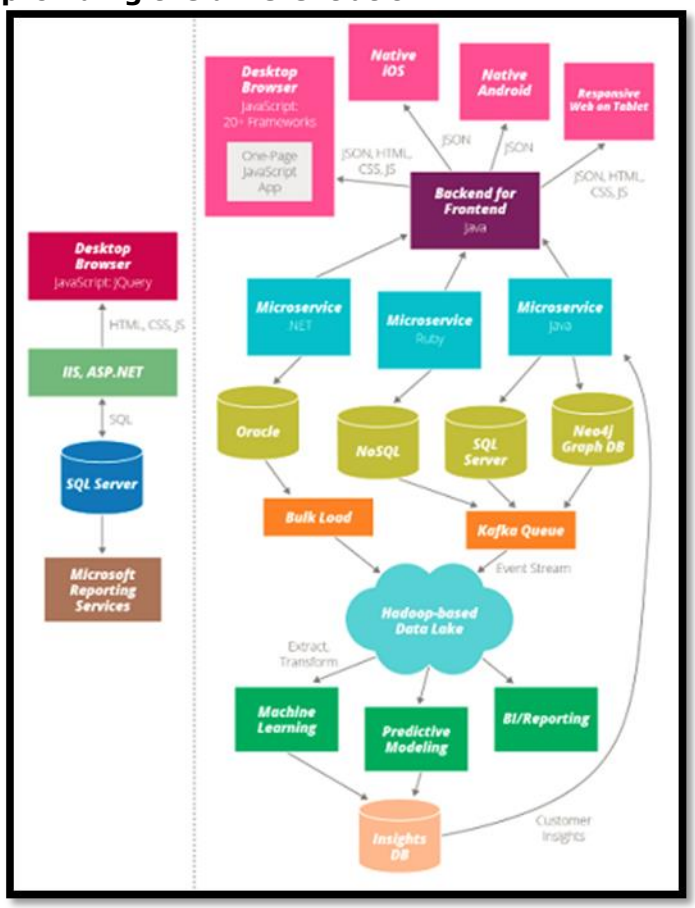
The list below shows the different components that are either IBM branded, used within IBM products such as IBM Cloud Private, IBM Cloud Platform (Public), or supported and backed by IBM either through open source communities or foundations.

Capability	Component	Framework Options
Database & Development	Database, Streaming & Analytics	IBM DB2, Cloudant, MySQL, PostgreSQL, ElephantSQL, Apache Spark, Redis, MariaDB, ClearDB, MongoDB, Hadoop, Compose for ElasticSearch, Compose for Etcd, Compose for MySQL,Compose for JanusGraph, Compose for MongoDB, Compose for ScyllaDB, Compose for Redis, Compose for PostgreSQL
	Application Definition, Source Code Management, CI/CD	GitLab, GitHub, Jenkins, UrbanCode, Continuous Delivery, Globalization Pipeline, DevOps Insights, Continuous Release, Microservices Builder, Compose, IBM Container Registry
Orchestration & Management	Scheduling & Orchestration	Kubernetes, IBM Cloud Container Service, CloudFoundry, SWARM, VMware
	Coordination, Service Discovery & Service Mesh	Istio, NGiNX, HA Proxy, Netfilter
	Monitoring	Prometheus, Grafana, Application Performance Monitoring, Availability Monitoring, New Relic, PagerDuty
	Tracing and Logging	ELK Stack, Zipkin, Log Analysis, Alert Notification, Cloud Event Managements
Connectivity & Integration	Gateway & Security	IBM DataPower, IBM API Connect, IBM Secure Gateway
	Messaging	IBM MQ, Compose for RabbitMQ, IBM Message Hub, Kafka
	Integration	IBM AppConnect, IBM Integration Bus
Runtime & Infrastructure	Cloud Native Storage	IBM Cloud Object Storage, IBM Spectrum Scale, IBM Spectrum Virtualize, IBM Spectrum Accelerate, Gluster, Swift, Hadoop HDFS
	Cloud Native Network	Calico, VMware NSX, Tigera, OvS Open vSwitch
	Runtime & Frameworks	WebSphere Application Server, Open Liberty, Strong Loop, Microprofile, .Java Liberty, .rb, .py, .js, .php, .net, .swift, .go
Platforms & Provisioning	Host Management Tooling	Chef, Ansible
	Infrastructure Automation	Terraform, IBM Cloud Semantics, Open Stack, Helm, Bosh
	Platforms	Docker, IBM Cloud Functions, Apache OpenWhisk

IBM Cloud Private Catalog

Next Generation Application Architectures

Single vendor solutions are a thing of the past and technology, in many forms, drives differentiation and disruption. The era where applications were build leveraging a single framework like a Dot Net for Java EE is legacy and more and more applications need to leverage various tools and frameworks to deliver not just the core services but also innovation and strategic capabilities. This is where a platform like IBM ICP will be the differentiator which encompass capabilities from both worlds i.e Enterprise as well and Open Source. **Each of components/framework elements of the IBM ICP platform will bring in different benefits as part of the target architecture providing the differentiation.**



Legacy Application Vs Next Generation Applications

Key Use Cases for IBM Cloud Private Platform

There are three main use cases where IBM Cloud Private can help solve your business challenges:

Create new cloud-native apps: Easily design cloud-native applications and meet the necessary regulatory and management requirements.
Modernize your existing apps on cloud: Reconstruct your application estates to rapidly meet today's highly dynamic business environment.
Open your data centre to work with cloud services: Create apps in the private cloud while integrating data & application services from the enterprise and other clouds.
Cloud-enabled middleware: Optimize applications to work with the cloud.
Integration and hybrid cloud: Open data centres to work with cloud services.

IBM Cloud Private provides a common and consistent platform for enterprises to rapidly innovate while retaining the flexibility to use public clouds and services. It provides this while also integrating with business-critical applications, data and processes.

Key Competitors

The competitors for IBM Cloud Private are as follows:

RedHat - OpenShift
AtoS - AMOS
Oracle - Cloud Platform
SAP - Cloud Platform
VMWare – EMC Pivotal Cloud Foundry

Author

Sameer is a Solution Architect with IBM GBS (Global Business Services). He is responsible for the Presales, IT Strategy and Business Case Development for Commerce Solutions. Sameer has worked with fortune 100 organizations to advise their Business and Technical leaders on roadmaps to successful technology adoption strategies. Sameer is regarded as a creative and out-of-the-box-thinker. He has an in-depth understanding of a variety of systems and is able to articulate advantages and disadvantages of each as they relate to a customer's business model. Sameer has extensive experience in the ICT industry and has worked extensively in the U.S., UK, Europe, Asia Pacific and the Middle East regions.

