Cloud Computing V2

IBM Cloud compute choices

IBM Cloud service models

IaaS is a cloud computing model in which a vendor provides users access to computing resources, such as servers, storage, and networking. Organizations use their own platforms and applications within a service provider's infrastructure.

PaaS is a cloud computing model that provides users with a cloud environment in which they can develop, manage, and deliver applications. In addition to storage and other computing resources, users can use a suite of prebuilt tools to develop, customize, and test their own applications.

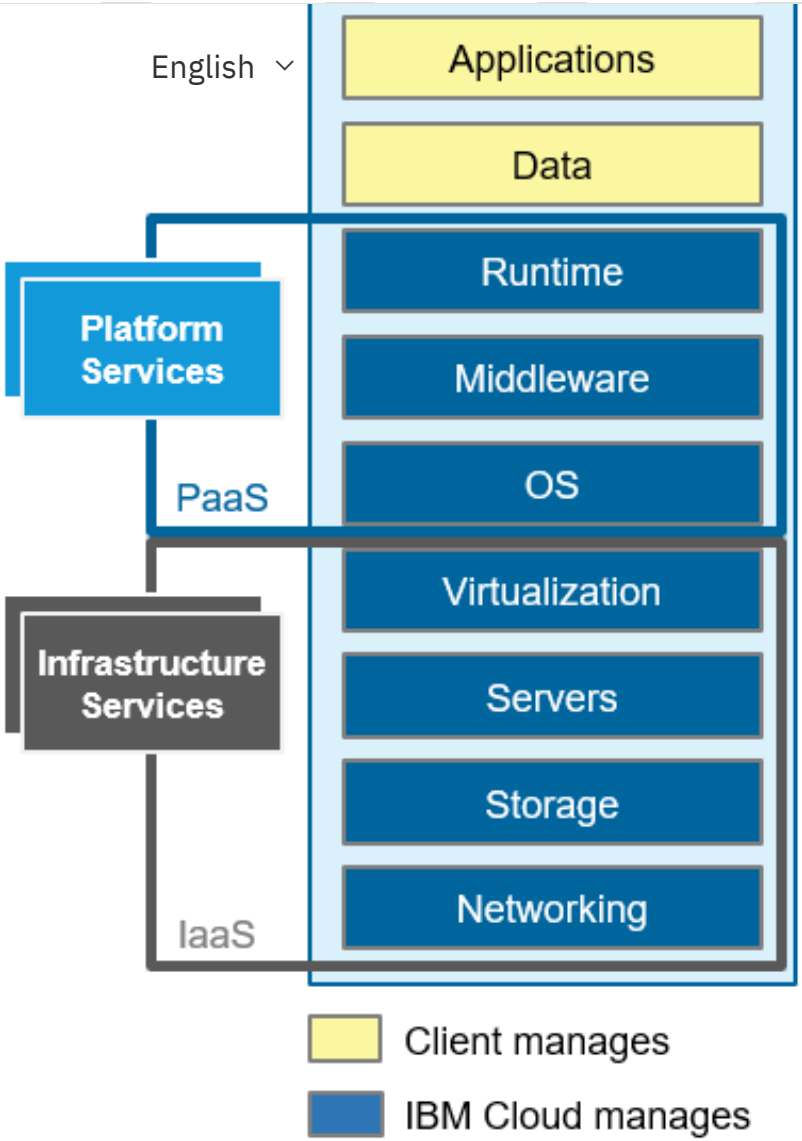

Figure 1. PaaS and IaaS

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- IBM Cloud enables you to deploy a high-performance compute and storage infrastructure in over 60 IBM Cloud data centers around the world that are automated and standardized to provide a seamless global platform for cloud resources.
- In addition to virtual servers, IBM Cloud offers bare metal servers, which provide the raw horsepower that many organizations require for processor-intensive and disk I/O-intensive workloads. Many organizations favor IBM Cloud because of the easy access it provides to bare metal servers.
- IBM Cloud also allows you to deploy containers, storage, and networking resources across the worldwide data centers.
- A catalog of services enables you to deploy, access, and manage the deployed infrastructure.

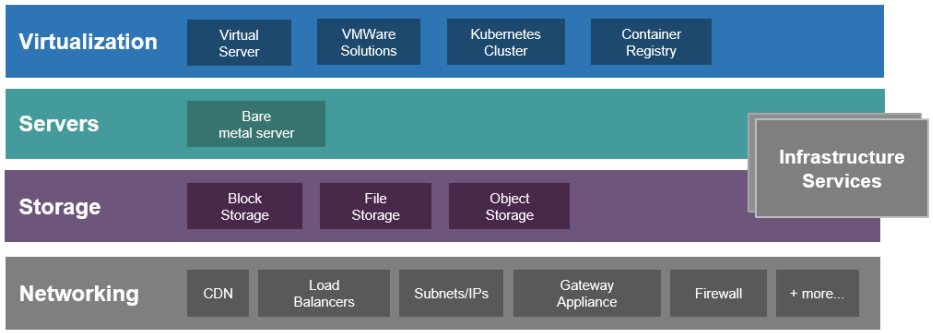

Figure 2. IaaS in IBM Cloud

Platform as a service from IBM Cloud

As a PaaS provider, IBM Cloud allows you to build, manage, and run applications, such as web, mobile, big data, smart devices, and IoT. IBM Cloud PaaS uses Cloud Foundry, which is an open PaaS offering that

data, smart devices, and IoT. IBM Cloud PaaS uses Cloud Foundry, which is an open PaaS offering that provides a choice of clouds, frameworks, and application services.

- Extends Cloud Foundry with services from IBM and IBM Business Partners.
- Provides a scriptable command-line interface (CLI).
- Provides integration with development tools to ease the deployment process. DevOps services provide an online code editor, a build pipeline, and a version control system.

IBM Cloud runs on IBM Cloud data centers locations around the world.

IBM Cloud enables application developers to focus on application capabilities by providing the following resources on the cloud:

- Runtimes on which to run applications.
- A catalog of selectable services, such as databases, mobile support, analytics, AI, and security, which are used to build applications.
- Ability to integrate with data from the organization and traditional workloads that are running in on-premises systems.
- DevOps capabilities and tools, including code editors, version control, deployment pipelines, and hosting, monitoring, and scaling apps.

Integration services allow applications to access traditional workloads that are running in the organization's on-premises environment.

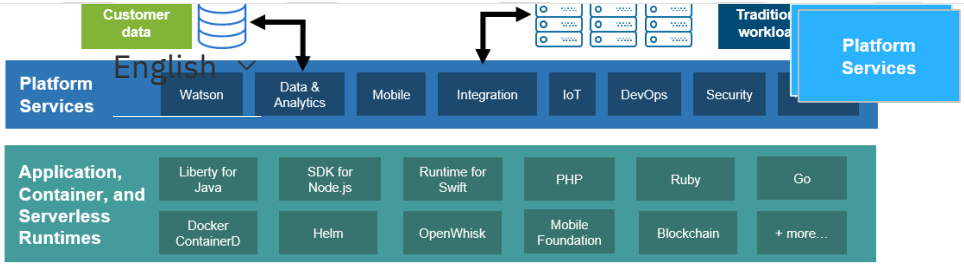

Figure 3. PaaS in IBM Cloud

IBM Cloud: Choices

With IBM Cloud, developers are given a choice of runtimes on which to run their applications. A *runtime* is a set of computing resources that are used to run an application. IBM provides five main ways to deploy, run, and scale workloads:

1. Bare metal servers: High-performance cloud servers that can be configured as hourly and monthly options.
2. Virtual servers.
3. Containers.
4. Platforms (Cloud Foundry).
5. Serverless.

Figure 4. PaaS in IBM Cloud

IBM Cloud: Choice of compute

IBM Cloud provides developers with multiple choices to deploy and run workloads:

- Bare metal servers: bare metal servers provide users with sole access to the entire server. Unlike a virtual server with multiple tenants, the bare metal server is single tenant and offered without a hypervisor, which eliminates the “noisy neighbor” effect and any performance “tax” from the hypervisor. Bare metal servers can be acquired in a preconfigured form or custom-configured to exact specifications.
- Virtual servers: Virtual servers are scalable and come with dedicated core and memory allocations that can be added in minutes, with access to features like image templates. The hypervisor is fully managed by IBM Cloud, and developers can perform configuration and management tasks by using both the IBM Cloud customer portal and the API. Virtual servers are deployed to the same VLANs as physical servers, allowing developers to spread workloads across virtual servers and bare metal servers while maintaining interoperability. Virtual servers are fully customizable with options to scale up as your compute needs grow.
- Containers: IBM Cloud Kubernetes Service is a managed container service for the rapid delivery of applications that can bind to advanced services such as IBM Watson and blockchain. As a certified

Kubernetes provider, IBM Cloud Kubernetes Service provides intelligent scheduling, self-healing,

management, container security and isolation policies, the ability to design your own cluster, and integrated operational tools for consistency in deployment.

Compute (bare metal, virtual servers, and containers) allow the developers to have total control of the compute and platform that deploys and runs the workloads with granular control over the scalability, customization, and management.

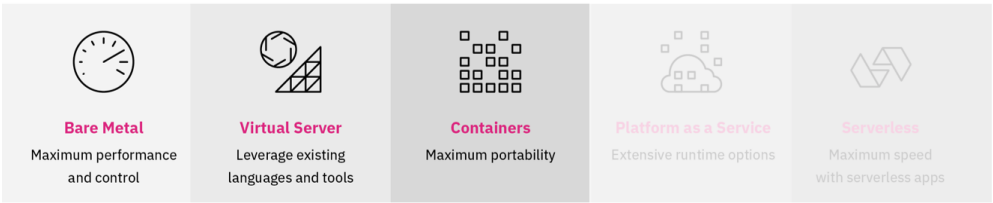

Figure 5. IBM Cloud: Choice of Compute

IBM Cloud: Choice of runtime

IBM Cloud provides developers with two choices to bootstrap and run applications:

- Platforms (IBM Cloud Foundry): Cloud Foundry is the premier industry standard PaaS that ensures the fastest, easiest, and most reliable deployment of cloud-native applications. Cloud Foundry ensures that the build and deploy aspects of coding remain carefully coordinated with any attached services, which result in quick, consistent, and reliable iterating of applications. The IBM runtimes include Liberty for Java, SDK for Node.js, and Runtime for Swift. IBM Cloud and Cloud Foundry support more runtimes through the Community Buildpacks. This open source community features written buildpacks for other runtimes, such as Go, PHP, Python, Ruby, and Tomcat.

demand. IBM Cloud Functions provides access to the Apache OpenWhisk infrastructure in which anyone can contribute their action code as building blocks to the expanding repository.

Run times (Cloud Foundry and Cloud Functions) allow the developers to focus on development and delegate management to the cloud provider (development and deployment of 12-factor apps).

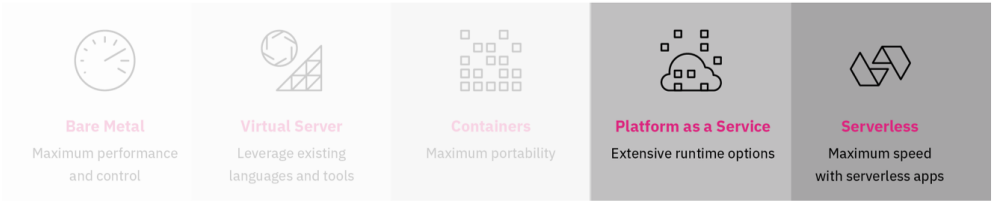

Figure 6. IBM Cloud: Choice of runtime

IBM Cloud: Services

IBM Cloud provides a broad range of pre-built services (from IBM and third-party providers) that can be used when assembling your application:

- Watson services enable you to add the power of AI to your application with speech, vision, and natural language processing (NLP) APIs.
- Data & Analytics services help you to get data from integrated cloud databases, build data-driven applications, and analyze your data.

In addition, services in the following categories help you to develop key features within your application:

- Integration services:

- APIs: Create, manage, enforce, and run APIs.

- Mobile: Use a mobile back-end infrastructure to build, monitor, and test mobile apps.

- IoT: Communicate with connected devices, sensors, and gateways.
- Functions: Run in response to incoming events (based on Apache OpenWhisk).
- Application services: Many application services, such as IBM Blockchain, Message Hub, WebSphere Application Server, Business Rules, and other application services on the cloud.
- DevOps: Tools to help innovate new applications faster and cheaper.
- Security: Build security into your application design.

Infrastructure services help you to manage the underlying infrastructure on which your application runs.

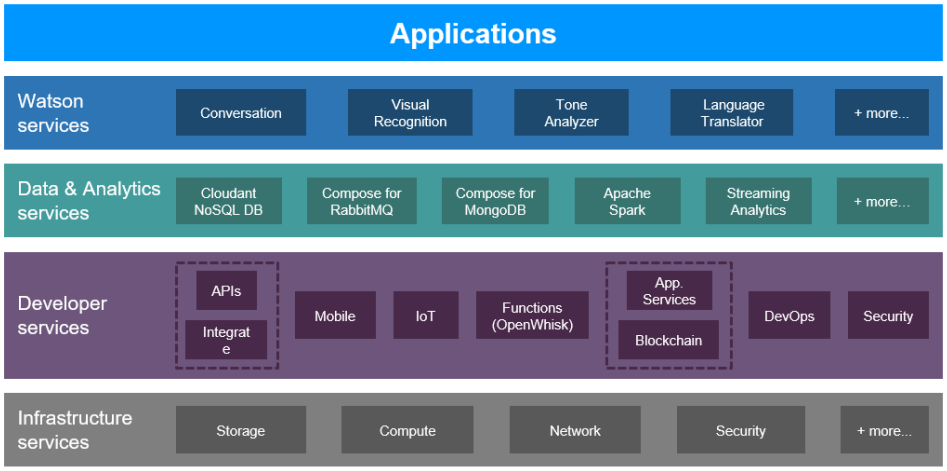

Figure 6. IBM Cloud: Services