

IBM Cloud

IBM  
CODE  
—

# Cloud Computing

- An estimated 85% of new software is being built for cloud deployment
- Cloud Computing is a broad term that describes a range of services
- Infrastructure as a Service (IaaS)
  - Hardware / software – servers, storage, networks, operating systems
- Platform as a Service (PaaS)
  - Set of tools and services designed for application development
- Software as a Service (SaaS)
  - Designed for end users, delivered over the web



# IBM Cloud

The most advanced cloud platform that weaves together services, infrastructure, and data to rapidly bring your ideas to production.



**Third-party**

Name	Route	Memory (MB)	State
demo-nodered-tor18	demo-nodered-tor18...	256	Running (V1)
node-cloudant-tor18	node-cloudant-tor18...	256	Running (V1)

Name	Service Offering	Plan
demo-nodered-tor18-cloudantNoSQLDB	Cloudant NoSQL DB	Lite
node-cloudant-tor18-cloudantNoSQLDB		Lite



**IBM**



**Open source**



**Your own**

# IBM Cloud



Open-standard, cloud-based platform for building, managing, and running applications of all types (web, mobile, big data, new smart devices, and so on)



## Go Live in Seconds

The developer can choose any language runtime or bring their own. Zero to production in one command.

## DevOps

Development, monitoring, deployment, and logging tools allow the developer to run the entire application.

## APIs and Services

A catalog of IBM, third party, and open source API services allow the developer to stitch an application together in minutes.

## Layered Security

IBM secures the platform and infrastructure and provides you with the tools to secure your apps.

## On-Prem Integration

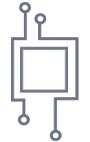
Build hybrid environments. Connect to on-premise assets plus other public and private clouds.

## Flexible Pricing

Sign up in minutes. Pay as you go and subscription models offer choice and flexibility.

# What IBM Cloud offers

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## Compute

Offerings spanning from bare metal to serverless programming

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## Hybrid

Delivered across public, dedicated, and on-premises deployment models

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## Global

Available in nearly 60 IBM Cloud data centers around the globe

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## Services

Offers over 170 composable services across Watson, data, mobile, IoT, and DevOps

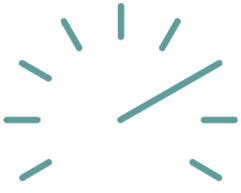
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## Open

Built on open standards and architecture

# Flexible compute options



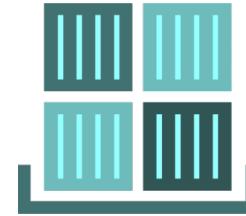
## Bare Metal

Maximum performance and control



## Virtual Server or VMware

Leverage existing languages and tools



## Containers

Maximum portability



## Cloud Foundry

Open PaaS environment

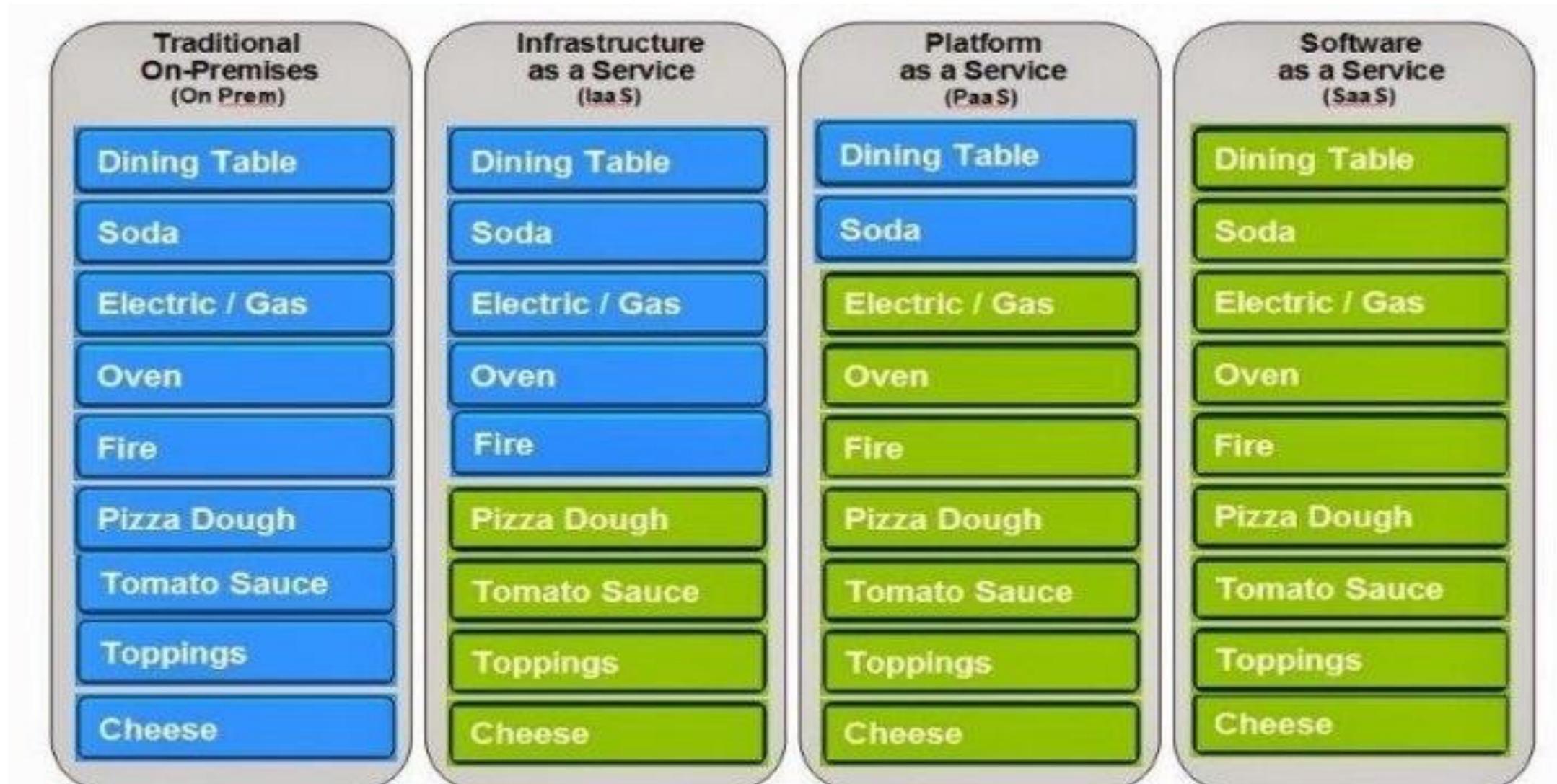


## Cloud Functions

Maximum speed with server-less apps



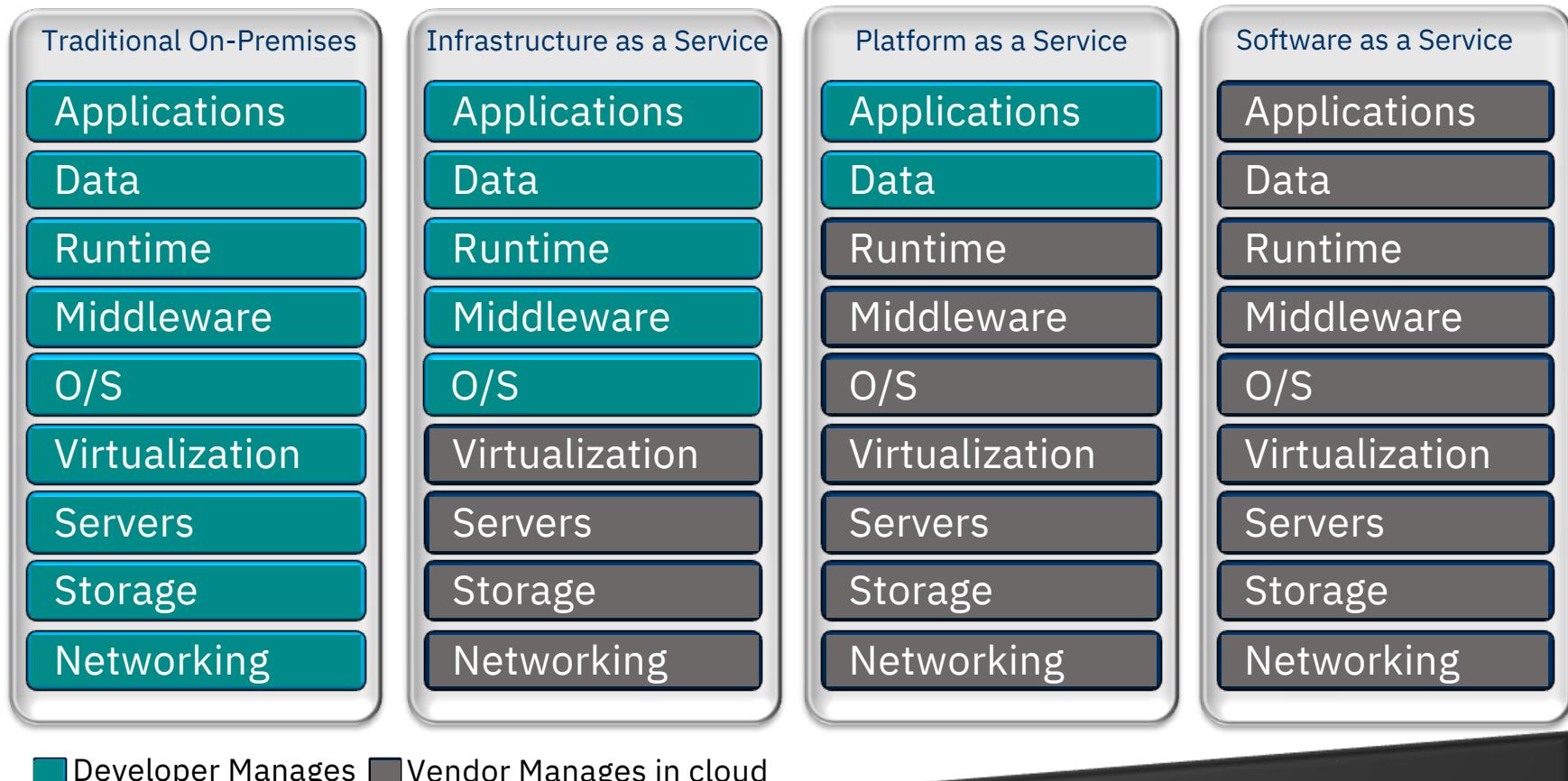
# Pizza as a service



# From on-premises to IBM Cloud compute and services

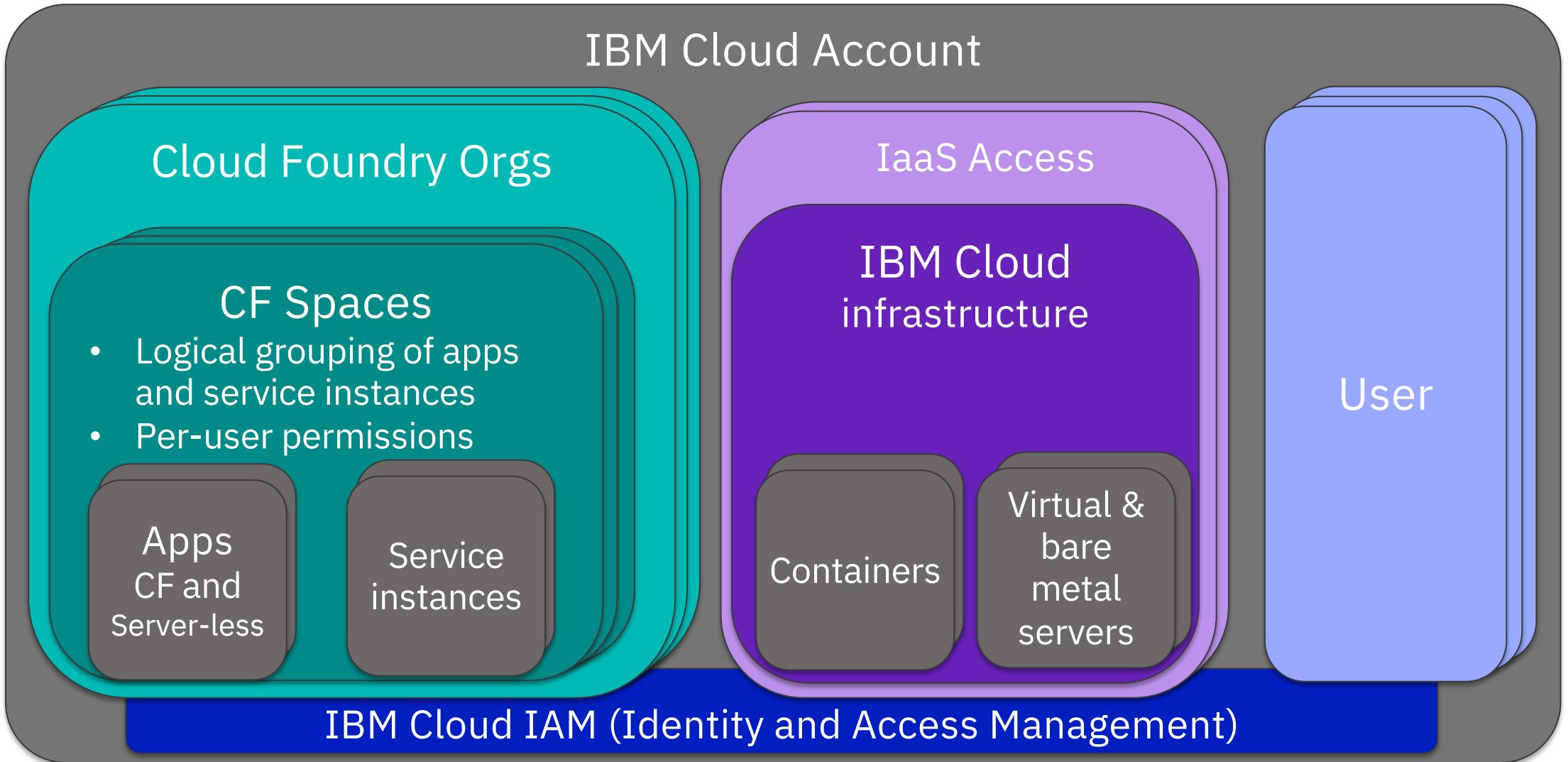
IBM Cloud PaaS environments **simplify** various tasks compared to on-premises or IaaS

- Health management
- Load balancing
- Scaling
- Deployment
- OS patching
- OS security hardening



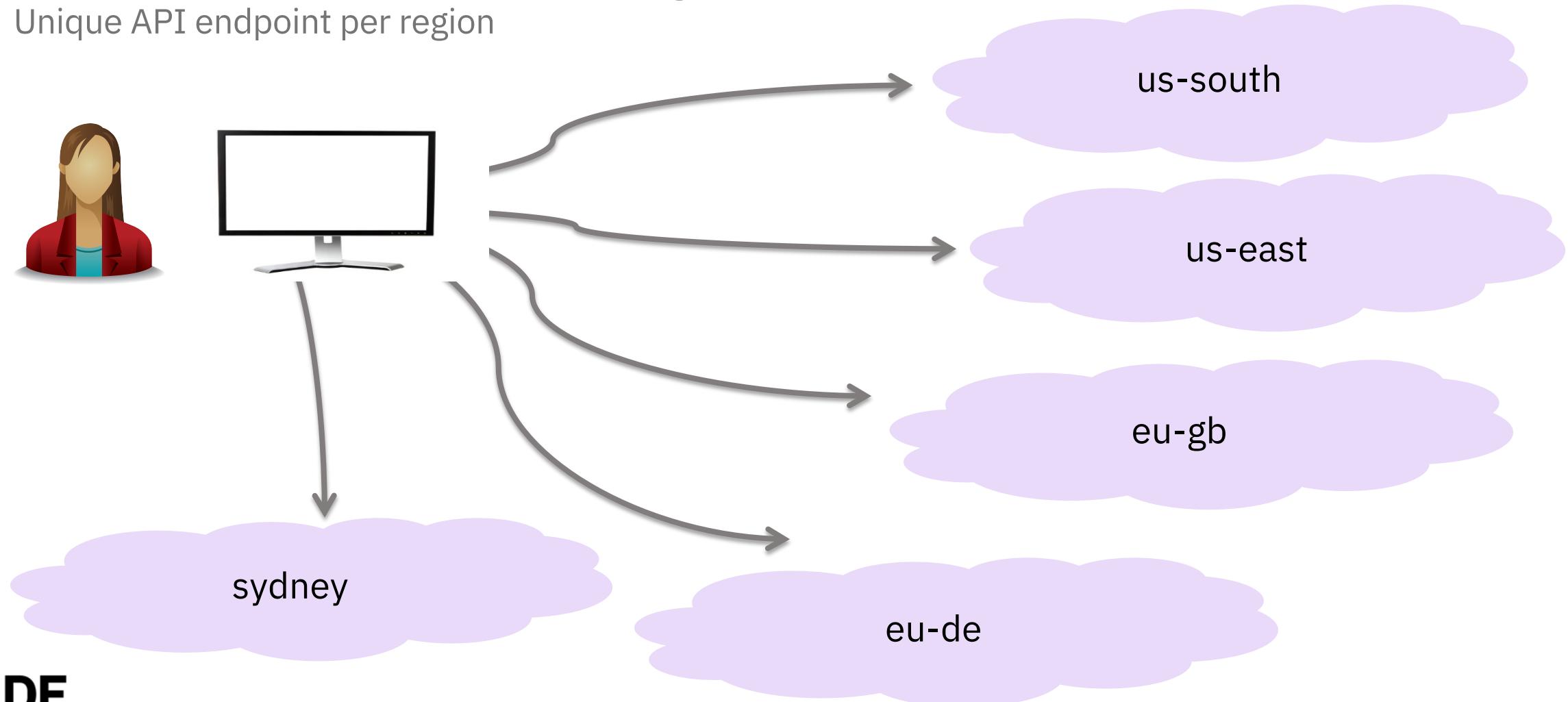
Standardization; OPEX savings; faster time to value

# IBM Public Cloud account and organization model

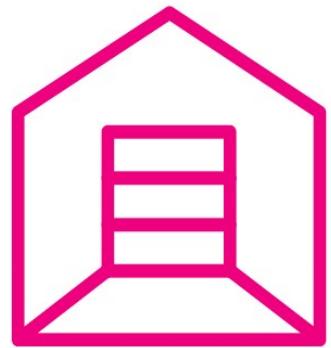


# IBM Cloud regions

- Stand-alone PaaS cloud with catalog, apps, and services
- Maximum isolation from entities in other regions
- Unique API endpoint per region



A hybrid model is an interim step that helps clients realize partial benefits of a public cloud



## Private

Management and deployment options

On Premises and Hosted



## Hybrid

Hybrid model tooling

Choice and Control



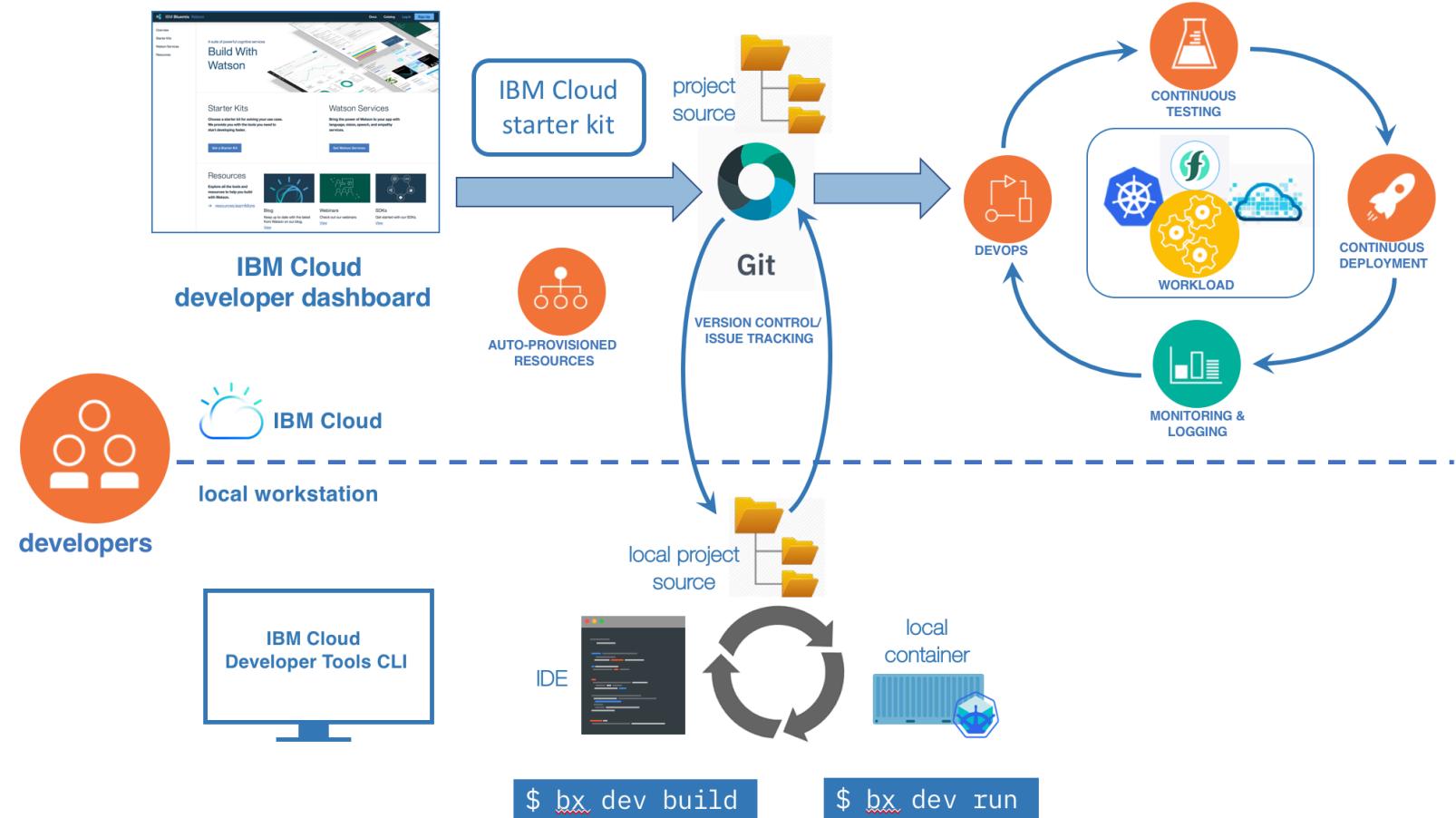
## Public

Public and open-by-design

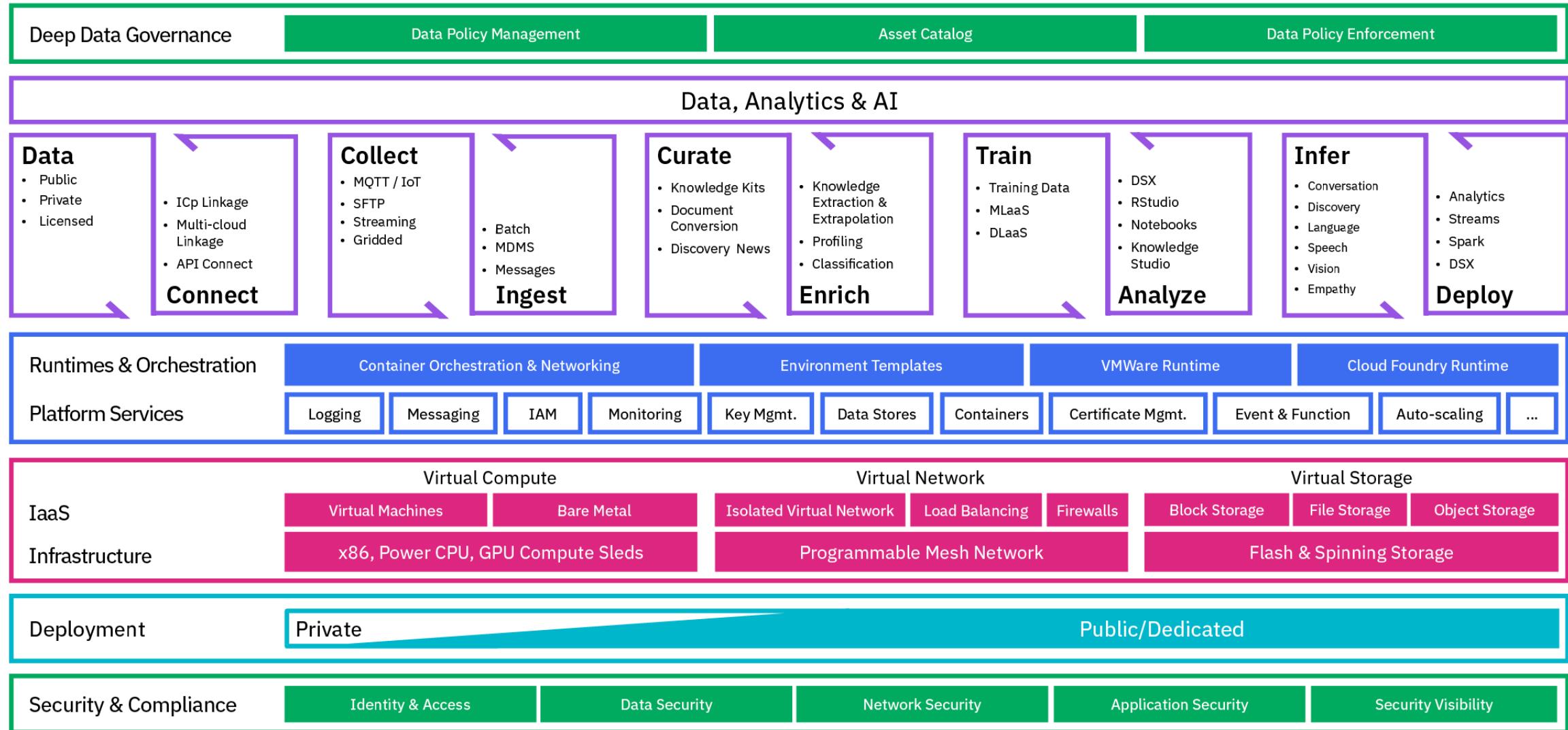
Infrastructure on Demand

# Developing for IBM Cloud

- Starter Kits
  - Working code
  - Auto-provisioned services
- Develop and test locally
- Deploy manually... or
- Use continuous delivery to automatically deploy with commits

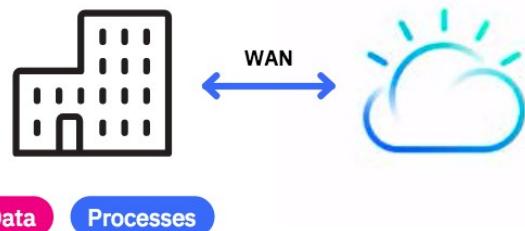


# IBM Cloud



# IBM Cloud deployment options

## Private



### When to use

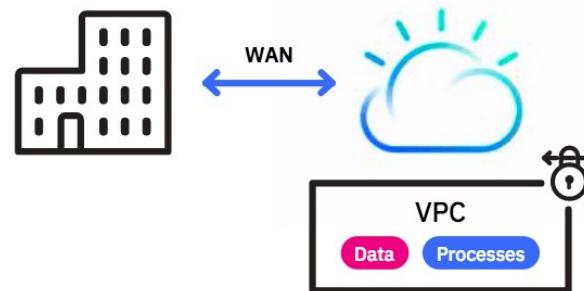
Organization has requirement to utilize on-premises infrastructure (security policy, investment equity, limited WAN bandwidth, etc)

30-40 IBM Cloud services

### Optimal Workloads

- Containerize existing IBM Middleware apps
- Containerize high bandwidth HPC apps

## Dedicated



### When to use

Organization has isolation requirement for security and/or performance reasons

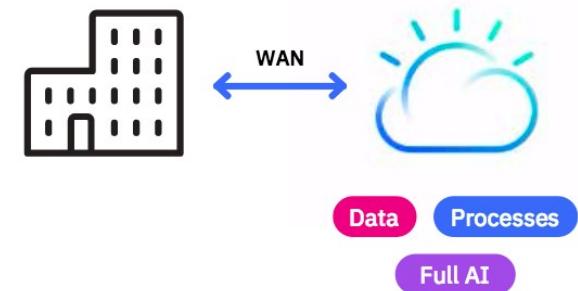
Organization seeks the security and compliance benefits of public cloud

100+ IBM Cloud services

### Optimal Workloads

- New Cloud-Native Development
- Fast Growing Datasets
- Migration from aging hardware
- Bursty workloads
- Need for ML/DL AI Services

## Public

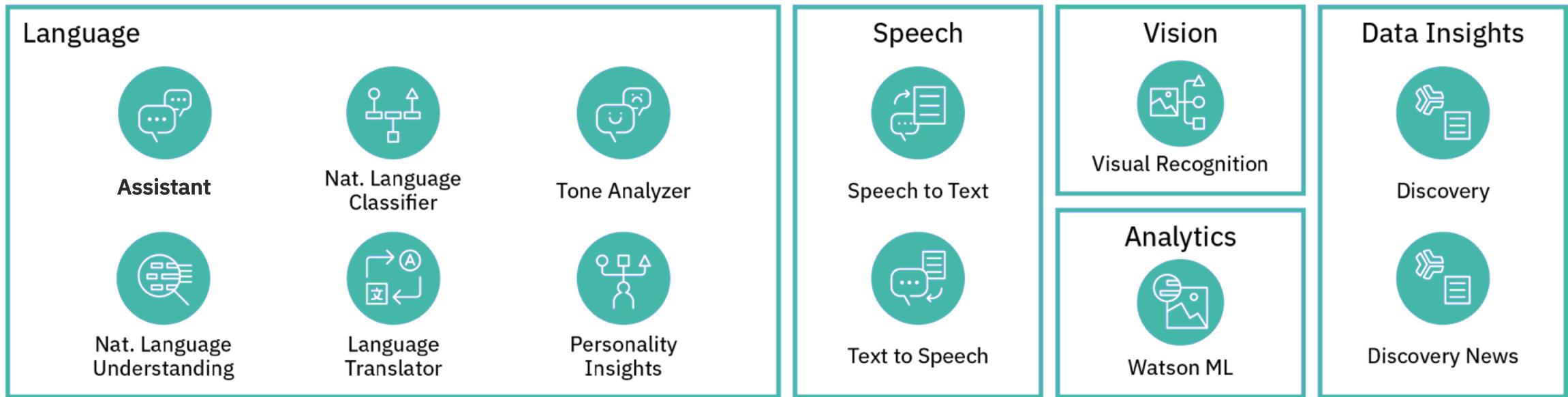


### When to use

Organization embraces encrypted multi-tenant data and shared processing models



# Watson API Services



# What is Cloud Native?

“

Cloud native computing uses an open source software stack to be:

- 1.Containerized.** Each part (applications, processes, etc) is packaged in its own container. This facilitates reproducibility, transparency, and resource isolation.
- 2.Dynamically orchestrated.** Containers are actively scheduled and managed to optimize resource utilization.
- 3.Microservices** oriented. Applications are segmented into microservices. This significantly increases the overall agility and maintainability of applications.

# Cloud Solution approach – 12 app factor

## <https://12factor.net/>

1. Codebase - One codebase tracked in revision control, many deploys
  - 1-1 relationship between app & code repo – use packages for shared code
2. Dependencies – Declared and isolated (no system wide dependencies)
3. Config - Store config in the environment (not in constants in the app)
4. Backing Services - Treat backing services as attached resources
  - Can be attached and reattached w/o affecting code, no differentiation between local and remote
5. Build, release, run - Strictly separate build and run stages
  - Release has unique id
6. Processes - Execute the app as one or more stateless processes
  - State shared via external services – no sticky sessions !
7. Port binding - Export services via port binding
  - In deployment, a routing layer handles routing requests from a public-facing hostname
8. Concurrency - Scale out via the process model
9. Disposability - Maximize robustness with fast startup and graceful shutdown
10. Dev/Prod parity - Keep development, staging, and production as similar as possible
11. Logs - Treat logs as event streams
12. Admin processes - Run admin/management tasks as one-off processes

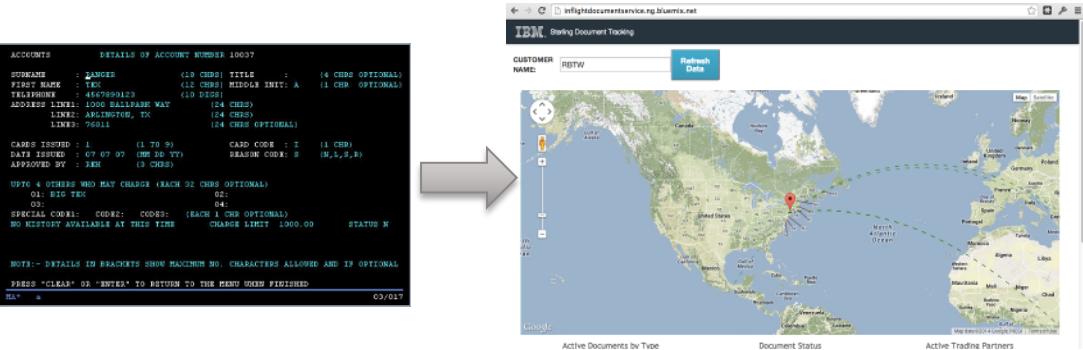
## You'll see cloud native used interchangeably with twelve-factor

Twelve-factor is the methodology and cloud native refers to a computing environment and its tools

# How will you use it?

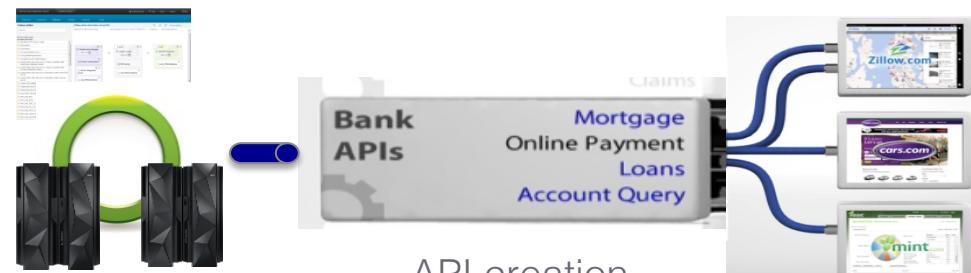
## Extend existing applications

- Add user experience such as mobile, social
- Add new capabilities integrating other services and APIs
- Do **rapid** experimentation for new capabilities



## API-enable applications

- Scalable API layer on top of existing services
- Simplify how composite service capabilities are exposed through APIs



## New applications

- Systems of Engagement
- Internet of Things



Backend systems and integration

API creation  
and  
management

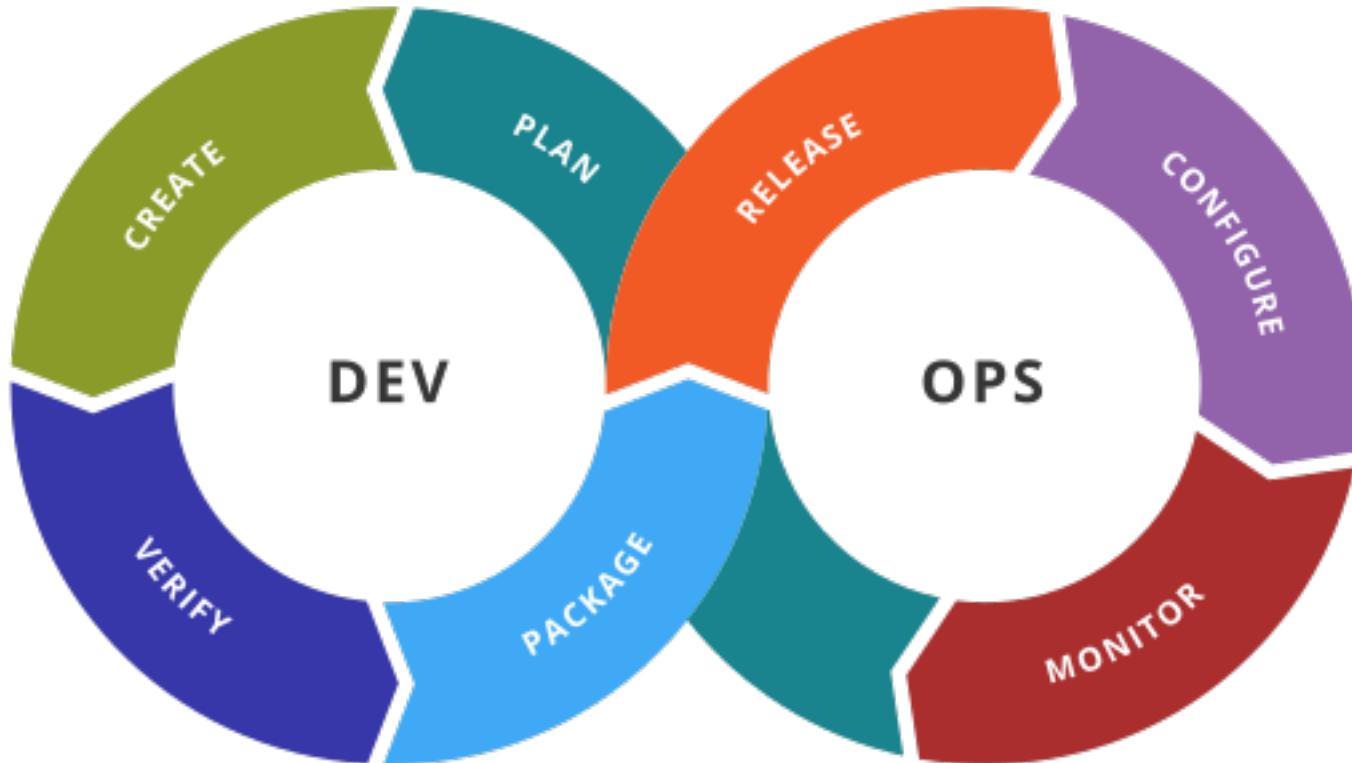
New channels and opportunities

# DevOps

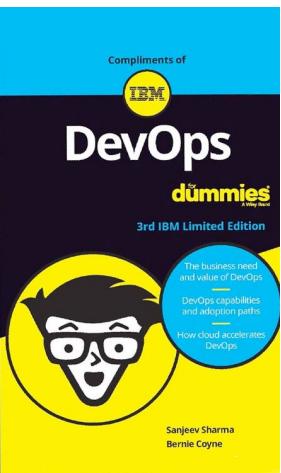
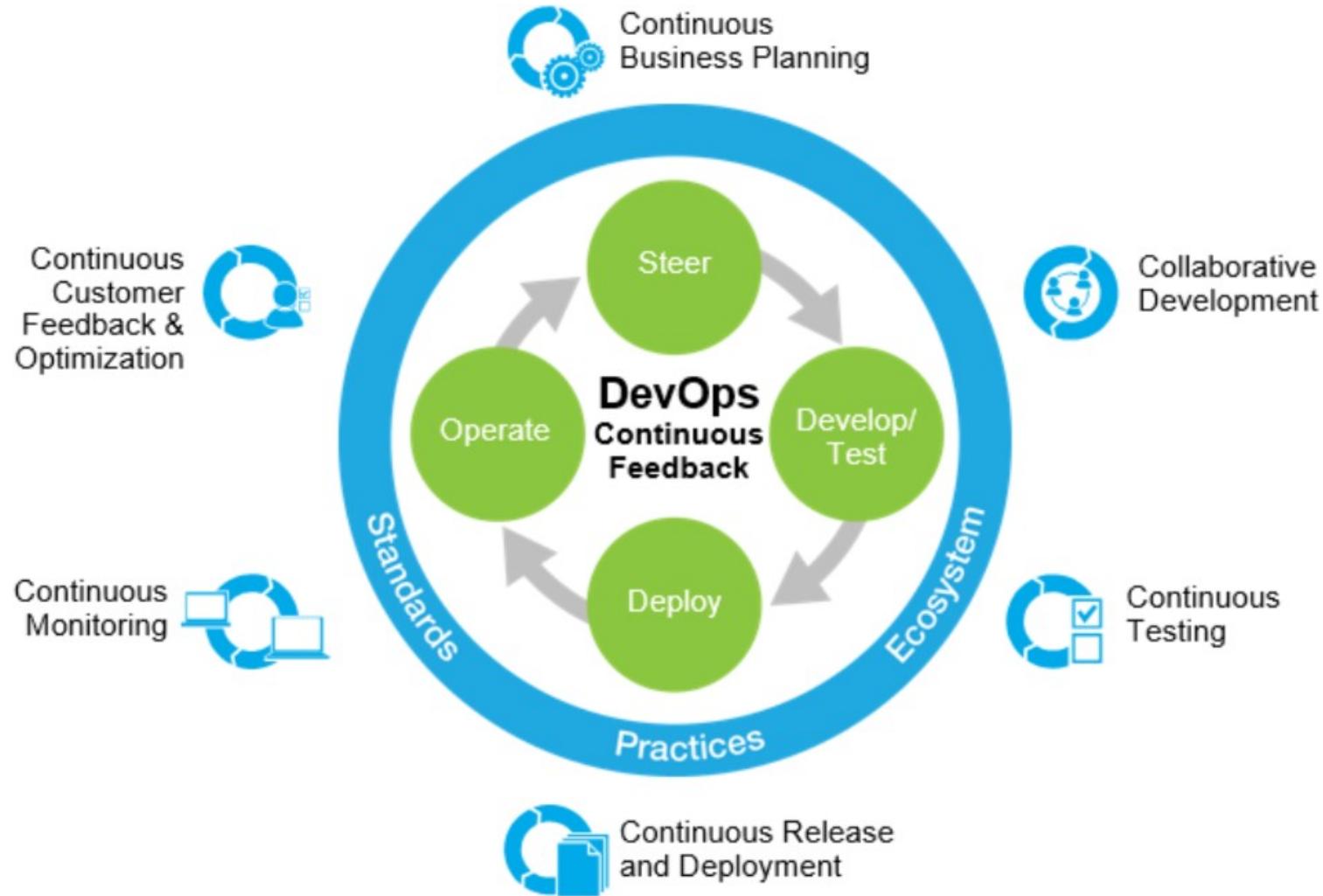
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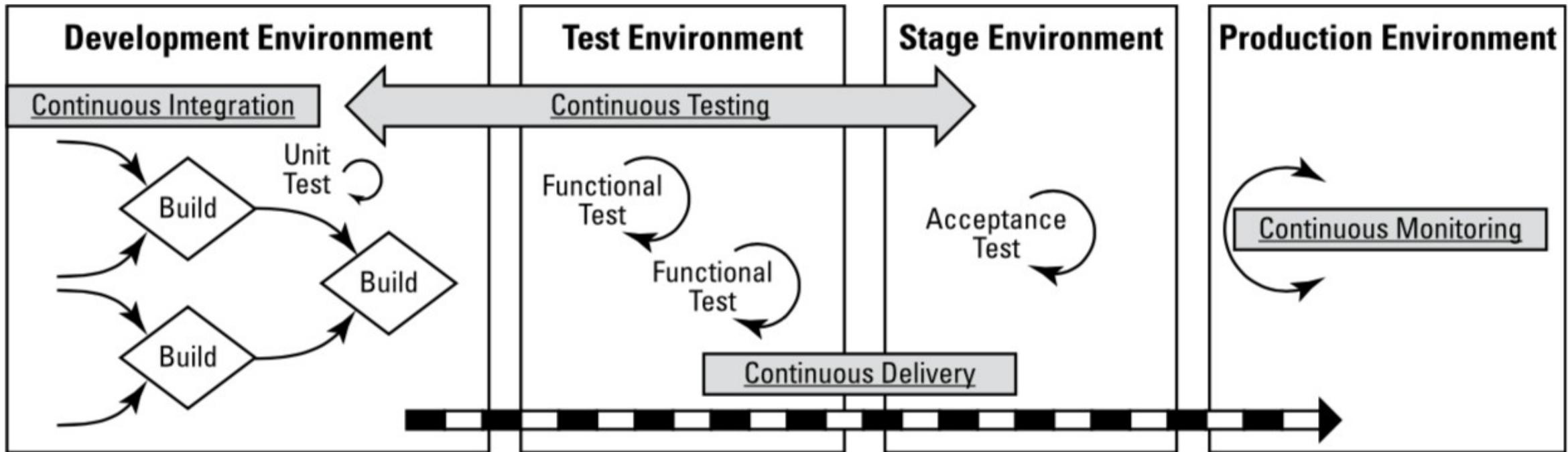
# Continuous

# Delivery



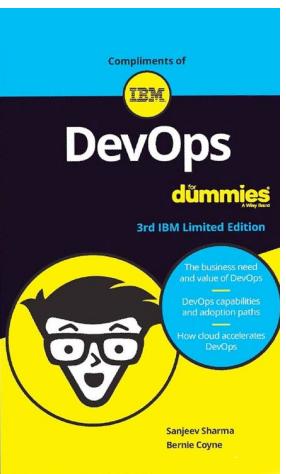
# DevOps reference architecture



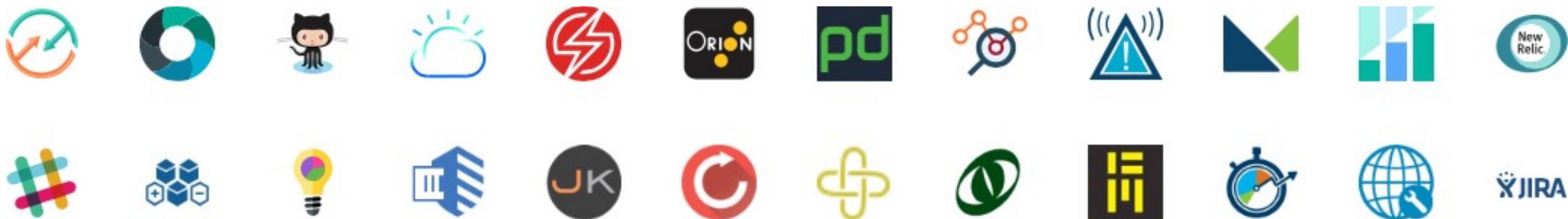


## 'Shift Left' – Operational Concerns

The shift-left concept moves operations earlier in the development life cycle.

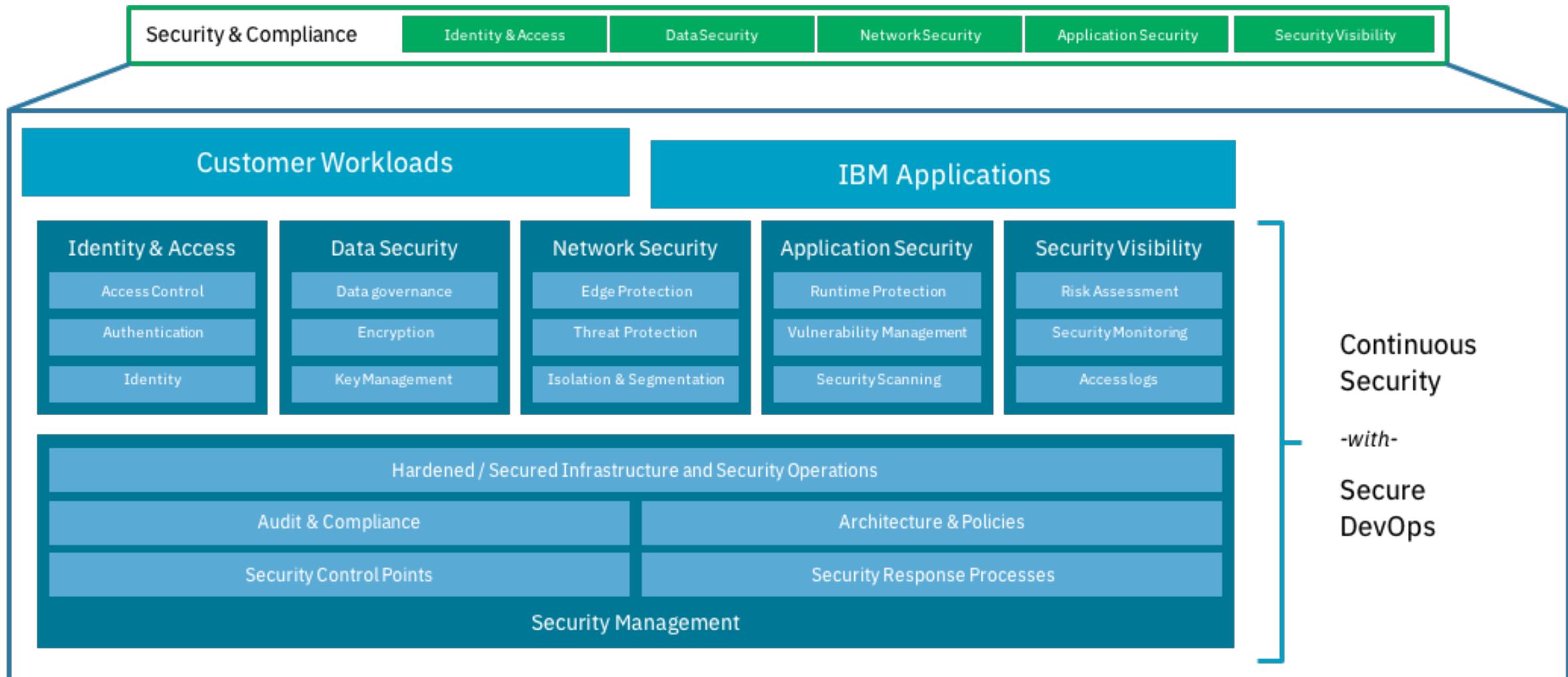


# Create an integrated DevOps toolchain



<https://cloud.ibm.com/devops/getting-started>

# IBM Cloud Security and Compliance



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



**HIPAA**  
Health Insurance Portability  
and Accountability Act



cloud  
**CSA** security  
alliance<sup>SM</sup>

**HITRUST**

# A faster, more secure journey to cloud

## Hybrid

Enable enterprises across public, private, and traditional environments

## Multicloud

Manage other vendors' clouds, acknowledging the reality that client environments are heterogeneous

## Open

Build capabilities that are open by design, enabling client flexibility and reducing vendor lock-in

## Secure

Provide reliability and continuous security for the client's environment

## Management

Offer consistent service level support, logging, management and delivery across the cloud environment



IBM® Cloud™

# Accelerating the digital transformation through a continuum of solutions designed to simplify and reduce risk

IBM offers value at each step on the cloud journey.

## Advise

Advise on every step of the journey to cloud

## Move

Migrate and modernize workloads and applications

## Build

Build innovative applications and experiences

## Manage

Manage, govern and optimize hybrid multicloud environments

### Cloud

- 90,000 experts
- 20-year promise to open source
- 100,000 migrations
- 38 global studios

### Security

- Security built in
- 60 billion security events managed every day

### Data

- 20,000 data scientists, developers, and consultants

### Industry

- Depth in 20 industries
- \$6 billion spent in R&D each year
- Patent leader for 26 consecutive years

# A flexible hybrid cloud architecture maximizes agility

## Choice

Choose from the broadest set of cloud models, or cloud vendors

## Open

Managed and private Kubernetes options, with Istio scalability

## Consistency

Service catalog, security, DevOps, monitoring, for seamless stack on/off prem

## Applications

Consistently develop & deploy on any cloud

## Data

Access more data sources, analytics, AI/ML

## Integration

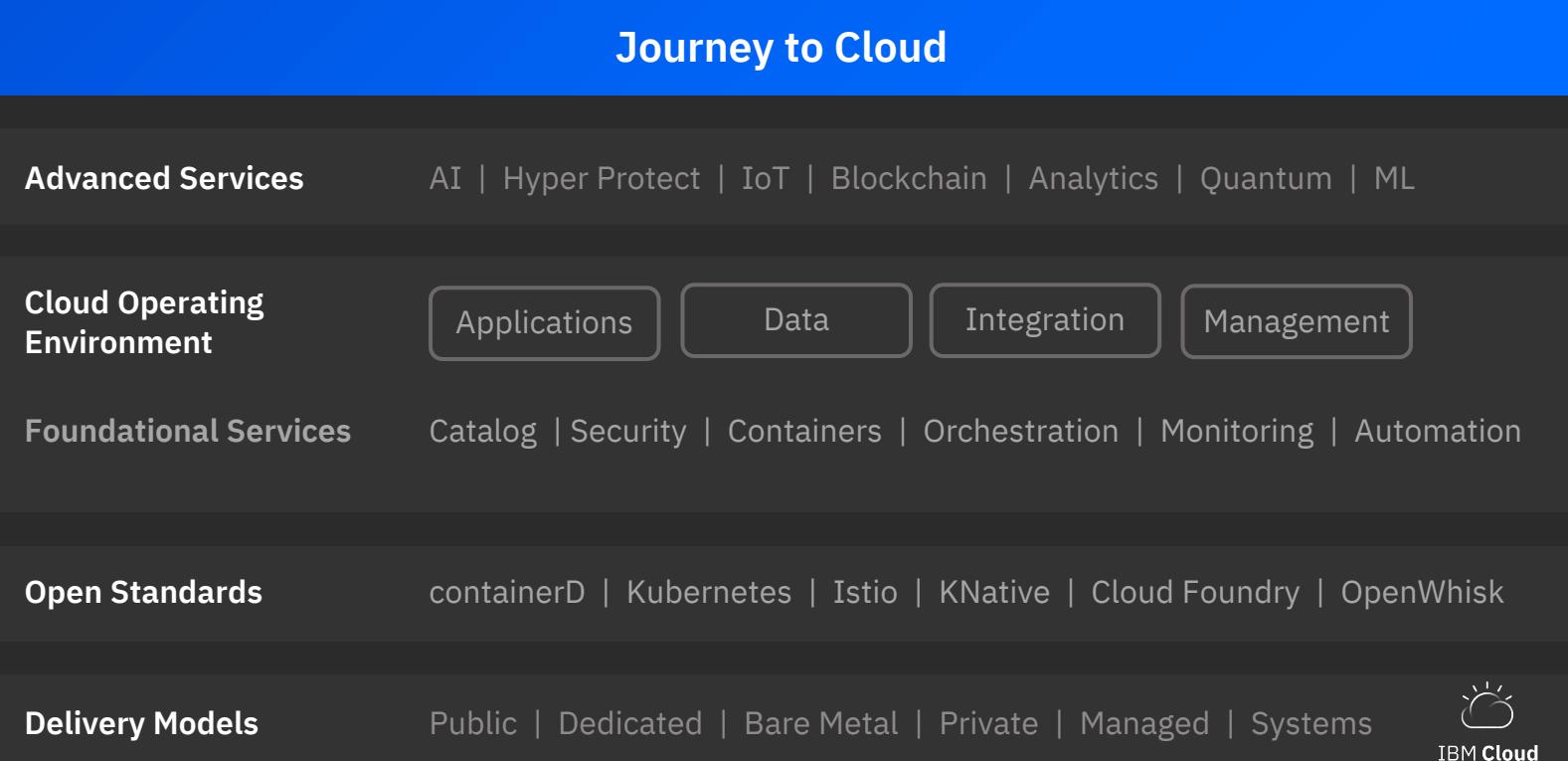
One platform to integrate your apps & clouds

## Management

Visibility & control across clouds, vendors & IT.

## Advanced

Cutting edge services for cloud native development available globally.



IBM has helped thousands of enterprises across 20 industries realize a faster, more secure journey to cloud.



Shifted AA.com and VMware applications to the cloud in four months



Modernized applications 10x faster, 3x less expensively



Added 3,000 new clients a day with new AI and mobile banking capabilities



Gained consistency and control across IBM and Amazon Web Services clouds

# Open, standards-based cloud operating environment



**kubernetes**

## Container Orchestration

- Manages scalable deployment and lifecycle management
- Large open source community and rapid enterprise adoption
- De facto choice for new applications



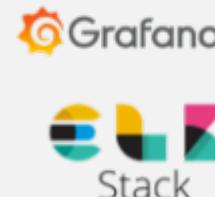
## Security

- Identity and Access
- Key management
- Network Security



## Containers

- Enables portability across hardware platforms and clouds
- Accelerating enterprise adoption
- Integrates Development and IT
- Open source and strong community



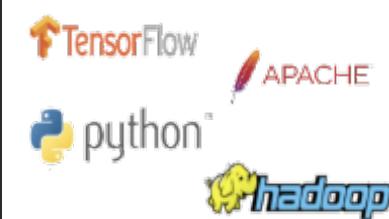
## Management

- Monitoring
- Logging
- Metering



## Operating Systems

- Power, Z and Intel
- #1 Enterprise OS across cloud providers
- Open source with strong community
- Broad hardware vendor support



## AI Enabled

- Watson Studio & AI OpenScale
- Machine Learning Frameworks
- Open Source Databases

# An enterprise-grade public cloud – optimized for Hybrid

## Security rich

- Protect data at rest & in transit with IBM Hyper Protect services
- Choice of deployment options: Public, Dedicated, Private. Virtualized or Bare metal.
- Build on open technologies for flexibility
- Complete service catalog including AI, Blockchain, IOT and full suite of dev, app, data, security and management services

## Modernize

- Containerize & secure existing applications & IBM middleware with Kubernetes Services
- Accelerate innovation using public cloud services & data

## Migrate

- Market-leading VMware solutions w/ 1700+ clients
- SAP certified for S/4HANA, BW/4HANA, BOBJ, and all IBM applications deployed on the NetWeaver platform

## CODE



**1<sup>st</sup>**

cloud provider to deliver hyper-data protection & commit to GDPR compliance

**170+**

services with public, private & local models

**ONE  
Cloud  
Architecture**  
running Watson, Data, IBM Z, Blockchain

**60+**

IBM Cloud data centers across 19 countries & 6 continents

**1,900**

Cloud –technology patents granted in 2017 to IBM

# The Weather Company

Migrated the world's largest weather websites to the IBM Cloud, gaining more secure, scalable, open and agile app development.

## Business challenge

The Weather Company serves millions of users worldwide each day. In extreme weather, their sites must perform fast and reliably. People rely on getting timely information to stay safe.

## Transformation

The Weather Company web platform migrated to IBM Cloud  
**in 6 months.**

## Result

**100% uptime**  
and **seamless scaling** during the 2018 hurricane season.



**Significant cost savings**  
in both hosting & support



**DevOps elasticity with managed Kubernetes** accelerates delivery of new services



**Greater data center reach**  
expands access to more local markets globally

## Service volume (daily):

**30 million**  
normal page views

**100 million**  
Extreme weather page views

**250 billion**  
On demand forecasts

**13 billion**  
API requests

# Benefit from extensive expertise when you need it

## Move to Cloud

### Over 100,000 migrations

Advisory services help define a strategy for your unique needs

- Includes discovery, migration execution, and modernization

Migration factory, with multicloud platform support, enables best fit:

- Public, dedicated and private cloud models
- Choice of IBM other leading cloud providers

Flexible migration models that scale from 50 to 50K workloads

Up to 25% reduction in time and effort required for migration

## Build for Cloud

### Innovate @ 38 global studios

- Combines industry expertise with proven methods to deliver superior UX and product quality:
  - Design thinking, Agile development, Garage workshops, best practices
  - DevOps tools and a full API solution to accelerate delivery.
  - Design, road mapping, and architectural services
  - Addresses Cloud Security & Compliance concerns

Up to 50% less effort w. automated microservices code generation

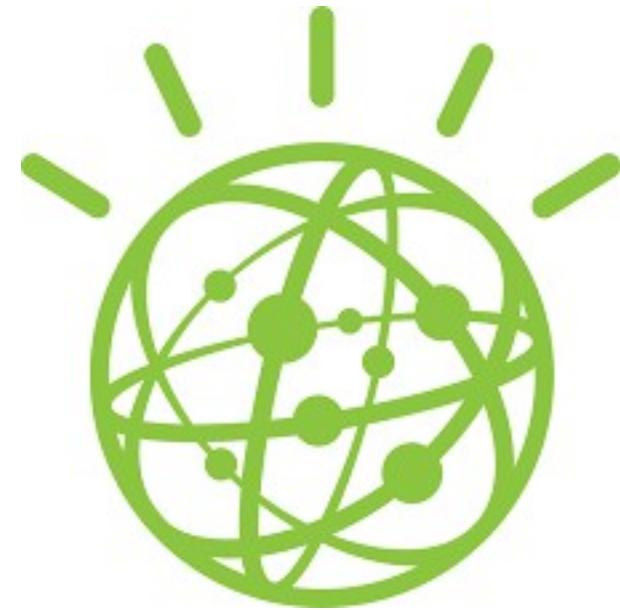
## Manage on Cloud

### Multicloud visibility & control

- Streamlines management of hybrid, multicloud environments:
  - On and off premises
  - Across clouds, vendors & IT
- Boosts financial performance by unlocking/sustaining opportunities associated with cloud investment
- Procure secure, multi-cloud services alongside private cloud and traditional assets
- Optimize cloud spend, asset usage, operations, and more using automated insights from data & AI

Up to 25% reduction in errors from manual activities.

# Thank You



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