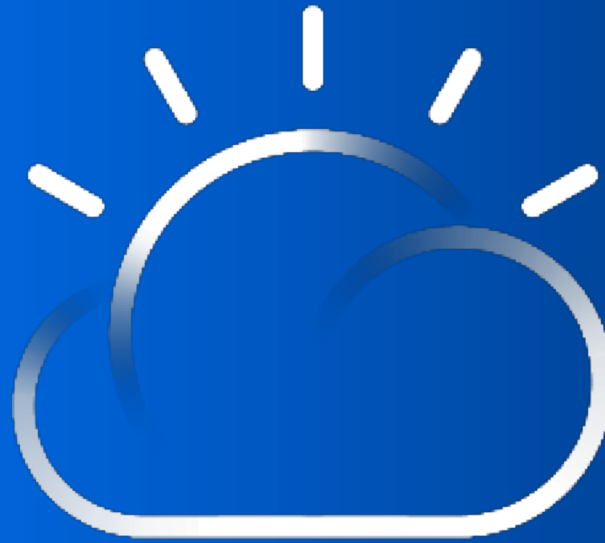


Hybrid, multcloud by design. Accelerating the enterprise cloud journey

November 20, 2018



Frank Østergaard,
Director IBM Cloud Tech and Solutioning

Cloud accelerates business transformation

- Innovate with the latest technology from any source
- Access more types of data, analytics & AI, anywhere
- Improve return on existing investments



Yet less than 20% of enterprise workloads have moved to date. Why?



However Enterprise cloud adoption is relatively low

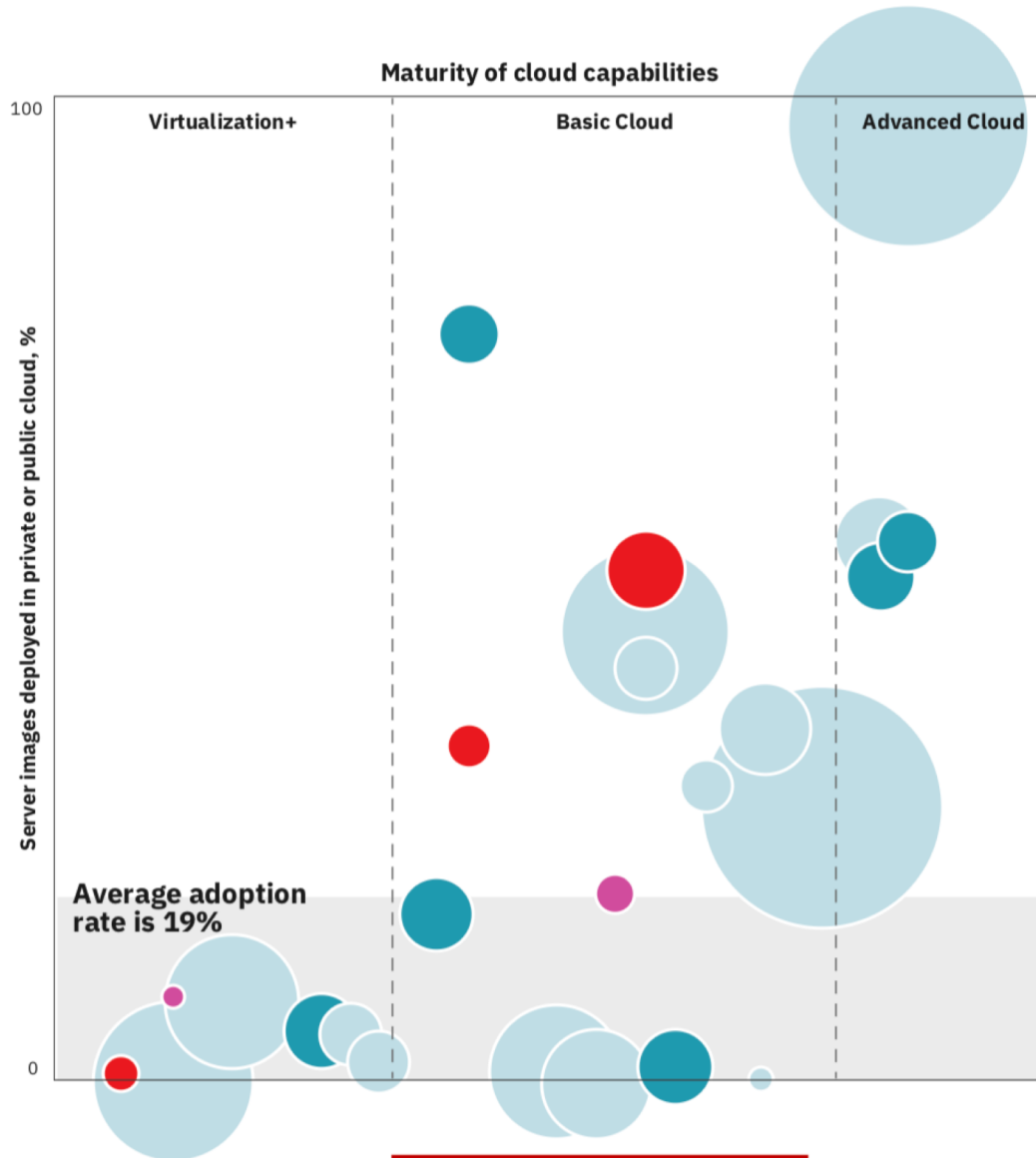
**On average,
enterprise
cloud adoption
remains low,
at around 20%**

Volume of server images deployed, by industry, compared to maturity of cloud capabilities



Size represents volume of server images

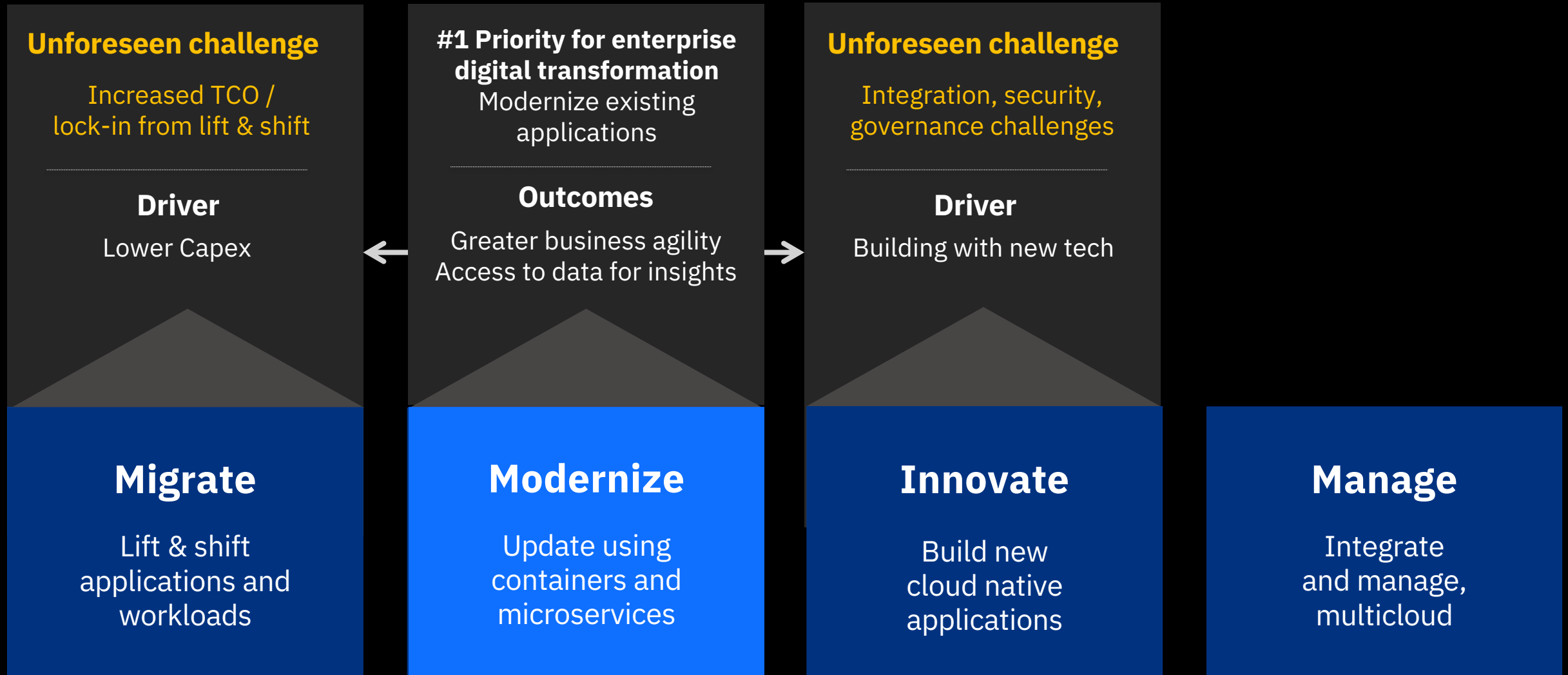
Source: McKinsey Enterprise Cloud Infrastructure Survey, 2016



An **enterprise-out** cloud strategy is necessary to reach the other 80%

Each bubble is a different company interviewed

Emphasis has been on simple migration & innovation...



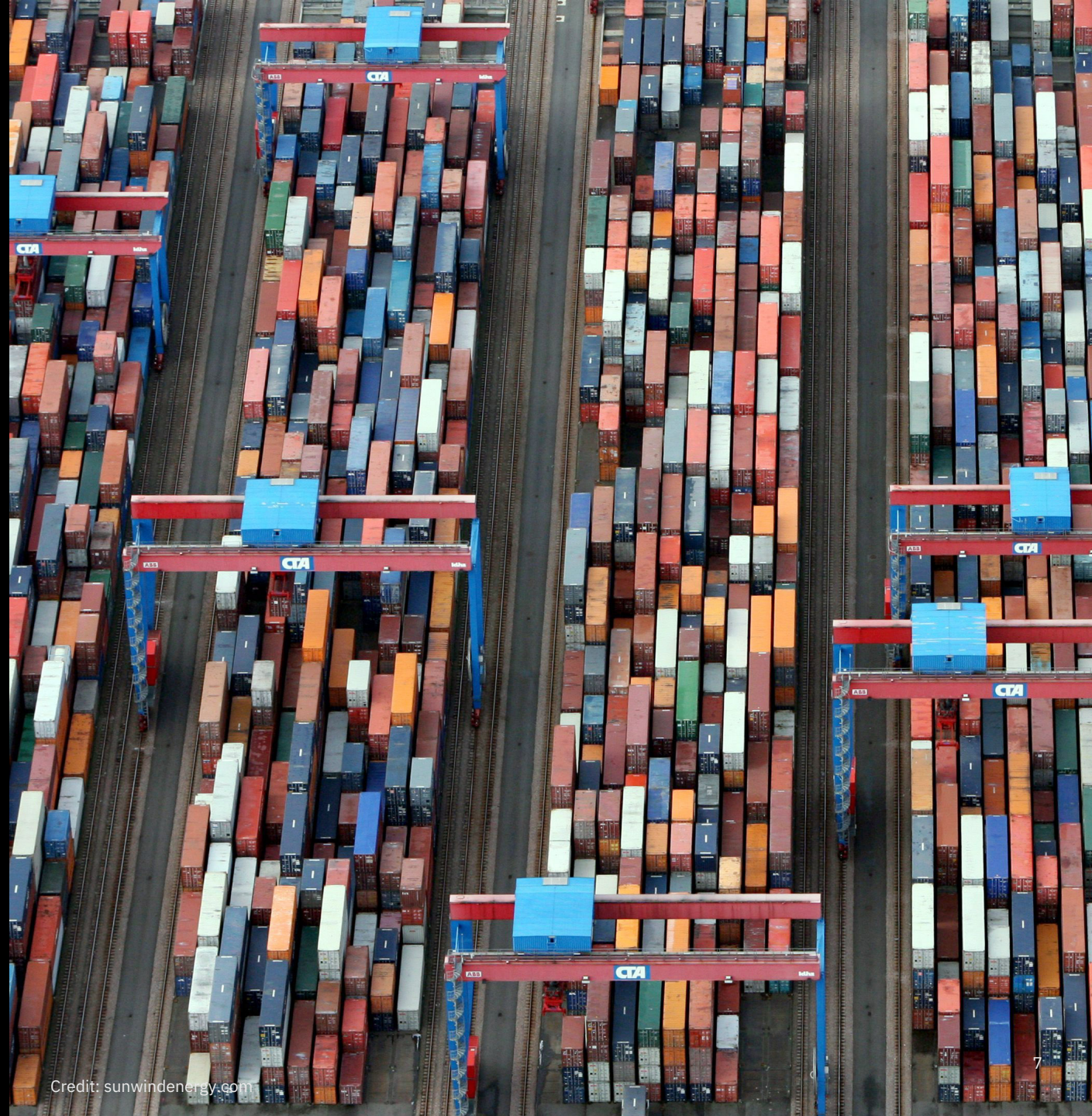
Organizations saved upwards of **70%** on dev/test costs, **40%** on production costs, while operating on **80%** fewer servers

77%
of containers are
managed by
Kubernetes



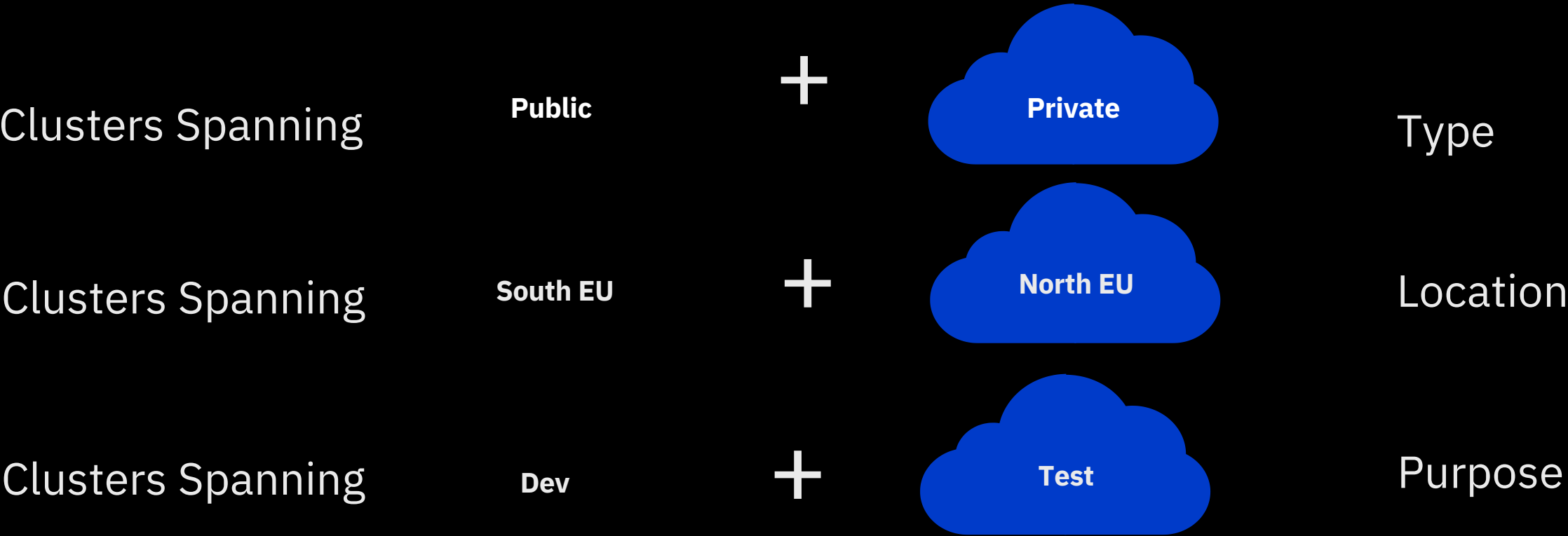
Increase in Kubernetes adoption
since 2017

200%

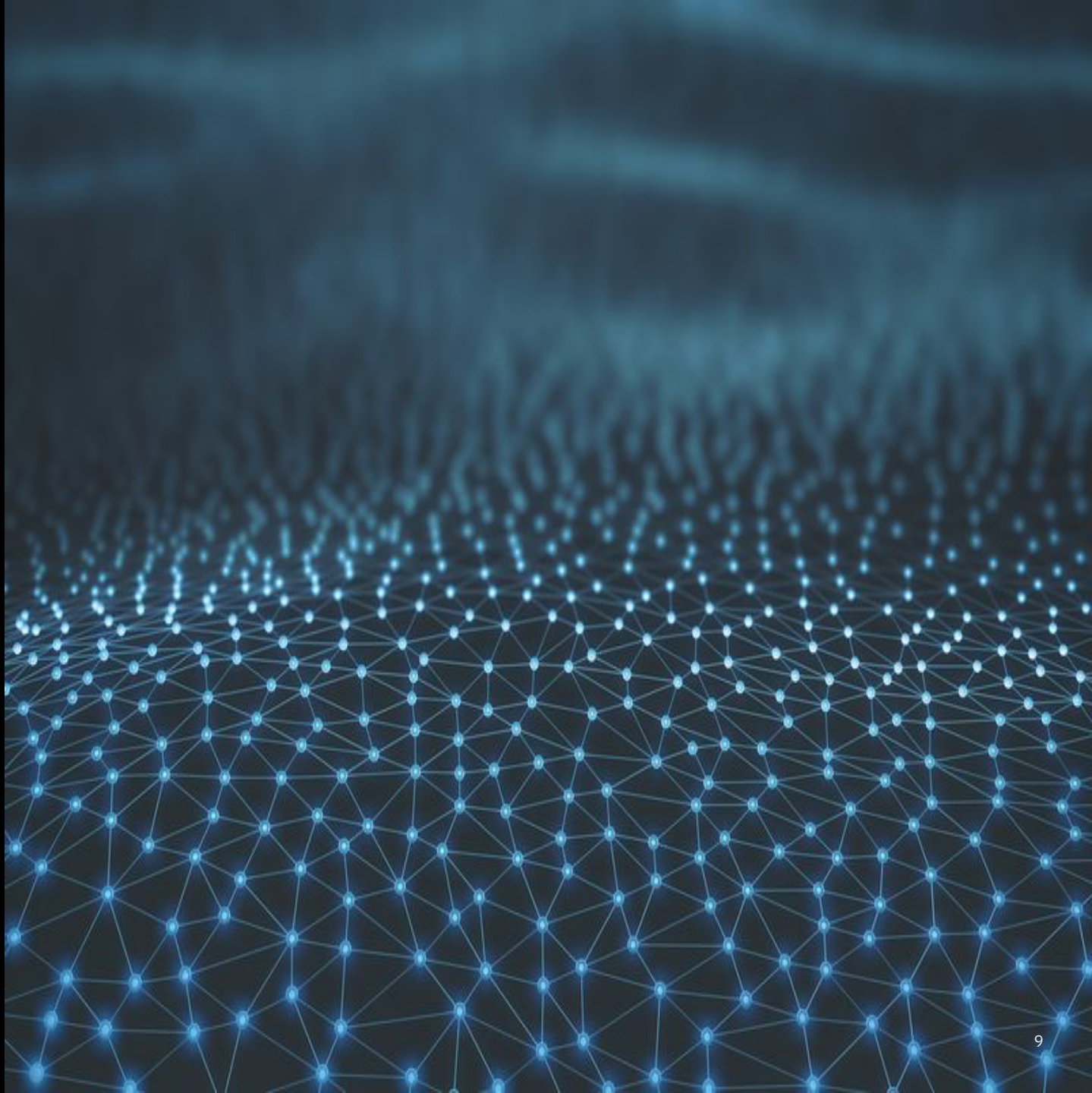


Organizations are deploying multiple clusters

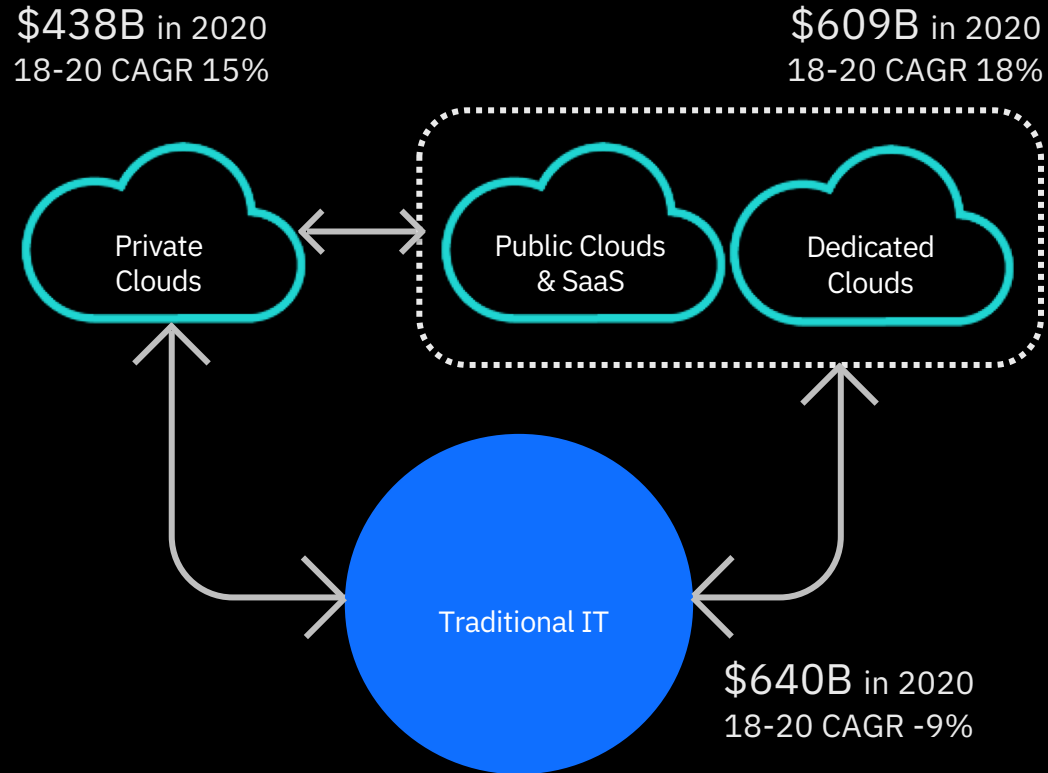
9 out of 10 enterprises adopting Kubernetes have already deployed multiple clusters



**As organizations
deploy more
clusters, new
challenges are
introduced.**



Today's Hybrid, Multicloud reality presents new opportunities, as well as new challenges...



A real world look at multicloud

94%

Share of enterprise customers using multiple clouds

67%

Share of enterprise customers using more than one public cloud provider



**Movement
between clouds**

73%

priority
concern



**Connectivity
between clouds**

82%

priority
concern



**Consistency
of management**

67%

priority
concern

Introducing Multi-cloud Management



Simplified Multi-Cluster Management



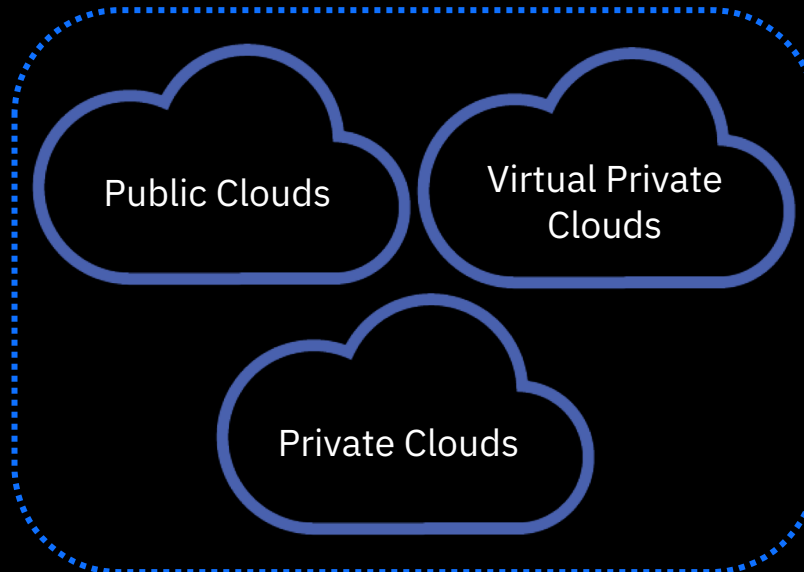
Policy Based Role & Compliance Management



Multi-Cluster Application Management



Works across Public & Private Environments



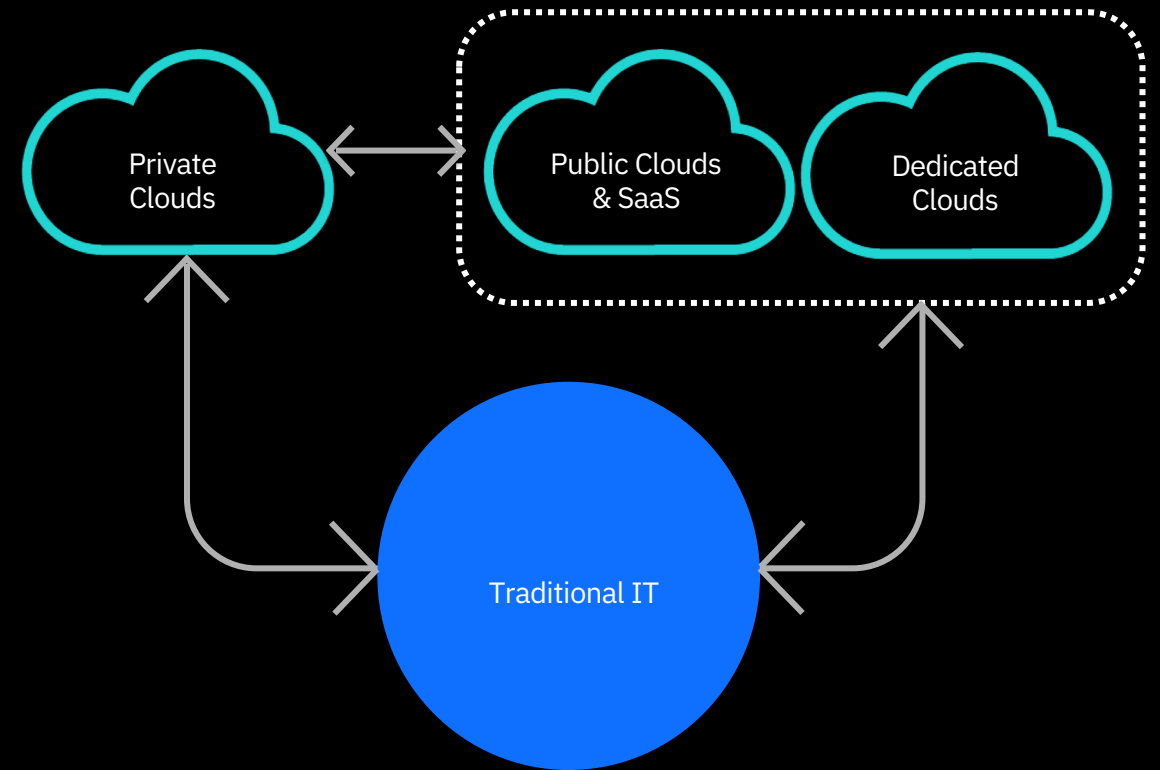
Integrated Operational Tools

What's preventing rapid modernization of the remaining 80%?

Unique workload needs – compliance, security, location - requires more choice

Multiple clouds & vendors – hard to connect / manage across clouds and IT

Lack of necessary skills – how do you prioritize and deliver modernization



Cloud

90,000 experts
100,000 migrations
38 global studios

Security

60 Billion security
events managed
per day

Data

20,000 data
scientists, developers,
and consultants

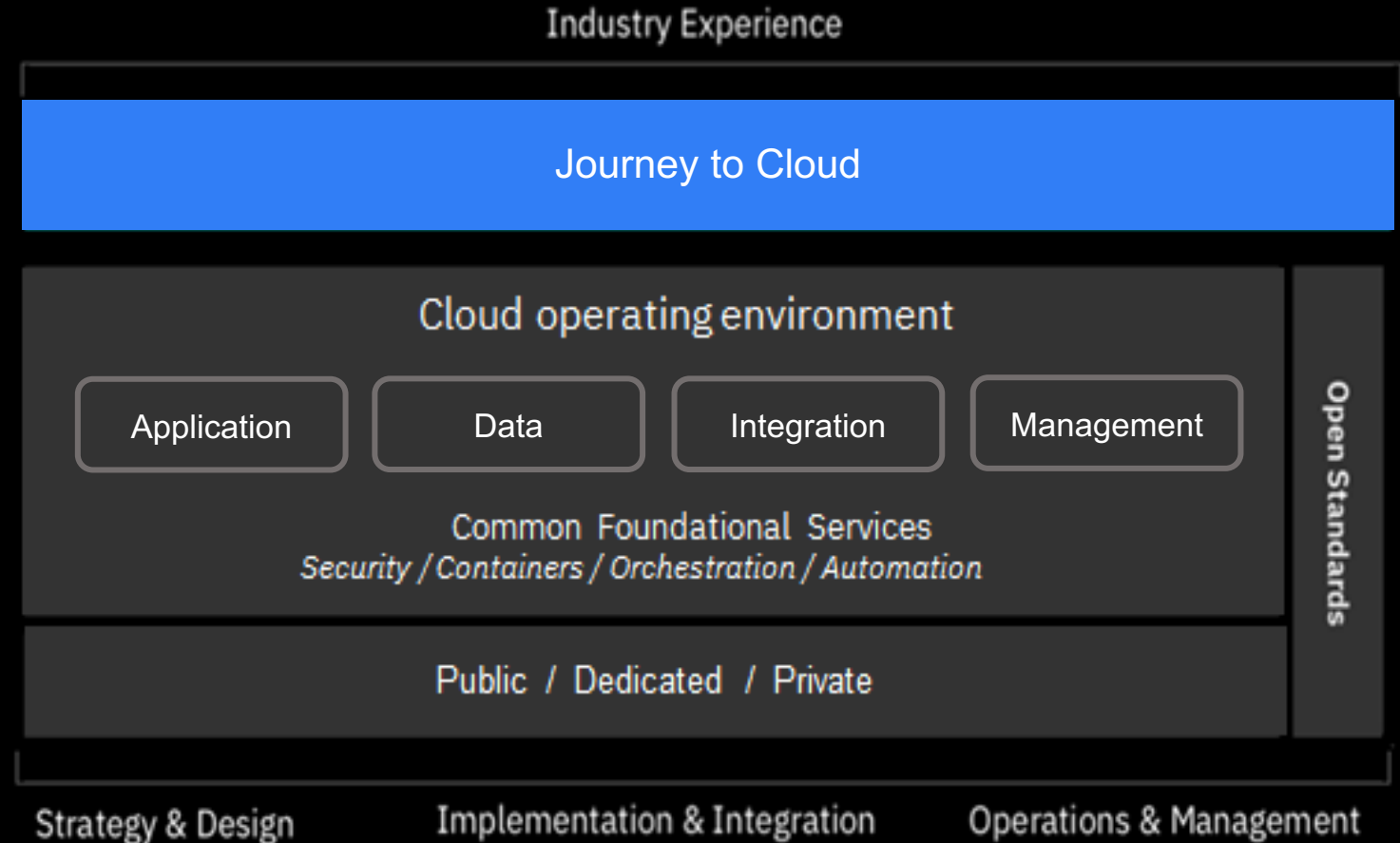
Industry

Depth in 20 industries
\$6 billion in R&D;
Patent Leader 25 yrs

IBM offers a secure, open, and flexible architecture

Cloud Operating Environment

- **Flexibility:** Open, Kubernetes-based containers architecture
- **Multicloud Choice:** Develop and deploy in more places with IBM Cloud
- **Consistency:** Common services
- **Security:** Access to pervasive encryption/data protection
- **Multivendor:** Support for 3rd party clouds



Five key principles define IBM's approach

1

Hybrid

Enable enterprises across Public, Private, and traditional environments

2

Multicloud

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

3

Open

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

4

Secure

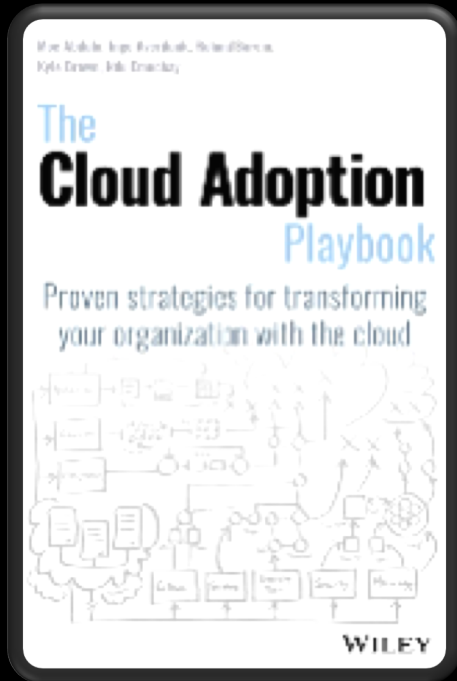
Provide reliability and continuous security for the client's environment

5

Management

Consistent service level, support, logging, management and delivery across complete cloud environment

The enterprise cloud journey



**We wrote the book
on cloud adoption
–literally!**

ibm.com/cloud/garage/adoption

IBM gives you unique advantage

- ✓ Migrate & modernize on the best fit model
- ✓ Consistently develop & deploy on any cloud
- ✓ Securely integrate & manage hybrid, multicloud
- ✓ Access more data sources, analytics, AI/ML
- ✓ Unmatched industry expertise, methods & tools
- ✓ Emerging tech: IoT, blockchain, HPC -60 datacenters

Chapter 2

IBM hybrid, multicloud capabilities

Creating the world's leading hybrid cloud provider



+



Leading provider of open
source solutions

Leading provider of enterprise
cloud & AI solutions

Completely changing the cloud landscape

Red Hat has evolved from an open source pioneer to a driving force in hybrid cloud computing

Pioneer of enterprise Linux and open platforms

Wide enterprise adoption

Broad partner ecosystem

Deeply engaged developer community

90%

Fortune 500
adoption

Foundational technology for hybrid computing

Common platform across all environments

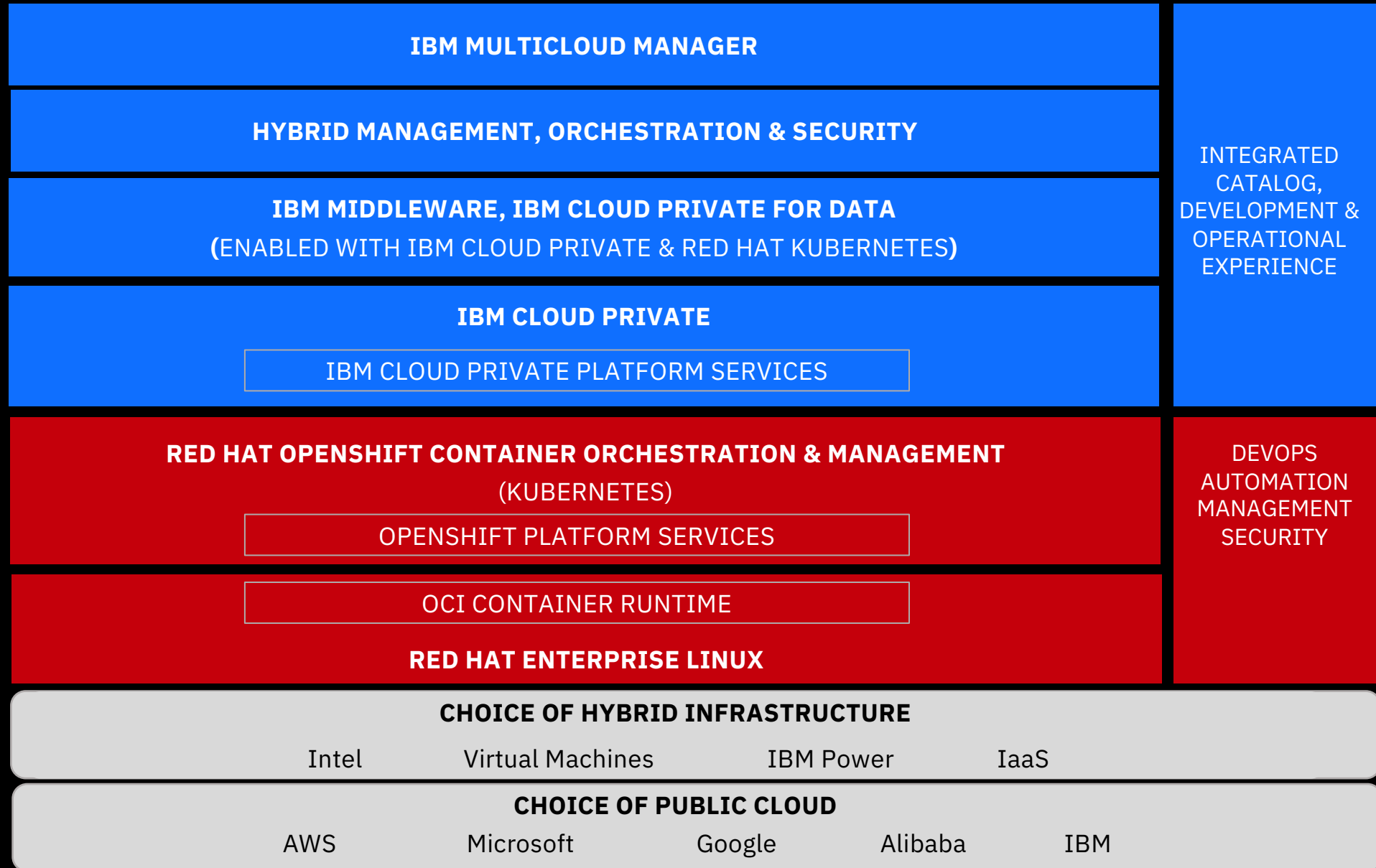
Leadership in container management

Based on open standards / cloud agnostic

8M+

Developers

IBM and Red Hat: May 2018 partnership announcement



Open, standards-based cloud operating environment



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

Manage all your data

Data Virtualization / Virtual Data Mart

Data, your most valuable resource is spread across the enterprise and there is no easy way to leverage / monetize it without spending significant time and resources

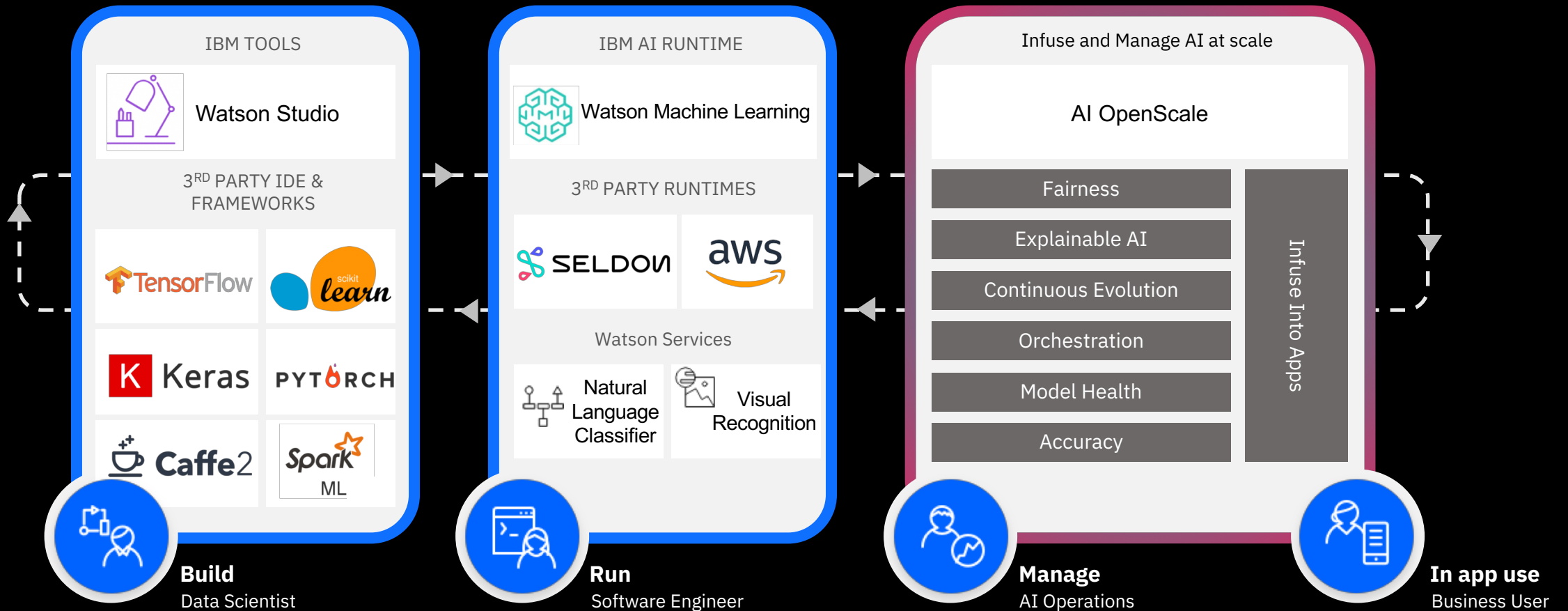
IBM's "Data Virtualization" technology helps access, govern and analyze data irrespective of where it resides and w/o actually moving it.



**Is AI the
solution to
biased AI?**



Scaling AI with AI OpenScale in the Enterprise



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 applications deployed on the NetWeaver platform



1st

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

170+

services with public, private & local models

60+

IBM Cloud data centers across 19 countries & 6 continents

ONE

Cloud Architecture

running Watson, Data, IBM Z, Blockchain

1,900

Cloud –technology patents granted in 2017 to IBM

