

# Accelerating Mainframe Application Modernization with Microsoft Azure and IBM Z

IBM

# IBM Microsoft Azure Digital Apps and Innovation capability

Enabling client's hybrid multi-cloud transformation journey with specialized focus on Advise, Move, Build and Manage on Azure

- **25000+** Azure certified
- **3500+** trained and certified professionals
- **1000+** Azure Developers and Migration practitioners
- **30+** Global delivery centers
- Unmatched **global scalability**

**Strategic acquisitions** focused on Azure



## Modernization



Capability and deep experience expertise in **delivering Azure solutions**. Offers a range of services and technology solutions to implement Azure services within Enterprise.

## SAP



Proven **proficiency and success in SAP implementation, migration, and innovation** along with the experience, tooling, methods and best practices to streamline SAP migration or transformation

## Migration



Capability and deep experience in **helping businesses move applications and infrastructure to Azure** through migration discovery, planning, design and deployment process.

## Security



Proven leadership, deep expertise and extensive experience in providing **Security solutions extended and embedded in every stage of Azure journey** to deliver world class secure Azure solutions

## AppOps



Infuse **enhanced efficiency and agility by leveraging the Azure platform and DevOps principles** using IBM's DevOps expertise and leadership in enterprise transformation

## Industry

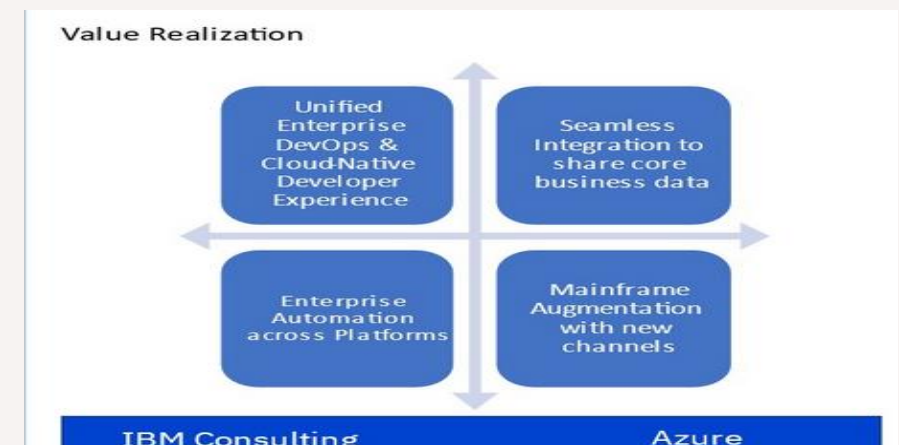


Deploy innovative technology solutions that **accelerate industry enterprise modernization** and innovation journey across all areas and phases of the retail value chain

## Advanced Specializations

<p><b>Kubernetes on Microsoft Azure</b> Advanced Specialization in Azure</p>	<p><b>AI and Machine Learning in Microsoft Azure</b> Advanced Specialization in Azure</p>	<p><b>SAP on Microsoft Azure</b> Advanced Specialization in Azure</p>
<p><b>DevOps with GitHub on Microsoft Azure</b> Advanced Specialization in Azure</p>	<p><b>Analytics on Microsoft Azure</b> Advanced Specialization in Azure</p>	<p><b>Modernization of Web Applications to Microsoft Azure</b> Advanced Specialization in Azure</p>

## Mainframe Application Modernization Patterns



## What?

- Mainframe application modernization with Azure refers to the process of integrating mainframe workloads with applications/services on the Microsoft Azure cloud platform. By doing so, businesses can take advantage of the benefits of the Azure native-cloud features, such as greater flexibility with Azure DevOps, scalability, API enablement, cost savings and integration with advanced services like IoT and ML etc.
- Mainframe offers multiple ways to provide seamless integration with Azure e.g. Cloud modernization stack, IBM Z Digital Integration Hub, z/OS Cloud Broker, IBM z Virtual test platform etc.
- Azure on the other hand, offers various cloud-native tools/services that can be easily integrated with Mainframe provided tools e.g. Azure API management, Azure DevOps, Azure Clusters, Azure Event Hubs, Azure Data Factory etc.

## Benefits

- Increased **agility**, innovate faster, speed to market with Modern DevOps tools/services.
- Single **integrated operating model** with hybrid cloud strategy.
- **Interoperability** of applications across Azure and on-prem.
- **Lower infrastructure** costs with greater ROI through **Azure Infrastructure as service**.
- Increased **scalability**.
- Increased **Security** with Azure features - network isolation, encryption, access control, certificates etc.
- Increased **Resiliency** with multi-region and zone-based deployments, automated backups and DR processes.
- **Integration with Azure managed cloud-native services** and capabilities enable new use cases.

# The industry is embracing Hybrid Cloud

**Forbes**

## The 6 Most Important Tech Trend Predictions For 2023

### Mainframe Modernization

[The 6 Most Important Tech Trend Predictions for 2023](#), Forbes, January 2023

**Deloitte.**

*“Rather than rip and replace legacy core systems, businesses are increasingly looking to link them to emerging technologies using innovative new connectors so that each family of systems can do what it does best”<sup>1</sup>*

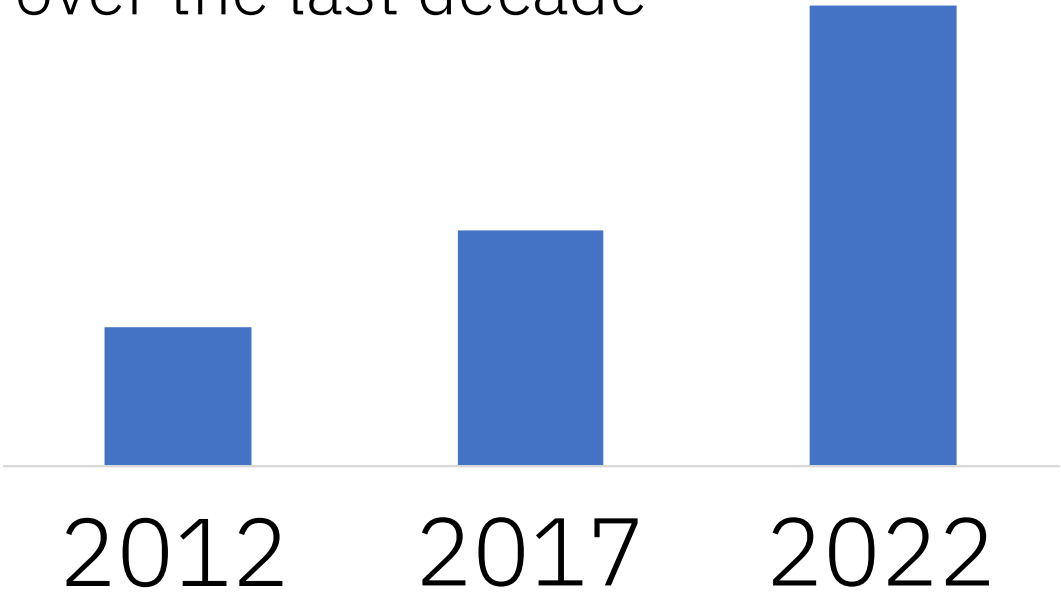
**Mike Bechtel**

Chief futurist | Deloitte Consulting LLP

1. [Connect and extend: Mainframe modernization hits its stride](#), Deloitte Insights, December 2022

# IBM Z: Increasing momentum in the era of hybrid cloud

>3x growth  
over the last decade



Workload as measured by installed Million Instructions Per Second (MIPS)

- 67 of the Fortune 100
- 45 of the world's top 50 banks
- 8 of the top 10 insurers
- 4 of the top 5 airlines
- 7 of the top 10 global retailers
- 8 of the top 10 telco's
- 24 of the top 25 countries by GDP\*

\*24 of the top 25 global countries ranked according to their GDP have public sector organizations that run on IBM Z or IBM® LinuxONE

Powering the world's economy with IBM Z  
IBM Z and IBM® LinuxONE run ~70% of global transactions by value

# Hybrid Cloud with IBM Z



*Business acceleration*



**Connect** to cloud applications using APIs



Make **IBM Z data available** to rest of hybrid cloud



*Developer productivity*



Integrate w/ standard **DevOps** tools for z/OS



Run **cloud-native** workloads



*Infrastructure cost efficiency*



**Optimize cost** through currency and best-fit platform



**Sustainability** through co-location & consolidation



*Compliance and security*

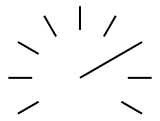
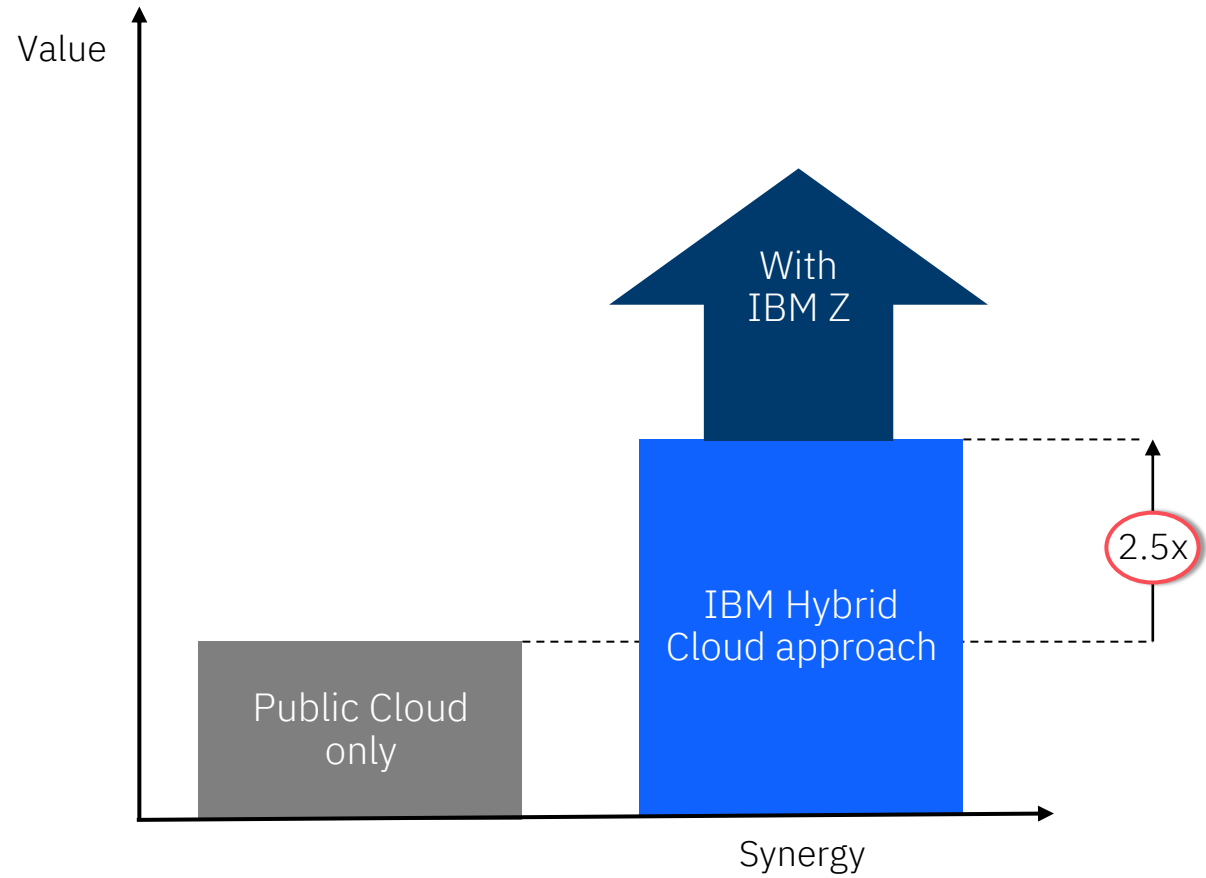


**Privacy assurance** with end-to-end encryption



**Protect** from insider and external threats

A hybrid cloud transformation that integrates IBM Z can extend beyond **2.5x** the value of a public cloud alone



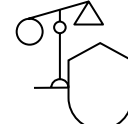
Business acceleration



Developer productivity

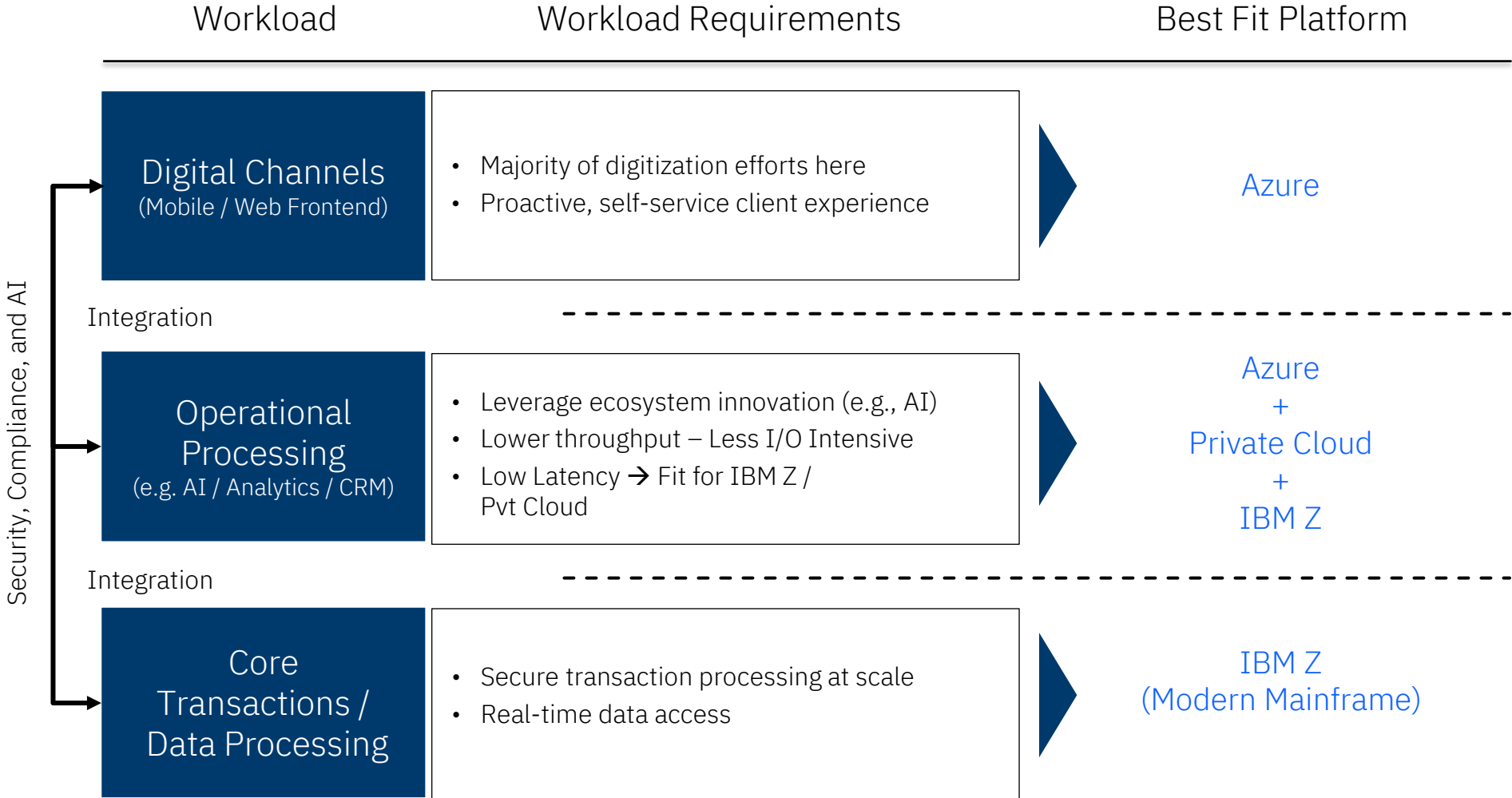


Infrastructure cost efficiency



Compliance & security

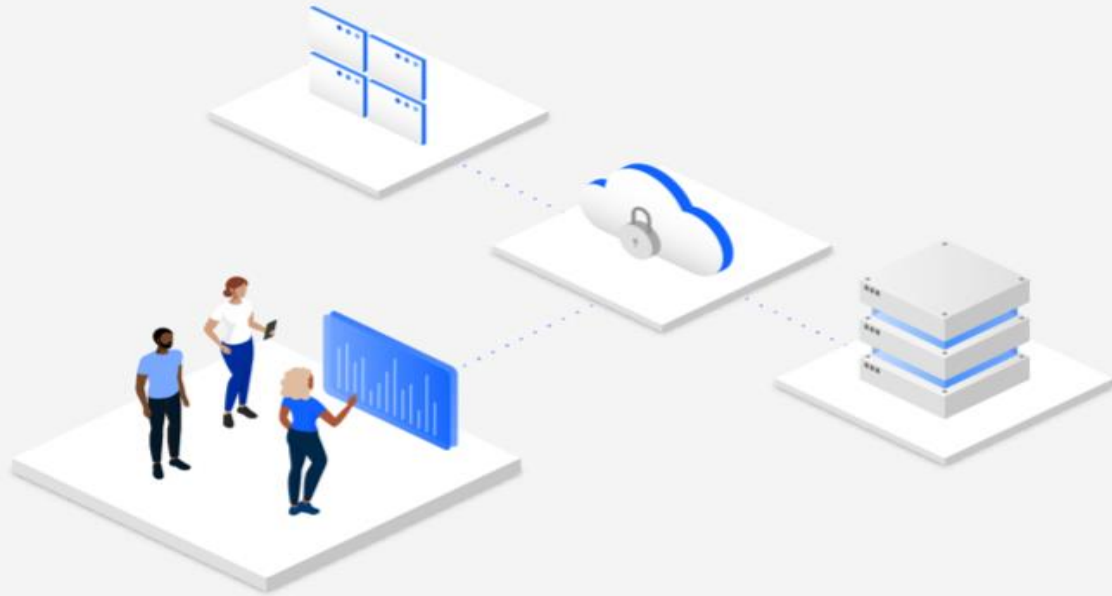
# Hybrid cloud applications optimized for *best fit* to achieve nonfunctional requirements including performance and scale





# Modernize mainframe applications with IBM Z and Microsoft Cloud

## 5 Hybrid Application Modernization Patterns

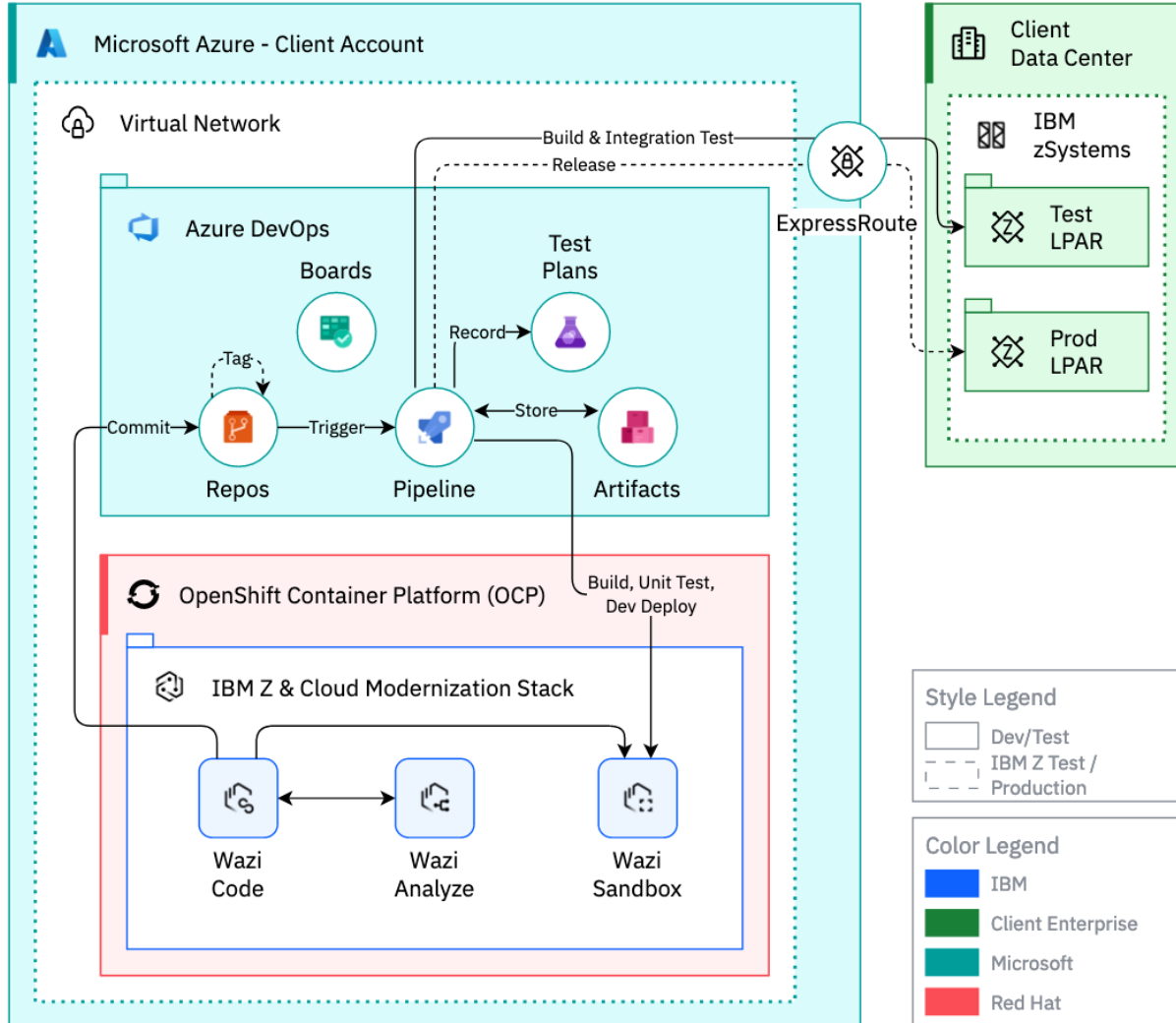


- Azure DevOps for z/OS applications
- Simplify access from Digital Channels
- Share near real-time information between z/OS applications and Azure
- IT Automation across IBM Z and Azure
- Archive and retain mainframe data across IBM Z and Azure

- Modernize Mainframe Applications for Hybrid Cloud with IBM and Azure – [IBM Blog](#)
- Accelerate mainframe application modernization with IBM Z and Cloud Modernization Stack on Microsoft Cloud – [IBM Blog](#)
- Azure DevOps for Mainframe Applications using IBM Z and Cloud Modernization Stack – [IBM Blog](#)

# Azure DevOps for z/OS Applications

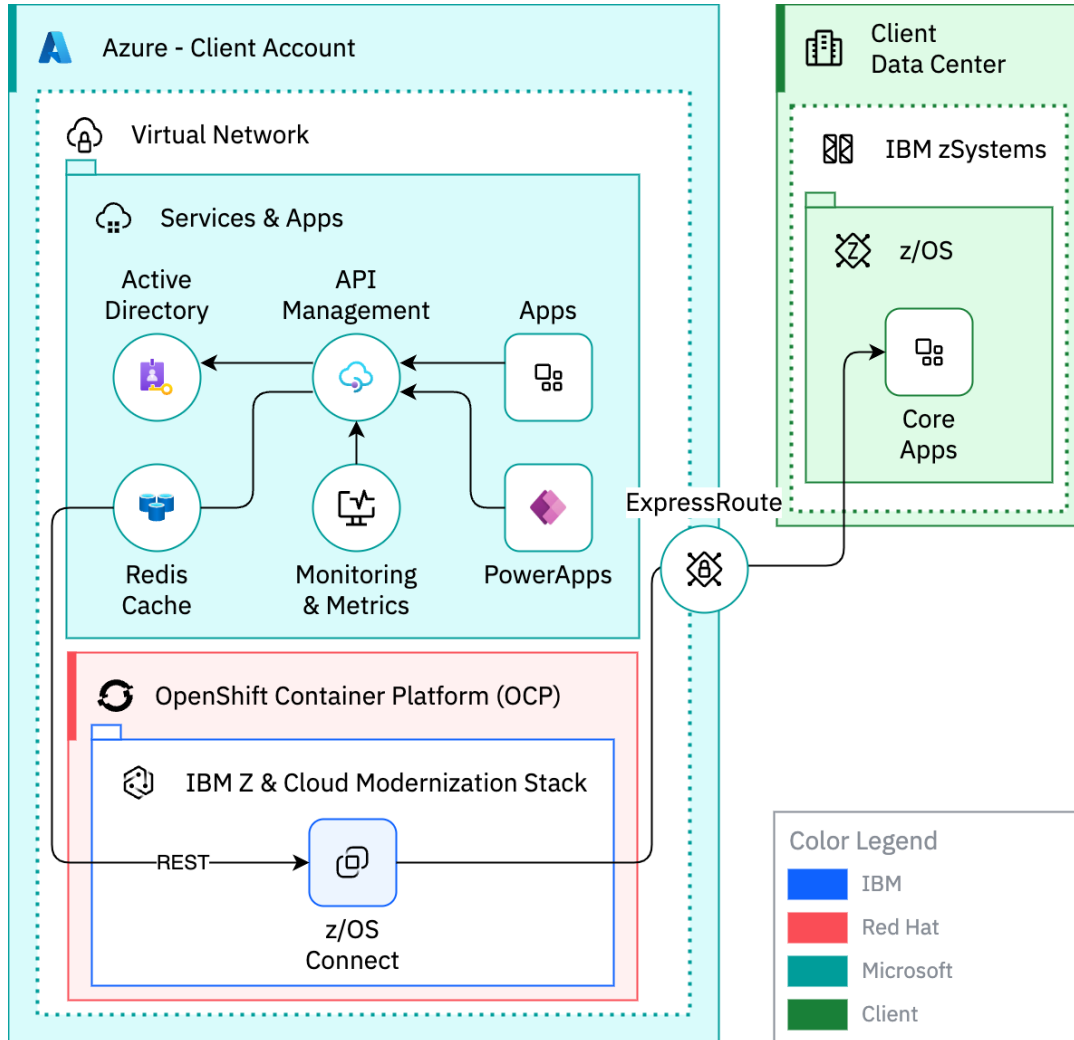
*Accelerate agility on the mainframe by providing consistent development experience on Azure using modern tools that are familiar to all developers.*



- Reduced needs for specialized skills with common and familiar tools
- Deliver application changes faster for existing COBOL, PL/1, Java™, or Assembler programs
- Integrated with Azure DevOps pipeline driving enterprise-wide standardization and consistency
- Self-service access to z/OS environments and resources for application development on Azure
- Leverage new programming languages including python, Node.js and Go that run on z/OS platform

# Simple & Secure access from Digital Channels using APIs

Capability to create industry standard and secure RESTful APIs enabling Azure digital assets to quickly integrate with mainframe apps and data



- Make mainframe (z/OS) applications and data available to applications running on Microsoft Cloud
- API Developers working on Azure can create industry standard APIs for mainframe applications in minutes
- Low code API creation using IBM Z & Cloud Modernization Stack
- Scale business critical REST APIs and seamlessly manage using API gateways on Microsoft Cloud
- Flexible, containerized deployment model – host your APIs on z/OS or directly on Azure

# IBM Z and Cloud Modernization Stack

A unified experience for developing your z/OS & Cloud applications



Z Mod Stack

Deliver your z/OS  
PaaS experience

Design & create  
secure APIs

Develop your  
applications

Analyze  
changes rapidly

Agile enterprise development via open industry standard tools



Red Hat OpenShift Container Platform

Available in AWS Marketplace as Public / Private listing and a BYOL Listing

# IBM Z and Cloud Modernization Stack is now available on Azure Marketplace

**Transactable listing**  
Supports public & private offers

**Bring your own license (BYOL)**  
Azure Resource Manager (ARM) templates for automated deployment of OpenShift and IBM Z & Cloud Modernization Stack



## IBM Z and Cloud Modernization Stack [Save to my list](#)

IBM Software

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A hybrid approach combining the best of the cloud with IBM® zSystems®

The IBM Z® and Cloud Modernization Stack is a software solution deployed on Microsoft Azure to help you accelerate your application modernization journey. With IBM and Microsoft, accelerate your mainframe application modernization using a hybrid cloud approach to improve your business agility and productivity, while helping to lower costs and risk. Pair the unmatched throughput, availability, and security of the IBM mainframe with the extensive services on Microsoft Cloud.



## IBM Z and Cloud Modernization Stack (BYOL) [Save to my list](#)

IBM Software

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A hybrid approach combining the best of the cloud with IBM® zSystems®

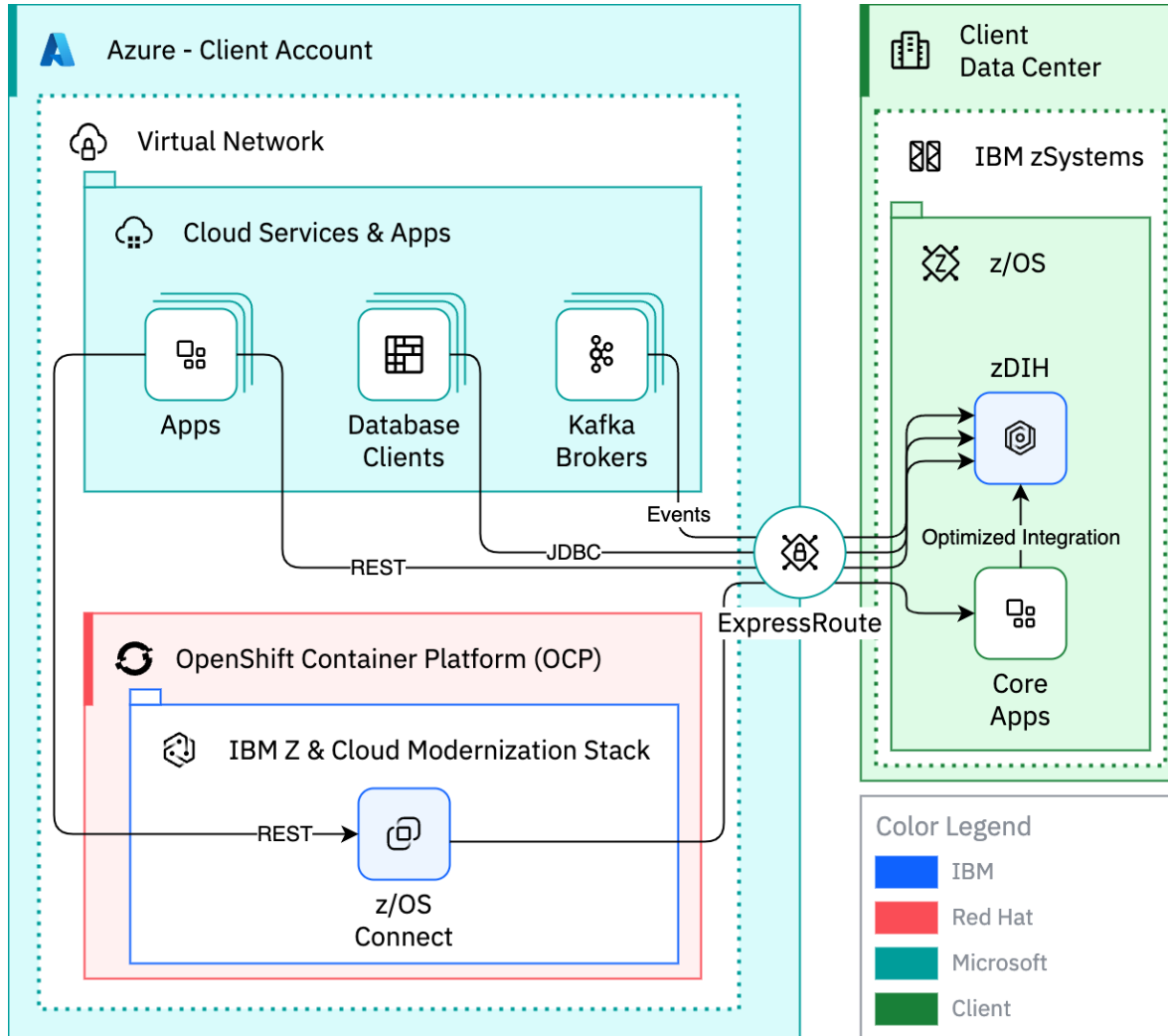
With IBM and Microsoft, accelerate your mainframe application modernization using a hybrid cloud approach to improve your business agility and productivity, while helping to lower costs and risk. Pair the unmatched throughput, availability, and security of the IBM mainframe with the extensive services on Microsoft Cloud.

**Highlights:**

- 1. Access applications and data
- Increase access to mainframe applications and data by creating industry standard APIs in minutes and securely manage and access them on Azure.

# Real-time sharing between z/OS applications & Azure

*Provides near real-time access to z/OS data with IBM Z Digital Integration Hub that are accessible via Kafka, JDBC, or REST APIs*

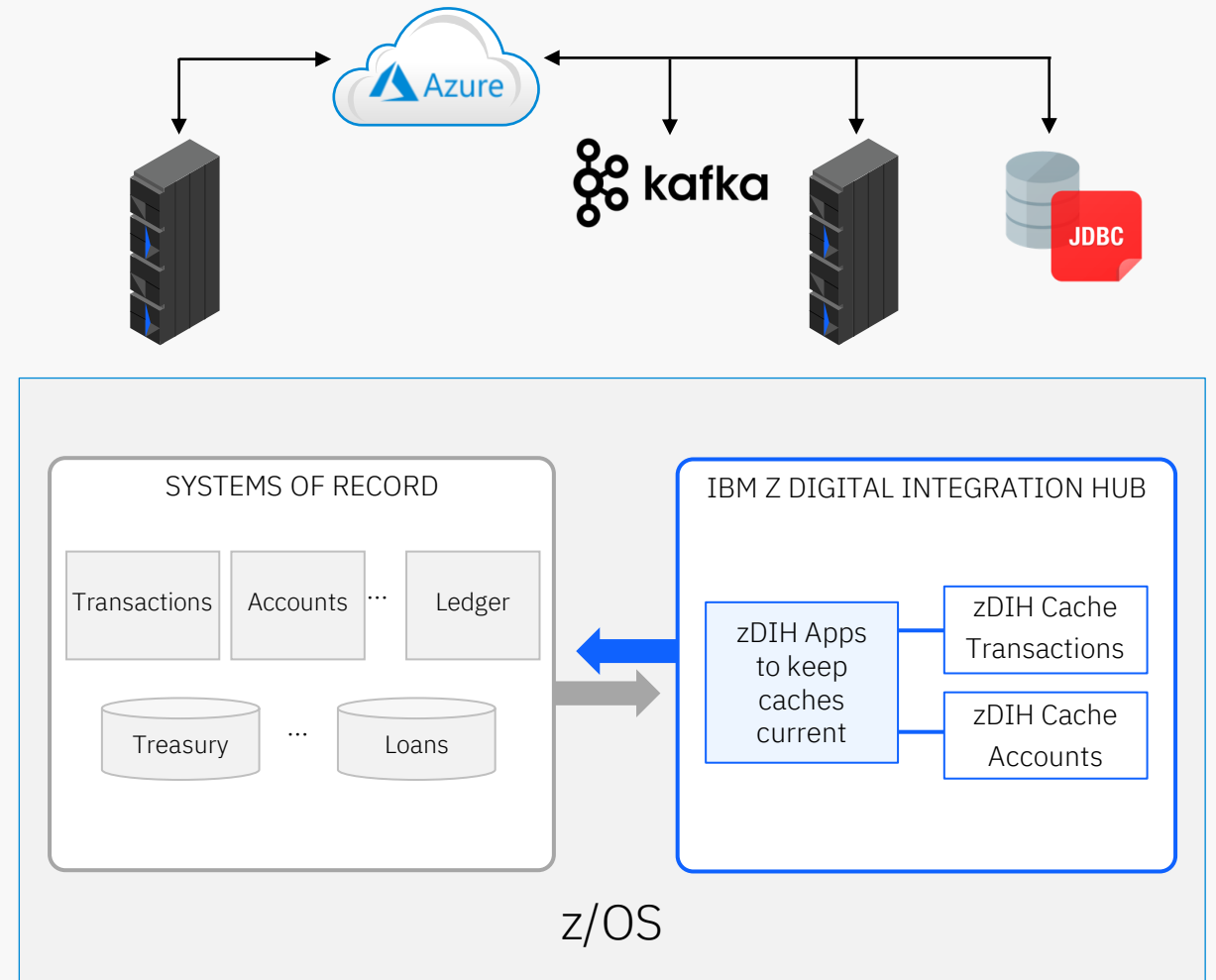


- Selectively curate and share mainframe information with Microsoft Azure applications.
- Reduce latency with high-performance environment
- Surface information through standards interfaces, including Kafka, JDBC, and REST APIs
- Microsoft Cloud services can access near real-time information on the mainframe without impacting OLTP

# Share real-time information between z/OS applications and Azure

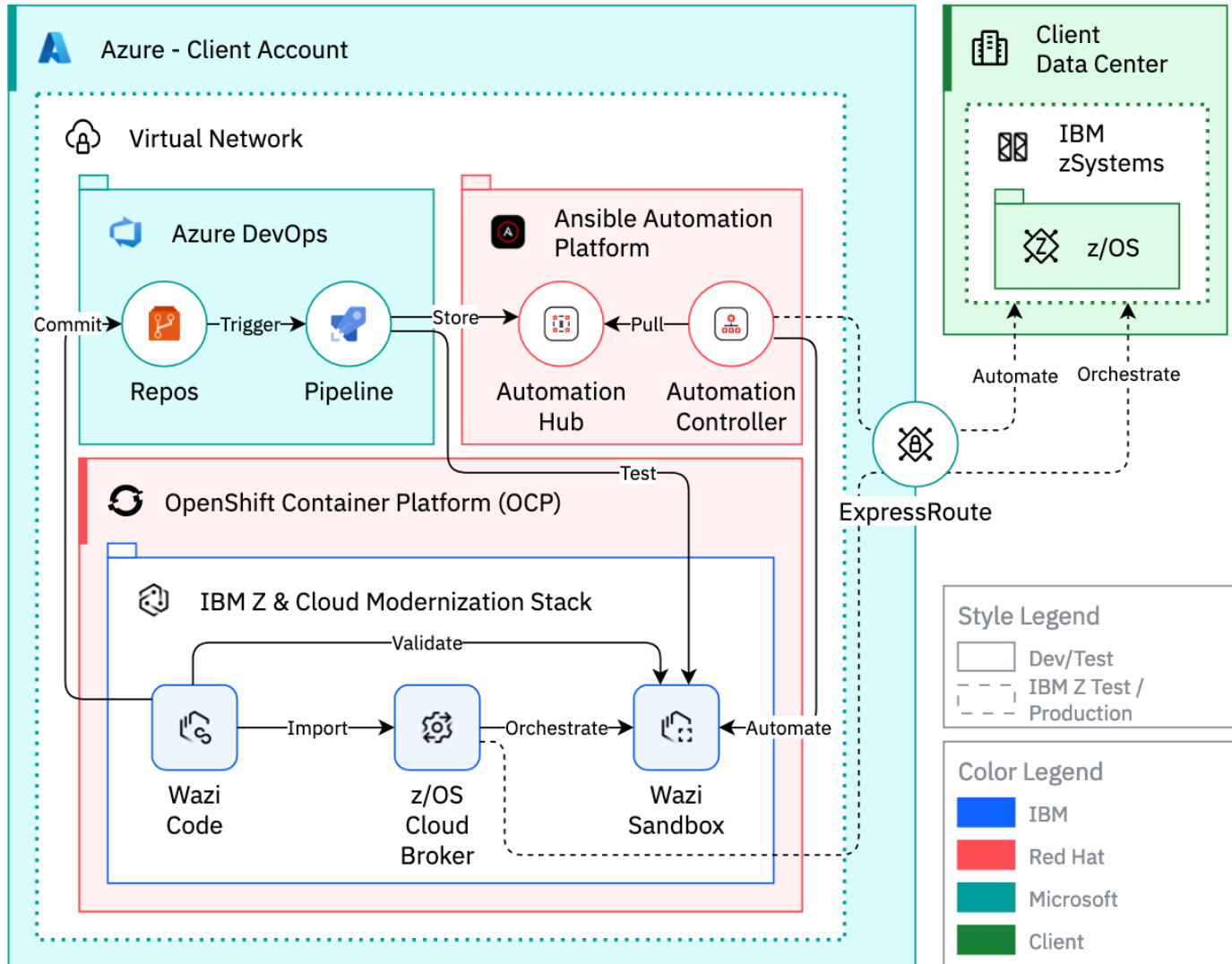
- [IBM Z Digital Integration Hub](#) optimized sharing of real-time core business information with cloud applications on Azure
- Curate & share necessary information as opposed to moving all the raw data — resulting in optimal performance
- Interact with in-memory caches on z/OS for handling request to and from Azure applications — resulting in faster cloud application development
- Surface information through standards-based interfaces, including event-based mechanisms such as Kafka, JDBC or open standard-based REST APIs
- Azure application services can access real-time intelligible/consumable information and events with little to no impact on core application environments

Optimized sharing of real-time core business information with cloud applications on Azure



# Enterprise automation across IBM Z and Azure

*Consistent and standard automation solution for developers and operators across hybrid cloud*

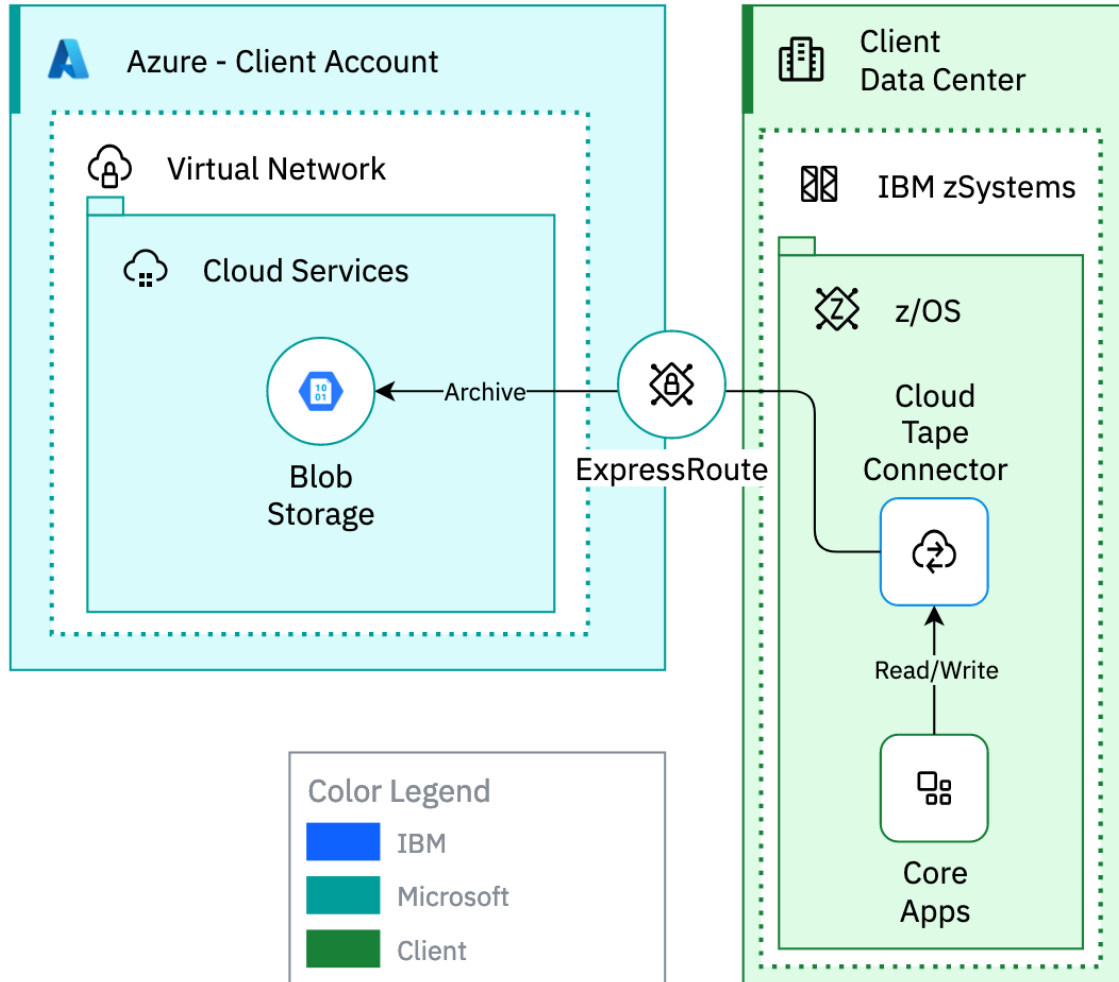


- The Red Hat Ansible Automation Platform is available on Microsoft Cloud
- Certified Ansible collections are available for Azure, z/OS and OpenShift
- Ansible playbooks can be maintained using the Azure DevOps
- Reduced need for specialized skills by leveraging infrastructure as code with Ansible
- Easily provision and scale systems and applications to meet business and development requirements



# Archive and retain mainframe data across IBM Z and Azure

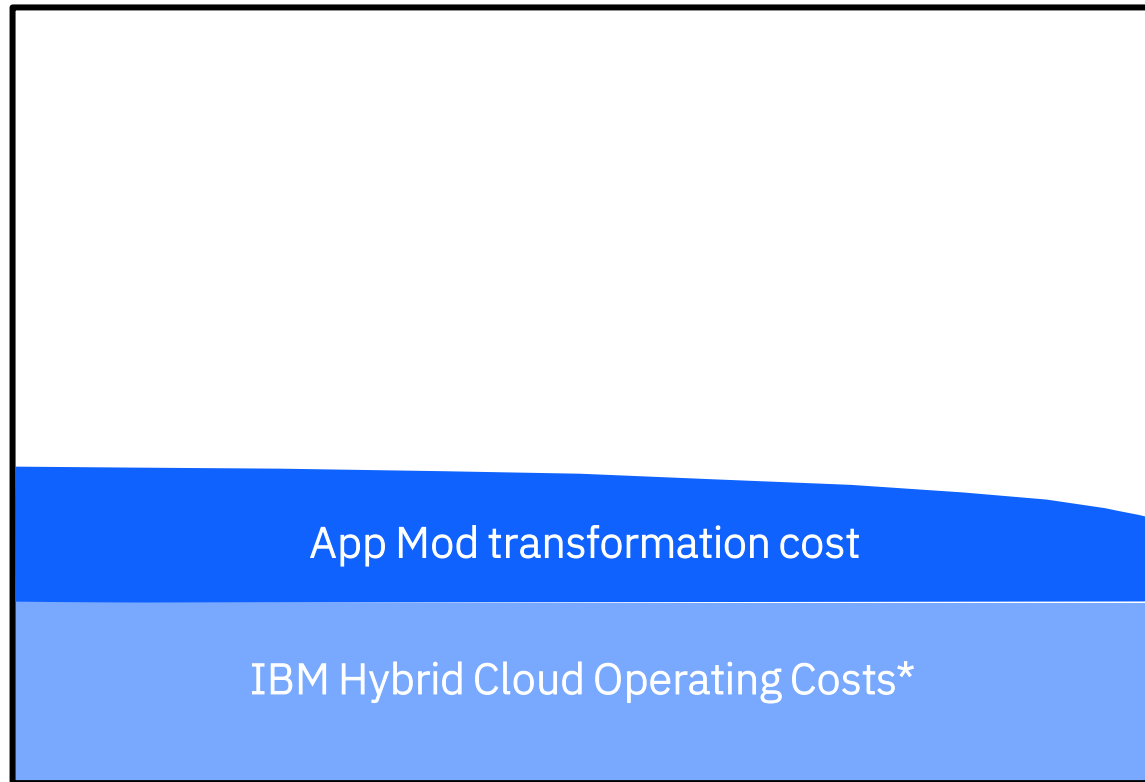
*Provide virtual tape storage mounts on z/OS where data is then written to Azure Blob Storage resulting in mainframe data being archived and retained with more efficiency and less costs*



- IBM Cloud Tape Connector (CTC) enables tape data to be easily copied to Cloud Object Storage
- Operational and storage efficiency by reducing HSM CPU while leveraging distributed storage for z/OS archive
- Reduce capital acquisition and operational costs through savings and footprint reduction
- Assured data protection through connector's being not visible in the event of an intrusion
- Data can be spread across multiple geos, ensuring full availability even if one entire site goes down

# IBM's continuous approach to application modernization is faster with less cost and risk than application migration only

Cost



Time

IBM's approach leverages existing investments and targets only required modernization

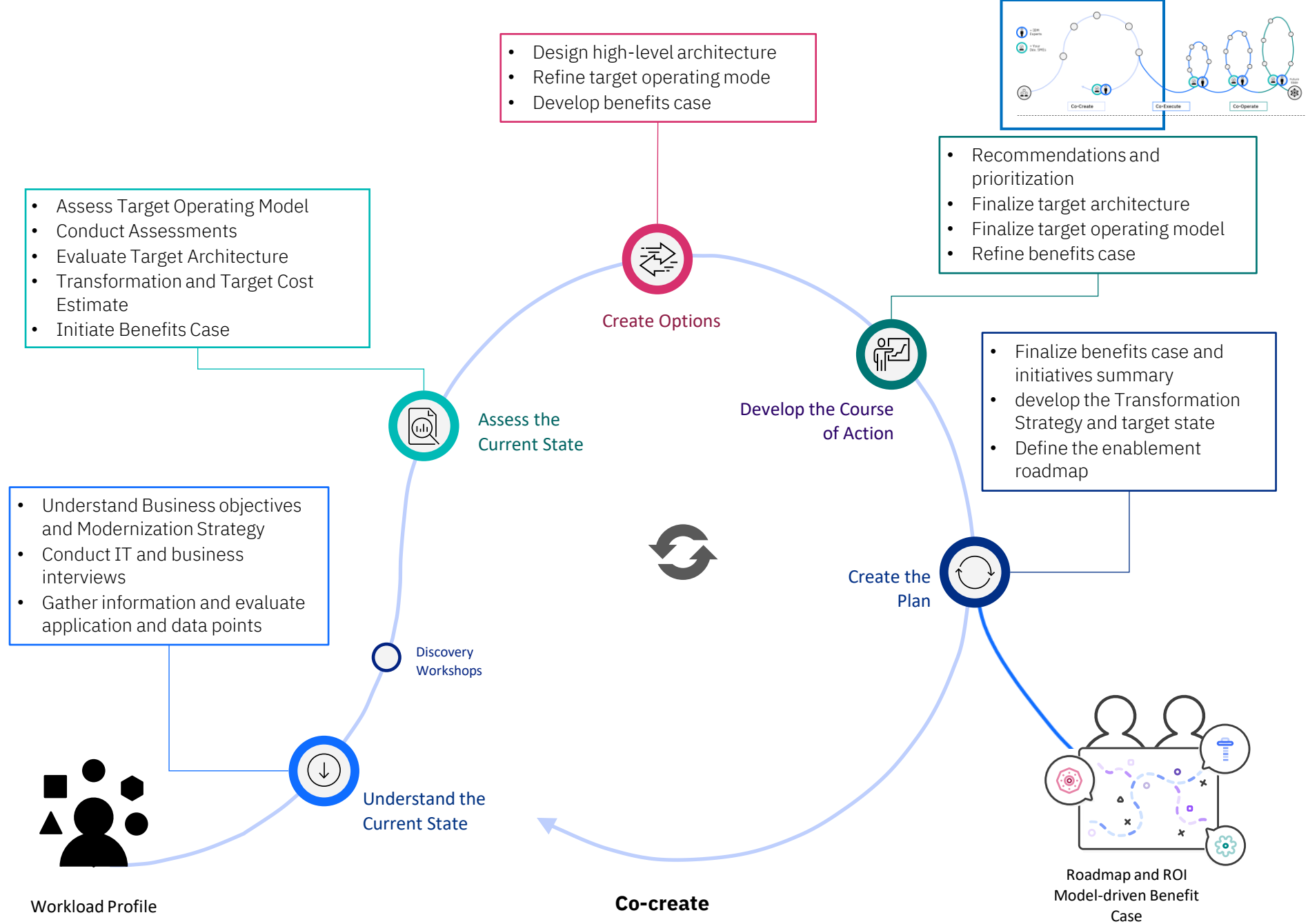
A continuous modernization process provides faster business outcomes with smaller project increments

Optimize transformation costs and operating costs by leveraging a range of application modernization techniques

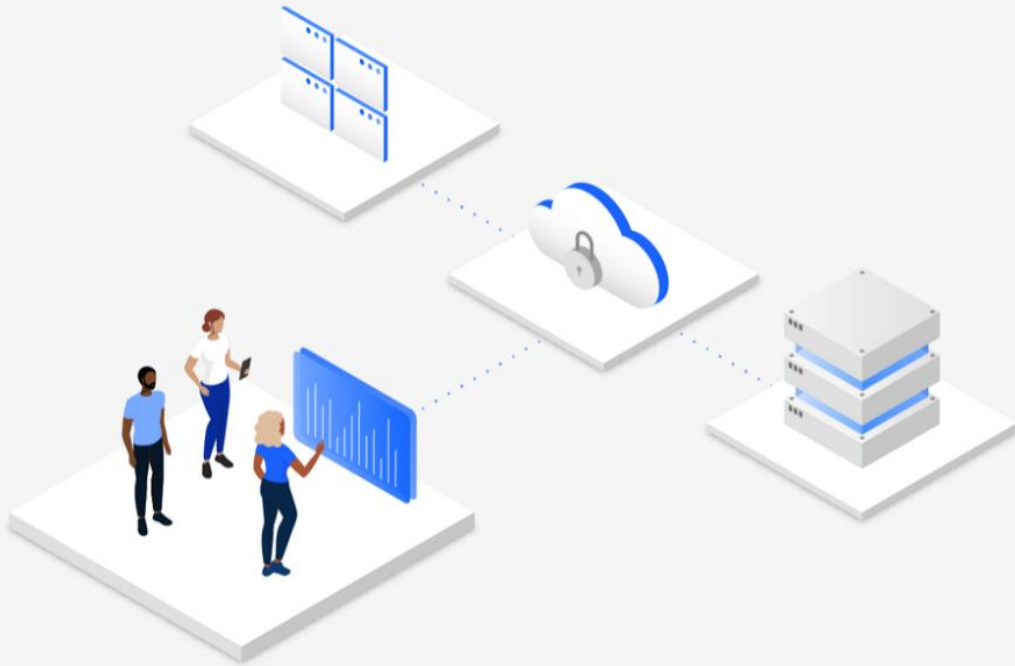
\* Cost assumes uniform transaction volumes

# Co-creating your path towards a Modernization Journey with agile sprints

The Mainframe Application Modernization Journey is something we do with you – not for you or to you. We combine the right people with useful data, applied technology, and our proven methodology to identify innovative ideas that can scale into new initiatives that deliver you value.



# Mainframe application modernization accelerated



## Learn More:

- [Blog: Accelerate mainframe application modernization with IBM and Microsoft](#)
- [IBM Consulting Mainframe Application Modernization](#)

A hybrid strategy that includes IBM Z and Microsoft Azure can:

- Significantly reduce talent gaps
- Deliver rapid innovation with an agile DevOps approach
- Provide easier to access applications and data without significant changes
- Optimize the costs of running or enhancing applications

Together, this approach maximizes business agility and return on investment