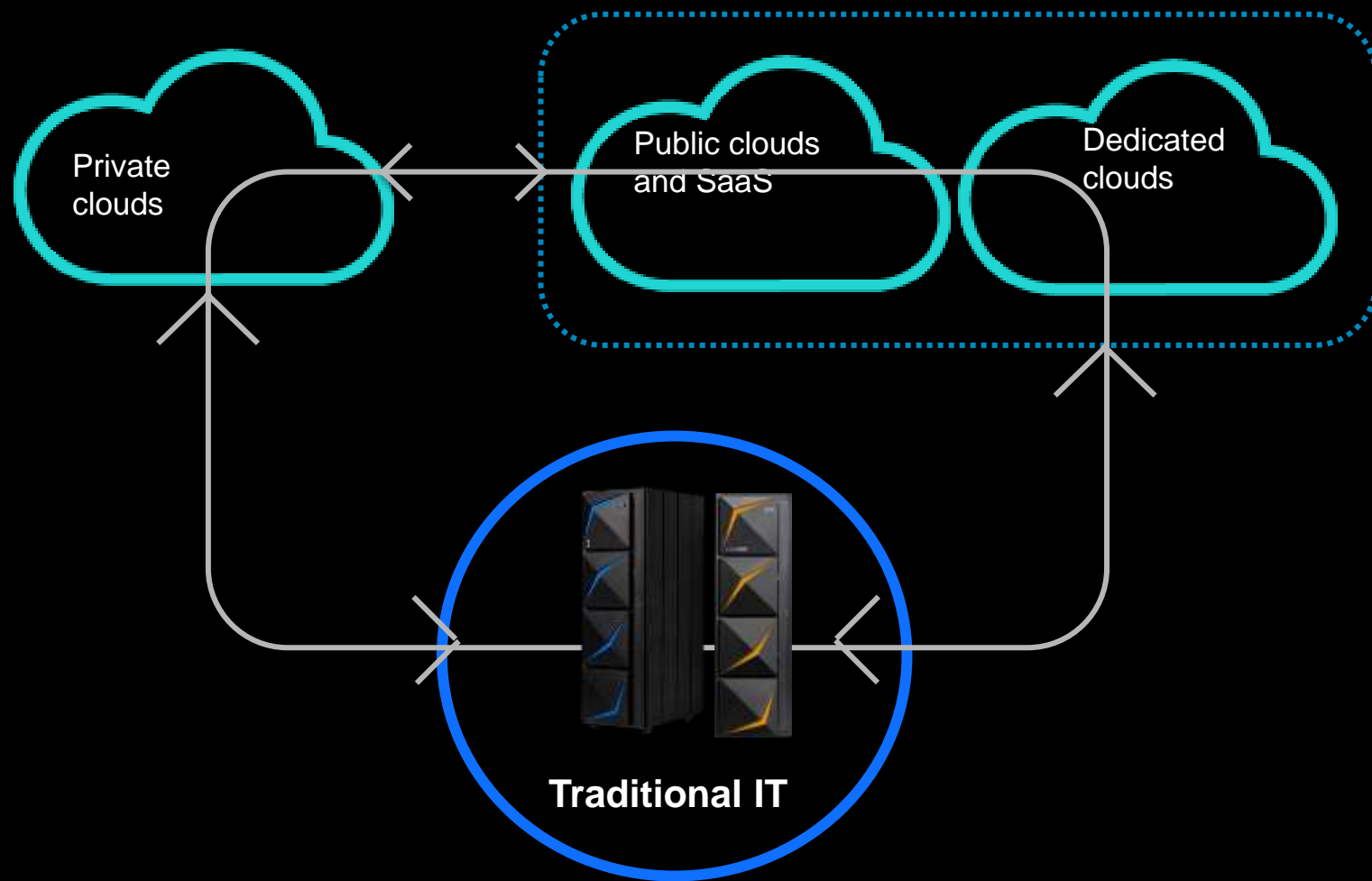


# The mainframe in the era of clouds and hyperscalers

Wilhelm Mild  
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IBM R & D Lab Germany  
[wilhelm.mild@de.ibm.com](mailto:wilhelm.mild@de.ibm.com)



# Hybrid and Multicloud are the new normal



## A real-world look at multicloud

**94%** Share of enterprises using a mix of cloud models

**67%** Share of enterprises 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

# IBM Z Digital Transformation Journey towards hybrid

## Hybrid Applications

Transforming *Apps* for Hybrid

**MANAGE** hybrid applications

**BUILD** open and hybrid applications

**INTEGRATE** with multi-architecture

TRANSFORM WITH AGILITY

EVOLVE WITH CERTAINTY

DELIVER WITH CONFIDENCE

**Secure,  
Reliable,  
High Performance  
Infrastructure for  
Traditional and  
Hybrid  
Applications**

**Core Infrastructure**

## Hybrid Data

Transforming *Data* for Hybrid

**INFUSE** – Operationalize AI with trust and transparency

**ANALYZE** – Scale insights with ML everywhere

**ORGANIZE** – Create a trusted analytics foundation

**COLLECT** – Make data simple and accessible

# Cloud Computing...

## Threat or opportunity?



Cloud Computing -> exploits services with the characteristics of:

- Self Service
- Automation
- Chargeback

Hybrid Applications

Hybrid Data

**Technology is not our challenge .....**

**choosing which technology to start with,  
as you go through this  
digital transformation journey and  
journey for ease of use**



**Core Infrastructure**

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ency

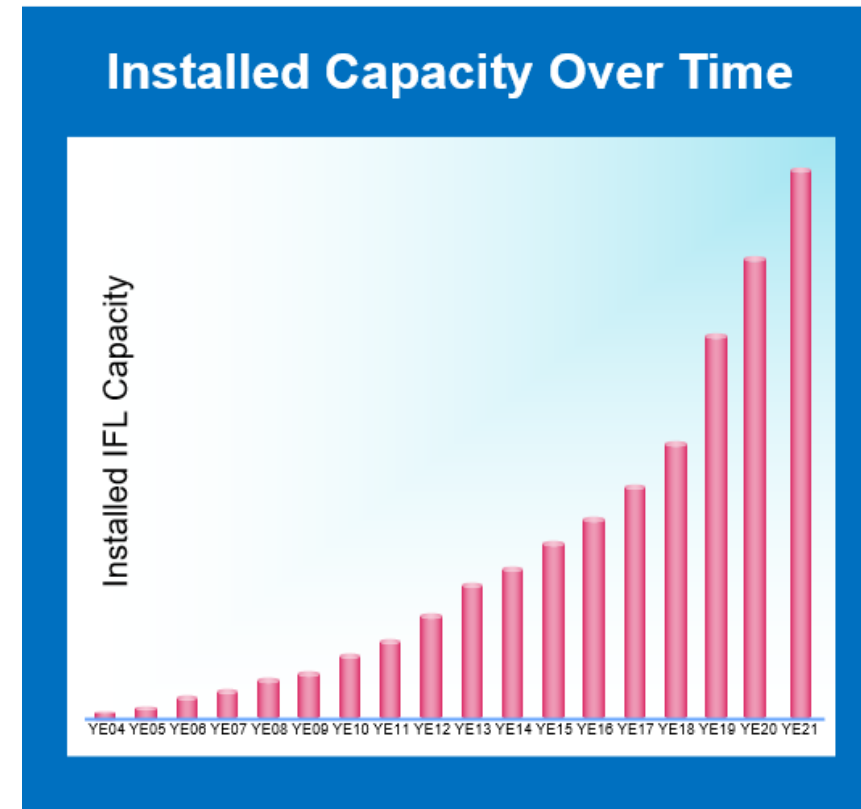
reate

ke

# The future is here...

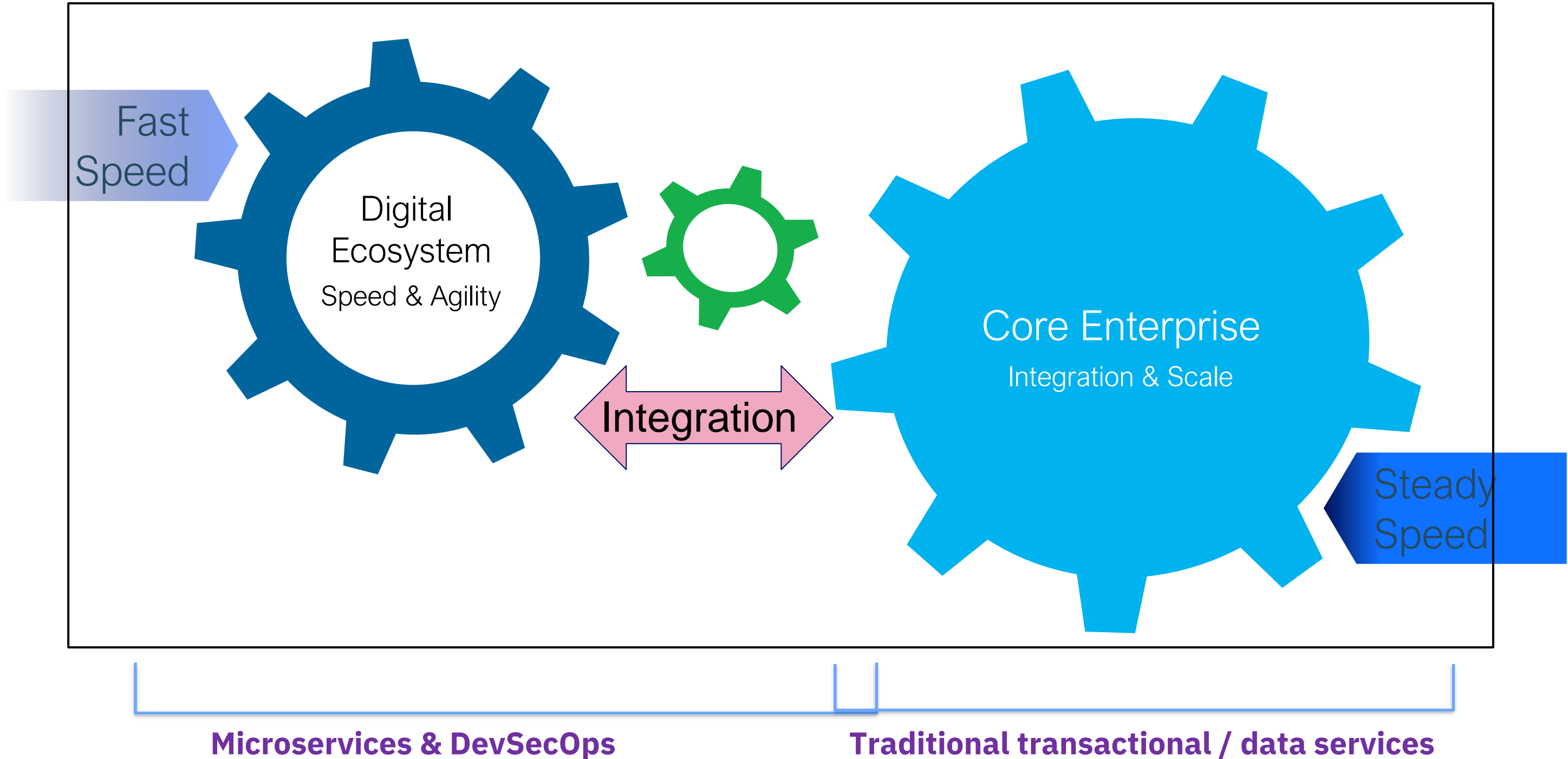


Installed IFL MIPS increased by 19% YTY from 4Q20 to 4Q21

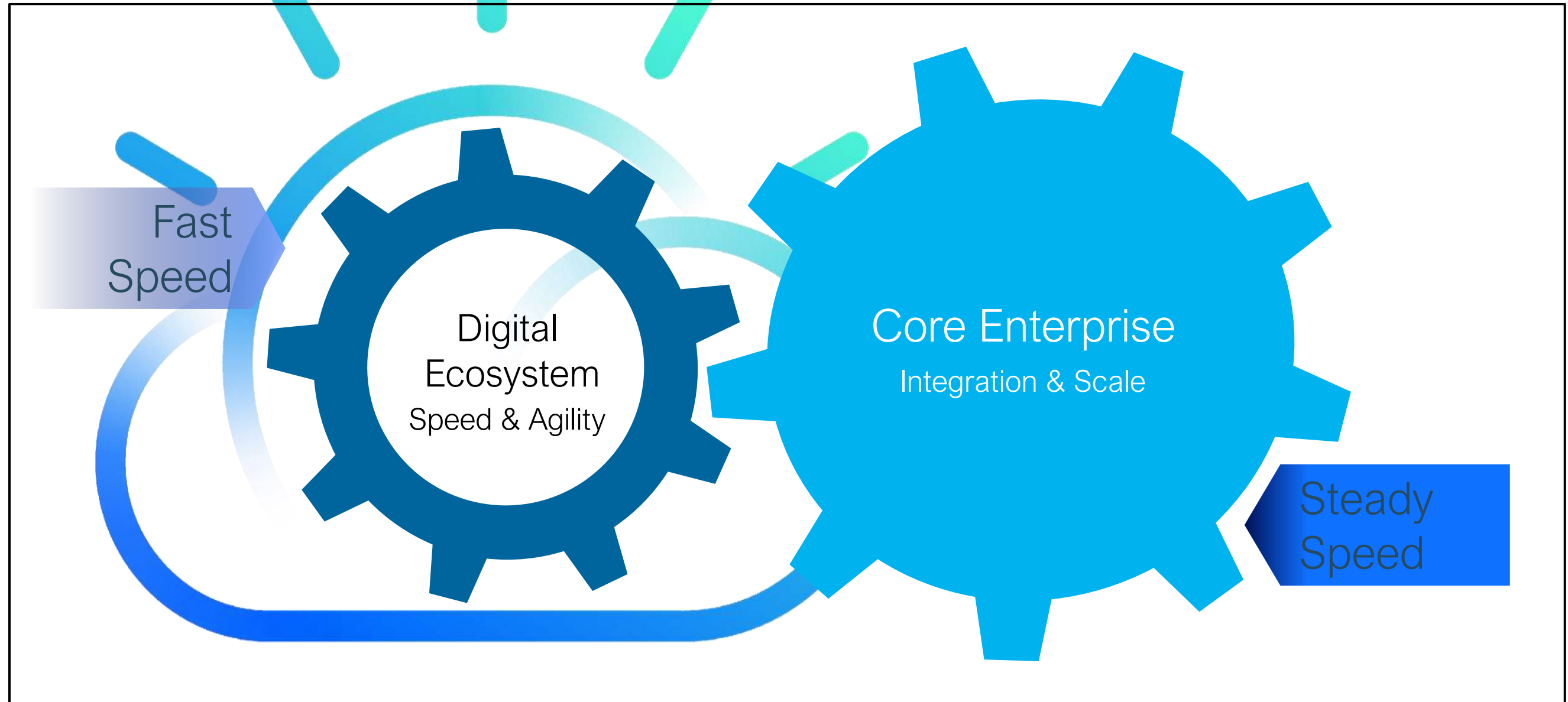


...and a new 'Era of computing' with IBM zSystems

# IT environments today - a multi-speed IT



# IT environments tomorrow - hybrid multi-speed IT

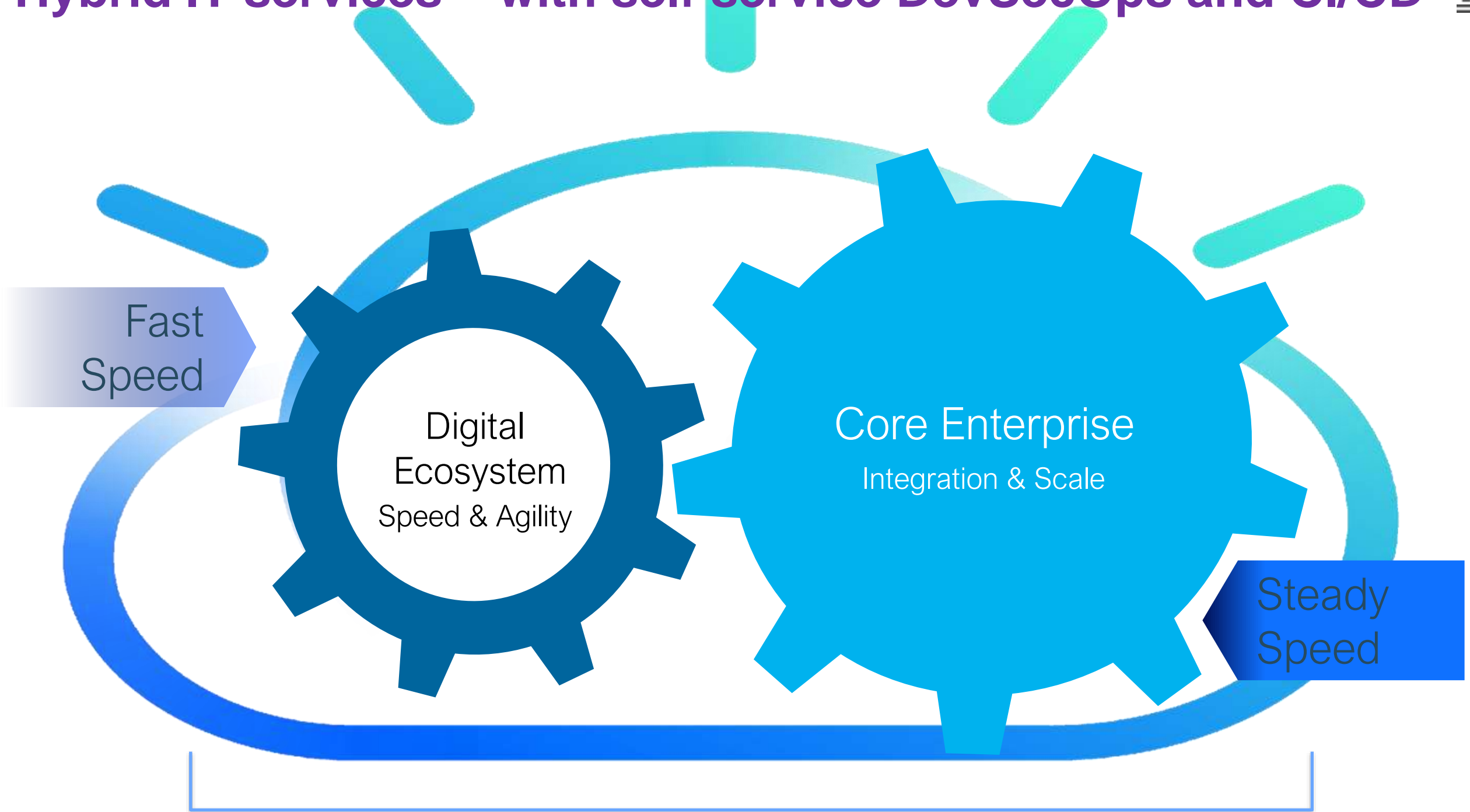


**Cloud Service Orchestrator  
( RH Openshift opportunity)**

**Traditional transactional / data services**



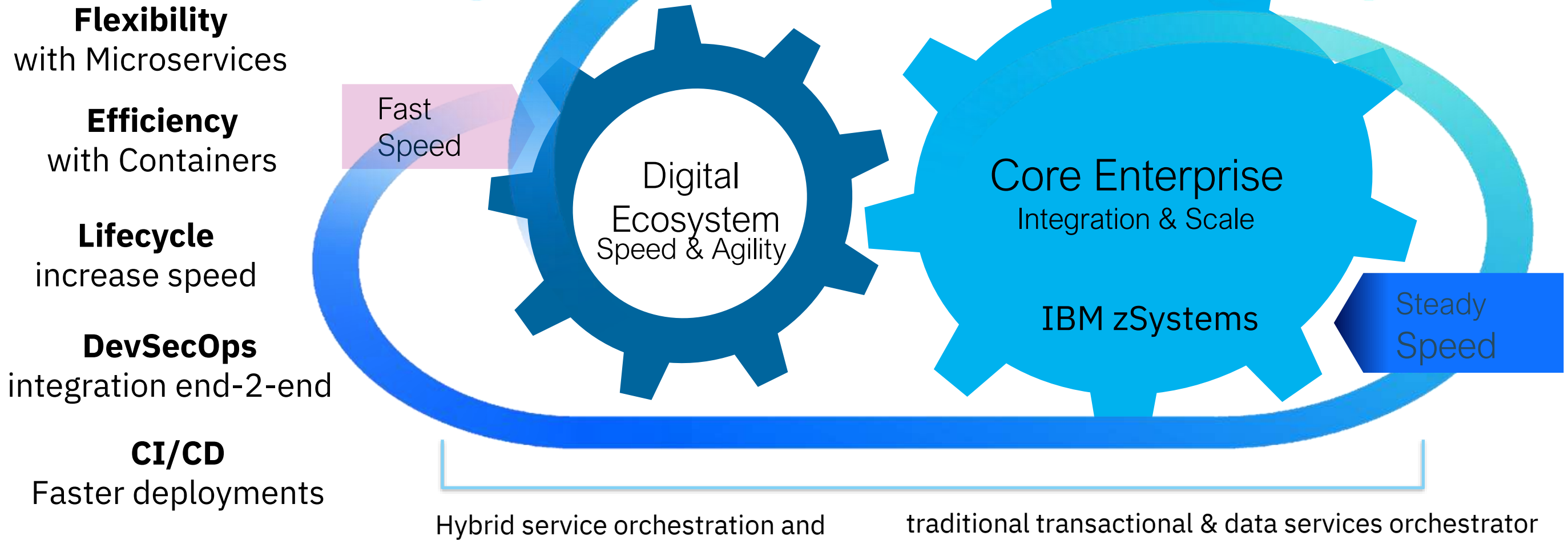
# Vision: Hybrid IT services – with self service DevSecOps and CI/CD



Hybrid Cloud Service orchestration and traditional transactional & data services orchestrator

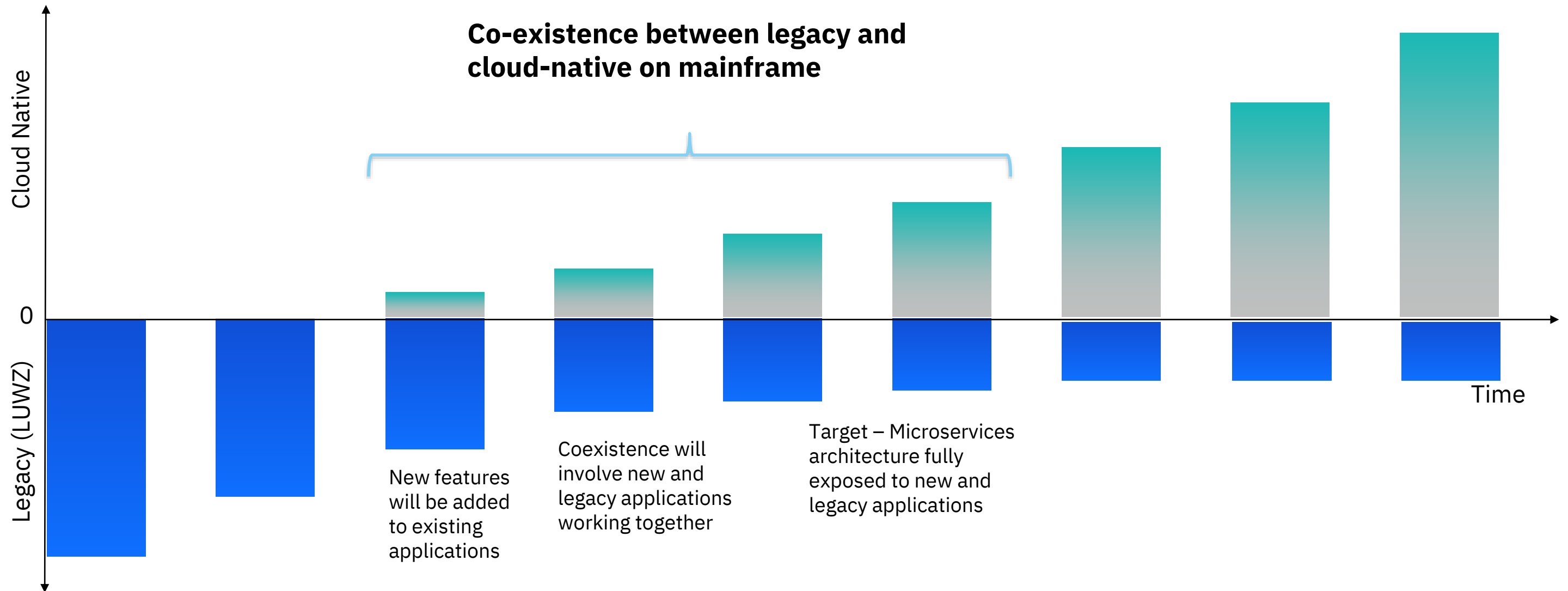
## RH Openshift and Multi Cloud Management opportunities

# Hybrid IT services, hybrid Cloud – with self service DevSecOps and CI/CD



**The cloud service model with end-to-end orchestration capabilities**

# Cloud native & traditional apps will co-exist at least for the next 10+ years



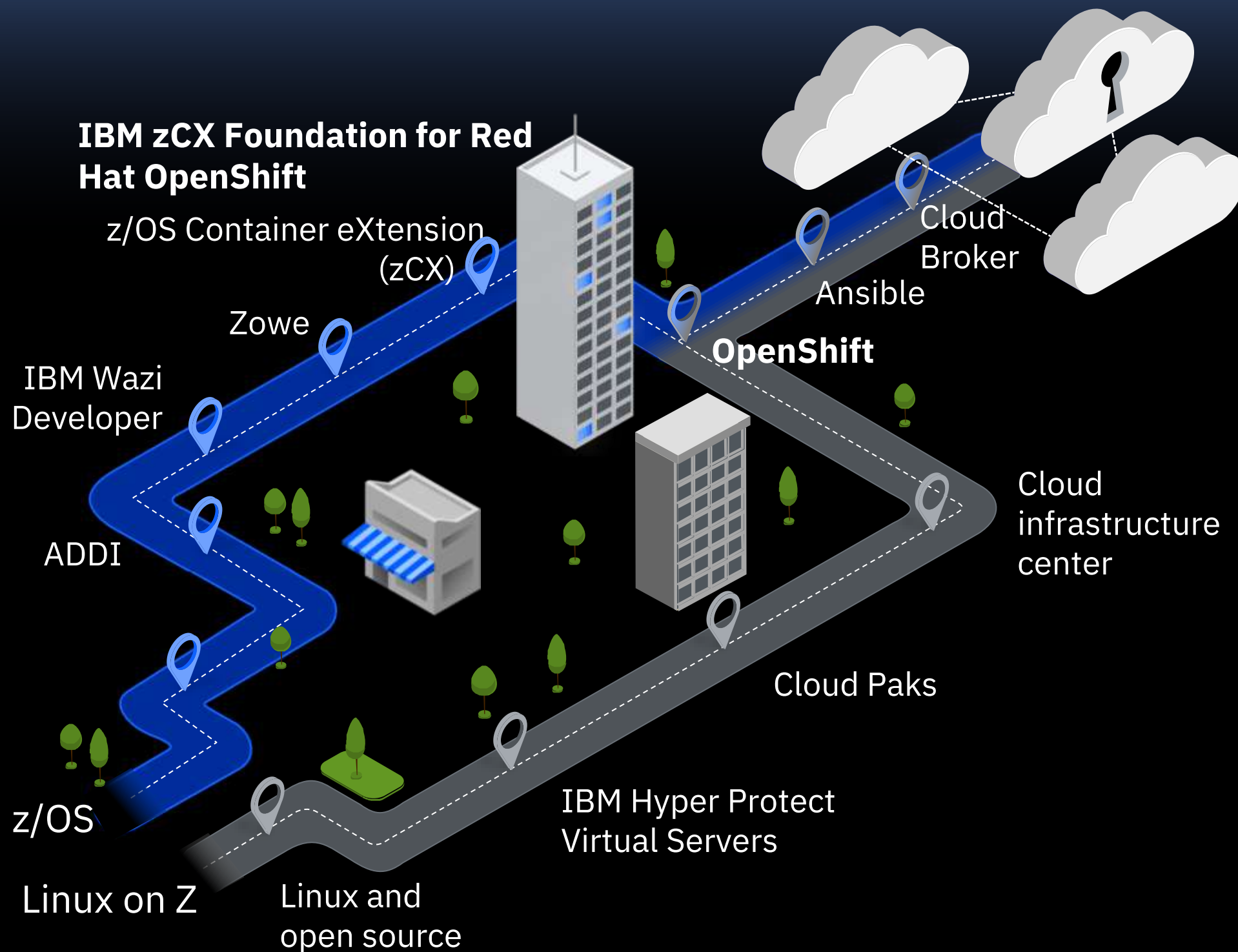
# IBM Z: Roadmap to hybrid cloud

Innovate with agility

Create better  
experiences

Fuel business  
growth

Build competitive  
advantage



# IBM Z and Cloud?

“How do I **modernize** and boost productivity?”



Modernize on Z  
and integrate with  
hybrid cloud

“I need **my cloud** in my data center!”



Modernize and deploy  
cloud on Z

“What about **public Cloud?**”



Modernize and leverage  
IBM Cloud security services  
running on IBM Z / LinuxONE

# Modernize on Z and integrate with hybrid cloud

*“How do I modernize my workload and boost developer and admin productivity?”*



- Implementing **DevOps** pipelines and practices on IBM z/OS®
- **Building Microservices & Containerization** of core **z/OS** and **Linux** applications
- **Reducing the time to market**, deploy/maintain/test code by >50%
- **Deploy a modern IDE** backed by open source tools and OpenShift
- **Empower developers** with insights to develop once and deploy multi-architectural
- **AIOps** – visualize Z operational data in the same context as rest of Hybrid data

# Modernize and deploy cloud on Z

*“I need my cloud in my data center!”*



- **Deploy the cloud Foundation with with Red Hat OpenShift on IBM Z** to deliver unmatched security, resiliency, and reliability while providing industry leading performance for efficient management and hosting of the world’s most critical workloads and data
- **Co-locate containerized apps to z/OS** and/or Linux to achieve low response time and meet enterprise SLA
- **Consolidate onto IBM Z / LinuxONE** and benefit from streamlined infrastructure, energy, space, operational efficiency, etc.
- **Adapt cloud native** DevSecOps and CI/CD tooling to achieve consistency across the enterprise and grow containerized workloads in hybrid solutions

# Modernize and leverage IBM Cloud security services running on IBM Z / LinuxONE

*“What about public Cloud?”*



- Make use of **Hyper Protect Virtual Servers** in IBM Cloud with IBM Z / LinuxONE
- Utilizing **Hyper Protect Services** to meet the stringent controls for data confidentiality
- **Address encryption key** control and amangement requirements
- **Leverage public cloud** to accelerate innovation of application modernization projects. (Dev/Test, Wazi on Z, AI on Z,..)



# IBM Z & LinuxONE in the cloud are waiting for you

- **Join the Community for IBM Z and LinuxONE**
  - <https://www.ibm.com/community/z/>
- **The access to Linux on IBM Z and Red Hat OpenShift environments – available in the IBM LinuxONE community cloud**
  - <https://community.ibm.com/community/user/ibmz-and-linuxone/groups/topic-home?CommunityKey=8c2c15eb-f059-4e7c-8cb6-5fb713a7806c>
- **IBM Cloud extended the IBM Z portfolio to z/OS Dev & Test and Linux on zSystems.**
  - <https://www.ibm.com/cloud/wazi-as-a-service>



IBM Cloud Delivers a  
New Era of  
Modernization with  
IBM Z

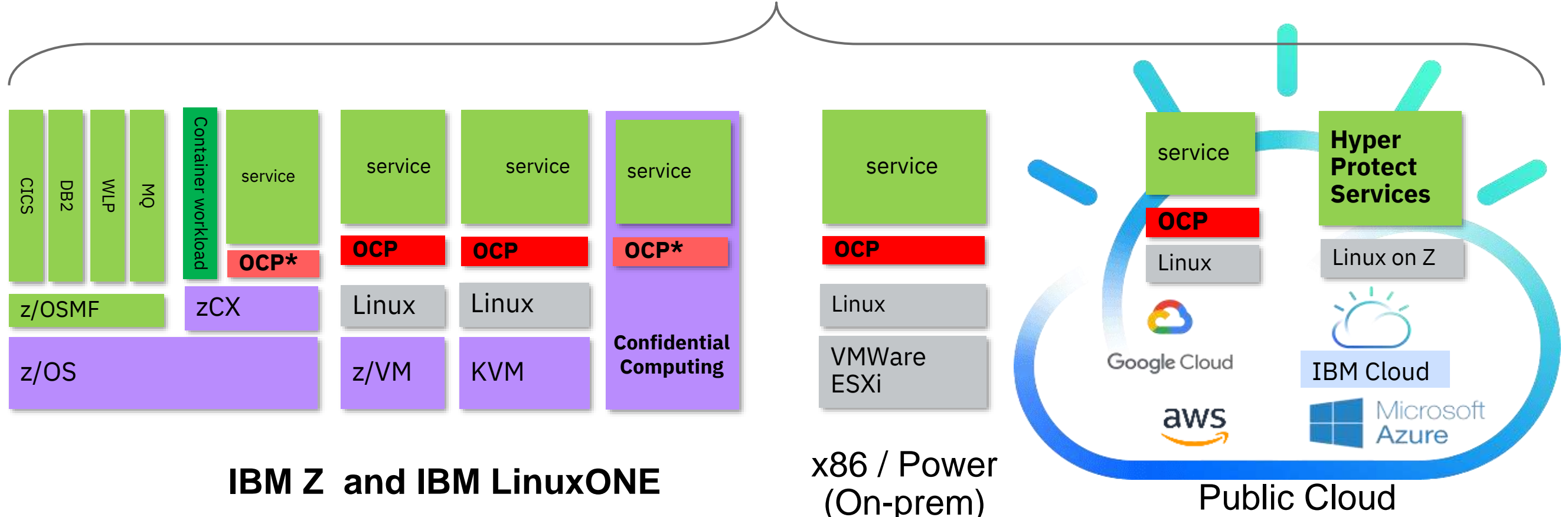
Cloud

DevOps

# Outlook: The Hybrid Multicloud Vision with OpenShift



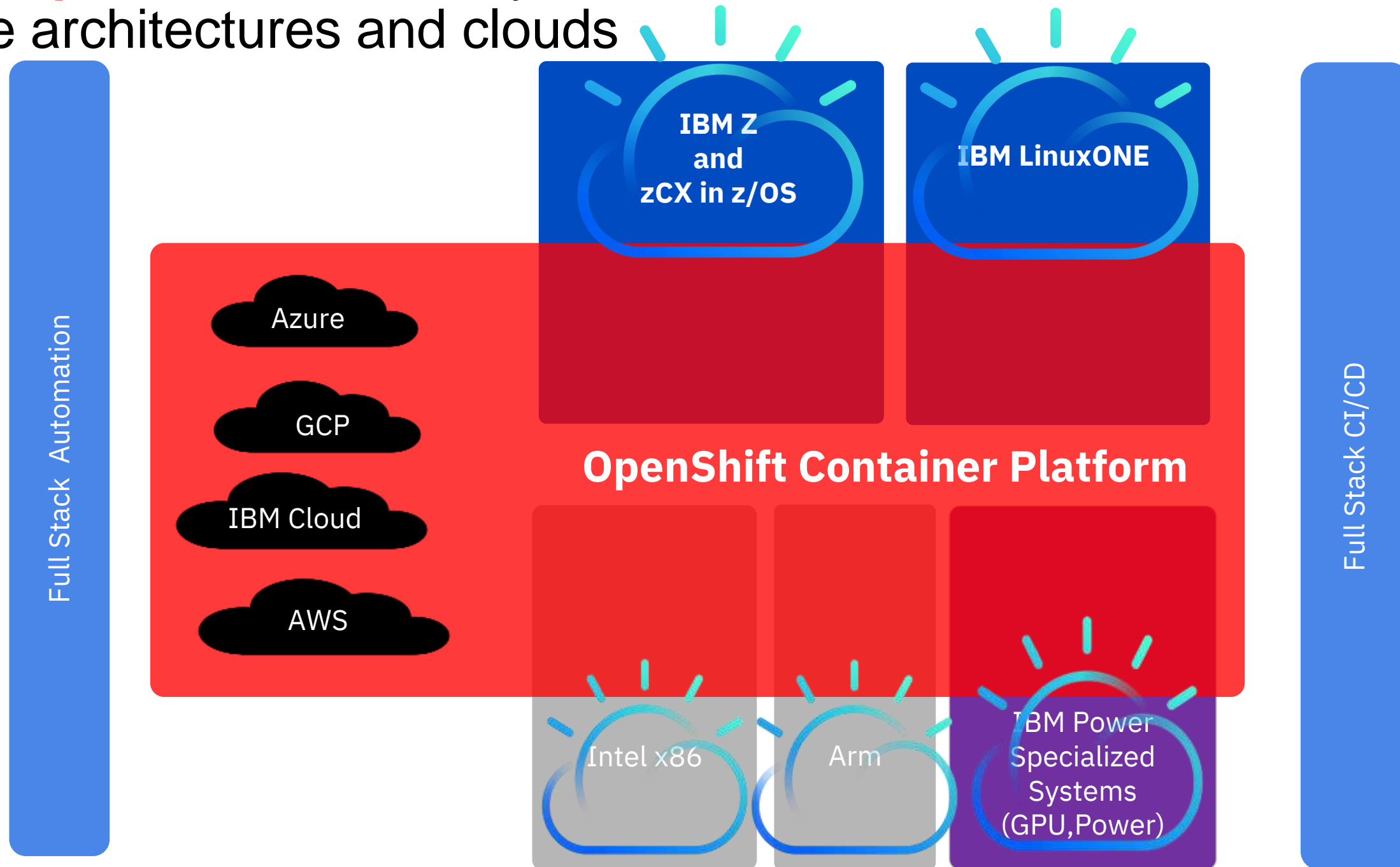
**Advanced Cluster Management (RHACM)**  
 for multi cloud solutions and App. Life cycle  
 - [Can manage Kubernetes and OpenShift cluster](#)



\* Roadmap item

*\* All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice and represent goals and objectives only.*

# Red Hat OpenShift - the only Container Platform across different hardware architectures and clouds



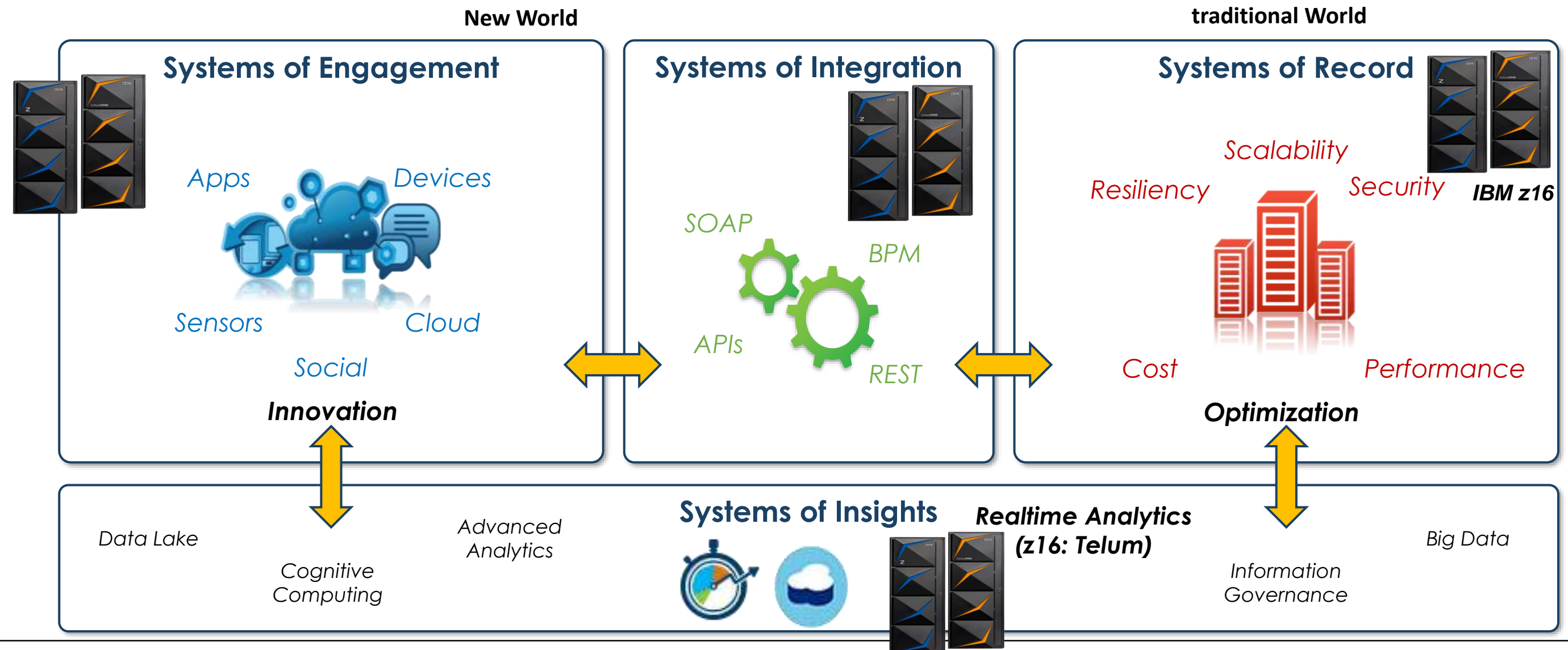
# IBM Z and IBM LinuxONE can be the core of your secure hybrid multi cloud

- Unparalleled trust and security for mission critical workloads and data
- Delivers single-point secure management and integration across environments and cloud platforms
- Agility in operations and development across the cloud ecosystem
- Remove skills barriers with open technology and tooling
- Support mobility of workloads, services and data across the hybrid cloud ecosystem



# Where IBM Z offers Value in a hybrid cloud architecture

- Enable enterprises to **build & run apps wherever fit best**
  - i.e. Kubernetes-based architecture with common services and ensured interoperability across all clouds
- Provide access to all data on or off premises, applying advanced **data science like ML and AI technologies.**
- Connect all business apps and data, no matter where they live – **with IBM Z just being another server platform**
- Deliver seamless visibility and governance of apps and workloads across clouds – **from a single pane of glass**



Save the ocean  
with  
LinuxONE

## Plastic Bank – the clean future with LinuxONE

Cognition Foundry and The Plastic Bank developed a Blockchain cloud service on LinuxONE



**‘IBM and LinuxONE provide the foundation for our Blockchain solution to ocean plastic. By revealing the value in waste we can increase collection, improve incomes, and provide a transparent supply chain for Social Plastic to some of the world's leading brands.’**

<https://www.ibm.com/case-studies/cognition-foundry-systems-hardware-linuxone-scalability>

# FIE: Plastic Bank – the clean future with LinuxONE

Cognition Foundry and The Plastic Bank developed a Blockchain implementation on LinuxONE  
<https://www.ibm.com/case-studies/cognition-foundry-systems-hardware-linuxone-scalability>



<https://www.youtube.com/watch?v=p0WH-EJ8FTA>



<https://www.youtube.com/watch?v=W97NbdT1jNs>



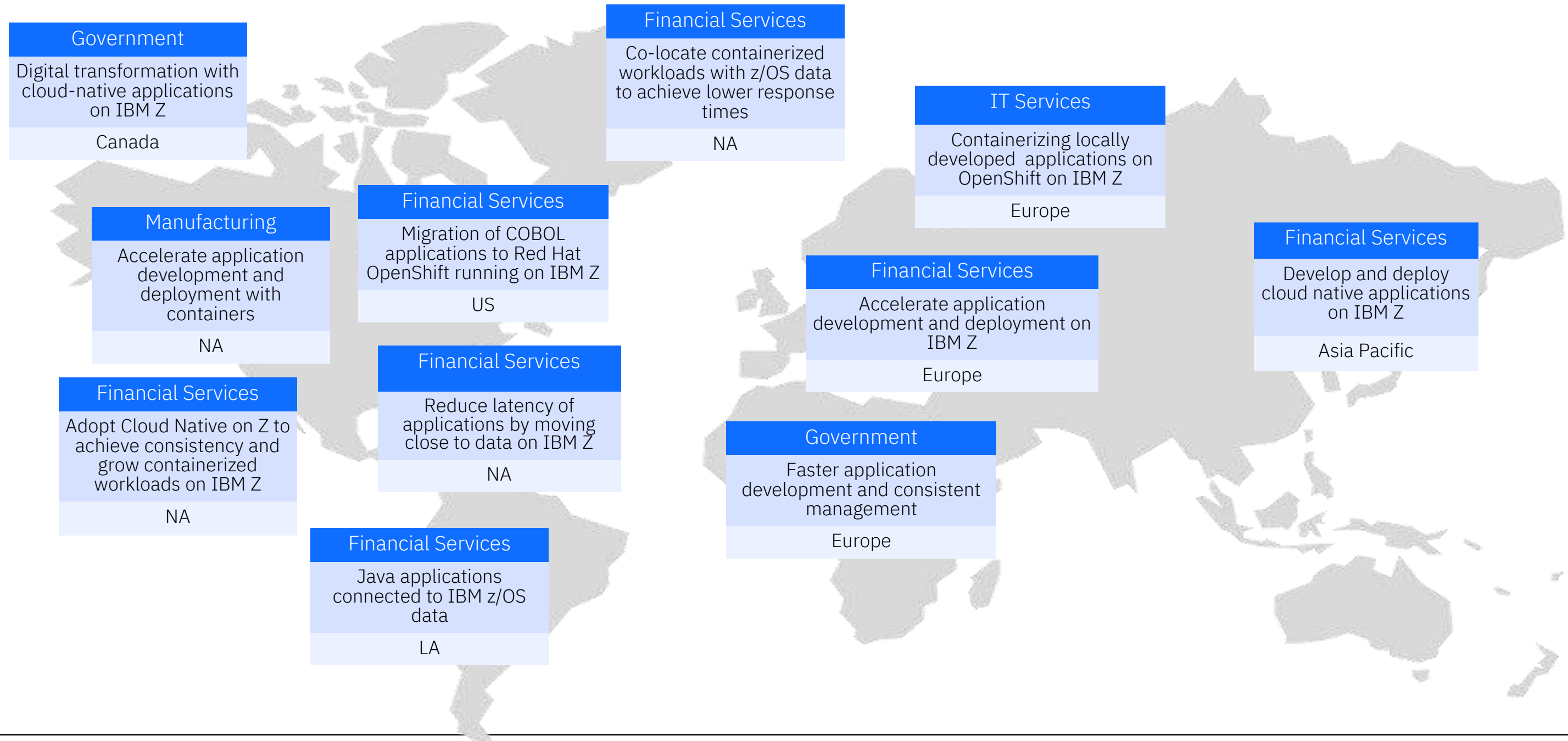
**ALDI geht Kooperation mit Plastic Bank ein**  
( ALDI has cooperation with Plastic Bank )

[https://www.youtube.com/watch?v=1A\\_F-zZz1GE](https://www.youtube.com/watch?v=1A_F-zZz1GE)



<https://www.youtube.com/watch?v=RI5lmb3hygQ>

# Real worldwide momentum for **Red Hat OpenShift** on IBM Z & Cloud Paks





# Hybrid Cloud Differentiation with Red Hat OpenShift & IBM Z & LinuxONE

## Benefits on Z

Low Latency and Large Volume  
**Data Serving** and **Transaction processing**

Enterprise class infrastructure –  
**Elastic, Scalable, Available and Resilient**

Highest levels of **Security and Compliance**



## Adoption Patterns

Enterprise scale **Private Cloud-in-a-Box**  
2.4M containers-per-box

**Digital Transformation and Modernization** for z/OS  
7x shorter batch windows  
5x better transaction response times

**Extreme Consolidation** and scalable **Data Serving**  
75% lower Op-Ex

**99.99999%**  
*system availability*

**4:1 better data-center footprint** **2:1**  
*lower power envelope*

**3.8x better Java throughput,**  
**24x faster Java Garbage Collection**

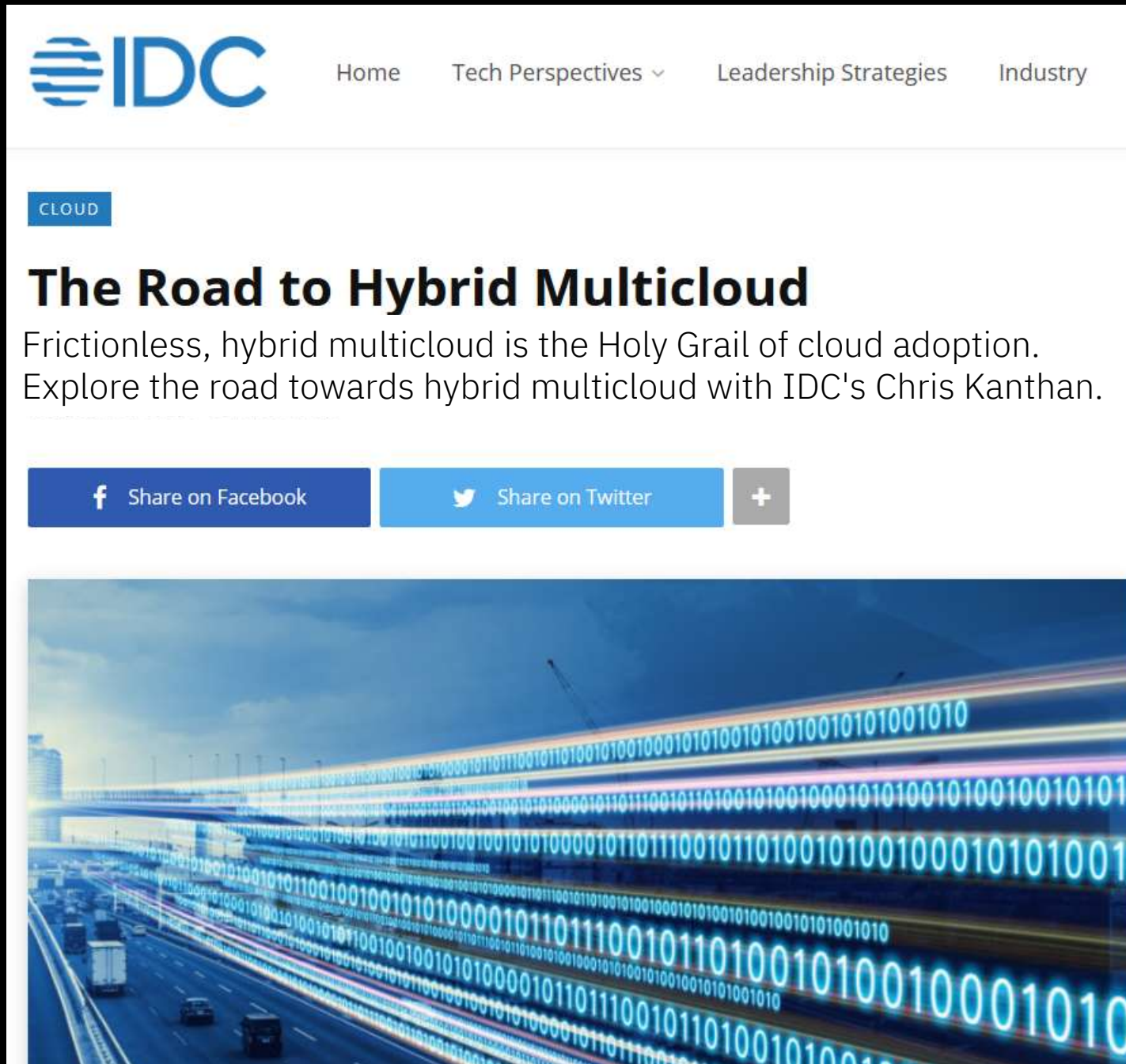
**Enterprise** grade. **Open** by design. **Secured** by IBM Z.



# Useful links for Linux and RH OpenShift on IBM Z & LinuxONE

- **Technical Linux on Z and LinuxONE customer webinars from the Labs**
- <http://ibm.biz/LinuxonZandLinuxONEwebcasts>
- **[IBM Knowledge Center](#) for Linux on Z and LinuxONE**
- [Blog: Linux and Mainframe](#)
- [News and tips for running Linux on IBM Z and LinuxONE](#)
- [OpenShift on IBM Z](#)
- **The Reference Architecture:** <https://lnkd.in/dpdpz8V>
- The Reference Architecture for [IBM Spectrum Scale Container Native Storage Access \(CNSA\)](#)
- Blog: <https://www.openshift.com/blog/installing-ocp-in-a-mainframe-z-series>
- **[Virtualization on IBM Z & LinuxONE](#)**
- [z/VM resources](#)
- [KVM on Z](#) blog
- **[Containers on IBM Z](#)**
- **Trusted IBM Container Image Registry -Sign up now:** <https://ibm.biz/zregeap>
- IBM Z container blog: [Linux on Z and Containers](#)
- zCX, Containers in z/OS : <https://www.ibm.com/support/z-content-solutions/container-extensions/>

# IDC - The Road to Hybrid Multicloud



The screenshot shows the top portion of a web page. At the top left is the IDC logo, followed by navigation links: Home, Tech Perspectives, Leadership Strategies, and Industry. Below the navigation is a blue button labeled 'CLOUD'. The main heading is 'The Road to Hybrid Multicloud' in a large, bold, black font. Below the heading is a sub-headline: 'Frictionless, hybrid multicloud is the Holy Grail of cloud adoption. Explore the road towards hybrid multicloud with IDC's Chris Kanthan.' Underneath the sub-headline are three social sharing buttons: 'Share on Facebook', 'Share on Twitter', and a plus sign for more options. At the bottom of the screenshot is a large image showing a highway with cars, overlaid with glowing blue binary code (0s and 1s) that appears to be flowing across the road.

Cloud adoption is not a destination. It is a journey with tremendous rewards for those who are willing to face daunting challenges on [this path of digital transformation](#).

The **Holy Grail** in cloud computing is a **frictionless, hybrid multicloud** that provides consistent experience and unified management across multiple public clouds, private clouds, and even traditional infrastructure.

While such an idealistic state may never be attainable, enterprises need to continuously move towards this goal in small but deliberate steps. The infographic in this blog post presents a roadmap for the hybrid cloud journey, which involves three phases – single cloud, multiple clouds, and hybrid multicloud.

<https://blogs.idc.com/2020/08/21/the-road-to-hybrid-multicloud/>

# Questions?



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 wilhelm.mild@de.ibm.com*



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