DIGITAL REALTY™

Are You Data and AI Ready?

Proven approach to enable data and AI-ready architecture

Introduction

Digital Economy Becoming the Data Economy

The digital transformation opportunity is giving way to a new data-powered era: the data economy.

Data Economy Creates New Interactions

The data economy is causing an explosive growth in data. This continuous data creation lifecycle is shifting data flows.

A New Architecture Is Needed

To support these shifting data flows, infrastructures must evolve to brings apps, services, and clouds to the data in centers of data exchange.

Digital Foundations Are Core to This Architecture

The infrastructure architectures in these centers of data exchange are supported by core digital infrastructure foundations.

Solve Infrastructure Imperatives to Be Data and AI Ready

There is no AI without data. And new business value won't be unlocked without AI. In order to be data and AI ready, businesses must solve for five key infrastructure design imperatives.

Chapters

[1]World Economic Forum, *$100 Trillion by 2025: the Digital Dividend for Society and Business*, January, 2016

Chapter 1

Setting the Stage

Digital transformation creates a $100 trillion opportunity.[1] It also creates infrastructure challenges with data exchange and platform growth.

[1]World Economic Forum, *$100 Trillion by 2025: the Digital Dividend for Society and Business*, January, 2016

Unrealized Opportunity

WORLD ECONOMIC FORUM

$100 trillion

[1]World Economic Forum, *$100 Trillion by 2025: the Digital Dividend for Society and Business*, January, 2016

Digital transformation generates an unrealized opportunity for all companies, irrespective of size.

In fact, the World Economic Forum estimates $100 trillion of incremental Gross Domestic Product (GDP) could be secured through digital transformation.[1]

In recent years, global economies transformed from being physical-powered to digital-powered.

And now, we are in the next phase, transforming to become 'data-powered' – with high-density data fueling economic growth.

With increased digitization*, the physical economy has shifted to a digital economy, which is now entering a new form:

the data economy.

[1]Bureau of Economic Analysis, *Value Added by Industry*, December, 2023
[2]IDC, 2021 *U.S. Data Valuation by Industry Vertical*, December, 2022

*Accelerated by widespread use of technology, e.g. connectivity, internet, mobile, cloud, analytics, data, social, artificial intelligence, and machine learning

Physical to digital to data economy

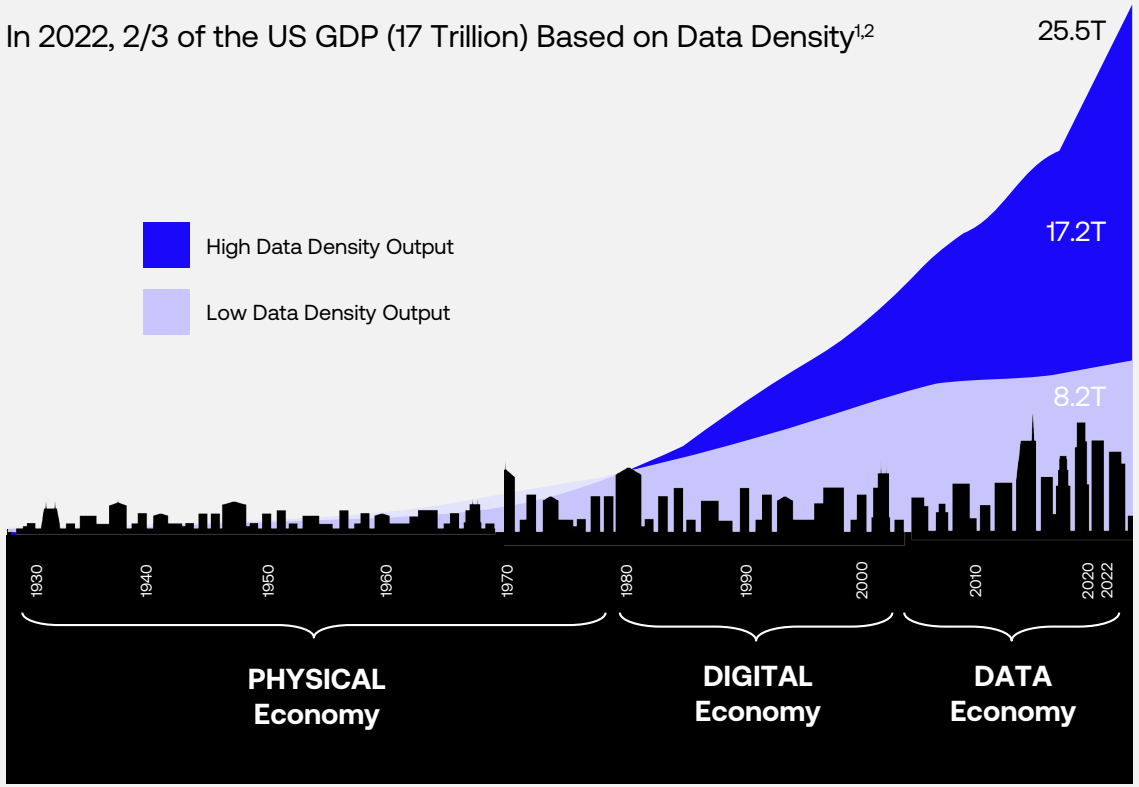


Fig. 1: *Bureau of Economic Analysis, Value Added by Industry*, December, 2023

The data economy stems from the abundance of data created from digital interactions, driven by fast growing technologies, including mobile, social, IoT, and AI/machine learning.

As a result, the physical locations at the centers of trade are also now centers of enterprise data creation, processing, and exchange.

Data economy drives explosive data growth[1,2]

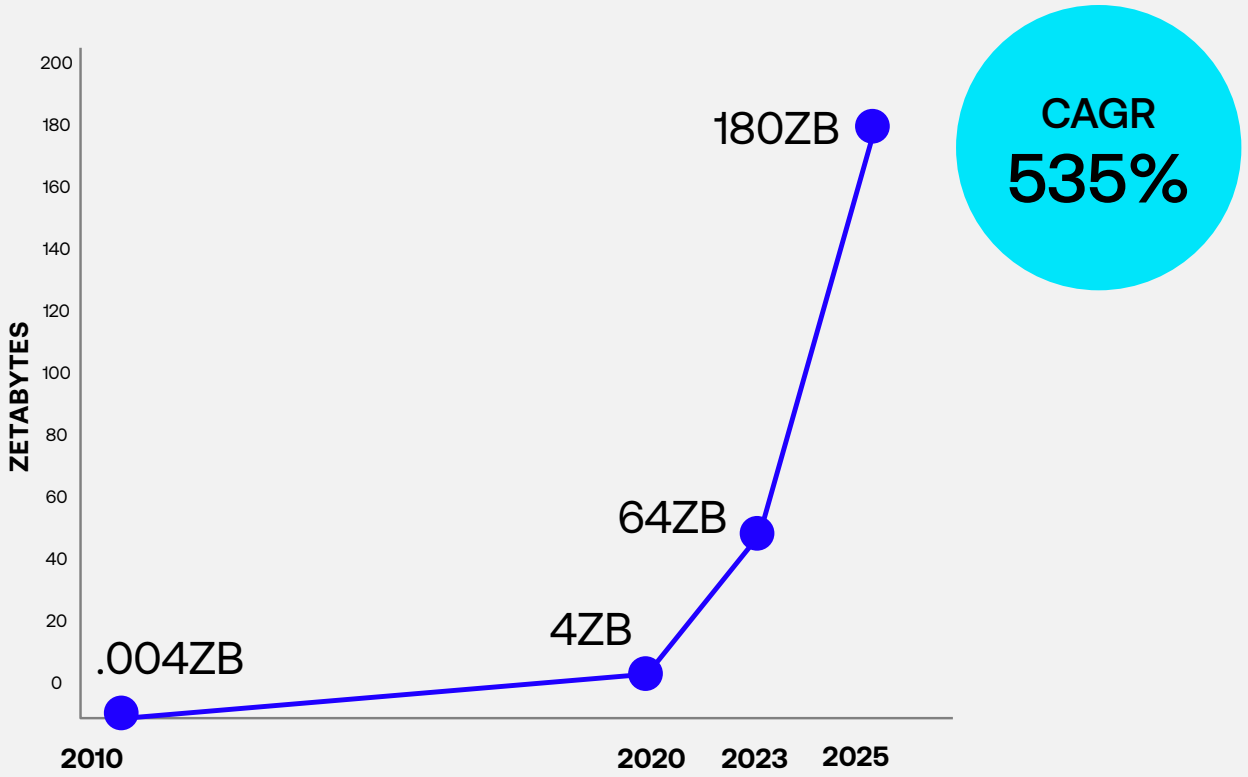


Fig. 2: IDC, *Worldwide Datasphere*, December 2023-2027
Digital Realty Market Intelligence, *Data Gravity Index (DGx)™ 2.0*, 2023

[1]IDC, *Worldwide Datasphere*, December 2023-2027
[2]Digital Realty Market Intelligence, *Data Gravity Index (DGx)™ 2.0*, 2023

Data economy shifts data flows[1,2]

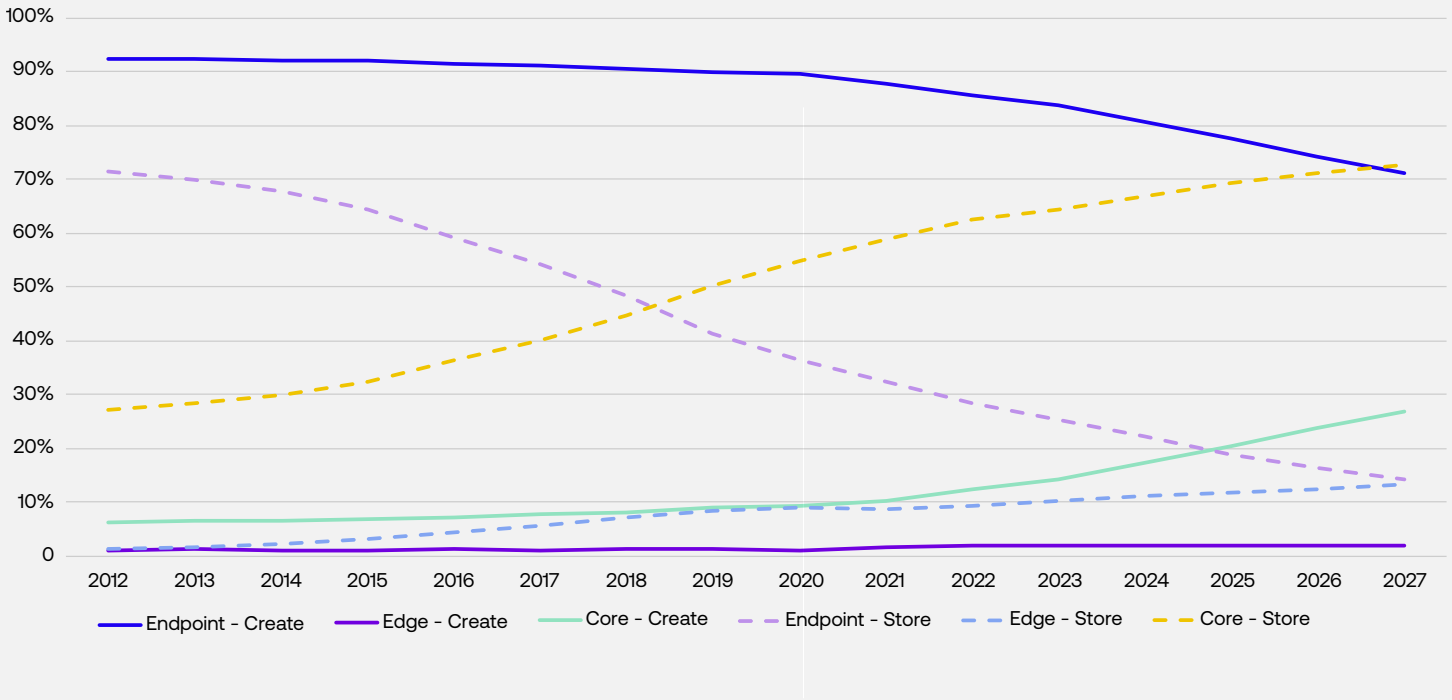


Fig. 3: IDC, *Worldwide IDC Global DataSphere Forecast, 2023-2027: It's a Distributed, Diverse, and Dynamic (3D) DataSphere*, April, 2023

With the advent of this data growth, the locations where data is created, processed, and stored are rapidly changing.

While many businesses have undertaken cloud migration for their data systems, new points of data generation – such as the rapid growth of enterprise AI adoption – along with security and compliance requirements have intensified data creation and processing at the edge.

The growth of data represents a significant shift in how data is created, processed, stored, and exchanged.

[1]IDC, *Worldwide IDC Global DataSphere Forecast, 2023-2027: It's a Distributed, Diverse, and Dynamic (3D) DataSphere*, April, 2023
[2]IDC, *Worldwide Global StorageSphere Forecast, 2023-2027: Despite Decreased Petabyte Demand Near Term*, the Installed Base of Storage Capacity Continues to Grow Long Term, May, 2023

The Data Economy Creates New Interactions

As data creation and utilization grows, it attracts applications and services, and as its density grows, it limits movement. This data creation lifecycle creates a new behavior for digital interactions and is the force multiplier that creates Data Gravity.

As Data Gravity increases, special consideration should be given to how infrastructure and data sets are deployed and connected.

[1]Patented Data Gravity Formula, McCrory & Bishop, Digital Realty

Data growth attracts applications and services[1]

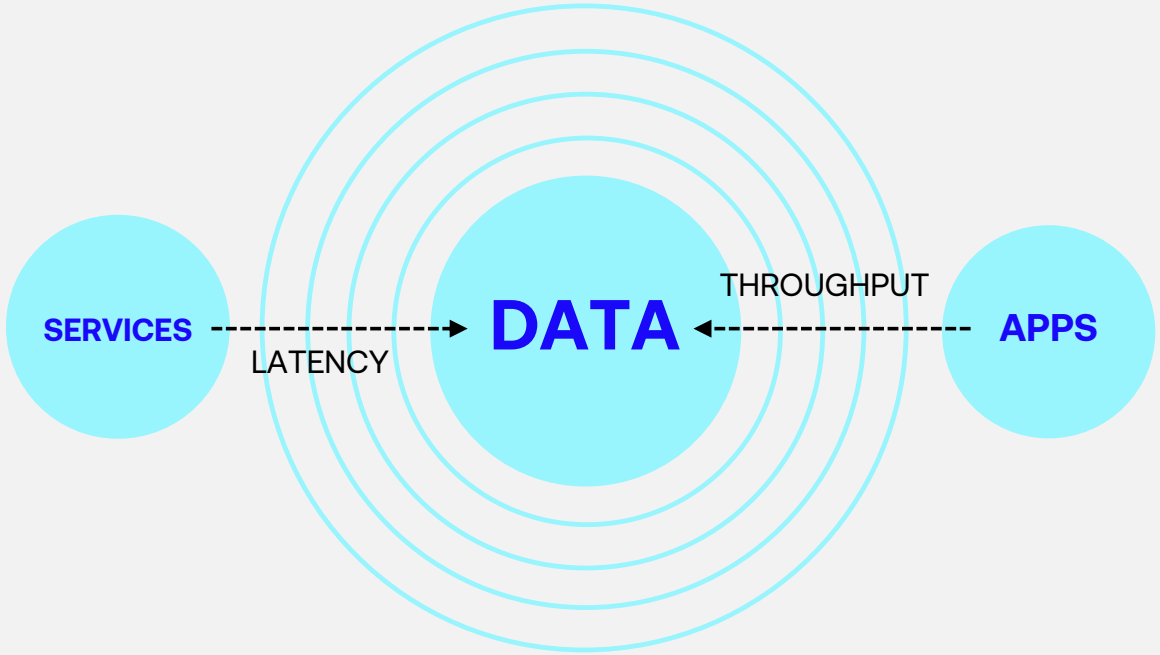


Fig. 4: Patented Data Gravity Formula, McCroy & Bishop, Digital Realty

Current IT Architectures Don't Take Data Gravity into Account

Rapid data creation and escalating needs for storage and processing capacity put tremendous strain on legacy servers and applications.

As data volumes experience rapid growth, it is no longer feasible to support existing application flows in a performant manner.

The cost of transport and increasing latency associated with larger data and AI-intensive flows and centralized data storage make legacy architectures unsustainable.

Thus, existing architectures are not data and AI ready.

[1]Digital Realty Market Intelligence, *Data Gravity Index (DGx)™ 2.0*, 2023

IT Infrastructure today[1]

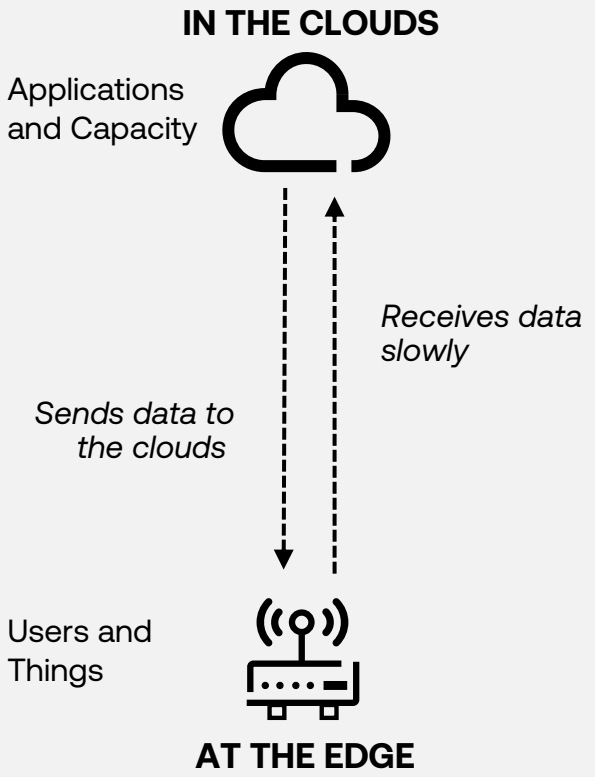


Fig. 5: Digital Realty Market Intelligence, *Data Gravity Index (DGx)™ 2.0*, 2023

Data Gravity Requires New Architecture

A new architecture is required to overcome infrastructure challenges with data exchange and platform growth.

Data and AI-ready architectures must be distributed, data-centric, and hybrid. This inverts traffic flow, leverages interconnection and brings clouds and users to the data, to integrate private and public data sources.

A strategy that incorporates these elements will make your business data and AI ready.

[1]Digital Realty Market Intelligence, *Data Gravity Index (DGx)™ 2.0*, 2023

Data and AI-ready architecture[1]

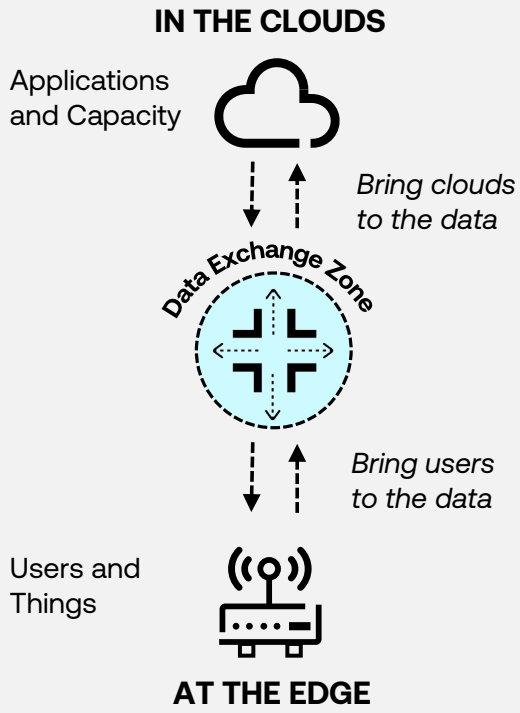


Fig. 6: Digital Realty Market Intelligence, *Data Gravity Index (DGx)™ 2.0*, 2023

Chapter 2

Solving the Problem

Rapid data creation and escalating needs for storage and processing capacity put tremendous strain on legacy infrastructure, limiting AI abilities and digital transformation.

Deploy Centers of Data Exchange at Points of Presence

Enterprises need to serve customers, partners, and employees across all channels, business functions, and points of business presence. This is forcing IT to implement a distributed infrastructure that removes Data Gravity barriers to accommodate data and AI-intensive workflows that vary by participant, application, information, and location-specific needs.

Companies who combine this strategy with a Pervasive Datacenter Architecture (PDx®) methodology can optimize data exchange, enabling distributed workflows at global points of presence.

Deployed at points of presence

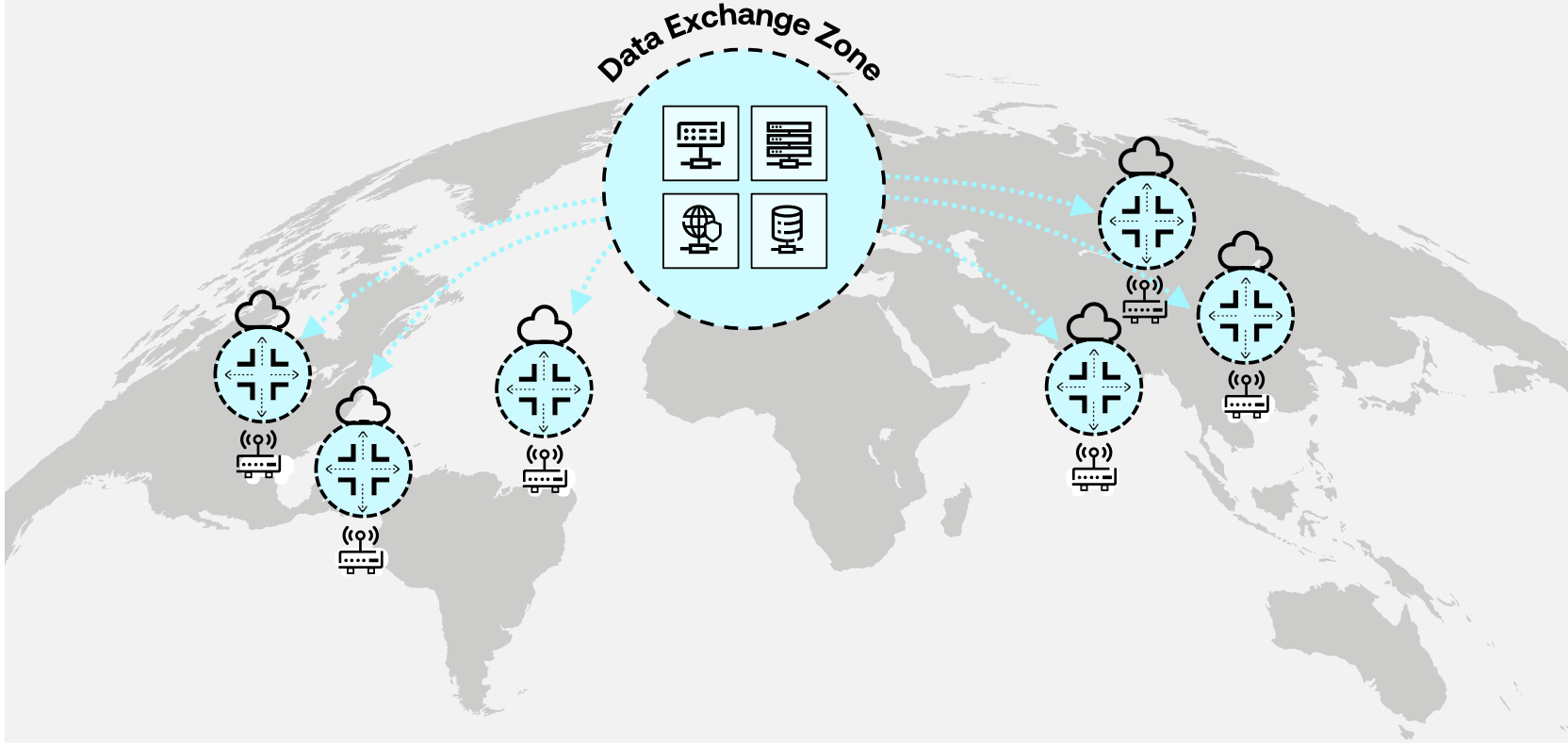


Fig. 7: Digital Realty, *Pervasive Datacenter Architecture (PDx)®*, 2021

Digital Infrastructure Foundations

Today's business and technology leaders require a business platform that operates ubiquitously and on-demand, augmented by real-time intelligence to best serve customers, partners, and employees via digitally-enabled interactions across all channels, business functions, and points of presence.

By 2027, more than 75% of Fortune 1000 companies will have formal infrastructure platform organizations, up from less than 20% in 2023, to enable their digital strategies.[1]

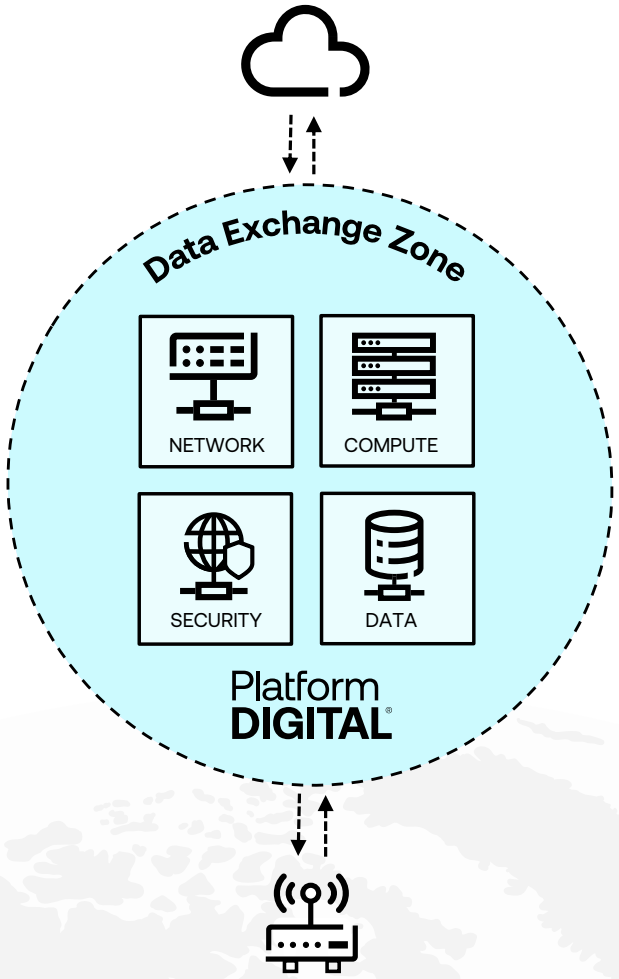


Fig. 8: Digital Realty, *Pervasive Datacenter Architecture (PDx)®*, 2021

Enabling platform growth and AI-ready architecture requires digital infrastructure foundations supporting four strategic IT priorities, including:

- **Network**
- **Security**
- **Compute**
- **Data**

These foundations will enable you to solve digital transformation in today's data economy, by placing, deploying, and connecting your network, data, and security locally, in the zones where you do business globally.

[1]Gartner®, *Modernizing Infrastructure Platforms and Operating Models in Support of Digital Foundations*, June, 2023

Digital Infrastructure Foundation: Network

Enterprises require a new network infrastructure architecture that reduces latency, localizes access to data, standardizes network deployments, and provides any-to-any interconnection.

To enable this data and AI-ready architecture, enterprises need to create local ingress and egress points in colocation to:

- **Consolidate and localize traffic**
- **Segment and tier traffic**
- **Interconnect network, cloud and service providers**
- **Deploy, interconnect, host SDN edge**

Network Foundation

Connect data, users, and applications

Insights

- Most (79%) companies have challenges with network latency to support demanding AI workloads[1]
- 77% of IT leaders identified data latency specific performance requirements[2]

Implications

1. Network traffic is shifting
2. Companies must establish network foundation to connect data, users, and applications
3. Requires local ingress/egress points to support demanding data and AI workloads
4. Pressure to optimize and manage network infrastructure
5. Legacy networking for critical infrastructure is inflexible and costly

Strategy

Create local ingress/egress points in colocation

Take the next step

[1]Cisco, *Cisco AI Readiness Index*, 2023
[2]Digital Realty Marketing Intelligence, *Global Data Insights Survey*, 2022

Digital Infrastructure Foundation: Security

Enterprises require a new security infrastructure architecture that allows them to secure controls and infrastructure in a distributed manner and unlocks seamless global security. To enable this data and AI-ready architecture, Enterprises need to secure, control, and protect infrastructure in order to:

- **Implement ingress/egress control points**
- **Host IT and security stacks at ingress/egress points**
- **Securely, direct connect SAAS security/data services**
- **Enhance security posture/reduce vulnerability points**

[1]*Cybersecurity Ventures, 2022 Official Cybercrime Report*, 2022
[2]Gartner Press Release, ***Gartner Forecasts Global Security and Risk Management Spending to Grow 14% in 2024***, September, 2023

Security Foundation

Secure, control, and protect infrastructure

Insights

- By 2025, the global cost of cybercrime will reach US $10.5T annually[1]
- Global spending on security and risk management projected to reach $215 billion next year[2]

Implications

1. Requires companies to colocate and interconnect digital infrastructure foundations to secure, control, and protect infrastructure
2. Needs IT strategy to operationalize distributed access points
3. Lengthy time-to-deploy security controls across footprint
4. Security difficult to manage across complex infrastructure
5. Geographically disperse

Strategy

Operationalize distributed security access points in colocation

Take the next step

Digital Infrastructure Foundation: Compute

Enterprises require a new secure Hybrid IT architecture with compliant data governance practices that enable them to transact, process, and enable insights.

To enable data and AI readiness, Enterprises require a distributed infrastructure architecture designed to:

- **Host analytics adjacent to network and data aggregation points**
- **Accelerate compute-intensive workloads with GPU/DPU**
- **Enable microservices with virtualization and containers**
- **Scale processing with clustering and high-performance interconnects**

Compute Foundation

Transact, process, and enable insights

Insights

- Majority of enterprise data is created and utilized outside the public cloud[1]
- At least half of critical enterprise applications will live outside of the public cloud through 2027[2]

Implications

1. Legacy IT inhibits modern HPC use case implementation and is capital-intensive, hardware-oriented
2. Hybrid and multi-cloud deployments decrease infrastructure costs and IT labor
3. Complex hybrid and multi-cloud workload performance and scalability issues
4. Requires hybrid multi-cloud IT architecture to support the increasing scale and complexity of data
5. Inefficient access to other cloud capabilities may delay business innovation

Strategy

Host applications and optimize for workloads and scale

Take the next step

[1]Digital Realty Market Intelligence, *Data Gravity Index (DGx)™ 2.0*, 2023
[2]Gartner Press Release, ***Gartner Says 50% of Critical Enterprise Applications Will Reside Outside of Centralized Public Cloud Locations Through 2027***, October, 2023

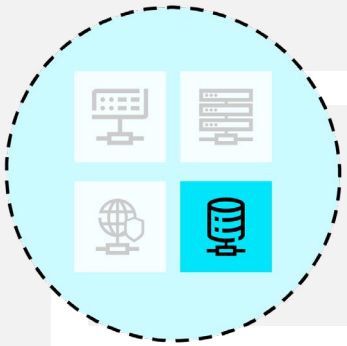
Digital Infrastructure Foundation: Data

Enterprises require a new data infrastructure architecture that localizes data aggregation, staging, analytics, streaming, and management at global points of business presence.

To enable data and AI readiness, Enterprises require a distributed infrastructure architecture designed to:

- **Host data adjacent to network and analytics aggregation points**
- **Optimize data exchange between users, things, networks, and clouds**
- **Enable real-time intelligence across distributed workflows locally and globally**
- **Create secure B2B data exchange to unlock new business opportunities**

1Cisco, *Cisco AI Readiness Index*, 2023
[2]Digital Realty Marketing Intelligence, *Global Data Insights Survey*, 2022



Data Foundation

Localize, integrate, and manage data

Insights

- 81% of respondents admit that their data exists in silos across their organizations[1]
- 72% plan to add new business locations in the next two years[2]

Implications

1. Distributed data workflows non-performant on legacy hardware and applications
2. Requires increase in points of business presence to localize, integrate, and manage data
3. Requires distributed data location strategy to enable AI-ready infrastructure
4. Reduced performance due to traffic, increased latency and data backhaul
5. Explosive cost associated with data transit cost

Strategy

Localize data sets for secure data exchange in colocation

Take the next step

Proven Approach: Enable Data and AI-Ready Architecture

With our PDx® Solutions, you can now **colocate and interconnect digital infrastructure foundations** locally to enable centers of data exchange:

Network – Connect data, users, and applications
Security – Secure, control, and protect infrastructure
Compute – Transact, process, and enable insights
Data – Localize, integrate, and manage data

It is typical to have multiple footprints deployed in multiple zones to support the demands of data and AI-intensive workloads. When deployed on a single global data center platform, PlatformDIGITAL®, our PDx® methodology enables data and AI-ready architecture locally, in the zones where you do business globally.[1]

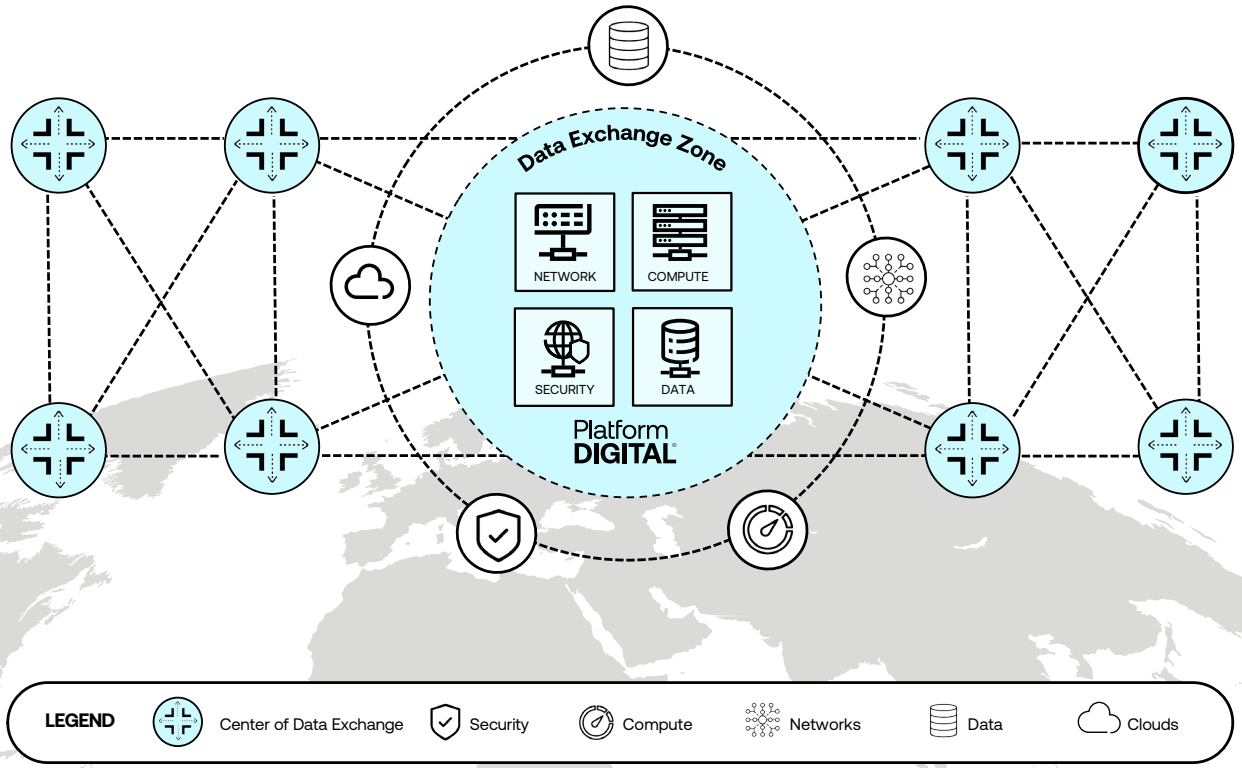


Fig. 9: Digital Realty, *Pervasive Datacenter Architecture (PDx)®*, 2021

[1]PlatformDIGITAL® is the largest, interconnected global data center platform according to 451 Research, *Market Forecast, Leased Datacenter Global Providers*, 2023
Capacity measured in terms of operational square footage.

Chapter 3

Key Takeaways

To be data and AI ready, businesses must solve for five key infrastructure design imperatives.

Infrastructure Design Imperatives

To be data and AI ready, businesses need an infrastructure architecture that solves for these key design imperatives.

Solve For:

Latency

Latency is the factor most associated with performance of modern applications. Apps, services, and data needs to be brought to the data to minimize latency.

Risk

Failure to manage risk can result in damage to a business' reputation, or even financial penalty. Remove risk by using proven, validated solutions.

Complexity

When not contained, complexity adds cost to projects and can result in inadvertent issues. Reduce complexity by leveraging preintegrated solutions.

Capacity

It's difficult if not impossible to accurately size new applications and systems. Businesses need infrastructure than can efficiently scale up or down.

Sustainability

Sustainability matters. Building performant infrastructure sustainably requires expertise and experience.

At Your Desk Tomorrow

- ✓ Gather Location Data
- ✓ Gather User Information
- ✓ Gather App and Data Inventory
- ✓ List Data/Performance Incidents

Getting Started Together

1. Request a Strategy Briefing
2. Engage in a Solution Workshop
3. Co-Produce a Validated Design
4. Co-Develop an Implementation Plan

Digital Realty. Global. Connected. Sustainable.

Interested in learning more?
Email **sales@digitalrealty.com**

About Digital Realty

Digital Realty brings companies and data together by delivering the full spectrum of data center, colocation, and interconnection solutions. PlatformDIGITAL®, the company's global data center platform, provides customers with a secure data meeting place and a proven Pervasive Datacenter Architecture (PDx®) solution methodology for powering innovation and efficiently managing Data Gravity challenges. Digital Realty gives its customers access to the connected data communities that matter to them with a global data center footprint of 300+ facilities in 50+ metros across 25+ countries on six continents.

To learn more about Digital Realty, please visit **digitalrealty.com** or follow us on **LinkedIn** and **X**.