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Pervasive Datacenter Architecture (PDx™) Design Guide:
DIGITAL WORKPLACE

CONTENTS

CURRENT STATE CHALLENGES

Many of today's remote worker architectures are not suited to the modern digital workplace. They are not optimized for:

+ Managing latency-sensitive workflows
+ Managing data-intensive workflows
+ Solving for ubiquitous "work from anywhere"
+ Solving zero trust security
+ Preventing negative impacts on quality of experience

CALL TO ACTION

This solution guide is intended as a companion to The Digital Workplace Blueprint found in the Pervasive Datacenter Architecture (PDx™) library.

Leverage this guide and the companion blueprint to build your modern digital workplace that is designed for:

+ Ubiquitous access
+ Performant user experience
+ Always-on secure access to data and applications

DESIGN GUIDE OVERVIEW

EXECUTIVE SUMMARY

The digital economy is remaking both private and public enterprises across all industries, transforming how they create and deliver value.

To succeed, companies need to:
+ Operate ubiquitously and on-demand
+ Augment workflows with real-time intelligence
+ Serve customers, partners and employees across all channels
+ In all business functions and points of business presence

This is forcing IT to re-architect towards a decentralized infrastructure which:
+ Removes data gravity barriers
+ Accommodates distributed workflows
+ Solves global coverage, capacity and ecosystem connectivity
+ Needs a pervasive datacenter platform that integrates the physical and virtual worlds within proximity to centers of data exchange, interconnected to digital ecosystems and tailored to business needs.

The global datacenter platform to enable this is PlatformDIGITAL™

USING THIS GUIDE
This guide is intended for:
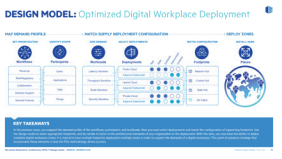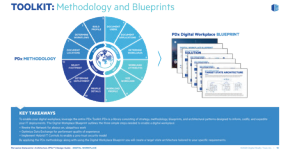
+ Business Strategists
+ Technology Leaders
+ IT Architects
+ Those responsible for the design and implementation of technology solutions

This solution guide is intended as a companion to The Digital Workplace Blueprint found in the Pervasive Datacenter Architecture (PDx™) library.

The PDx™ library contains blueprints, architectural patterns, and design guides for common building blocks and use cases.

Together, these documents provide a roadmap for the successful deployment of solutions to real-world digital transformation use cases. They cover critical steps and important considerations when architecting and implementing.

STORYBOARD

SET CONTEXT

STRATEGY MODEL: DIGITAL WORKPLACE	Strategic considerations, recommendations and what is driving them
TODAY: CURRENT CHALLENGES	Current state constraints and challenges with remote work
TOMORROW: FUTURE STATE CAPABILITIES	Future state capabilities and objectives of the Digital Workplace

APPLY METHODOLOGY

A PROVEN APPROACH: PDx METHODOLOGY	Introducing PDx methodology, aligning business requirements with technical objectives
INTEGRATED CHECKLIST	Checklists to ensure PDx steps are executed and required information is collected
DESIGN MODEL: Optimized Digital Workplace Deployment	Point of presence strategy aligned to business requirements and objectives

DESIGN SOLUTION

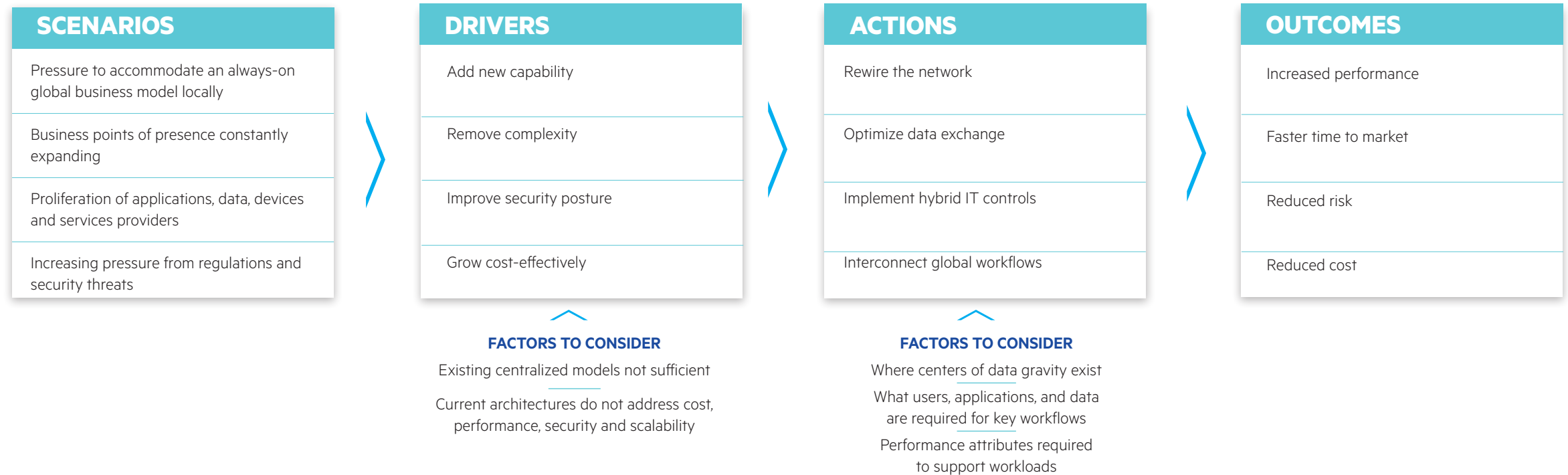|	
TOOLKIT: Methodology and Blueprints	PDx methodology and library to support realization of Digital Workplace
VALUE IMPACT	Advantages unlocked by implementing a Digital Workplace
YOUR PARTNER: Platform and Enablement	Experience and capabilities to assist you on your digital journey

KEY TAKEAWAYS

The Digital Workplace is designed around the concept of always-on, ubiquitous work, secured and powered by performant IT. To accommodate variability in demand and distribution of consumers and workflows, capacity is hosted at points of presence where centers of data exchange exist. Resources can be placed in these centers of data, connected via high performance interconnects to clouds and services, wrapped with a modern, fully-distributed security stack. Having these hubs close to users eliminates much of the network variability that can ruin the user experience with packet loss and high latency. Since these distributed centers of data have proximity to clouds, multi-cloud workflows provide a quality of experience comparable to an in-office scenario.

STRATEGY MODEL: DIGITAL WORKPLACE

SCENARIOS

Pressure to accommodate an always-on global business model locally

Business points of presence constantly expanding

Proliferation of applications, data, devices and services providers

Increasing pressure from regulations and security threats

DRIVERS

Add new capability

Remove complexity

Improve security posture

Grow cost-effectively

FACTORS TO CONSIDER

Existing centralized models not sufficient

Current architectures do not address cost, performance, security and scalability

ACTIONS

Rewire the network

Optimize data exchange

Implement hybrid IT controls

Interconnect global workflows

FACTORS TO CONSIDER

Where centers of data gravity exist

What users, applications, and data are required for key workflows

Performance attributes required to support workloads

OUTCOMES

Increased performance

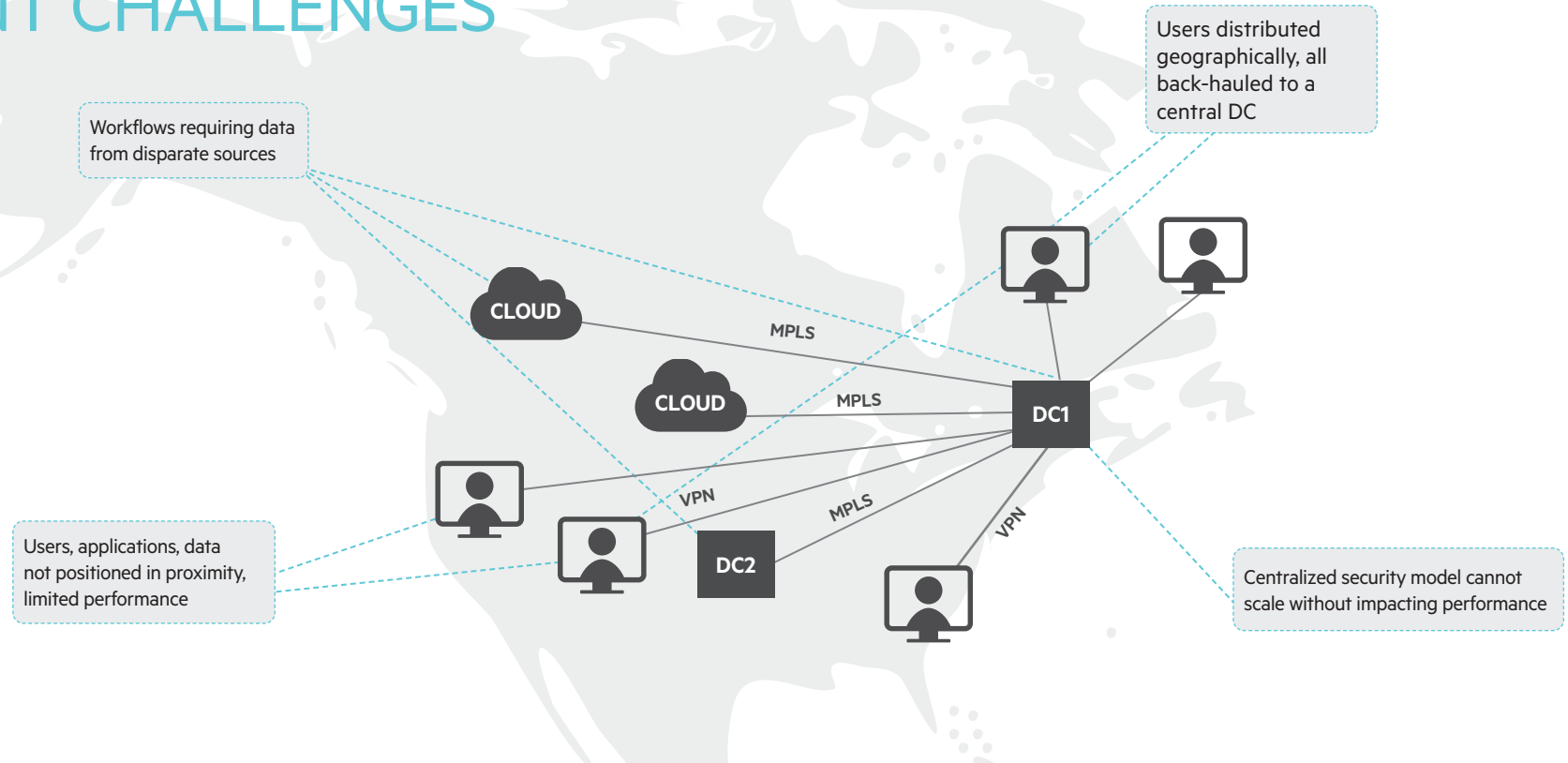Faster time to market

Reduced risk

Reduced cost

KEY TAKEAWAYS

The digital economy is remaking both private and public enterprises across all industries, transforming how they create and deliver value. The digital workplace is top-of-mind as businesses need to:

+ Operate ubiquitously – meet the customer in their market
+ Service on-demand – real-time is the new reality
+ Augment systems with real-time intelligence

They need to serve customers, partners and employees across all channels, business functions and points of business presence. This is forcing IT to implement a decentralized infrastructure which removes data gravity barriers to accommodate distributed workflows. These vary by participant, application, information and location-specific needs. Combine this strategy with PDx™ methodology and blueprints to build a digital workplace, enabling distributed workflows at centers of data exchange.

TODAY: CURRENT CHALLENGES

Users distributed geographically, all back-hauled to a central DC

Workflows requiring data from disparate sources

CLOUD

CLOUD

MPLS

MPLS

DC1

VPN

MPLS

VPN

Users, applications, data not positioned in proximity, limited performance

DC2

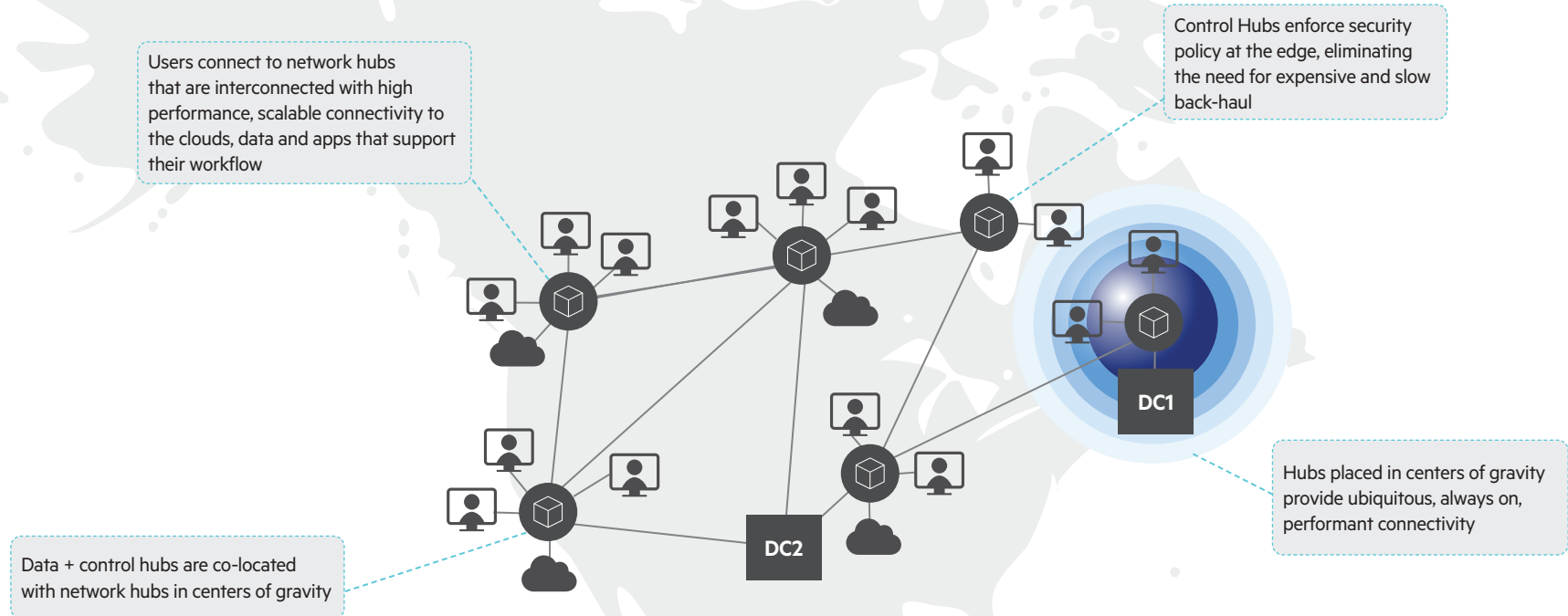Centralized security model cannot scale without impacting performance

KEY TAKEAWAYS

+ Increased usage results in compute-bound performance bottlenecks
+ Backhauling the user to centralized systems results in network-bound performance bottlenecks
+ Users are unpredictability routed across the Internet which negatively impacts quality of experience
+ Centralized security enforcement via backhaul doesn't address distributed vulnerability points or improve security posture

BEST PRACTICES

Recognize the gaps in this approach. This architecture cannot address:

+ Performance - Network not designed for today's interactive workload behavior and distributed workforce
+ Scalability - Backhauling end-point traffic to centralized datacenter does not scale
+ Security - Centralized security enforcement via network backhaul cannot scale or react fast enough

TOMORROW: FUTURE STATE CAPABILITIES

Users connect to network hubs that are interconnected with high performance, scalable connectivity to the clouds, data and apps that support their workflow

Control Hubs enforce security policy at the edge, eliminating the need for expensive and slow back-haul

Hubs placed in centers of gravity provide ubiquitous, always on, performant connectivity

Data + control hubs are co-located with network hubs in centers of gravity
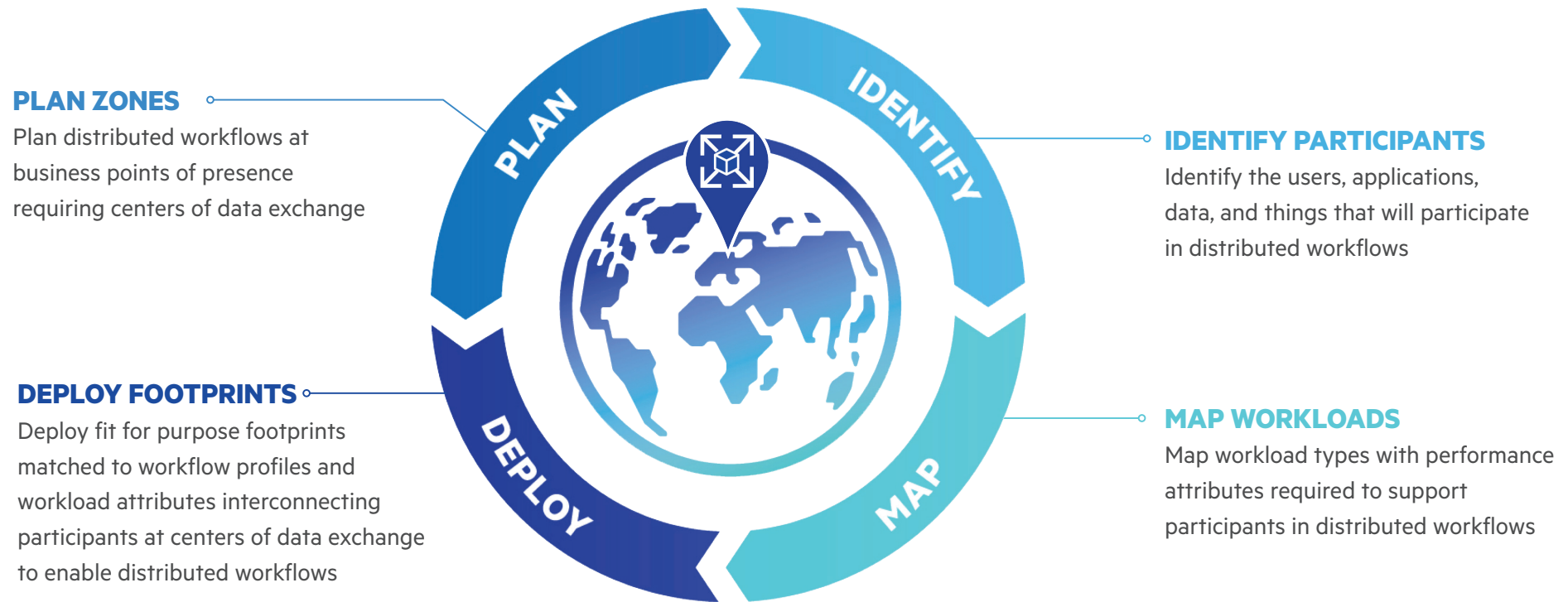
DC1

DC2

KEY TAKEAWAYS

+ Capacity is hosted at points of presence and interconnected to clouds to create elasticity
+ Traffic is consolidated at points of presence and interconnected to local services optimized for latency, throughput and ubiquity
+ Users, things, networks and capacity are integrated within proximity of centers of data exchange to optimize workflow & experience
+ Security controls are hosted and interconnected at points of presence to enable policy enforcement at ingress/egress points

BEST PRACTICES

A true digital workplace, enabled by:

+ Hubs placed at business points of presence, where there are identified participants and centers of data exchange
+ Users connect to hubs that are regionally located in proximity to them and equipped with localized data and applications to support a performant user experience
+ Security controls at the edge, reducing performance barriers and providing true end to end security and telemetry

A PROVEN APPROACH: PDx™ METHODOLOGY

PLAN ZONES

Plan distributed workflows at business points of presence requiring centers of data exchange

IDENTIFY PARTICIPANTS

Identify the users, applications, data, and things that will participate in distributed workflows

DEPLOY FOOTPRINTS

Deploy fit for purpose footprints matched to workflow profiles and workload attributes interconnecting participants at centers of data exchange to enable distributed workflows

MAP WORKLOADS

Map workload types with performance attributes required to support participants in distributed workflows

- PLAN
- IDENTIFY
- DEPLOY
- MAP

KEY TAKEAWAYS

PDx provides a methodology and repeatable strategy to enable your digital workplace, covering how to:
+ Plan distributed workflows where your customers/partners/employees engage
+ Identify users, apps, data, and things that will participate in distributed workflows
+ Map workload types with performance attributes to ensure a performant quality of experience
+ Deploy fit for purpose footprints to support your digital workplace

BEST PRACTICES

+ The digital workplace supports new business models that require a new IT architectural approach, incorporating a holistic view of business and technical requirements
+ Apply this model to each use case to accommodate distributed business workflows that vary by location, type, and participant
+ Apply the output of the PDx approach against established architectural blueprints from the PDx library to create a tailored IT plan for your digital workplace

PDx STEP 1
PLAN Zones of Data Exchange

Checklist

ACTION	ACTION STEP	COMPLETE
1 DOCUMENT LOCATIONS	• Legal Presence • Employee Concentration/Branch Office • Ecosystem Partners • Regional Headquarters	☐
2 DETERMINE WORKFLOWS	• Revenue • Risk & Regulatory • Collaboration/Decision Support • General Purpose	☐
3 BUILD WORKFLOW OPERATIONAL PROFILE	• Priorities x Workflow x Location • Downtime acceptable • Data loss acceptable	☐

KEY TAKEAWAYS

+ To enable a digital workplace, plan distributed workflows at business points of presence requiring centers of data exchange

Three main actions:
+ Document Locations
+ Determine Workflows
+ Build Workflow Operational Profile

BEST PRACTICES

+ Location-based design enables the correct engagement model for employees, partners, and customers

+ Placing emphasis on revenue, risk, and regulatory workflows while designing from that perspective solves for business requirements first instead of as an afterthought

+ A digital workplace architecture begins with the precept that users are distributed and not centralized as in traditional architectures

IDENTIFY Distributed Workflow Participants

Checklist

ACTION	ACTION STEP	COMPLETE
4 **DOCUMENT USERS**	• Employees • Customers • Ecosystem • Things	☐
5 **DOCUMENT APPLICATIONS**	• Applications and supporting services • Data repositories and data types	☐
6 **DETERMINE WORKLOADS**	• Latency sensitive (i.e. Interactive) • Throughput sensitive (i.e. Distribution) • Scale sensitive (i.e. Analytic) • Security sensitive (i.e. Ecosystem)	☐

KEY TAKEAWAYS

+ Building your digital workplace requires you to identify users, apps, data, and things that will participate in distributed workflows

Three main actions:
+ Document users
+ Document applications
+ Document workloads

BEST PRACTICES

+ Designing around users and what they are using is critical in order to avoid performance and security issues that plague legacy remote work architectures
+ Determining the workloads to be supported is key to understanding the critical and required performance characteristics of the digital workplace
+ Document the data requirements to ensure compliance with regulatory issues and ensure that all dependencies are satisfied before digital workplace deployment decisions are made

MAP Workloads and Performance Attributes

Checklist

ACTION		ACTION STEP	COMPLETE
7	**WORKLOAD ATTRIBUTES**	• Concurrency and messaging behaviors • User or event driven workflow • Compute and I/O dependencies • Policy enforcement requirements	☐
8	**SIZE WORKLOAD**	• Daily workload volumes • Size and variability of data sets, files, content • Exception based processing needs • Response time, availability, priority tiers	☐
9	**WORKLOAD PROFILE**	• Sensitivities x Attributes x Sizing • Cross reference with workflow profile • Combine reference with participant profile	☐

KEY TAKEAWAYS

+ Engineering a successful digital workplace experience necessitates that you map workload types with performance attributes to support participants in distributed workflows

Three main actions:
+ Determine workload attributes
+ Size workloads based on key characteristics
+ Create workload profiles to inform infrastructure requirements

BEST PRACTICES

+ Consider carefully the requirements for workloads (including dependencies between workloads) to ensure that performance targets can be met for the digital workplace participants
+ When sizing workloads, be mindful of dataset sizes and time-of-day considerations to avoid performance problems that can result from concurrency or oversubscription
+ A comprehensive workload profile considers both priority and performance and takes into account the business criticality of the workflow that a given workload supports

PDx STEP 4
DEPLOY Fit for Purpose Footprints

Checklist

ACTION		ACTION STEP	COMPLETE
10	**PROFILE DETAILS**	• Workflow Profile (type(s), priority, location, downtime, data loss) • Participant Profile (users, applications, data sources) • Workload Profile (type, attributes, sizing, dependencies)	☐
11	**DETERMINE DEPLOYMENT**	• Public Cloud w/adjacent datacenter • Hybrid Cloud w/adjacent datacenter • Private Cloud w/adjacent datacenter	☐
12	**SELECT FOOTPRINT**	• Network Hub • Control Hub • Data Hub • SX Fabric	☐

KEY TAKEAWAYS

+ Deploy fit for purpose footprints matched to workflow profiles & workload attributes interconnecting participants at centers of data exchange zones to enable distributed workflows in the digital workplace
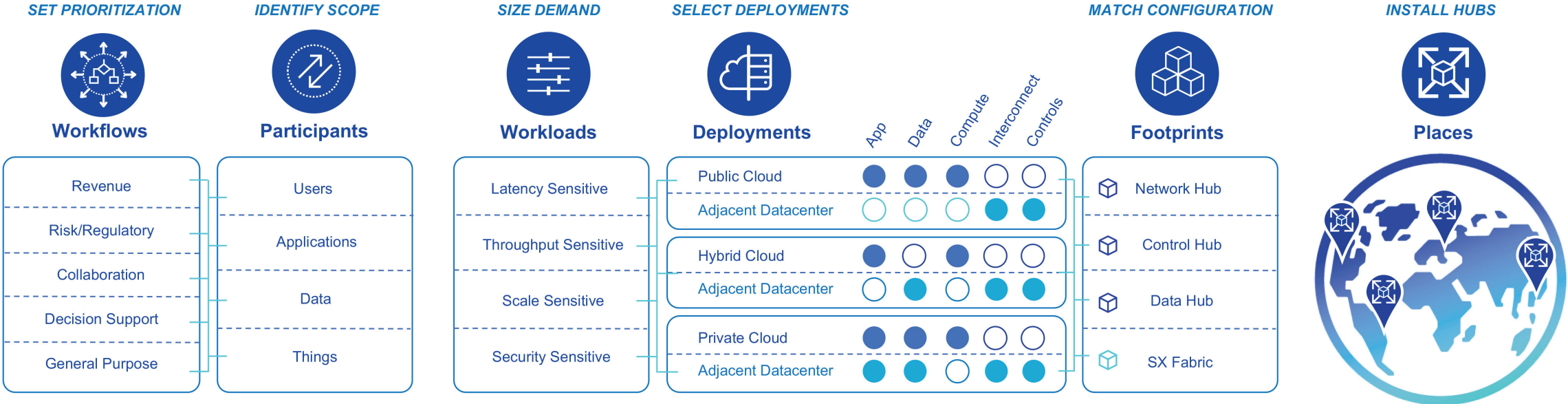
Three main actions:
+ Aggregate profile details
+ Determine deployment strategy
+ Select footprints

BEST PRACTICES

+ For each workload, determine whether it will be supported by public, private or hybrid cloud and what scale will be required to support the workload profile
+ Determine what services are needed to support the workload, including network and security services, and determine if they will be in-cloud or adjacent to the cloud
+ Select the footprints required to support the deployment – for example, in the digital workplace, the Network, Control and Data Hubs provide the necessary footprint

DESIGN MODEL: Optimized Digital Workplace Deployment

| SET PRIORITIZATION | IDENTIFY SCOPE | SIZE DEMAND | SELECT DEPLOYMENTS | | | | | | MATCH CONFIGURATION | INSTALL HUBS |

Workflows — **Participants** — **Workloads** — **Deployments** — **Footprints** — **Places**

Workflows	Participants	Workloads	Deployments	App	Data	Compute	Interconnect	Controls	Footprints
Revenue	Users	Latency Sensitive	Public Cloud	●	●	●	○	○	Network Hub
Risk/Regulatory	Applications		Adjacent Datacenter	○	○	○	●	●	
Collaboration	Data	Throughput Sensitive	Hybrid Cloud	●	○	●	○	○	Control Hub
Decision Support		Scale Sensitive	Adjacent Datacenter	○	●	○	●	●	Data Hub
General Purpose	Things	Security Sensitive	Private Cloud	●	●	●	○	○	SX Fabric
			Adjacent Datacenter	●	●	○	●	●	

KEY TAKEAWAYS

In the previous steps, you mapped the demand profile of the workflows, participants, and workloads. Now you must select deployments and match the configuration of supporting footprints. Use the design model to select appropriate footprints, and be certain to factor in the architectural standards of your organization in the deployment. With this data, you now have the ability to deploy complete digital workplace zones. It is typical to have multiple footprints deployed in multiple zones in order to support the demands of a digital workplace. This point of presence strategy that incorporates these elements is how the PDx methodology drives success.

TOOLKIT: Methodology and Blueprints

PDx™ METHODOLOGY

PDx™ Digital Workplace BLUEPRINT

KEY TAKEAWAYS

To enable your digital workplace, leverage the entire PDx™ Toolkit. PDx™ is a library consisting of strategy, methodology, blueprints, and architectural patterns designed to inform, codify, and expedite your IT deployments. The Digital Workplace Blueprint outlines the three simple steps needed to enable a digital workplace:

+ Rewire the Network for always on, ubiquitous work
+ Optimize Data Exchange for performant quality of experience
+ Implement Hybrid IT Controls to enable a zero trust security model

By applying the PDx™ methodology along with using the Digital Workplace Blueprint you will create a target state architecture tailored to your specific requirements.

VALUE IMPACT

AUGMENT
COMPUTE CAPACITY

Alleviate compute bound challenges of remote work

Dynamically connect to cloud capacity

Access local cloud zones globally

OPTIMIZE NETWORK
PERFORMANCE

Remove network bound challenges of remote work

Consolidate, localize, segment, and tier traffic

Interconnect networks, clouds, and services locally

EVOLVE TO A
DIGITAL WORKPLACE

Implement security & data controls for a digital workplace

Enable policy enforcement at data ingress/egress points

Integrate & host public and private data sources locally

KEY TAKEAWAYS

Using the PDx™ Toolkit to build your digital workplace, you can achieve this type of value. Today's digital workplace requires ubiquitous compute capacity delivered in the cloud or in proximity to cloud zones. In addition, the network needs to be rewired to support performance requirements. Finally, data needs to be hosted locally whether it is in the public or a private domain. This movement of compute capacity and hosted data drives the need for security and data controls to follow and deploy at the same locations. PDx™ tells you how.

YOUR PARTNER: Platform and Enablement

PlatformDIGITAL™

FIT FOR PURPOSE INFRASTRUCTURE

Customers can tailor infrastructure deployments to any size, scale or configuration to meet business needs on PlatformDIGITAL™

FIT FOR PURPOSE INTERCONNECTION

Customers can optimize right-size connectivity via a fabric of physical and virtual direct interconnections to whom they need on PlatformDIGITAL™

MISSION CRITICAL EXPERTISE

Customers can harness the expertise from operationalizing the most complex global data center facilities on PlatformDIGITAL™

GLOBAL COVERAGE

6	Continents
22	Countries
47	Metros
280	Data Centers

INTERCONNECTED SYSTEMS

700+	Network and Content Providers
600+	Cloud and IT Providers
800+	Enterprises

ALWAYS ON ALWAYS AVAILABLE

24/7	Support
365	Days per year
99.999%	Uptime

Visit: www.digitalrealty.com/platform-digital

PROVEN EXPERIENCE

PDx™ Blueprint – Solution Enablement Workshop

PDX™ WORKSHOP

PDX™ TOOLKIT

Blueprint   Design Guide

Methodology   PlatformDIGITAL™
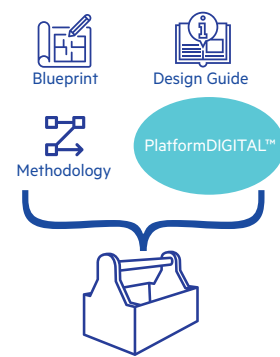
SCOPE
+ Pre Workshop Call
+ ½ Day Workshop
+ 2 Week Elapsed Time

DELIVERABLES
+ Tailored Blueprint
+ Value Model Strawman

BENEFITS
+ Identify Optimization Opportunities
+ Accelerate Time to Value
+ Compress Time to Execute

Combining our PDx™ methodology, blueprints, and the power of PlatformDIGITAL™ can solve for the needs of digital transformation.

Our expert Solution Architects can help accelerate your transformation with workshops built to leverage the PDx™ methodology, customized to your unique requirements.

Send an email to workshop@us.digitalrealty.com to coordinate your workshop (include "Workshop" as subject line).
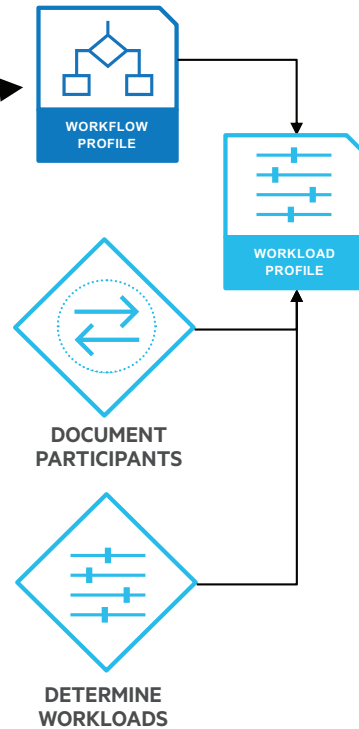
PROCESS MODEL

PLAN

Plan distributed workflows at **business points of presence** requiring centers of data exchange.
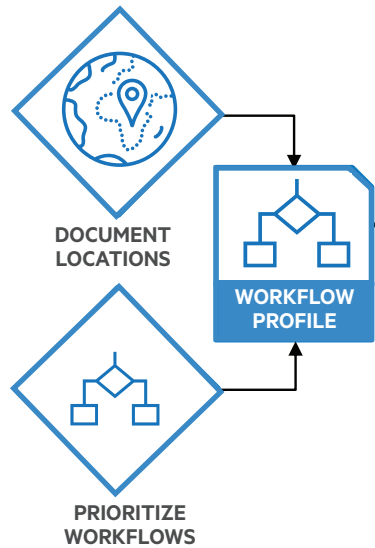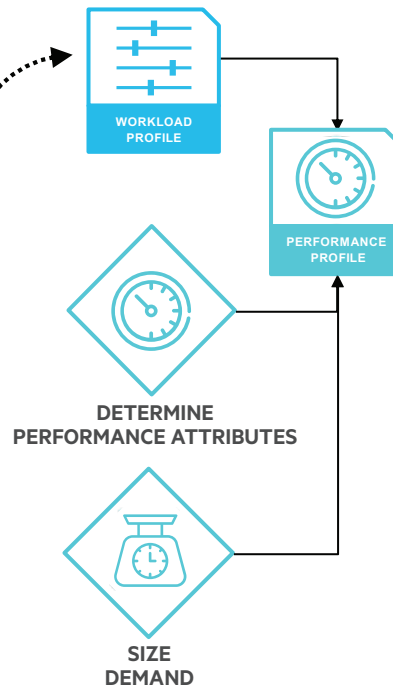
IDENTIFY

Identify the **users, applications, data, and things** that will participate in distributed workflows.
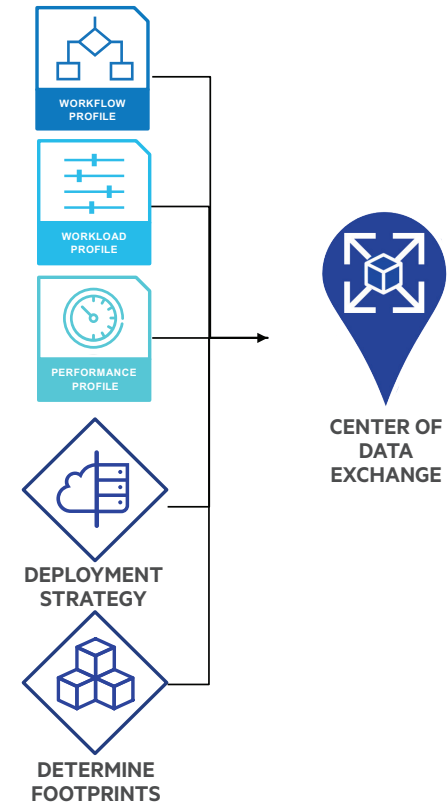
MAP

Map workload types with **performance attributes** required to support participants in distributed workflows.

DEPLOY

Deploy **fit for purpose** footprints **matched to workflow profiles and workload attributes** interconnecting participants at centers of data exchange zones to enable distributed workflows.

DOCUMENT LOCATIONS

WORKFLOW PROFILE

PRIORITIZE WORKFLOWS

WORKFLOW PROFILE

WORKLOAD PROFILE

DOCUMENT PARTICIPANTS

DETERMINE WORKLOADS

WORKLOAD PROFILE

PERFORMANCE PROFILE

DETERMINE PERFORMANCE ATTRIBUTES

SIZE DEMAND

WORKFLOW PROFILE

WORKLOAD PROFILE

PERFORMANCE PROFILE

DEPLOYMENT STRATEGY

DETERMINE FOOTPRINTS

CENTER OF DATA EXCHANGE

Pervasive Datacenter Architecture (PDx™) Process Model
The steps to create colocated and interconnected infrastructure at centers of data exchange tailored by workload and matched to a deployment configuration is outlined in the PlatformDIGITAL™ Architecture Process Model.

INTEGRATED CHECKLIST

Checklist

ACTION	ACTION STEP	COMPLETE
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