Microsoft

Lenovo

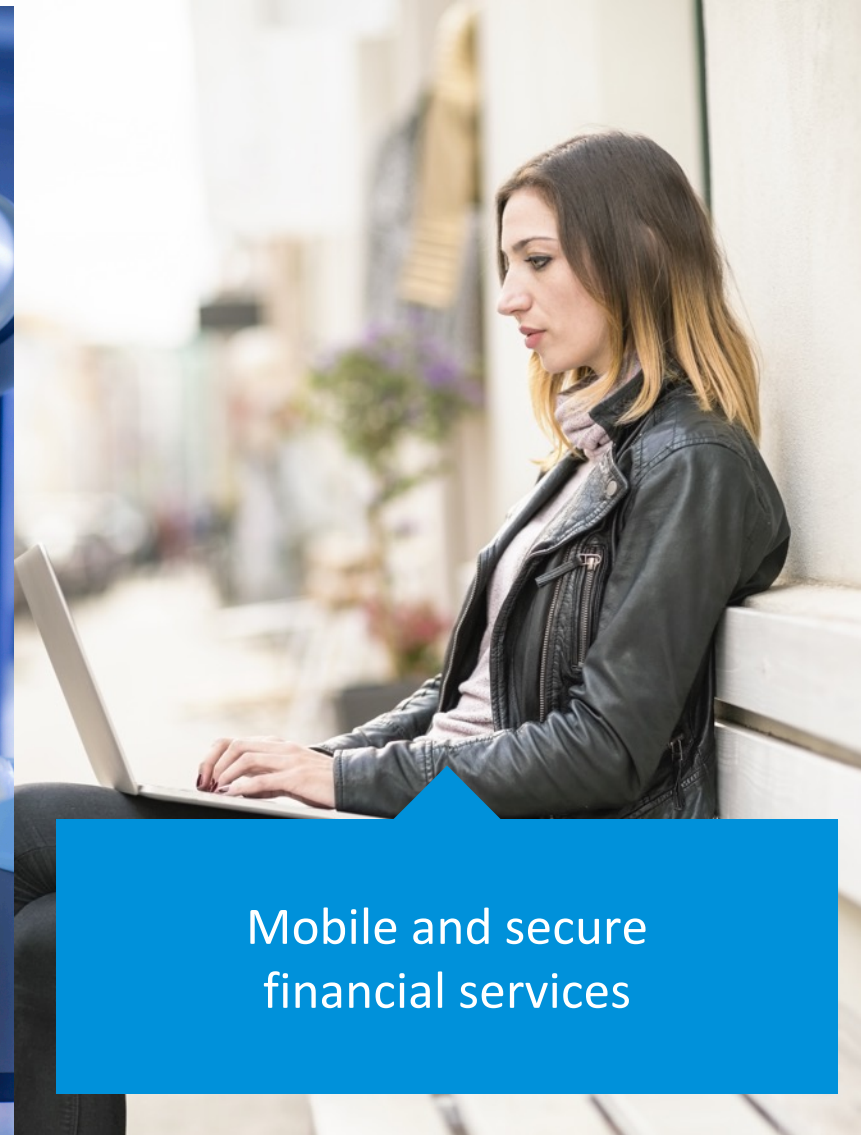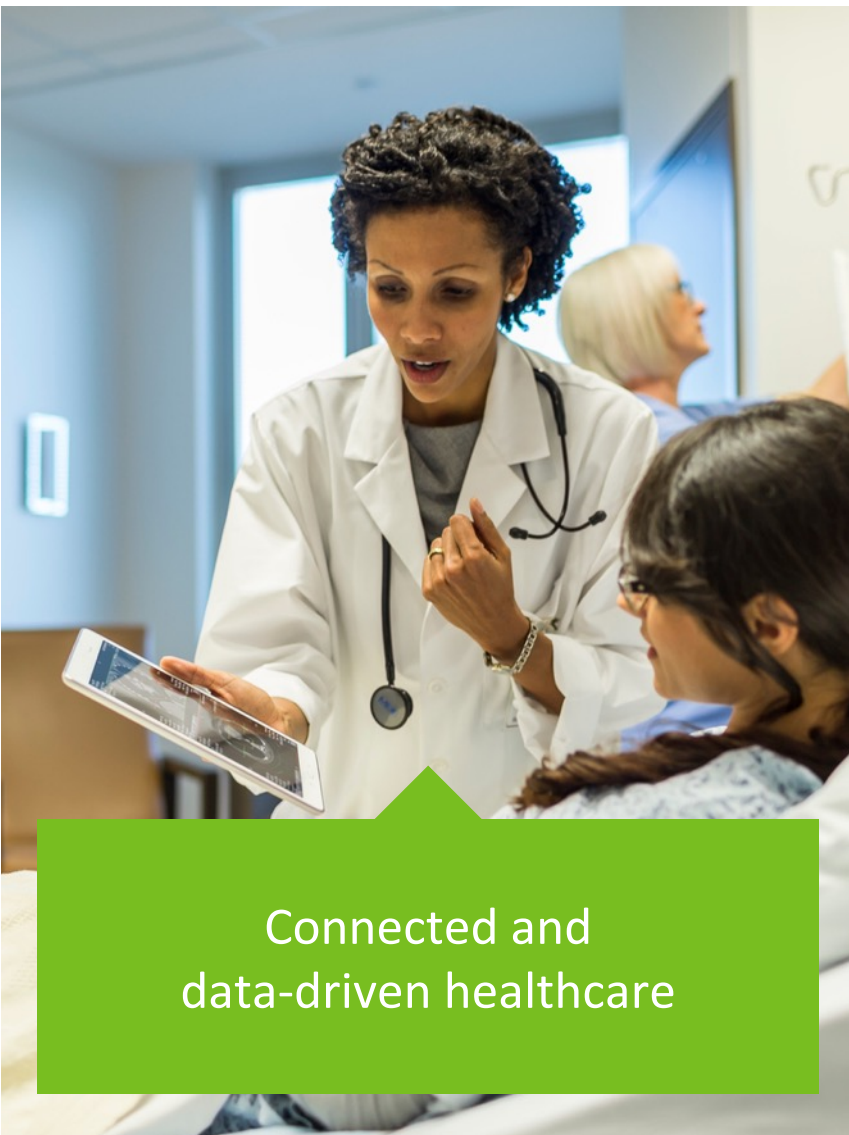# Transforming Data Center

William │ DCG Solution Architect
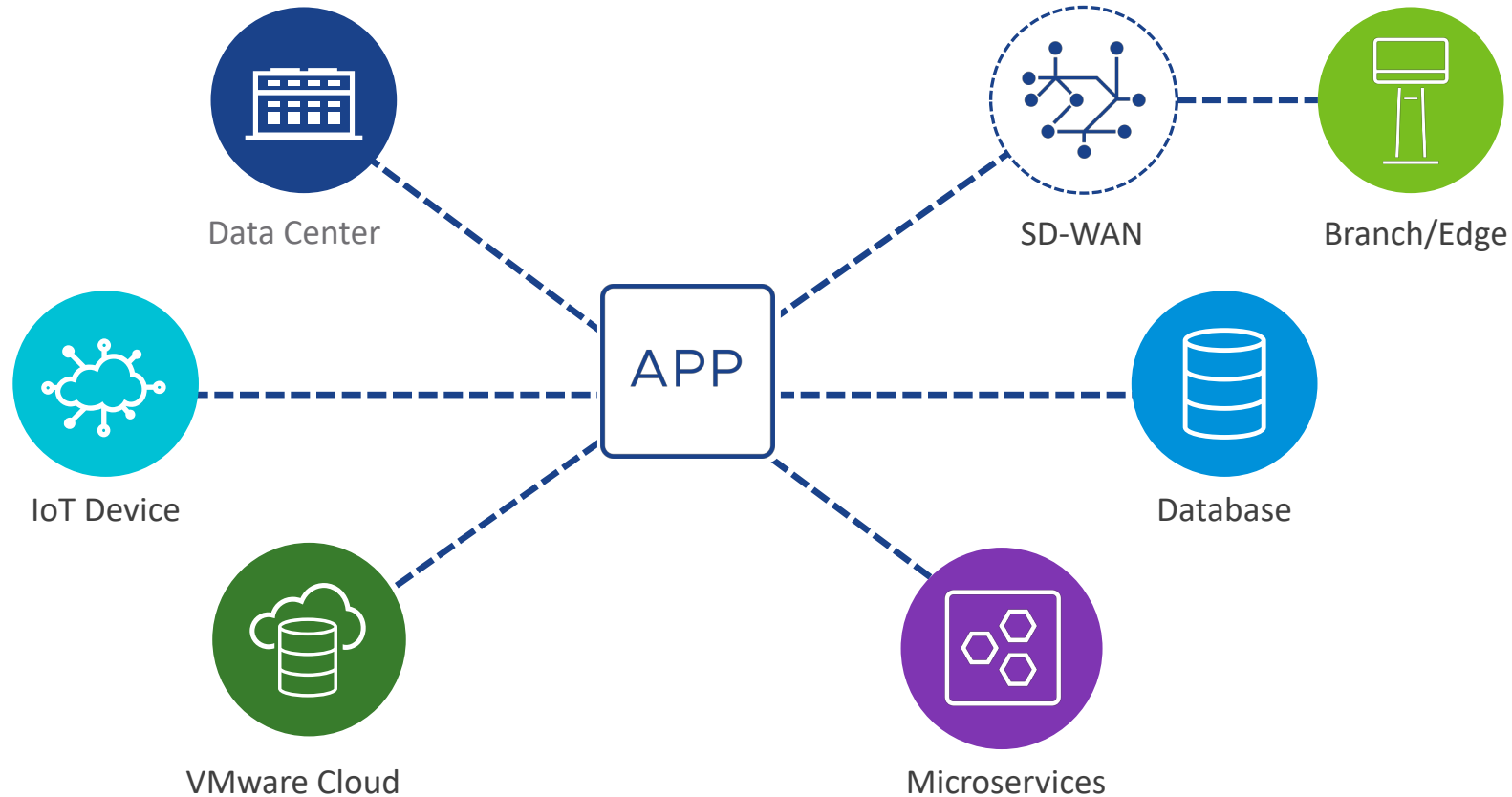
Lenovo Indonesia

Technology Is Transforming Every Industry

Connected and data-driven healthcare

Analytics-driven manufacturing

Mobile and secure financial services

Modern Apps Are Complex and Distributed

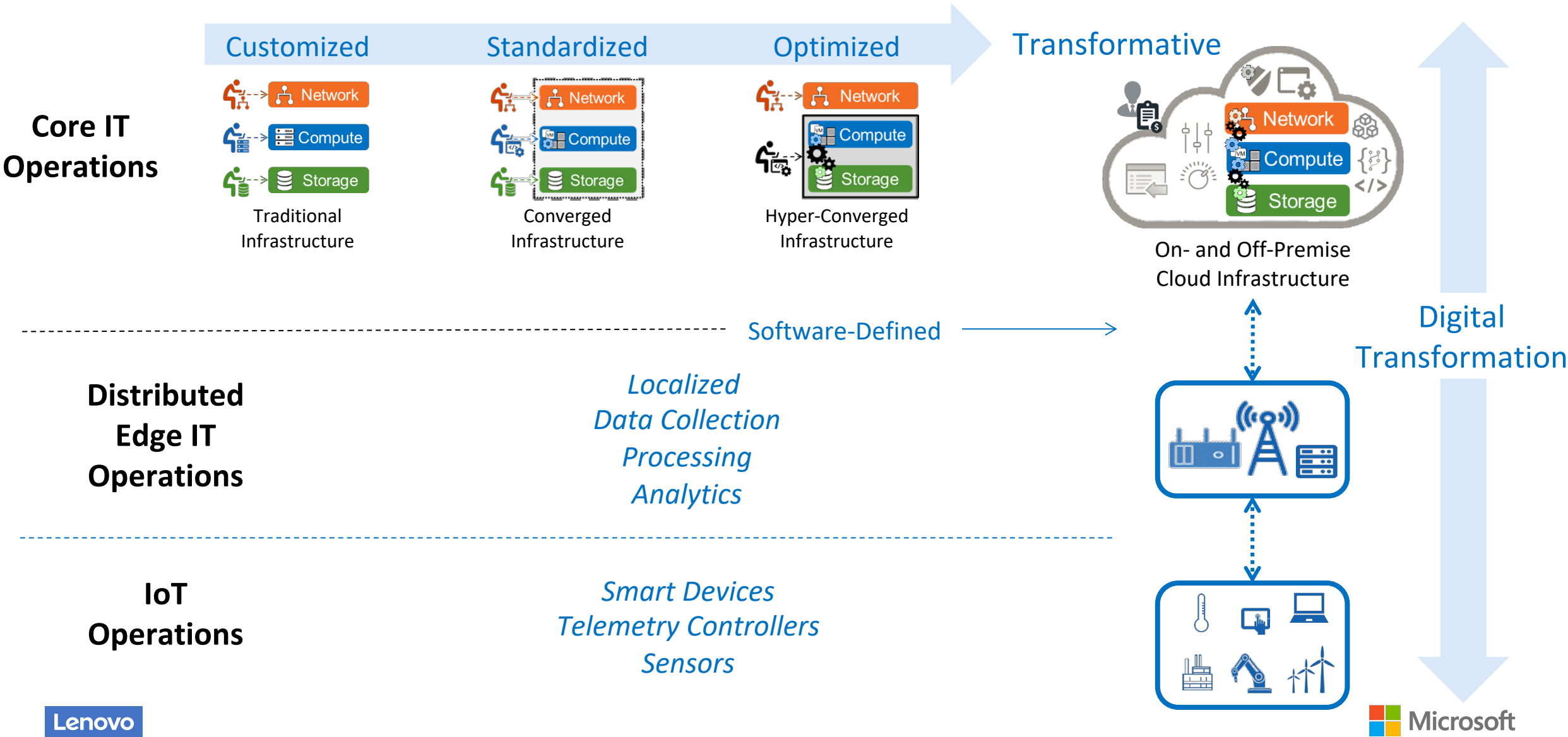# Traditional Data Centers are Unable to Keep Up

Complex · Inefficient · Slow · High Risk · Siloed

Lenovo · Microsoft

IT Evolution supporting Business Transformation

Customized   Standardized   Optimized   Transformative

Core IT Operations

Traditional Infrastructure

Converged Infrastructure

Hyper-Converged Infrastructure

On- and Off-Premise Cloud Infrastructure

Software-Defined

Distributed Edge IT Operations

Localized
Data Collection
Processing
Analytics

IoT Operations

Smart Devices
Telemetry Controllers
Sensors

Digital Transformation

Lenovo   Microsoft

KEY TRENDS

Aggressive innovation redefines the DATA CENTER

SOFTWARE on Standard Hardware displaces specialized hardware…

SOFTWARE DEFINED ACCELERATES

Flash is the new DISK
Disk is the new TAPE,
50~100X faster than Flash …
… NVM EMERGES

Accelerators will deliver significant value for next gen applications

BIG DATA, IOT & AI

Rise of
HYBRID CLOUD

**AUTOMATION
of**
SYSTEM MANAGEMENT

Transformation

Building foundations for our customers strategic workloads and requirements

CUSTOMIZE

Creating a customized solution, tailored to their business needs, through traditional IT
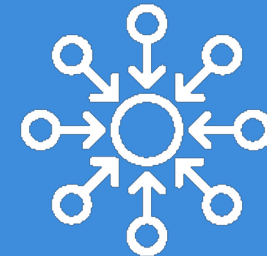
MODERNIZE

Renovate on-prem IT to drive efficiency and agility with virtualization or hyper-converged infrastructure technologies

TRANSFORM

Reduce customers overhead with a turnkey cloud solution that is fully-automated and pre-integrated

Who is Lenovo?

Since 1984

Four Decades of Transformation

1994-2004

Lenovo released and sold its own branded PCs and became the top brand in China with a market share of 30%.

2004-2014

Acquired IBM PC, started globalization, and became #1 PC company in the world

2014-2018

Acquired IBM System x and Motorola transforming to multiple business model

2019-

3S strategy to fuel the next generation of smart solutions
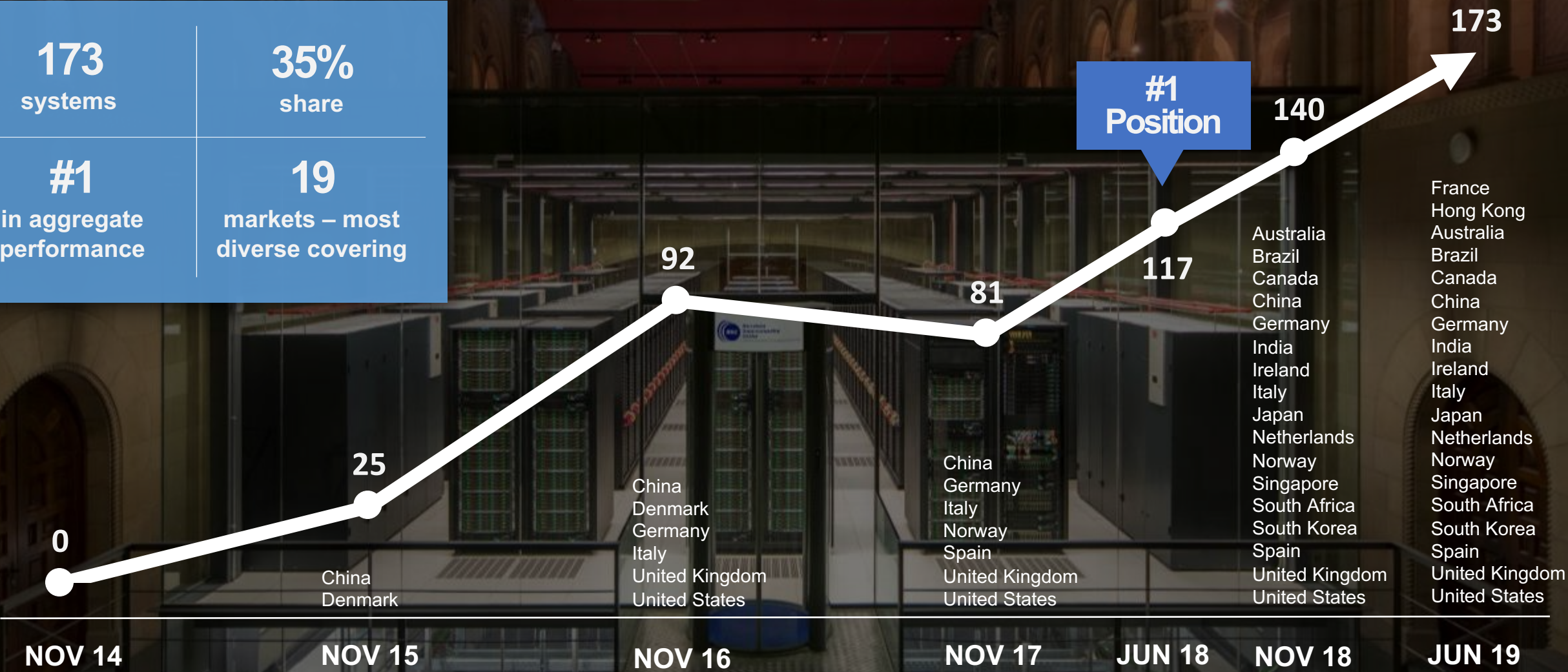
Lenovo

9

Smart IoT

Smart Infrastructure

Smart Verticals

#1 Provider of supercomputers in the world
More than 1 in 3 run on Lenovo

173 systems	35% share
#1 in aggregate performance	19 markets – most diverse covering

173

140

#1 Position

117

France
Hong Kong
Australia
Brazil
Canada
China
Germany
India
Ireland
Italy
Japan
Netherlands
Norway
Singapore
South Africa
South Korea
Spain
United Kingdom
United States

Australia
Brazil
Canada
China
Germany
India
Ireland
Italy
Japan
Netherlands
Norway
Singapore
South Africa
South Korea
Spain
United Kingdom
United States

92

81

China
Denmark
Germany
Italy
United Kingdom
United States

China
Germany
Italy
Norway
Spain
United Kingdom
United States

25

China
Denmark

0

| NOV 14 | NOV 15 | NOV 16 | NOV 17 | JUN 18 | NOV 18 | JUN 19 |

Based on count of listing on the Top500.org June 2019 list.

Solving Humanity's Greatest Challenges

THE UNIVERSITY OF CHICAGO

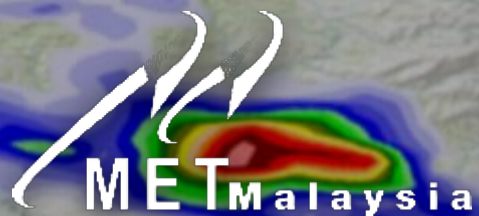**Early and effective detection of Prostate Cancer**

UNIVERSITY OF SASKATCHEWAN

Finding new ways to solve food shortages

TAIPEI TECH

Supporting children with ADHD

Solving Humanity's Greatest Challenges

Predicting severe weather

MET Malaysia

Increasing the global food supply with Artificial Intelligence

NC STATE UNIVERSITY

Barcelona Supercomputing Center
Centro Nacional de Supercomputación
BSC

Retinal disease screening

Data Center Group

ThinkAgile
Next Generation IT for future software-defined solutions

ThinkSystem
Server, Storage & Networking Solutions

DCG product portfolio

ThinkAgile
Software-Defined Infrastructure

ThinkAgile CP SERIES | Microsoft | SCALE COMPUTING

NUTANIX | Pivot 3 | veeAM | vmware

ThinkSystem
Engineered Solutions & Software

AI
Big Data/Analytics
Blockchain
Cloud
Database
DevOps
HPC
Hyperscale
IoT/Edge
NFV
Virtualization

CITRIX | CLOUDERA | IBM

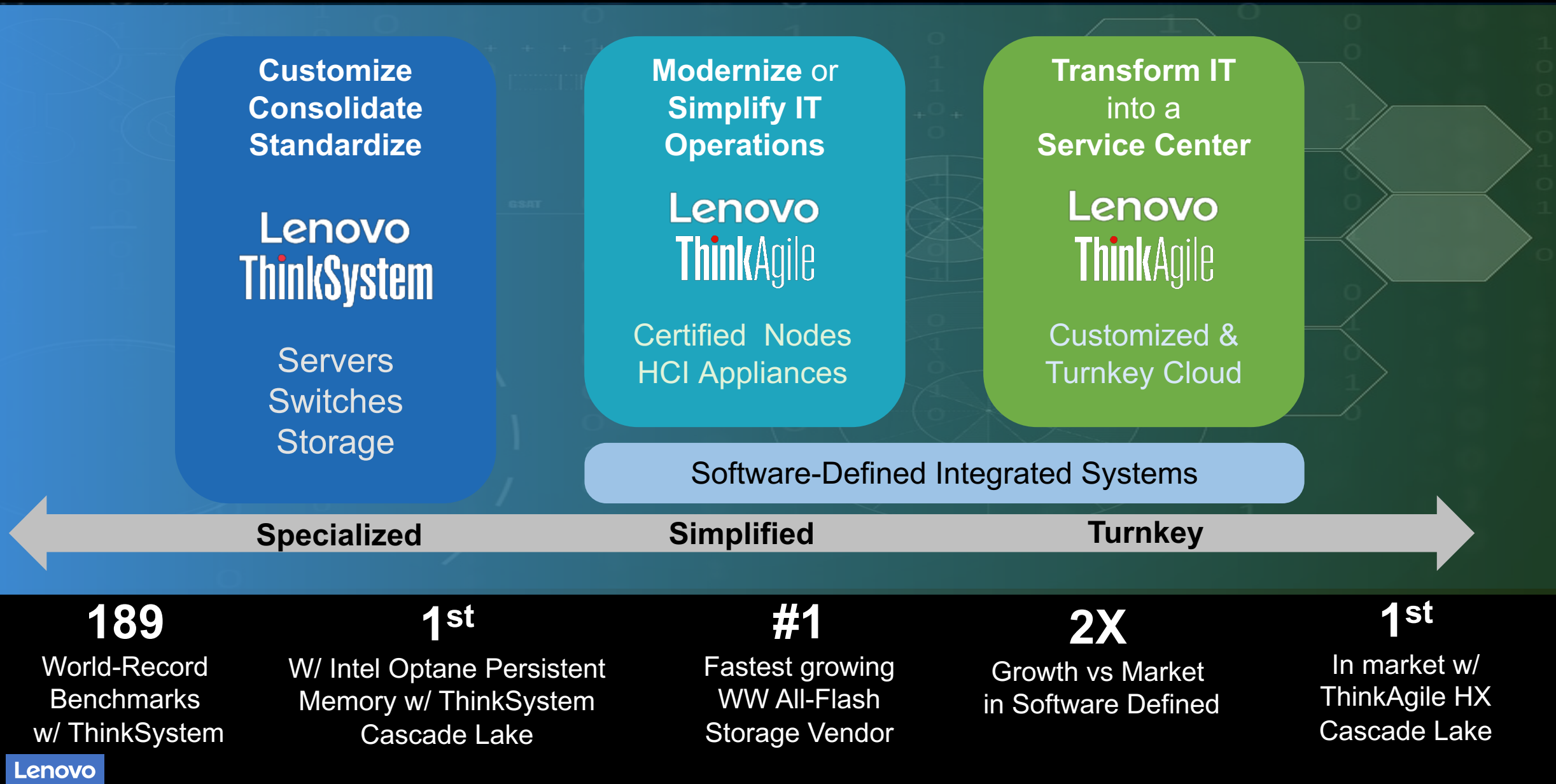MAPR | Microsoft | ORACLE

Red Hat | SAP | openSUSE

vmware

Storage
HPC/AI
IoT/Edge
Servers
Hyperscale
Networking

Lenovo

Services: Solution Design, Implementation, Support, TruScale

Solutions for Hybrid IT

Customize
Consolidate
Standardize

Lenovo
ThinkSystem

Servers
Switches
Storage

Modernize or
Simplify IT
Operations

Lenovo
ThinkAgile

Certified Nodes
HCI Appliances

Transform IT
into a
Service Center

Lenovo
ThinkAgile

Customized &
Turnkey Cloud

Software-Defined Integrated Systems

Specialized   **Simplified**   **Turnkey**

189	1st	#1	2X	1st
World-Record Benchmarks w/ ThinkSystem	W/ Intel Optane Persistent Memory w/ ThinkSystem Cascade Lake	Fastest growing WW All-Flash Storage Vendor	Growth vs Market in Software Defined	In market w/ ThinkAgile HX Cascade Lake

Lenovo

Fast: Industry Leading Performance with ThinkSystem Servers

ThinkSystem Servers have been engineered to extract the maximum performance possible out of the Intel and AMD architectures with 189 #1 benchmarks as of 5-07-2020

PERFORMANCE

Total #1 Benchmarks by Workload Across All Generations of ThinkSystem Servers

Transaction Processing	Virtualization	General Computing	Energy Efficiency	SAP	Data Analytics	Java Applications	High Performance Computing
5	**9**	**36**	**10**	**17**	**51**	**35**	**26**
TPC-E	SPECvirt sc 2013	SPEC CPU	SPECpower _ssj2008	SAP SD 2T & BWoH	STAC-M3 TPCx-IOT TPCx-BB	SPECjbb2015	SPEC MPI2007 SPEC OMP2012 SPEC ACCEL

189 WORLD RECORD PERFORMANCE BENCHMARKS

[1] lenovopress.com/lp1145
[3] Intel Xeon Scalable Processors World Record Benchmarks web page

USE CASE – Healthcare

Industries:

Hospitals , Clinics , Pathology labs etc.

- VDI enables the admin team to customize rules and permissions based on the individual virtual desktop, this becomes extremely convenient in healthcare settings where **privacy** is a concern.

- By designating specific permissions, each medical professional can have their own virtual desktop that only allows them to see their **relevant patient records.**

- Furthermore, they can move from device to device throughout the day, boot up their virtualized desktop, and access the records they need.

Workplace Challenges

Increasing mobility of work

Ownership of end-point devices is changing with BYOD programs

Data security and compliance

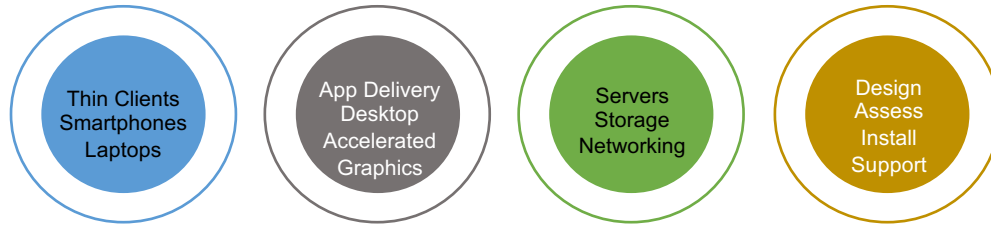**Complexity and cost of managing existing desktop environments**

Need for high availability solution, and rapid recovery from theft, failure and natural disasters

Lenovo VDI End to End Solution

Solution Components

The Solution

Thin Clients Smartphones Laptops

App Delivery Desktop Accelerated Graphics

Servers Storage Networking

Design Assess Install Support

Endpoints
- Variety of devices
- Lenovo Terminal Manager

Software
- Citrix resell (NA)
- VMware Horizon
- NVIDIA GRID/Quadro

Infrastructure
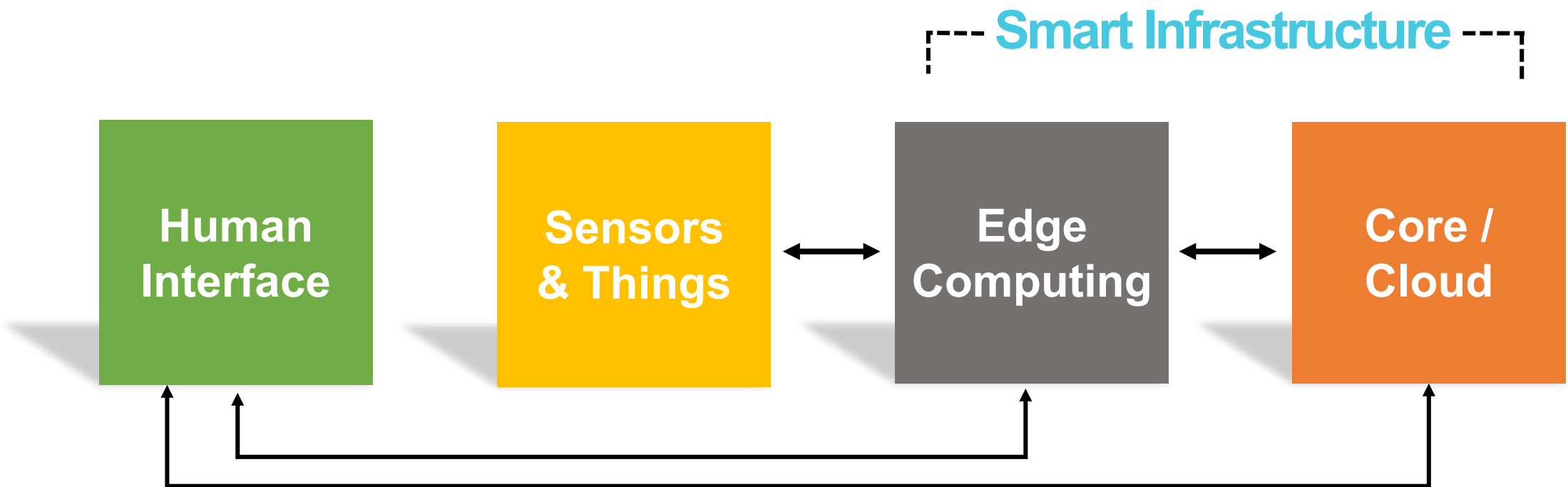- ThinkAgile servers

Services

Clients: 14w, M625q, M715q, Laptop, Smartphone

Broker: VMware Horizon View, CITRIX Virtual Apps and Desktops

Virtual Desktop | Virtual Apps

Hypervisor: VMware ESXi, CITRIX Hypervisor

Compute Servers: ThinkAgile HX (Nutanix) ThinkAgile VX (VMware), ThinkSystem SD530, ThinkSystem SR655/SR635 ThinkSystem SR650/SR630

Storage: ThinkSystem DM Series Storage Arrays, ThinkSystem DE Series Storage Arrays

Networking: ThinkSystem NE0152T

Services

Lenovo   Microsoft

Smart Infrastructure Architecture

Smart Infrastructure

Human Interface	Sensors & Things	Edge Computing	Core / Cloud

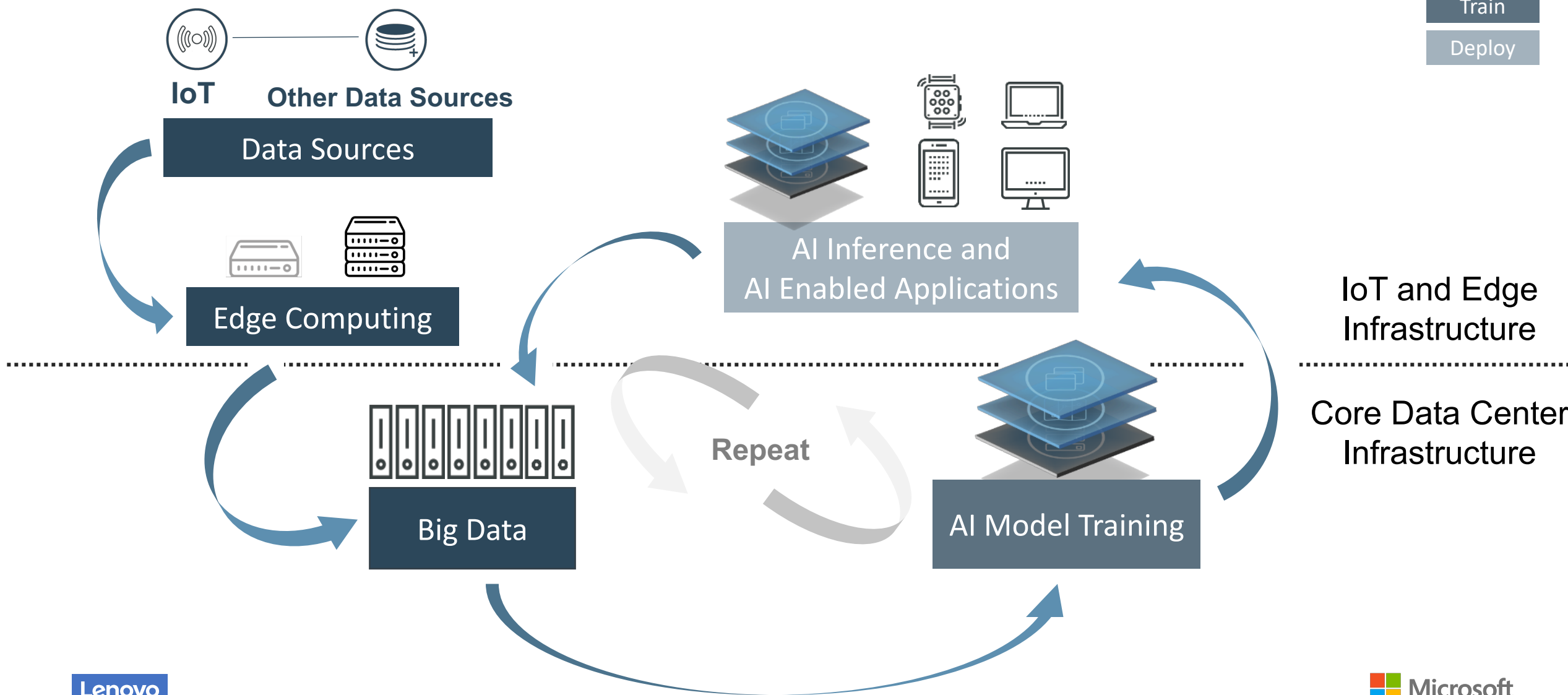**Functions**

Human Control Visualization	Generate Data Interact w/ physical world	Collect Pre-process Automate Analyze Forward	Store Data Deep Analytics Automate Control

Lenovo

Microsoft

Data Intelligence Workflow in Operation

An Ecosystem of IoT, Edge Computing, Big Data, Training & Inference

Source

Train

Deploy

IoT

Other Data Sources

Data Sources

Edge Computing

AI Inference and
AI Enabled Applications

Big Data

Repeat

AI Model Training

IoT and Edge
Infrastructure

Core Data Center
Infrastructure

Lenovo

Microsoft

Lenovo Solution Platforms
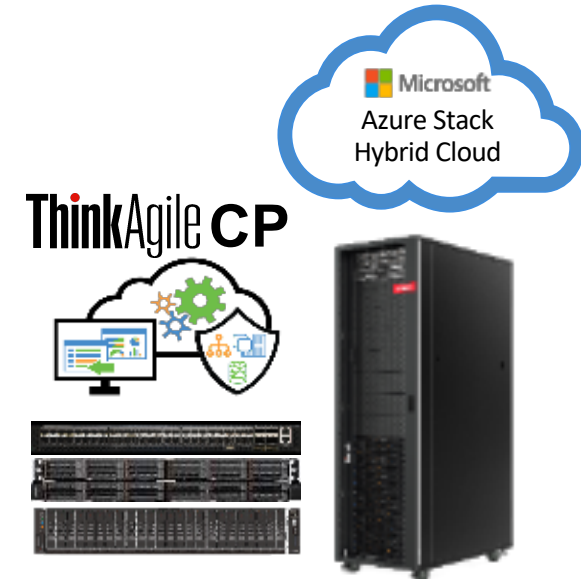
thanks.

Smarter
technology
for all

Lenovo