Reconstruyendo una Nube Privada con la Innovadora Hiper-Convergencia

Infraestructura Huawei FusionCube Hiper-Convergente

Ronald Paz – IT Product Director

Huawei del Peru

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2 IT Infrastructure Evolution

3 FusionCube: Pioneering Private Cloud Infrastructure Transformation

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5 Success Stories

Today, Huawei is leading ICT

Who is Huawei

- A leading global ICT solutions provider
- A Fortune Global 500 company, ranking No. 228 in 2015 and 129 in 2016
- No.88 of Interbrand's Top 100 Best Global Brands

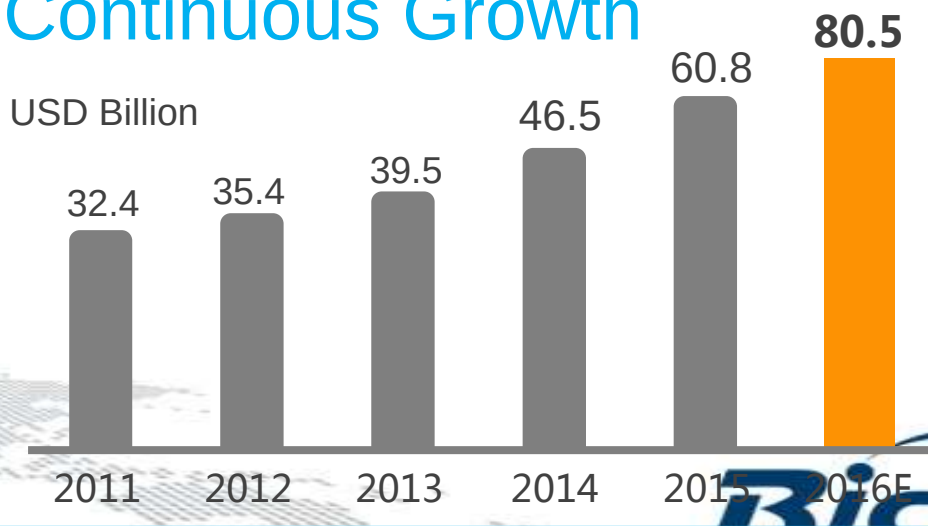
Employees

- 176,000+ employees worldwide
- 79,000+ engaged in R&D, 45% of the total workforce
- LinkedIn World's 100 Most In Demand Employers

Market Progress

- Providing professional services for 1,500+ networks in over 170 countries and regions
- Serving 1/3 of the world's population
- 108M units of Smartphone shipments in 2015, grow 44%, ranked No.3
- 2016H1, revenue reached CNY245.5B, grow 40%

Continuous Growth



Global leader of ICT for 3 business groups

HUAWEI

Consumer Business	Carrier Business	Enterprise Business
A brand loved by consumers	Customers' best strategic partner	Enterprises' best innovation partner

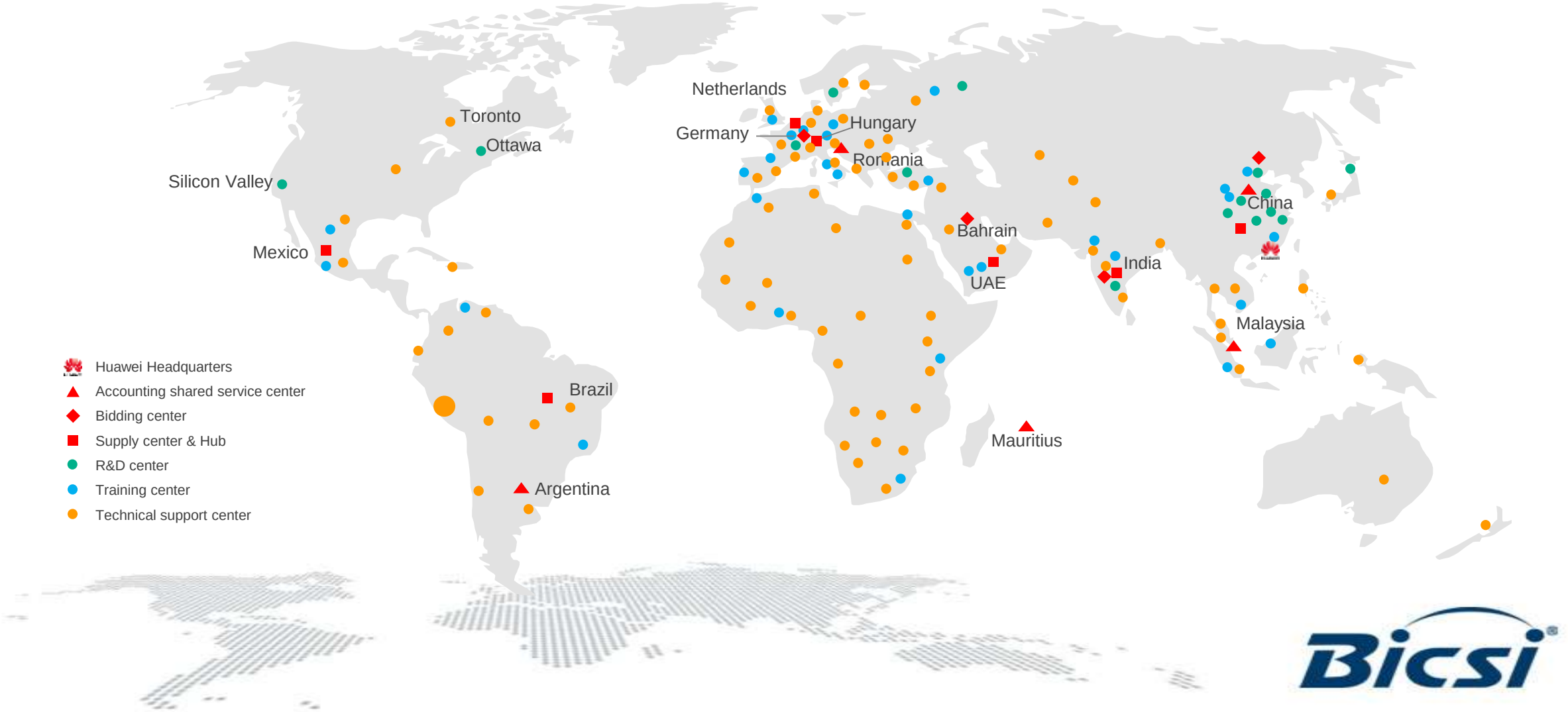
A Global Leader of ICT Solutions

Information Distribution and Presentation	Information Transmission		Information Storage
Smartphones MBB & home devices Wearable devices Vehicle telematics	Mobile networks Fixed networks Carrier software and core networks	Enterprise networks M2M connection management platforms	Data center infrastructure Big Data analytics platforms Cloud services

Professional services

Bicsi

Globalized Resource



Huawei take root in Peru, grow with Peru

230 Employees
Local staff 80%

700 Direct & indirect job

211M USD
2011-2015 TAX paid

2300+ rural sites with Telefonica, for **0.5M** users,

4 provinces national broadband for local municipals and schools

2000+
clients and employees trained in china
30
“Future seeds” in 3 years

Serving all operators

90% of users

1st 3G, 1ST 4G, 1st Smart Home, 1st 4.5G

Achieve win-win outcomes with global partners through open collaboration

HUAWEI

Government

SEGOB

CONAGUA Comisión Nacional del Agua

SEP

PERÚ Ministerio de Transportes y Comunicaciones

ONPE

PERÚ MINSA

SUNEDU

PERÚ Ministerio de Educación

Energy

epm

PEMEX

EMCALI

CFE Comisión Federal de Electricidad

CHINALCO

STATE GRID CORPORATION OF CHINA

Finance

BANCO CENTRAL DE RESERVA DEL PERÚ

Santander

BBVA

中国农业银行 AGRICULTURAL BANK OF CHINA

Banco AV Villas

Banco do Nordeste

BANORTE

CAIXA

Global Partners

ALSTOM

THALES

Telefónica

Schneider Electric

accenture High performance. Delivered.

Indra

SAP

IBM

Honeywell

Bicsi

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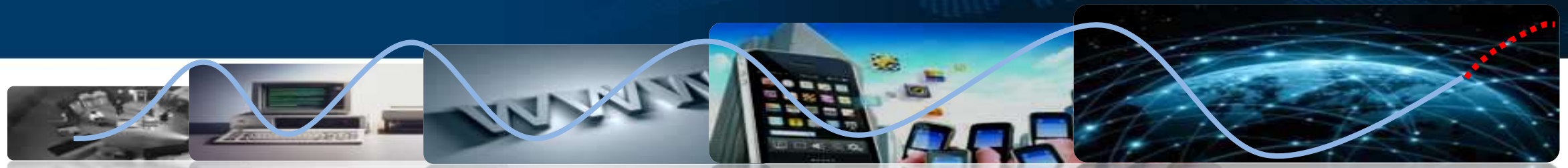
IT Infrastructure Evolution



1960s Mainframes | 1980s PCs | 1990s Internet | 2000s Mobile Internet | 2010s Big Data, Cloud computing

IaaS 1.0

Predominantly hosts, terminals, and DAS

GB era, MB/s

IaaS 2.0

Predominantly servers and SAN/NAS

TB era, GB/s

IaaS 3.0

Cloud service, MBB network, Big Data analytics, and social networking technologies

PB era, 10 GB/s to 100 GB/s, Distributed architecture

1956: IBM RAMAC 305
World's first computer with a hard drive for storage
Magnetic disks replaced punched cards
5 MB capacity and 10 KB/s read/write

1993: EMC Symmetrix
16 MB DRAM, 1 GB global memory, 1 TB capacity

IBM DS8000

EMC VMAX

Huawei 18000

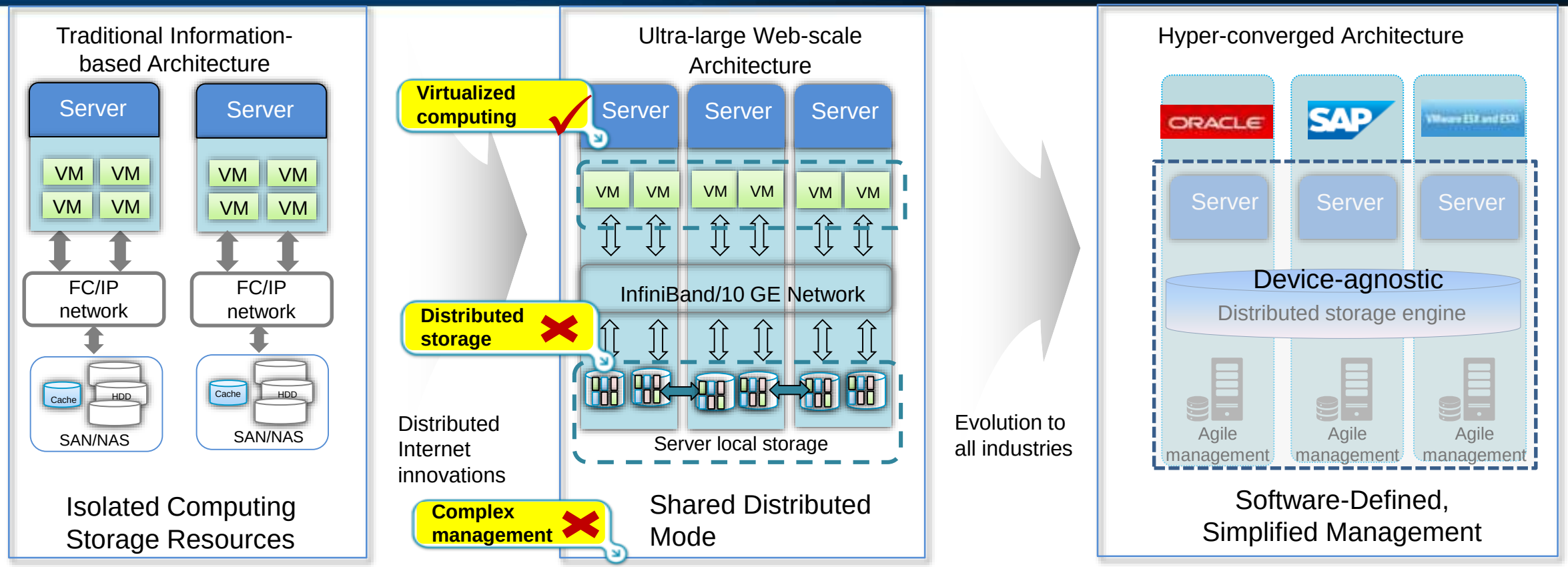
Hyper-converged architecture

Google FS

Amazon S3

Ever-growing service demands are driving infrastructure towards a distributed and cloud-based architecture.

Evolution of Traditional Architecture

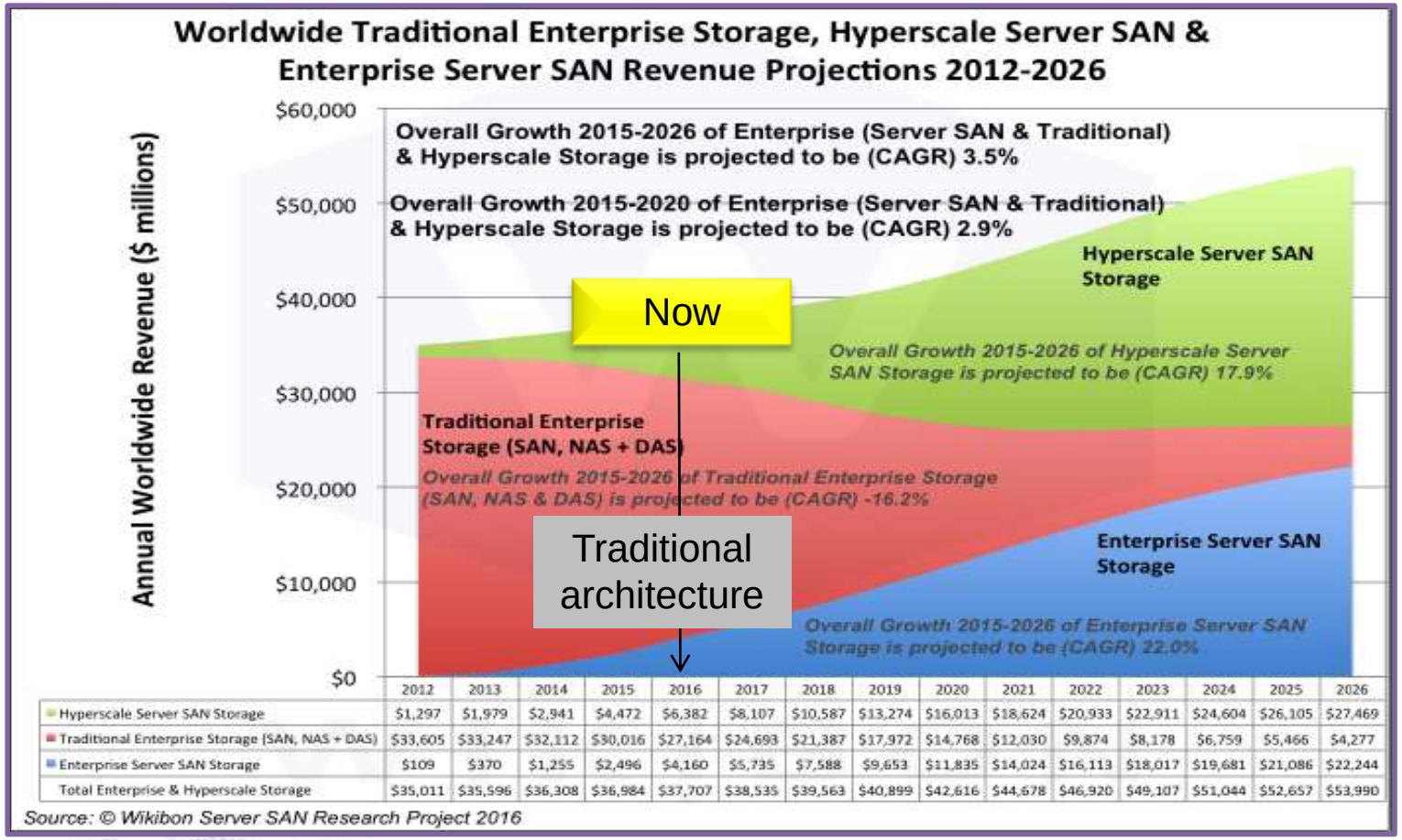


Computing-centric scale-up architecture → Data-centric scale-out architecture → Service-centric scale-out architecture

Evolution of Internet architecture to all industries is difficult due to distributed storage and complex management.

Hyper-Converged Architecture Is the Predominant Trend

- A scalability pattern similar to Internet scale-out
- Appliance-based manageability
- Compute node as storage
- Compute power and storage capacities increase with demands
- Linear expansion of performance and capacities
- Low TCO



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Hyperscale Server SAN Storage	$1,297	$1,979	$2,941	$4,472	$6,382	$8,107	$10,587	$13,274	$16,013	$18,624	$20,933	$22,911	$24,604	$26,105	$27,469
Traditional Enterprise Storage (SAN, NAS + DAS)	$33,605	$33,247	$32,112	$30,016	$27,164	$24,693	$21,387	$17,972	$14,768	$12,030	$9,874	$8,178	$6,759	$5,466	$4,277
Enterprise Server SAN Storage	$109	$370	$1,255	$2,496	$4,160	$5,735	$7,588	$9,653	$11,835	$14,024	$16,113	$18,017	$19,681	$21,086	$22,244
Total Enterprise & Hyperscale Storage	$35,011	$35,596	$36,308	$36,984	$37,707	$38,535	$39,563	$40,899	$42,616	$44,678	$46,920	$49,107	$51,044	$52,657	$53,990

Source: © Wikibon Server SAN Research Project 2016

The global hyper-convergence market is set to grow rapidly from NOW forward.

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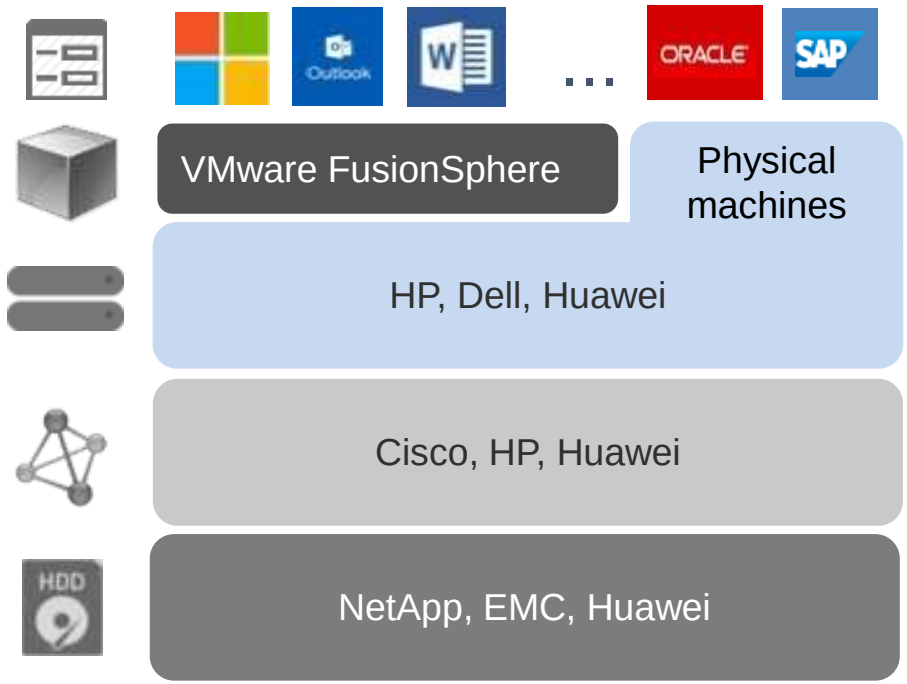
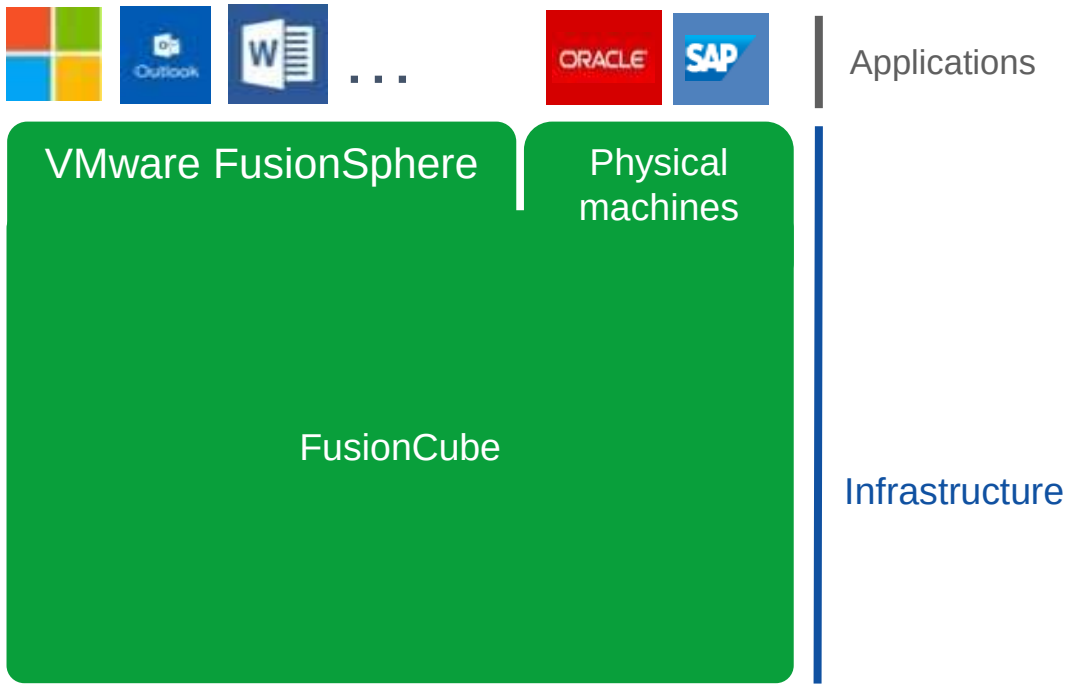
FusionCube: Pioneering the Private Cloud Infrastructure Transformation

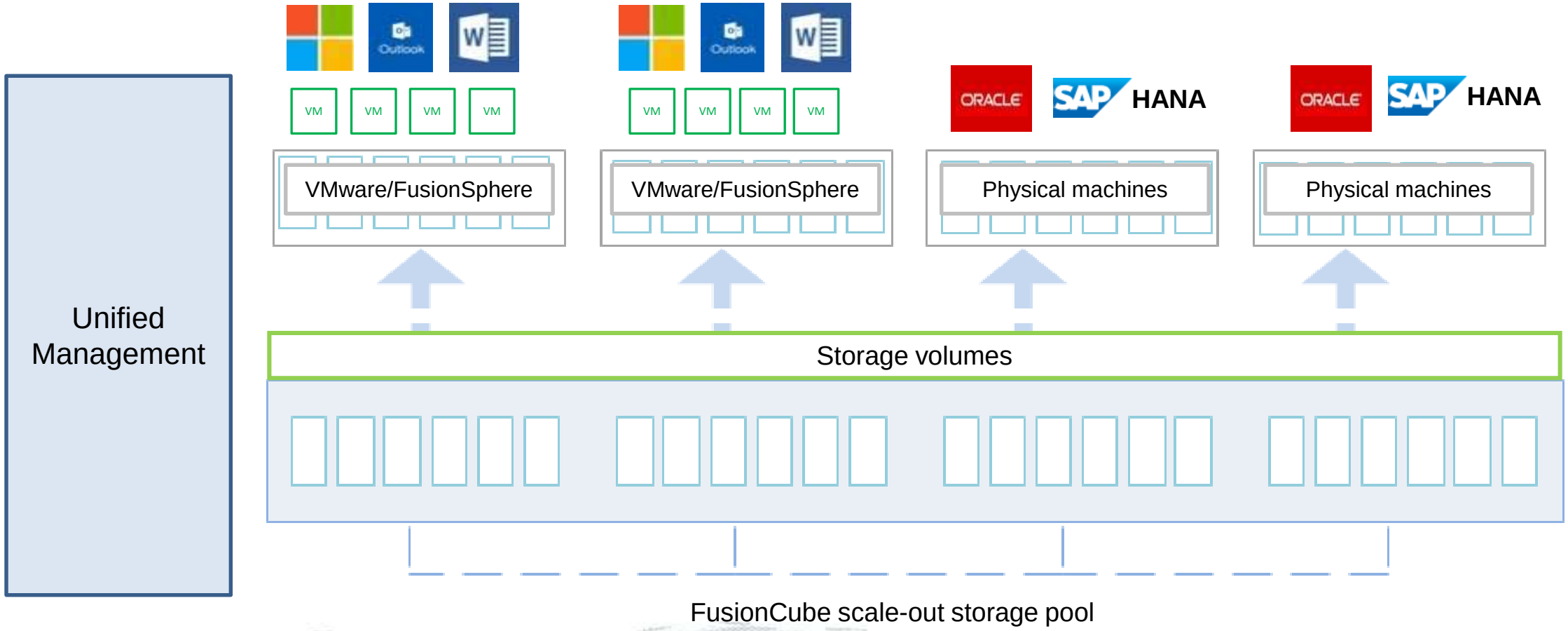




Software-Defined Storage: Replacing Dedicated Servers with Universal Servers

FusionCube
Hyper-converged Infrastructure

Cloud-Enabled Enterprise Data Center



Advanced Hardware Platform Unleashes Compute and Storage Power

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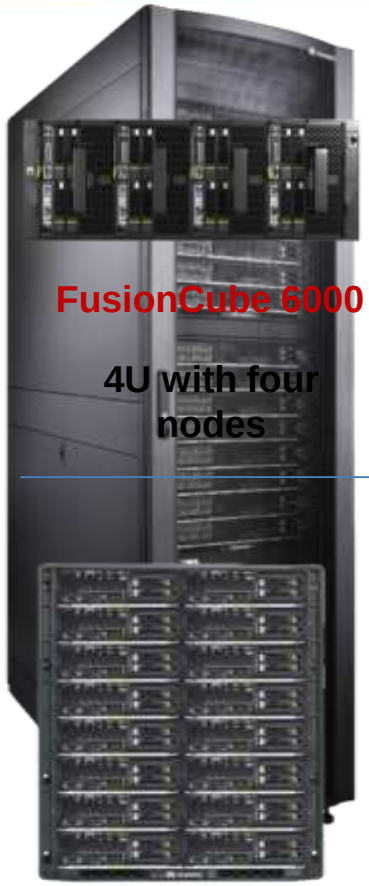

FusionCube 6000

4U with four nodes

XH628	XH628	XH628	XH628
12 disks	12 disks	12 disks	12 disks
Computing and storage converged node	Computing and storage converged node	Computing and storage converged node	Computing and storage converged node

2/4 x 10 GE + 2 GE Ethernet

CH121	CH222	CH220	CH242 V3
Half-width 2-socket compute node	15 SSDs Full-width storage node	Full-width high-performance I/O node	Full-width 4-socket compute node

10 GE/FCoE — CX311

IB FDR — CX611

FusionCube

Hyper-converged Infrastructure

FusionCube 9000

12U with 16 nodes

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FusionCube 9000: A Leading Computing, Storage, and Networking Converged Platform

Easy management
Rapid deployment: System go-live time shortened from weeks to hours.

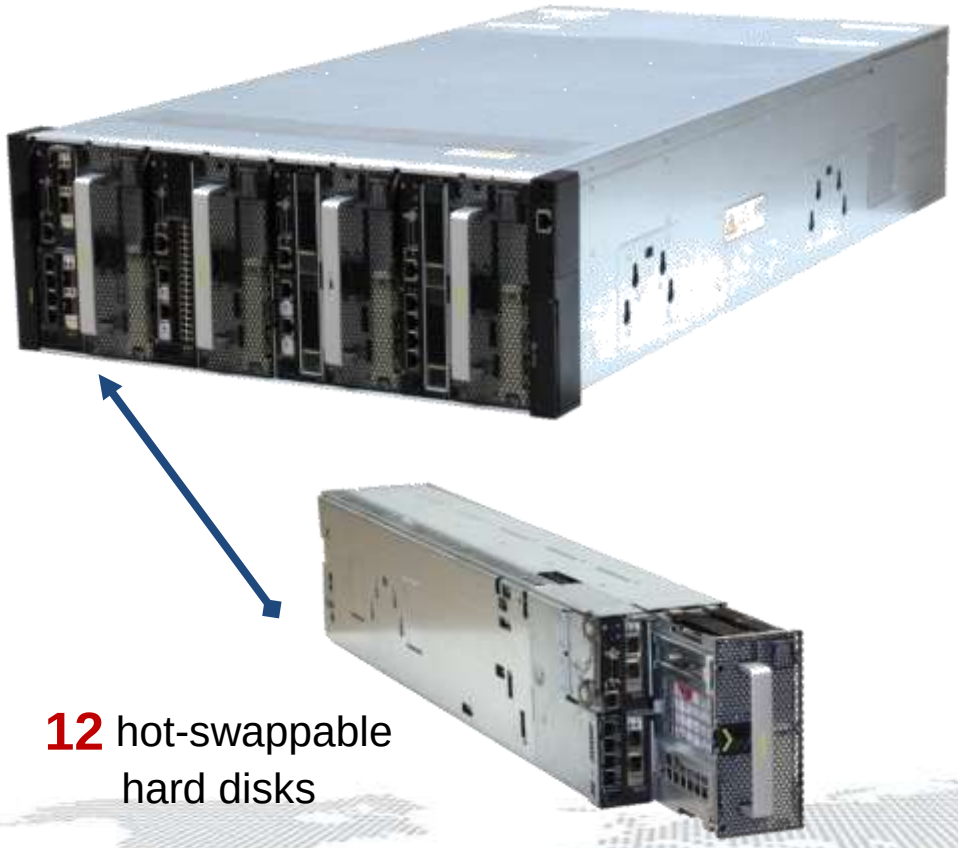
Modular design
Modular design: Meeting IT hardware resource requirements in multiple service scenarios.

High-density architecture
Computing density improved by 66%: Supports next-decade evolution of CPU and network technologies.

Energy conservation
Industry-leading Platinum PSUs: Improves energy efficiency by 13% with patented energy-conservation technologies.

1	Computing	A single chassis supports **64** Haswell EP 145W CPUs, the highest density in the industry.
2	Storage	A single chassis supports an internal **storage capacity of up to 316.8 TB,** the largest single-chassis internal storage capacity in the industry.
3	Networking	Based on state-of-the-art **Huawei data center switch technologies** and supports 10 GE/IB/FC. **15.6 Tbit/s** midplane switching capacity, up to **128** 10 GE uplink ports per chassis.
4	Reliable	Supports continuous operation at **40°C.** Failure rate **15% lower** than the industry average.
5	Energy efficient	**China Environmental Labeling** certified, with **top ranking** in China Mobile and China Unicom tests.
6	Easy-to-use	**Plug-and-play** boards and cards, **automatic configuration and transfer of parameters.**

FusionCube 6000: An Integrated Platform with Converged Computing and Storage



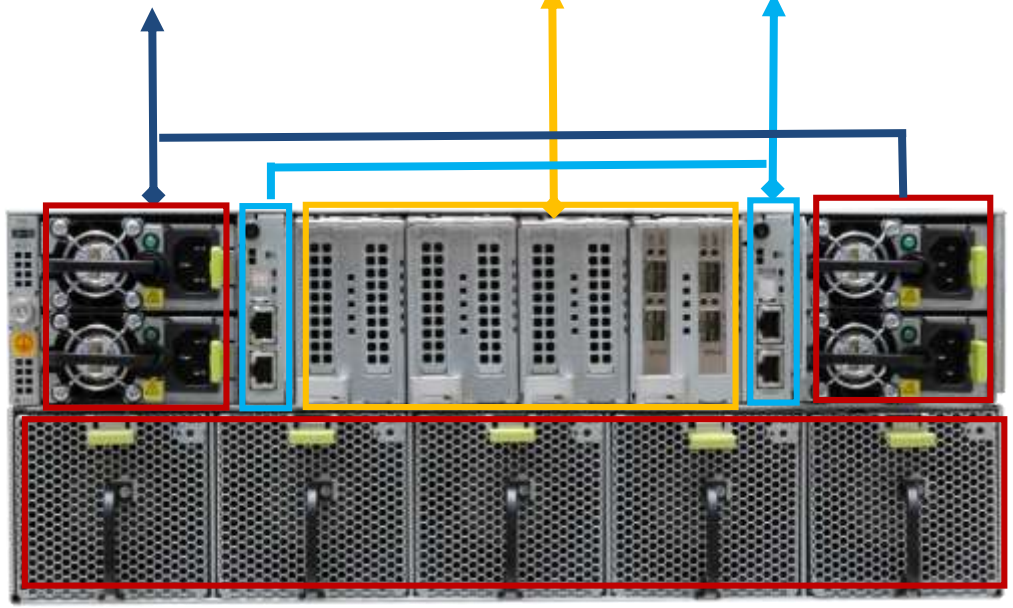
12 hot-swappable hard disks

4 PSUs in redundancy

750W/1,200W Platinum AC PSU (94%)
or 800W golden DC PSU (92%)

8 HHHL rear PCIe 3.0 x8 slots

Chassis management module HMM



5 counter-rotating fan modules, tolerating failures of a single fan module

N+1 redundancy, with 3,000W heat dissipation capability

FusionCube 2000: Enhanced Foundation for Enterprise Basic IT Services

- 16*8TB ultra-large local storage capacity
- 44-core new-generation full series processors
- 24 NVMe SSDs superior storage performance
- 9 PCIe slots flexible I/O expansion

44 cores + 16*8TB storage capacity + 9 PCIe slots, ideal for Big Data, Virtualization, and VDI

Trendsetting Embedded Distributed Storage Software

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Cloud

FusionSphere

vSphere

OpenStack

KVM

Database

ORACLE

SAP HANA

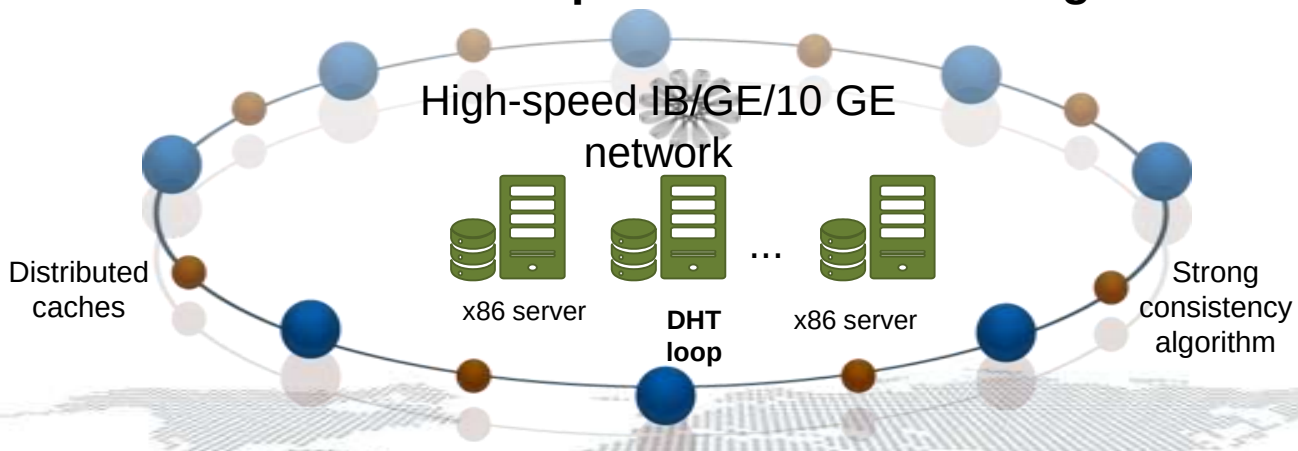
MySQL

IBM DB2

Sybase IQ

达梦数据库

FusionCube Distributed Block Storage enables universal servers to replace dedicated storage.



High Scalability

- Simultaneous linear growth of performance and capacities
- Resources added/reduced on demand, protecting customer investments

High Performance

- **Industry's highest performance: 6 million IOPS**
- Distributed engines for parallel I/O
- Industry's fastest 56 Gbit/s IB network

High Reliability

- Supports multiple copies
- Fast self-healing; rebuild time for 1 TB data shorter than 15 minutes
- Cross-node redundancy

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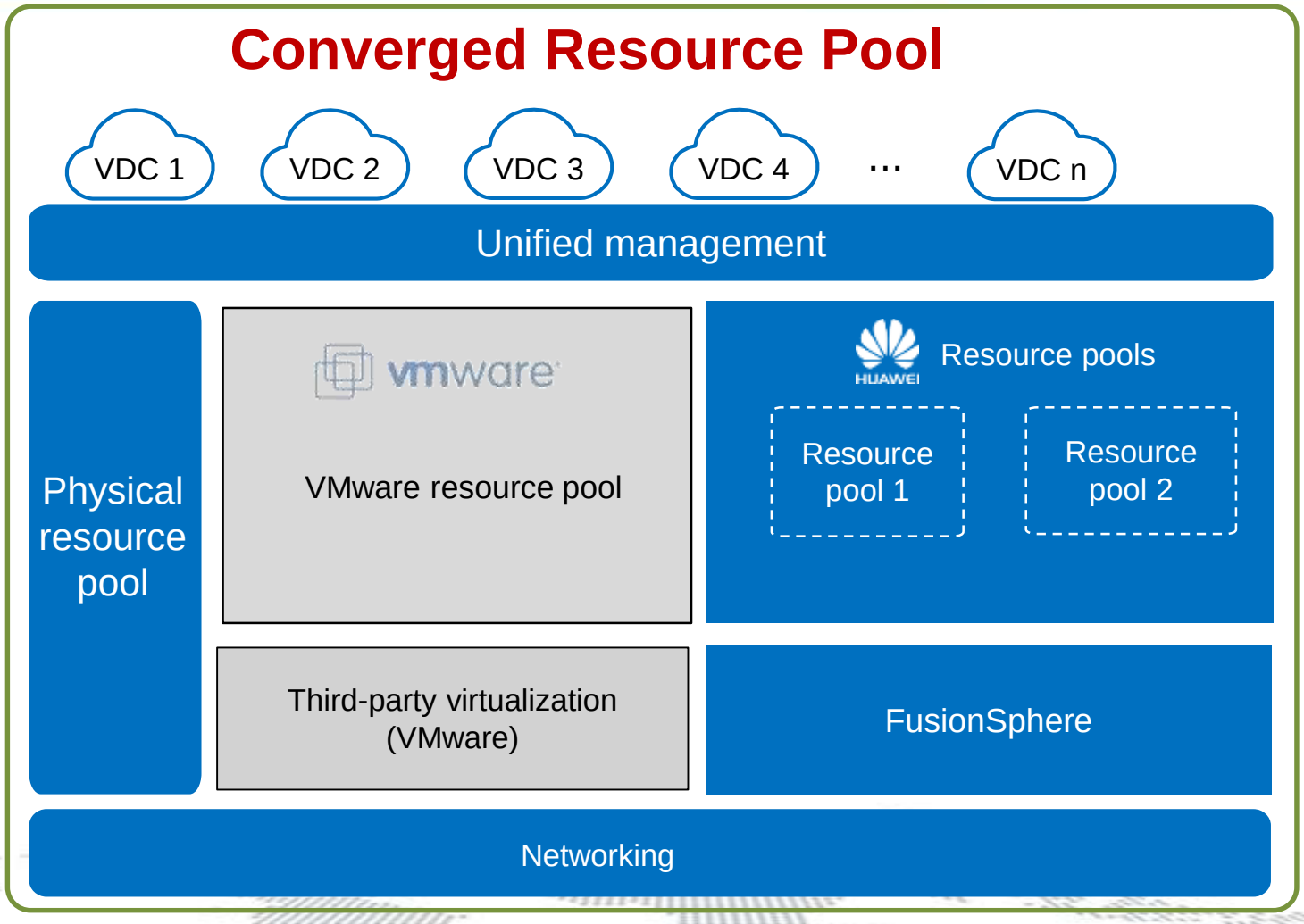
Heterogeneous Virtualized Platform Enables Unified Management of Resources



Protects initial enterprise investments

- Heterogeneous third-party mainstream virtualization platforms, VMware, KVM, etc.
- Heterogeneous management of physical and virtual resource pools

Infocast COFCO Coca-Cola

Open architecture, unified management of heterogeneous resource pools

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Hyper-Converged Infrastructure: Highest Performance in the Industry

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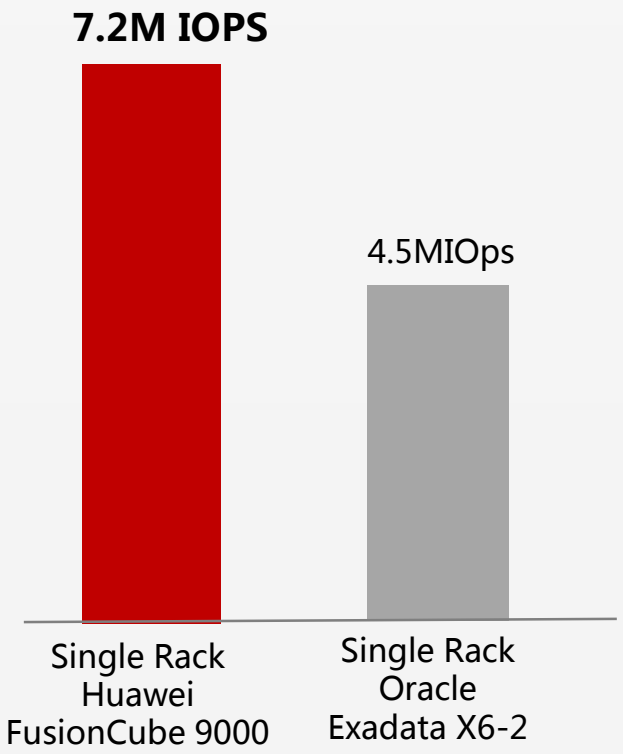
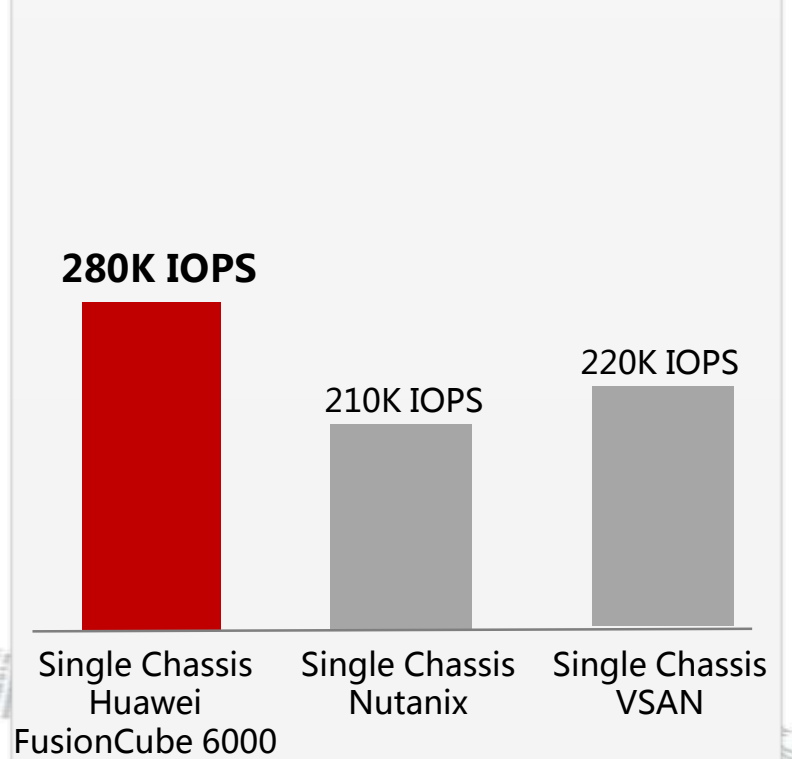
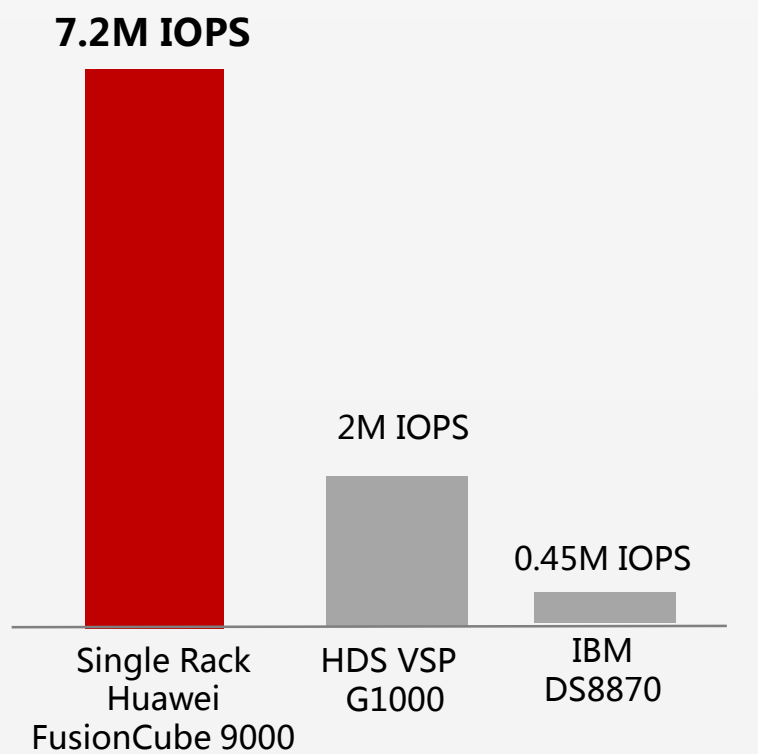
Highest Performance (Databases)



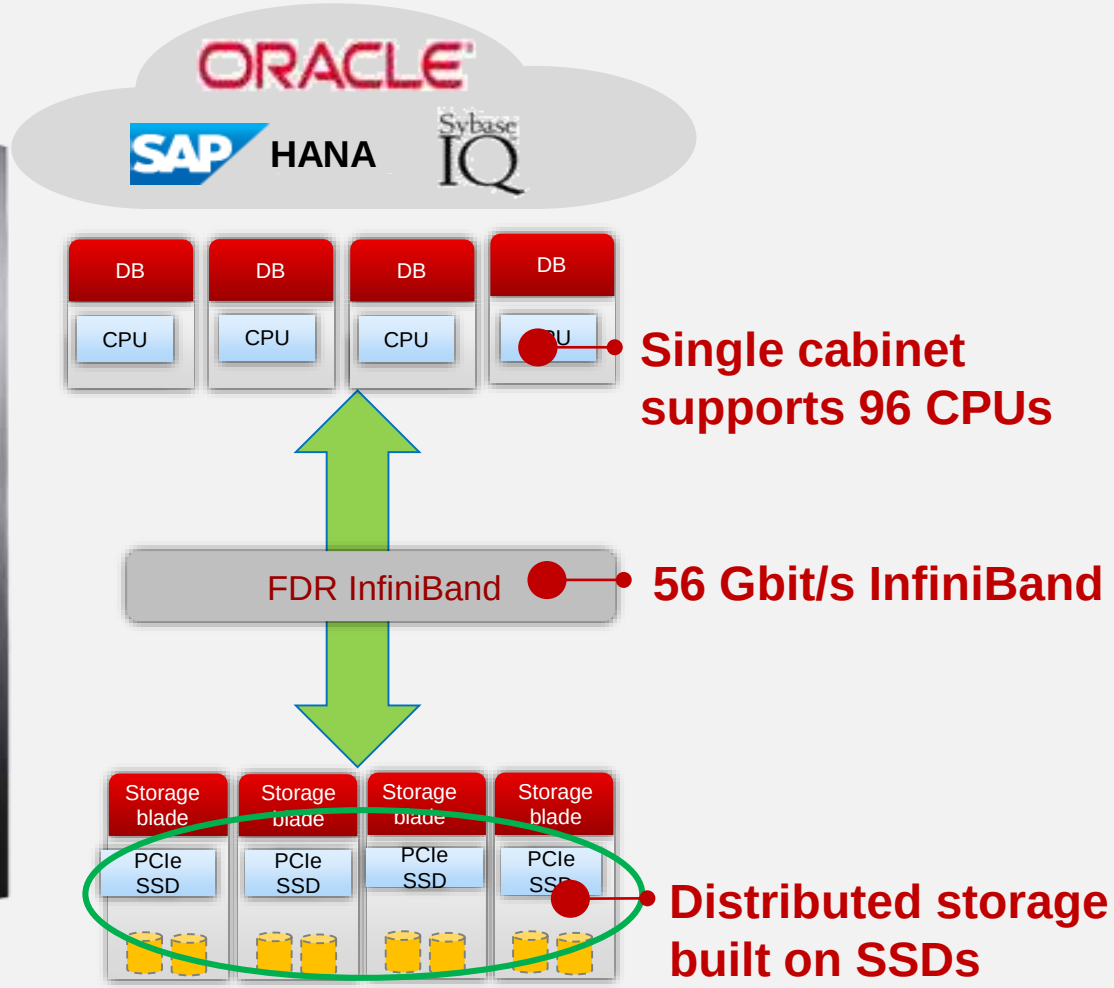
Highest Performance (Virtualization)



10x Performance of Legacy Architecture



World's Fastest SAP HANA Appliance



World's Fastest SAP HANA Appliance

18 billion records

30 TB live-network data

3.2s of query time

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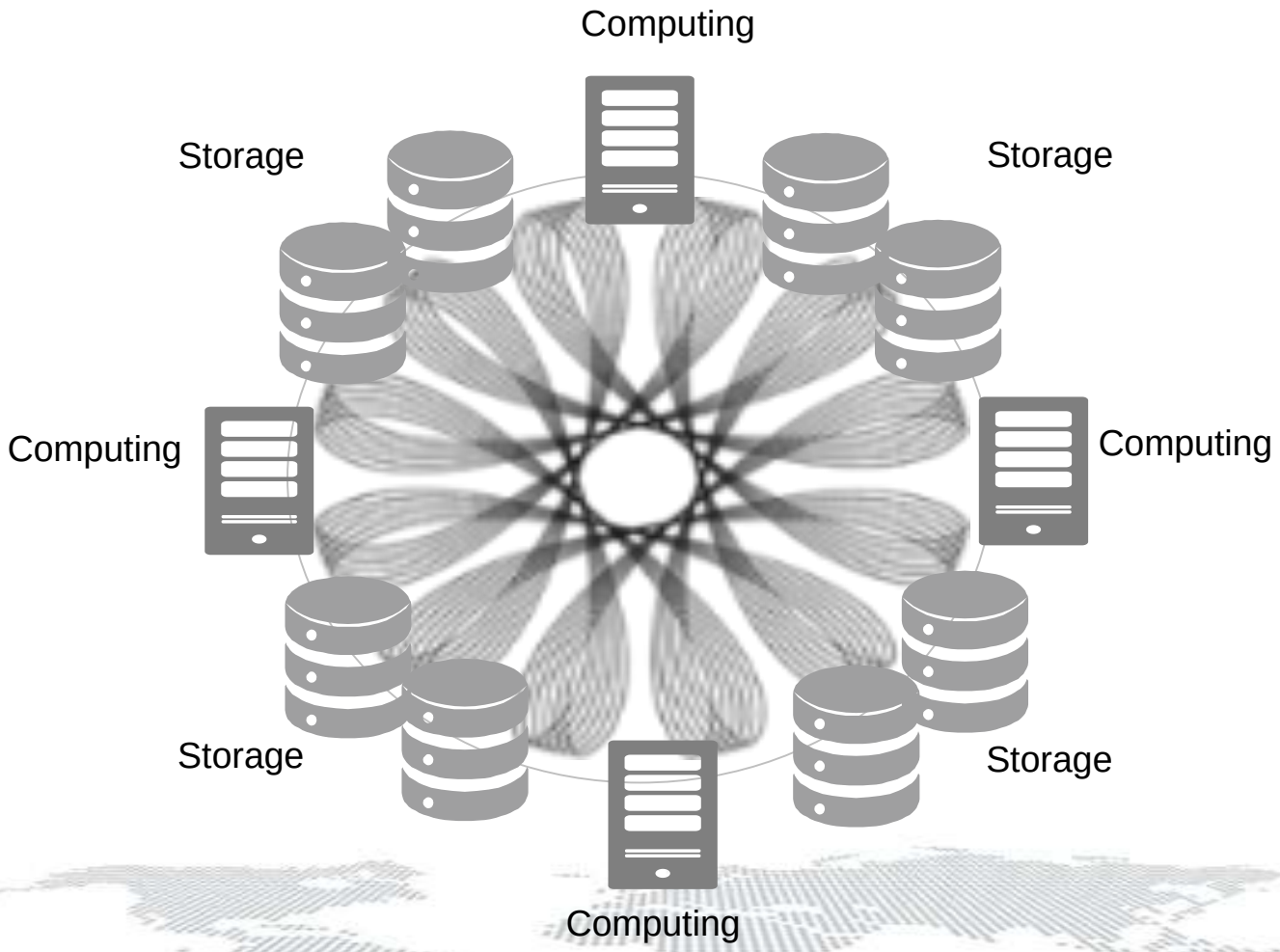
Symmetric Distributed Architecture for All-Node Non-Blocking Concurrency

HUAWEI



- **Symmetric distributed architecture, without metadata nodes**
  Supports concurrent I/O for 256 nodes, without independent metadata nodes
- **InfiniBand high-speed interconnections**
  Network with industry's highest speed and shortest latency, P2P interaction between nodes
- **RDMA data direct reading**
  Data direct reading, reducing CPU resource consumption and achieving shortest latency

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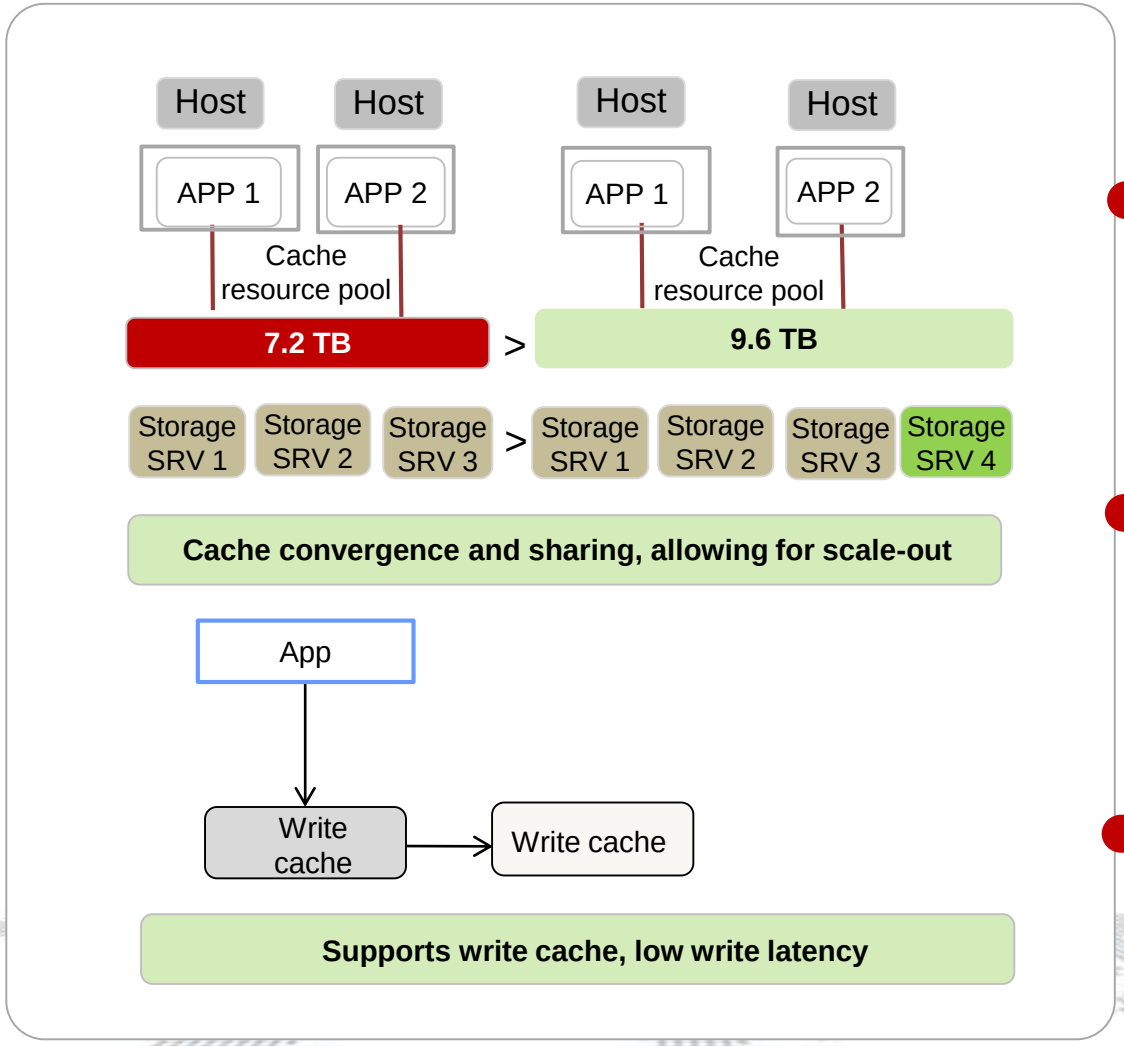
Cache Convergence Technology for Global Sharing of Cache Pool



- Cache convergence for up to 256 nodes
- Huawei proprietary consistency technology supports write cache
- Dynamically adjust read/write cache ratio according to I/O model

Full NVMe SSD Configuration Eliminates I/O Bottleneck

HUAWEI

NVMe SSDs replace hard disks: Game-changing performance improvement

Dominant Performance
800K IOPS
3.2 GB/s bandwidth

High Reliability
2 million hours MTBF
5 years service life

ES3000 V3 NVMe SSD

Huawei proprietary SSD controller chip

1812

High performance
Energy-efficient
High efficiency

Groundbreaking Huawei NVM Control technology

Intelligent FTL
CVT scheduler
LDPC error correction
Dynamic RAID

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Multiple Data Safeguarding Mechanisms Ensure Always-on Services

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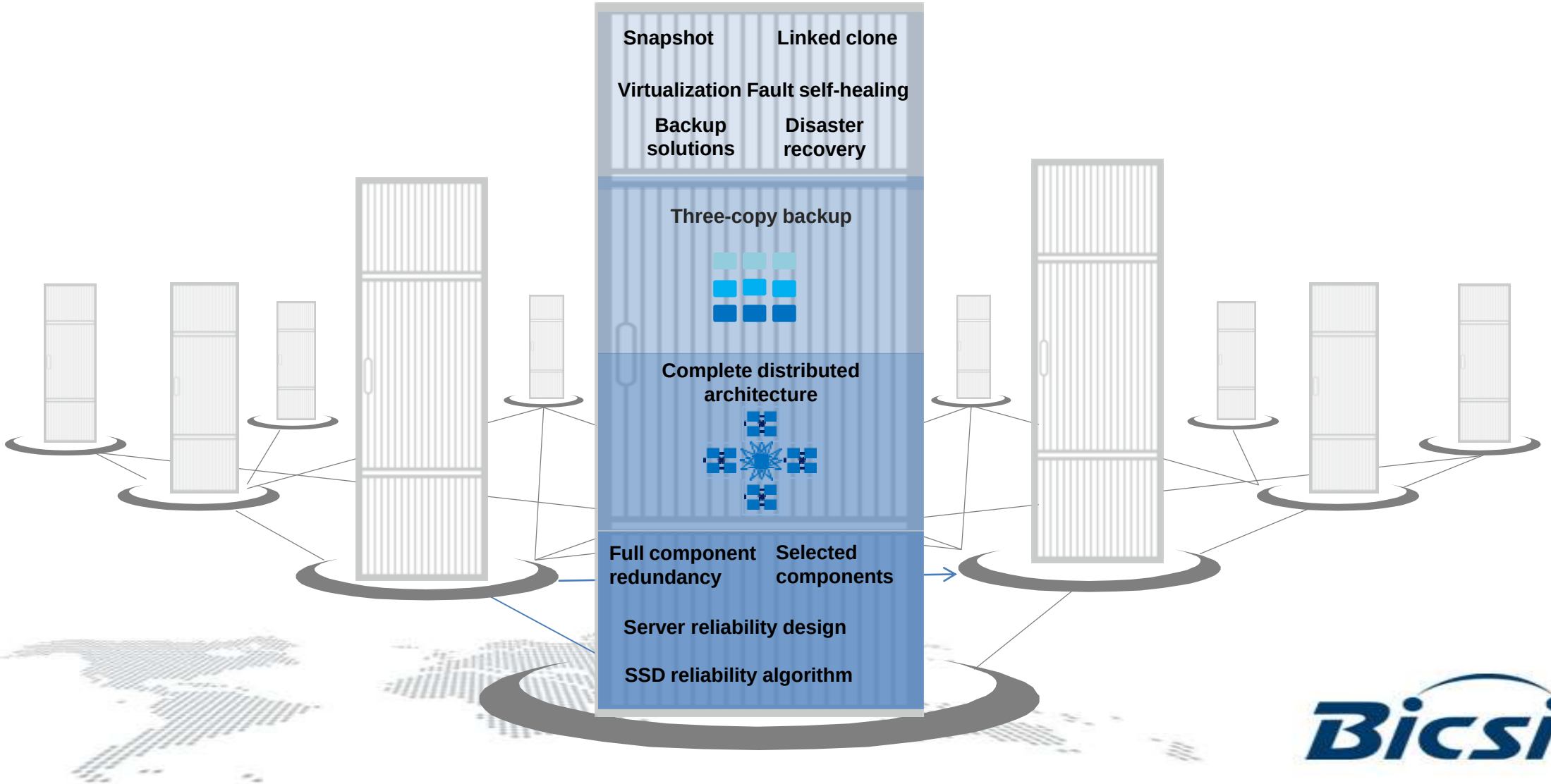

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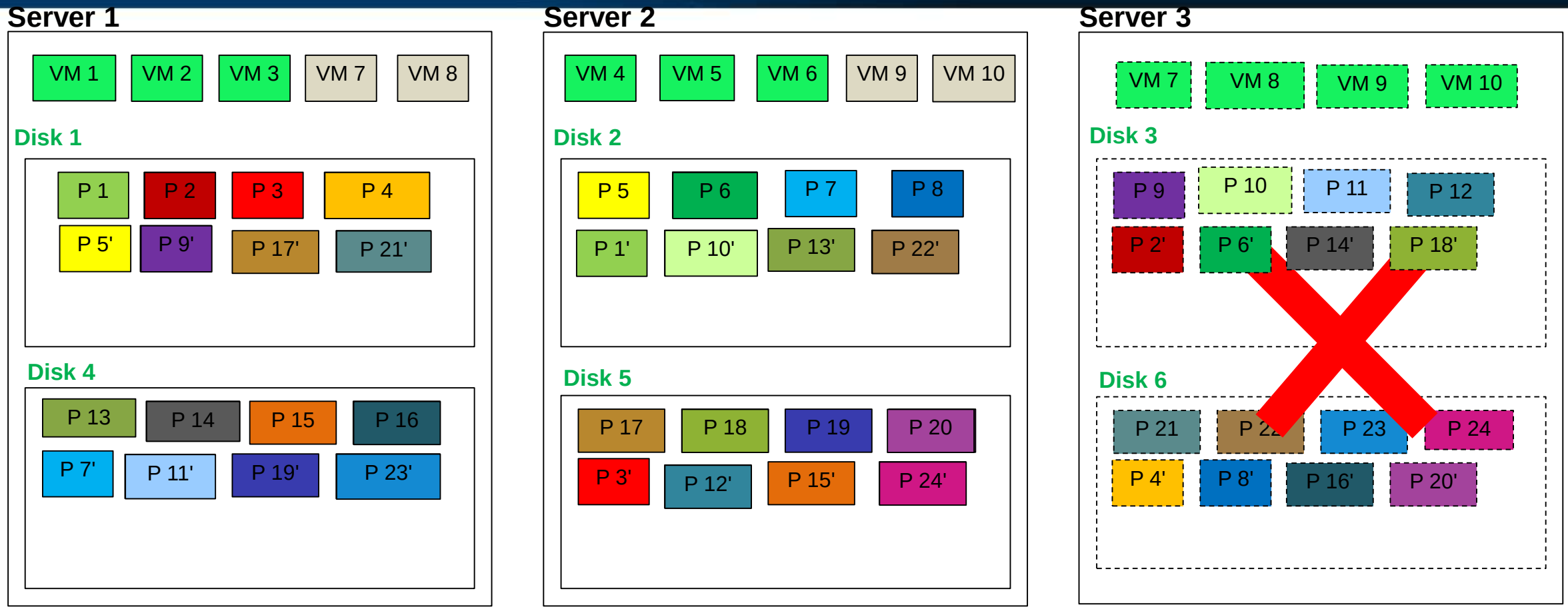
VM Intelligent Self-Healing, Improving Rebuild Speed by 40 Times



- Data is distributed across servers or cabinets, ensuring successful data access even when a server or cabinet is faulty
- Data slices are distributed across the resource pool and can be auto-built in parallel within the resource pool after a hard disk fails. Only the data of the faulty disk is rebuilt, without requiring independent hot spare disks

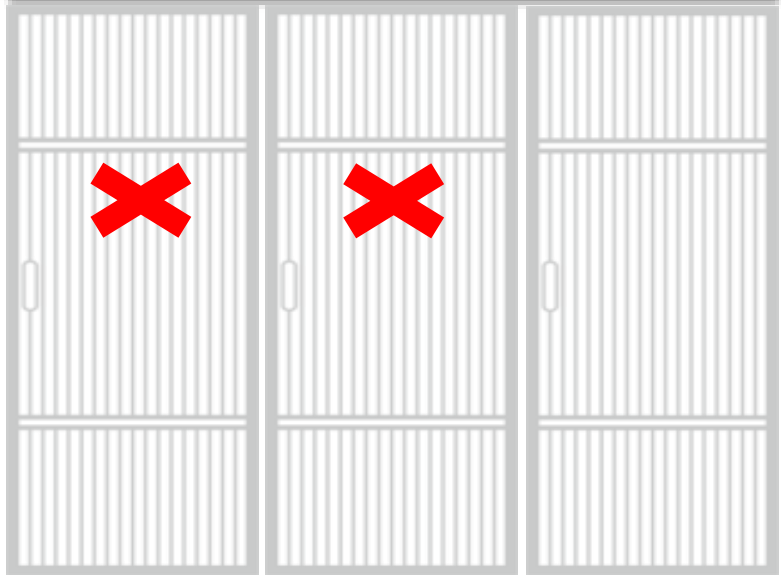
1 TB data rebuild time < 15 minutes (12 hours are required by a traditional SAN), and data reliability is improved.

First in the Industry to Support Cabinet-Level Security

Tolerates dual-node faults

Tolerates concurrent dual-server faults

Supports cabinet-level security



Tolerates concurrent dual-cabinet faults

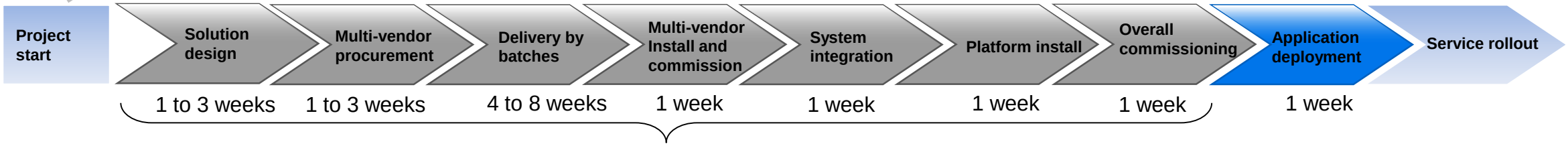
2-copy scenario: Reliability ≥ **99.99%**; 3-copy scenario: Reliability ≥ **99.99999%**

Data reliability always comes first. Suggest using three copies with FusionCube.

Google, Facebook, and BAT all use at least three copies.

Integrated Delivery: Services Go Live in 30 Minutes

FusionCube: Fastest arrival within 1 week; install and commission within 30 minutes



10–18 weeks

Pre-integration

- Preinstalled with virtualized database software
- Shortens system integration time
- Prevents human error

Pre-verification

- Based on best practice
- Real-world verification with vendors
- Accelerates solution design

Unified service

- Simplifies procurement process
- Shortens arrival time
- Improves after-sales experience

Unified Resource Allocation and Simplified Device Management

HUAWEI

FusionCube Builder (installation tool)

- All-in-one delivery
- Device auto-discovery
- Wizard-aided installation
- Preinstallation and preconfiguration
- Graphical configuration
- Fast initialization

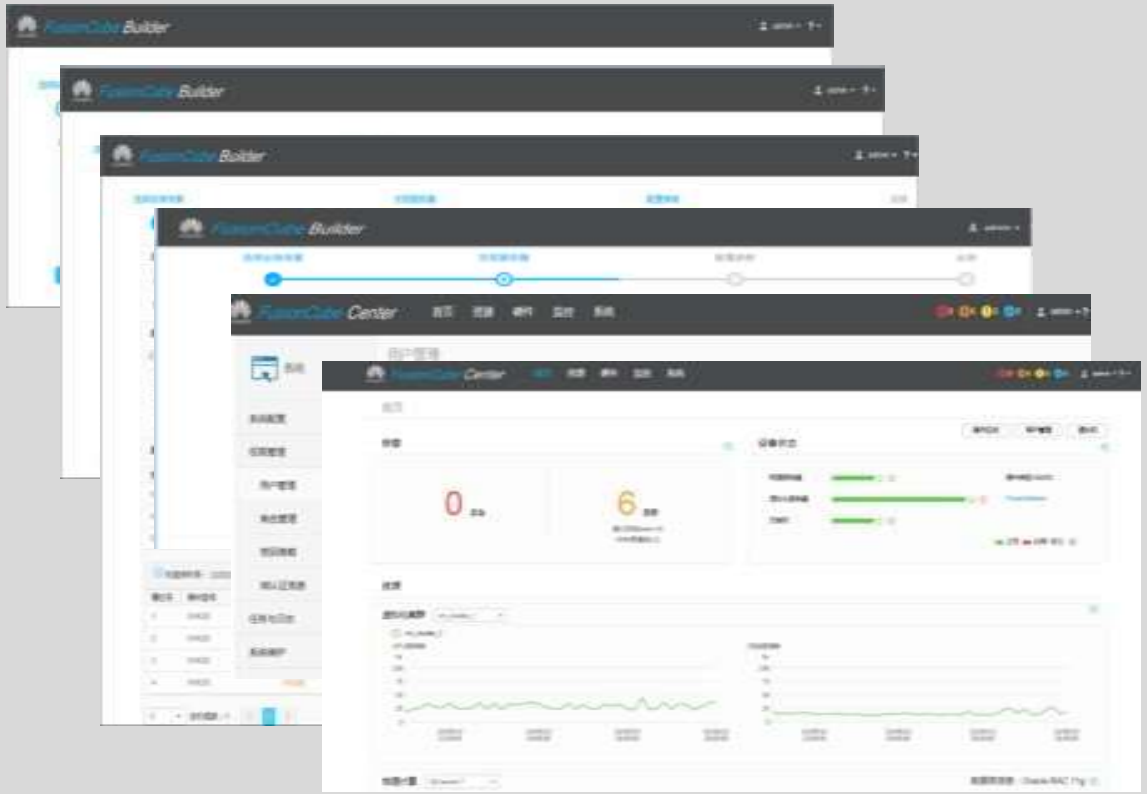
FusionCube Center (management tool)

Unified resource management
- Hardware devices
- Virtualization platform
- Storage resources

Unified alarm management
- Alarm list display and export
- Alarm threshold and masking settings
- Alarm statistics

Unified monitoring
- Physical machine health monitoring
- VM status monitoring
- Performance indicator monitoring

Unified Management of Virtualized Resources, Distributed Storage, Servers, and Networks



Public network demonstration: https://112.95.253.74

Empowers enterprises to use a simplified, high-performance, and high-reliability private cloud with a unified set of management software.

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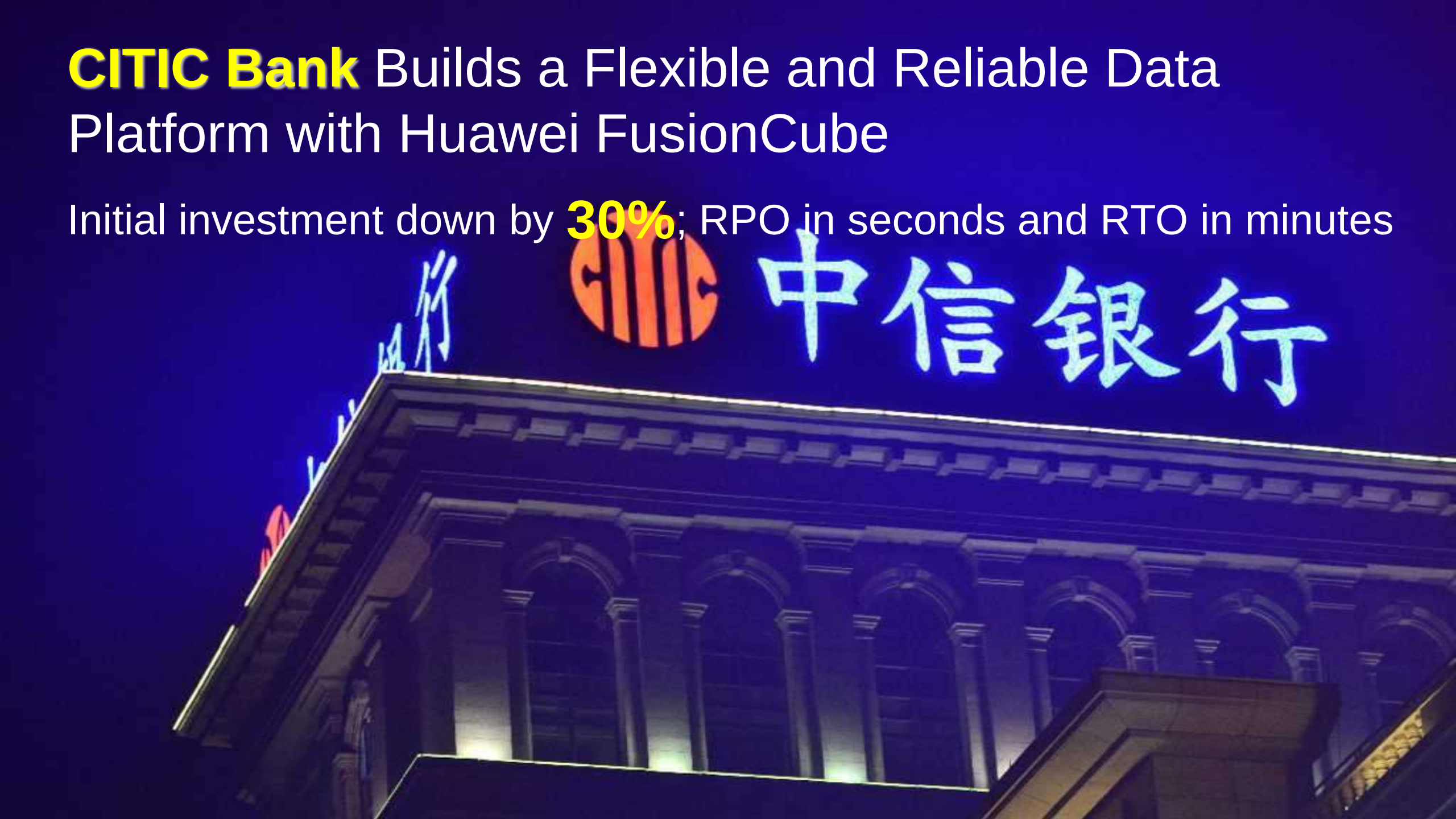
Huawei FusionCube Success Stories

Finance	Communications and Manufacturing	Carrier	Public departments	Education and Retail	Energy
China Merchants Bank	Nanchang Railway Bureau	Orange	Public Security Bureau of Hubei Province	Nankai University	Sinopec
Agriculture Bank of China	CRSC	China Mobile	Guangdong/Liaoning Maritime Safety Administration	Shanghai Maritime University	CNPC
CITIC Trust	Pudong International Airport	Telefónica		TVTC, Saudi Arabia	China Huaneng Group
Infocast	Hong Kong Airlines	China Telecom	Shenzhen/Huangpu Customs	Tawazun Rabdan Academy	China Minmetals Corporation
Spanish Exchanges (BME)	COFCO	Asia Pacific Telecom		Italian retailer	

CITIC Bank Builds a Flexible and Reliable Data Platform with Huawei FusionCube

Initial investment down by **30%**; RPO in seconds and RTO in minutes



Guangzhou Local Taxation Bureau Builds an Efficient Agile Private Cloud with Huawei FusionCube

Improves performance by **10 times** compared with traditional architecture, enabling easy management and fast rollout.

Sinopec Builds the World's Largest Enterprise Data Warehouse System with Huawei FusionCube

87 TB, the largest SAP cluster in the world, improving performance by **4** to **6 times**

Nankai University Enables Intelligent Education on a Private Cloud

Unified management platform, improving O&M efficiency by **50%**

PLA 305 Hospital Builds an Agile IT Infrastructure with Huawei FusionCube

医疗

Equipment footprint reduced by **60%** and resource utilization improved by **70%**

Huawei FusionCube Enables Fast Desktop Cloud Rollout for **Hong Kong Airlines**

Deployment efficiency improved by **10 times**

China Mobile Jiangsu Builds an Operation Analytic System with Huawei FusionCube

中国移动
China Mobile

Replaces midrange computers for data analytics, empowering precision marketing to a massive userbase

Gracias

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