



# Achieving Real-Time Business Operation

— Huawei SAP HANA Appliance

**LEADING** NEW ICT

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SAP System Requires Innovative Infrastructure Solution

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Huawei SAP HANA Appliance Solution

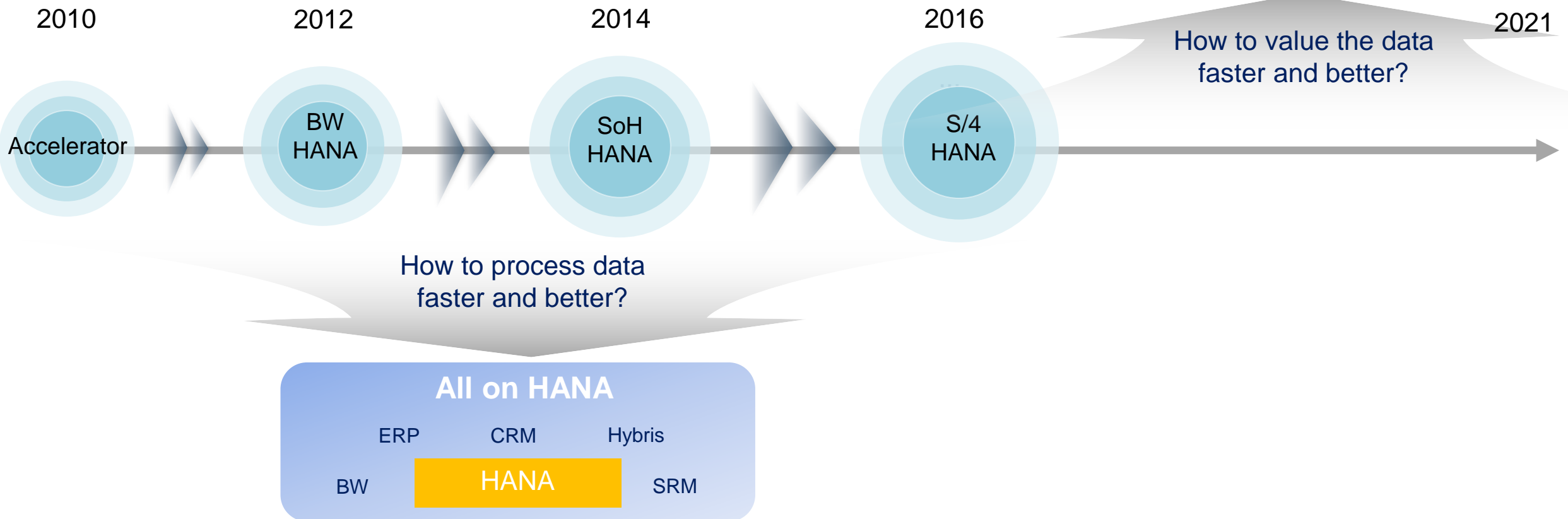
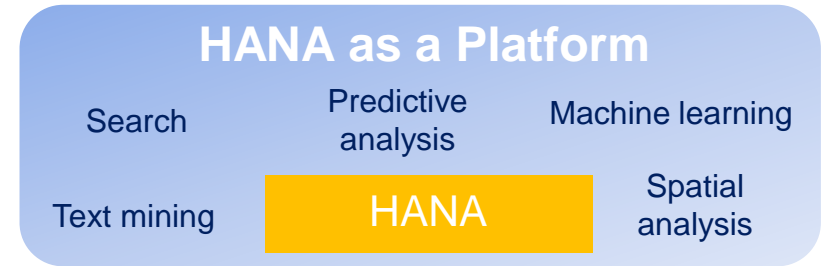
3

Success Cases

# Changes Brought to Hardware Infrastructure by Enterprises' Upgrade to S/4HANA

The SAP Business Suite will reach the end of maintenance by 2025.

- After the current system is migrated from UNIX to S/4HANA, which is based on in-memory computing, how should the hardware infrastructure adapt to the changes?

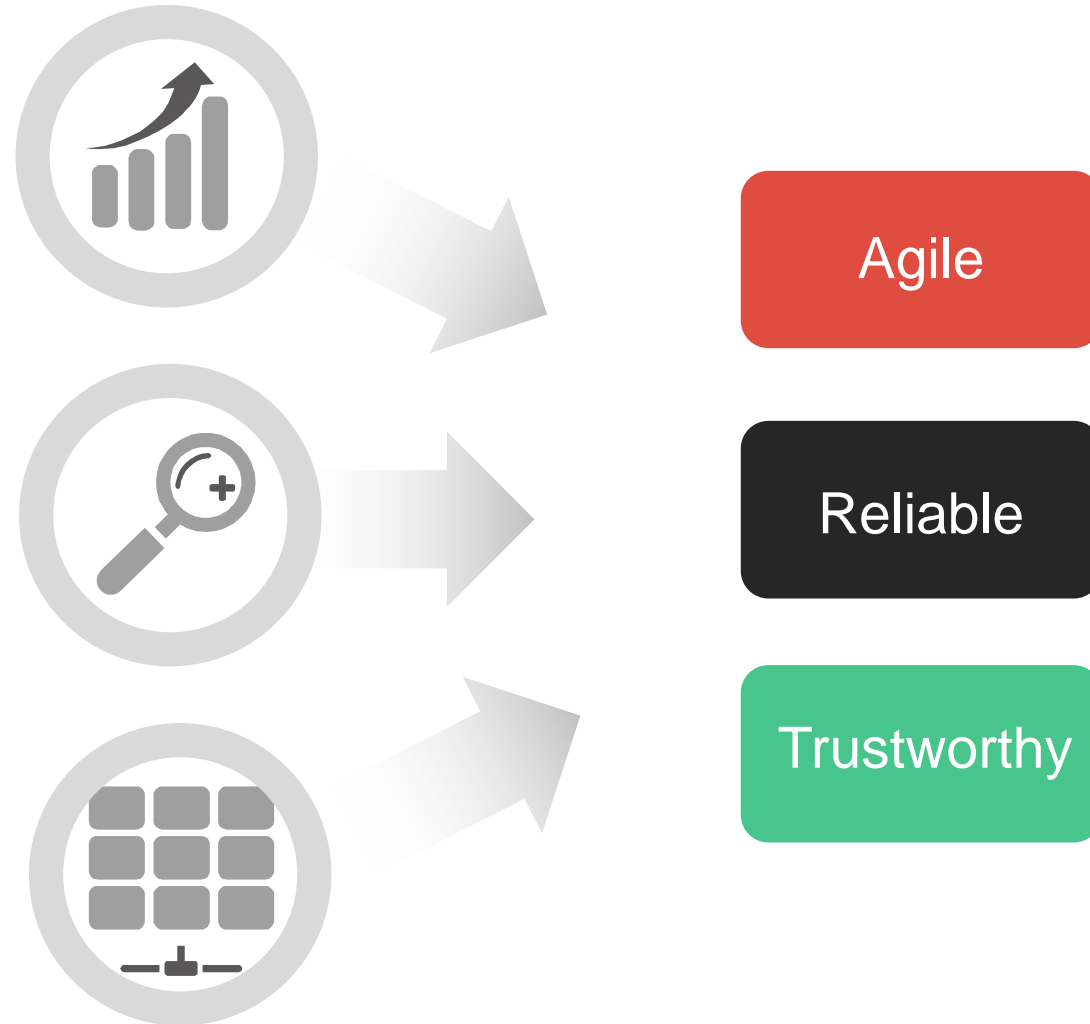


# Enterprise Transformation Calls for an Open Business Critical Infrastructure

Enterprises not only generate data, but also need to explore the value of data and quickly guide operation decision-making through value data.

Moving SAP system infrastructure from closed UNIX servers to open x86 platform requires comprehensive measures to ensure reliability.

Customers do not want separate hardware components, but professional, trustworthy SAP one-stop system infrastructure design and services.



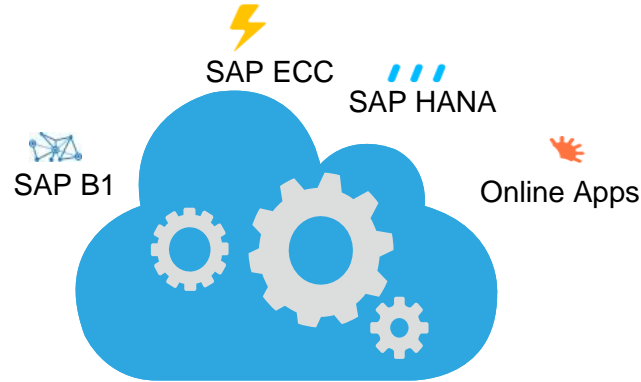
# Huawei & SAP Joint Innovation Enables Enterprise Transformation

## Innovative IT Infrastructure



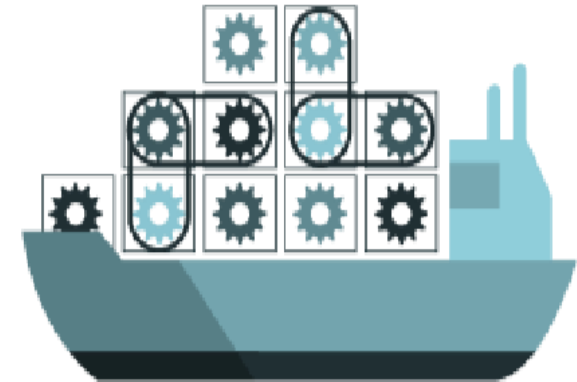
SAP HANA E2E infrastructure  
Real-time business decision-making  
Innovative and open IT architecture

## Critical Business Cloudification



Cloudified SAP Apps and SAP HANA  
Less CAPEX for enterprises  
Simplified IT O&M

## IoT Intelligent Interconnect



Intelligent manufacturing solutions  
for industries  
E2E IoT implementation

# Huawei and SAP Join Hands to Build Leading Solutions



July, SAP announced Huawei as its first global technical partner in China.

2012



February, Huawei and SAP together released the first certified RH5885 V2 appliance solution.

2013



July, Huawei Day was held at the SAP HQ, meanwhile celebrating the official opening ceremony of Huawei Partner Port Office.

2014



June, Huawei and SAP announced the official opening of the Huawei & SAP Co-Innovation Center in Shenzhen.

2015



June, SAP and Huawei jointly held SAPIHuawei Forum Shenzhen, setting regional cooperation implementation benchmark.

2016



September, as top-class sponsor, SAP attended Huawei Connect 2017, announced successful joint innovation with Huawei in big data and cloud businesses.

2017



September, Huawei and SAP agreed on setting up strategic partnership.



March, Huawei and SAP announced extending the SAP & Huawei collaboration into a strategic alliance and released the FusionCube solution.



March, Huawei and SAP signed a MOU to deepen collaboration in Industry 4.0 and the IoT.



May, Huawei attended the SAPHIRE NOW 2016 global flagship conference held by SAP in Orlando, USA.



March, released KunLun Engineered System for SAP HANA based on SAP and Huawei joint innovation and optimization.

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# Comprehensive Portfolio of Huawei HANA Solutions

SAP® Certified  
Hardware for SAP HANA®

## Single Node

Business Warehouse on HANA,  
S/4HANA and Business Suite on HANA



E9000 V5 (2/4S)



2488H V5 (4S)



2288H V5 (2S)



KunLun  
(9008 V5 8S,  
9016 16S)

## Cluster

Business Warehouse on HANA,  
S/4HANA



FusionServer



KunLun



OceanStor

## Tailored Data Center/TDI

SAP Business Warehouse on HANA  
S/4HANA and Business Suite on HANA



FusionServer

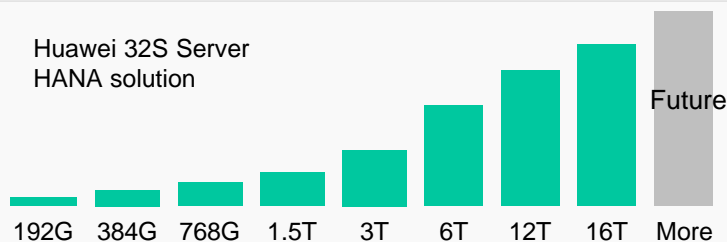


KunLun

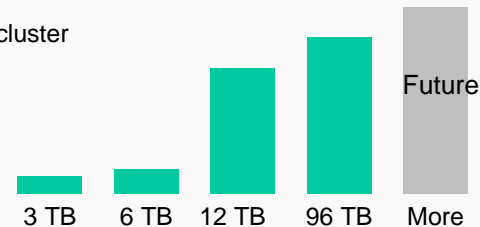


OceanStor

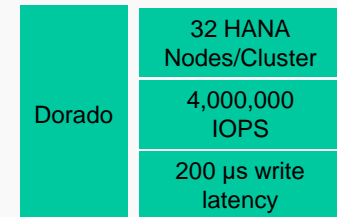
Huawei 32S Server  
HANA solution



Large-scale HANA cluster



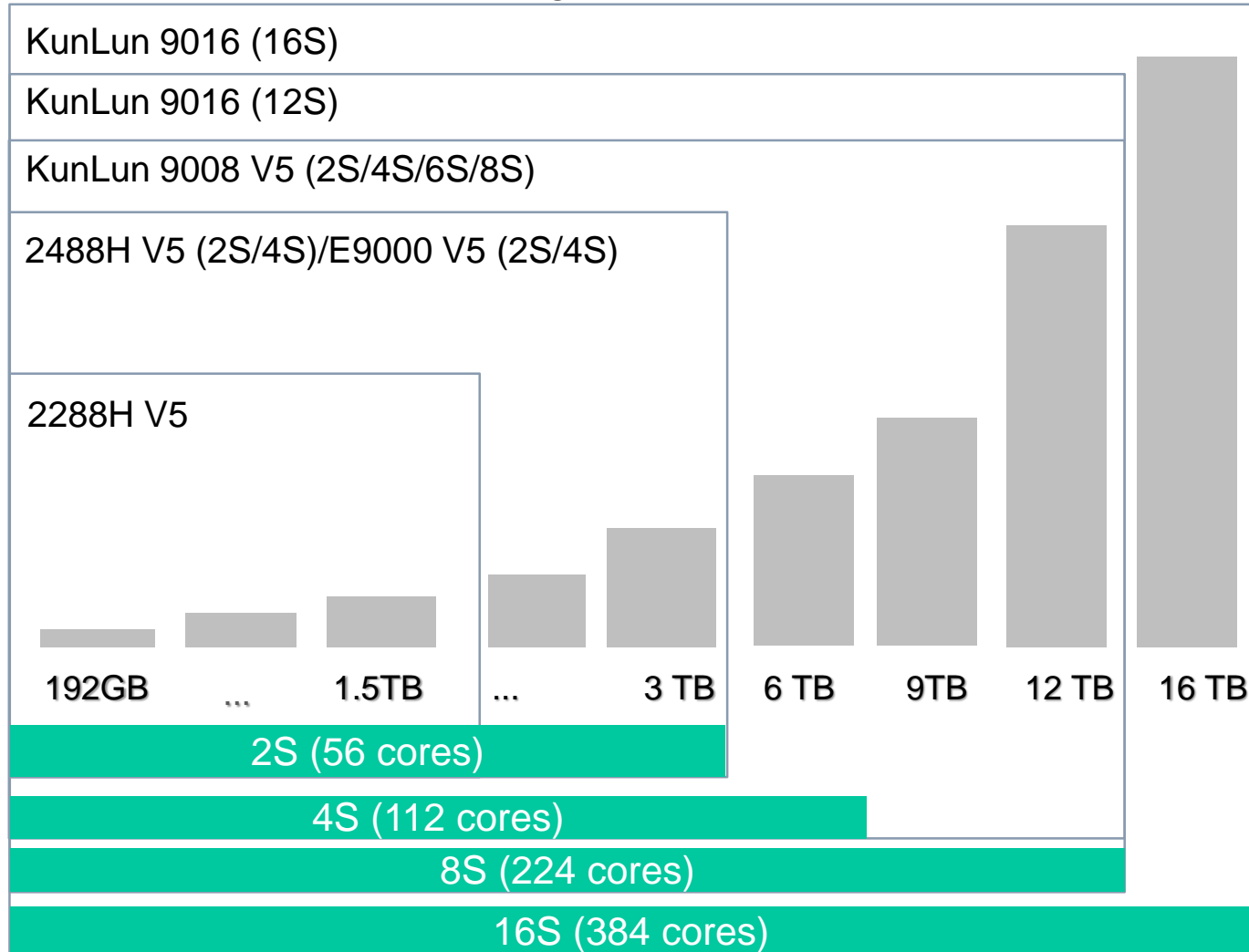
Leading Storage  
Products





# Single-Node Solutions Enable Enterprise Business System Scale-Up

## Single Node Solution



SAP® Certified  
Hardware for SAP HANA®

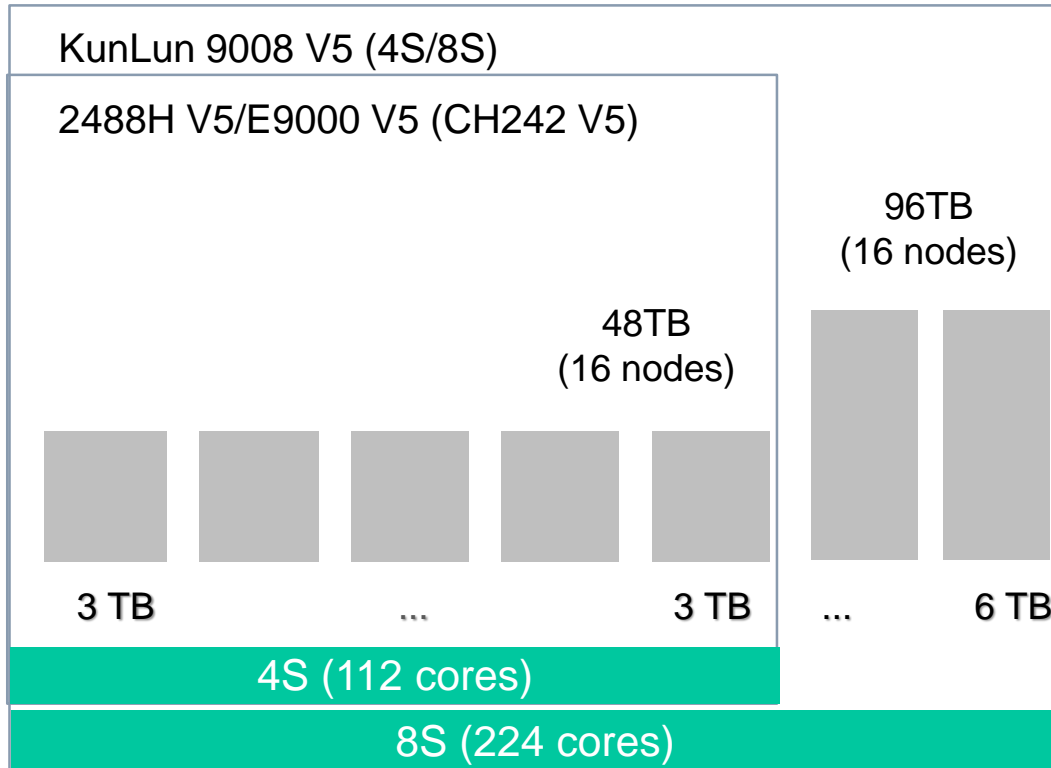


FusionServer

KunLun

# Cluster Solutions Enable BW System Smooth Scale-Out

## Scale Out Solution



SAP® Certified  
Hardware for SAP HANA®



FusionServer




KunLun



OceanStor

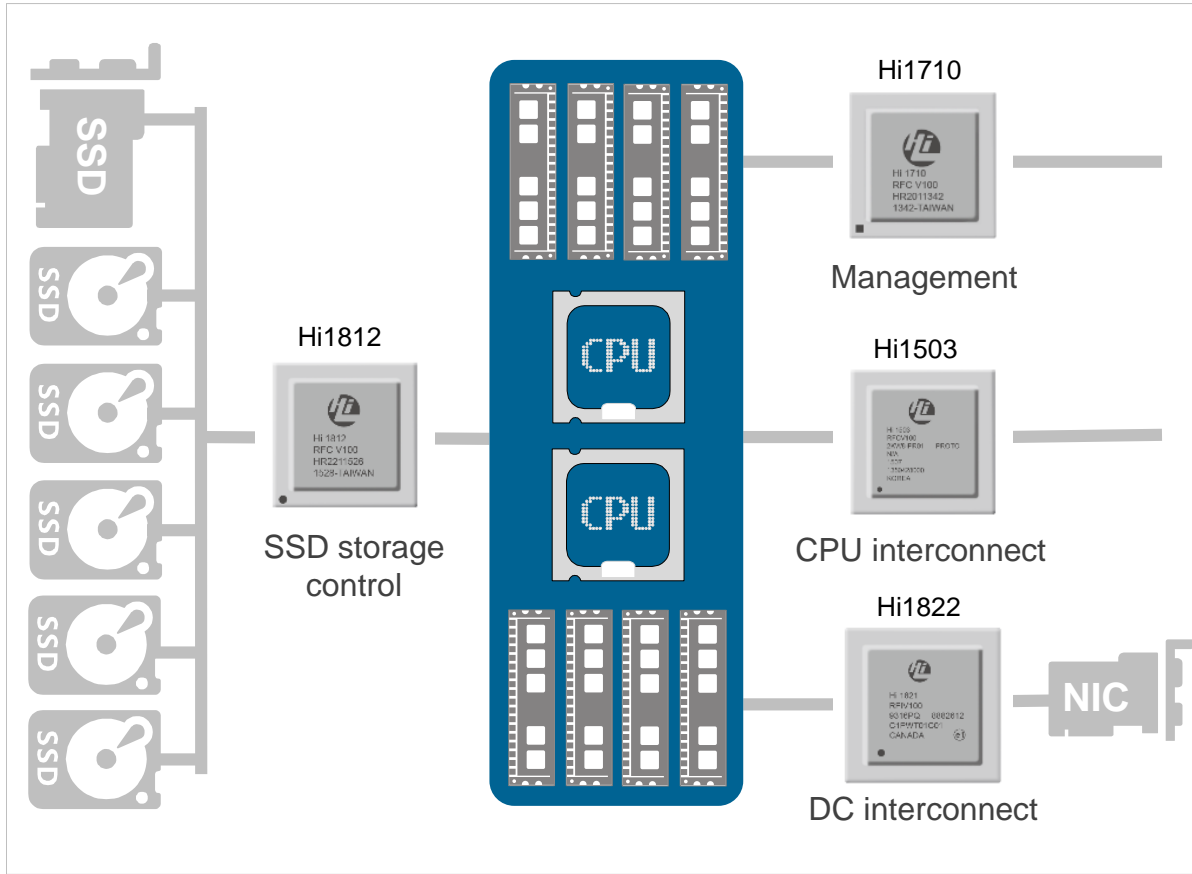
\*Scale-out solution clustered by 8TB nodes will be certified case by case.

# Highlights of Huawei SAP HANA Appliance Solutions

Agile	
<p>Real-Time Decision</p> <p>Top1 HANA Benchmark</p> <p>*Top1 SAP BW edition for SAP HANA Benchmark (B4H)</p>	
Reliable	Trustworthy
<p>Non-Stop Services</p> 	<p>Best Practice One-Stop Solution</p> 
Huawei SAP HANA Appliance	<b>SAP Certified</b> Hardware for SAP HANA

# Huawei HiSilicon Chips Cultivate Product Competitiveness Through Continuously Innovation

Agile Reliable Trustworthy



**Hi1503**  
Enhanced HANA appliance  
Scale-up capability

**Hi1710**  
Out-of-band fault management  
Improved RAS capability

**Hi1822**  
High-speed, flexible data center interconnect

**Hi1812**  
HANA data/Log data  
Read/Write I/O acceleration

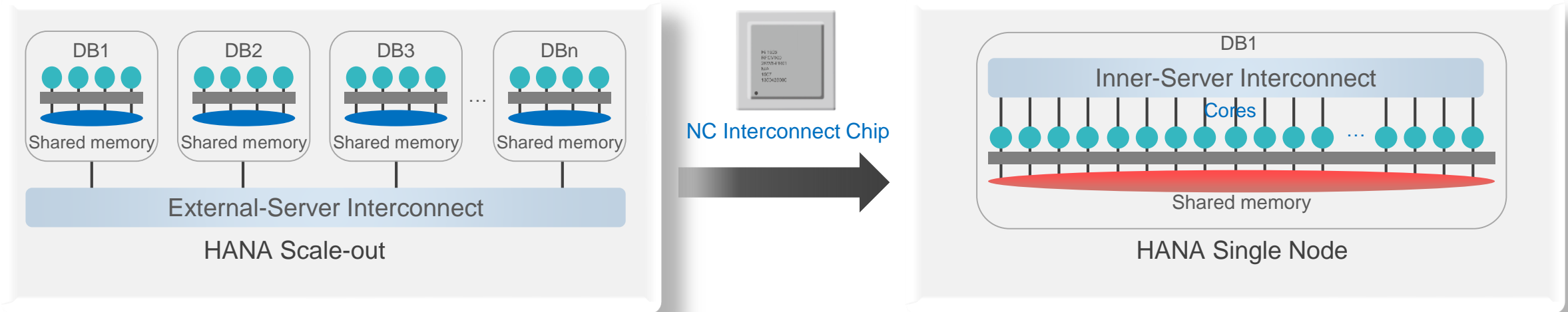
# SAP HANA Scale-up Performance Is Superior to Scale-out Performance

Agile

Reliable

Trustworthy

— High-speed CPU interconnect reduces data transmission latency on networks from milliseconds to nanoseconds, enabling quicker service response.



- Up to 8 CPUs per system
- Milliseconds of latency for inter-server data transmission, including latency from CPU processing, NIC processing, and link transmission

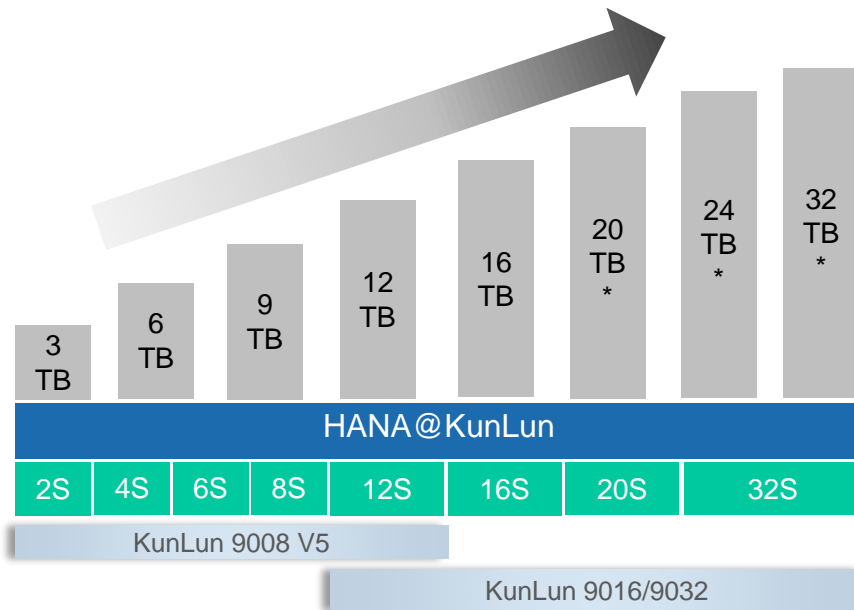
- 32 CPUs per KunLun 9032 system, 16 CPUs per KunLun 9016 system
- High-speed CPU network slashes data transmission latency to nanoseconds, enabling faster service response

If the customer has explicitly indicated that a Scalable processor (internally called V5 processor) must be used, this page should be deleted.

# Huawei SAP HANA Solution Provides Flexible Scalability

Agile Reliable Trustworthy

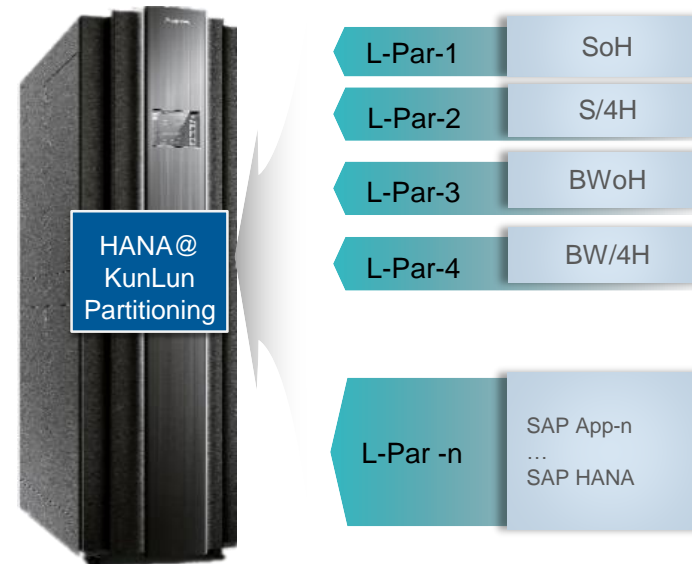
## Small granularity, high scalability



- KunLun 9008 V5 HANA supports capacity expansion by 2S.
- KunLun 9016 and KunLun 9032 support 12 TB+ memory capacity.

16 TB and below: already certified; \*20 TB and above: to be certified case by case

## KunLun L-Par, integrated deployment



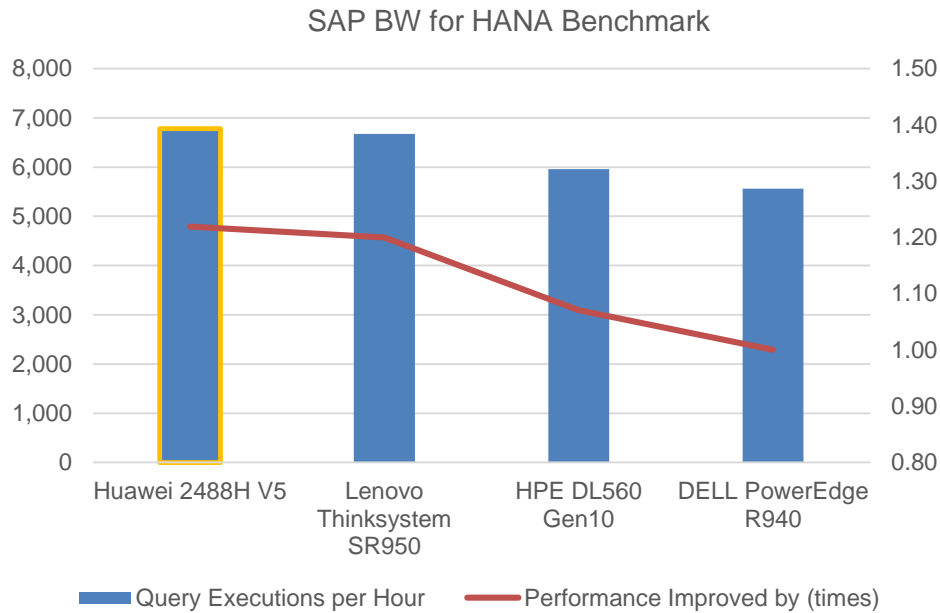
- L-Par for SAP application
- L-Par consolidating HANA databases (HANA cloud and database consolidation)

\*HANA certification for L-Par of KunLun 9008 V5 is in progress.

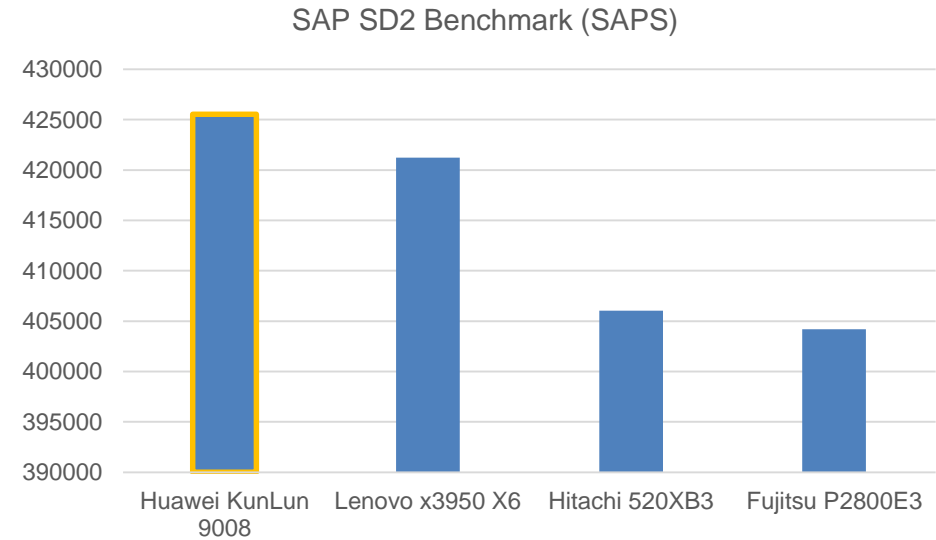
# Huawei SAP HANA Solution Provides Ultimate Performance

Agile Reliable Trustworthy

## Global Leading Benchmark Performance



Source: SAP BW edition for SAP HANA benchmark



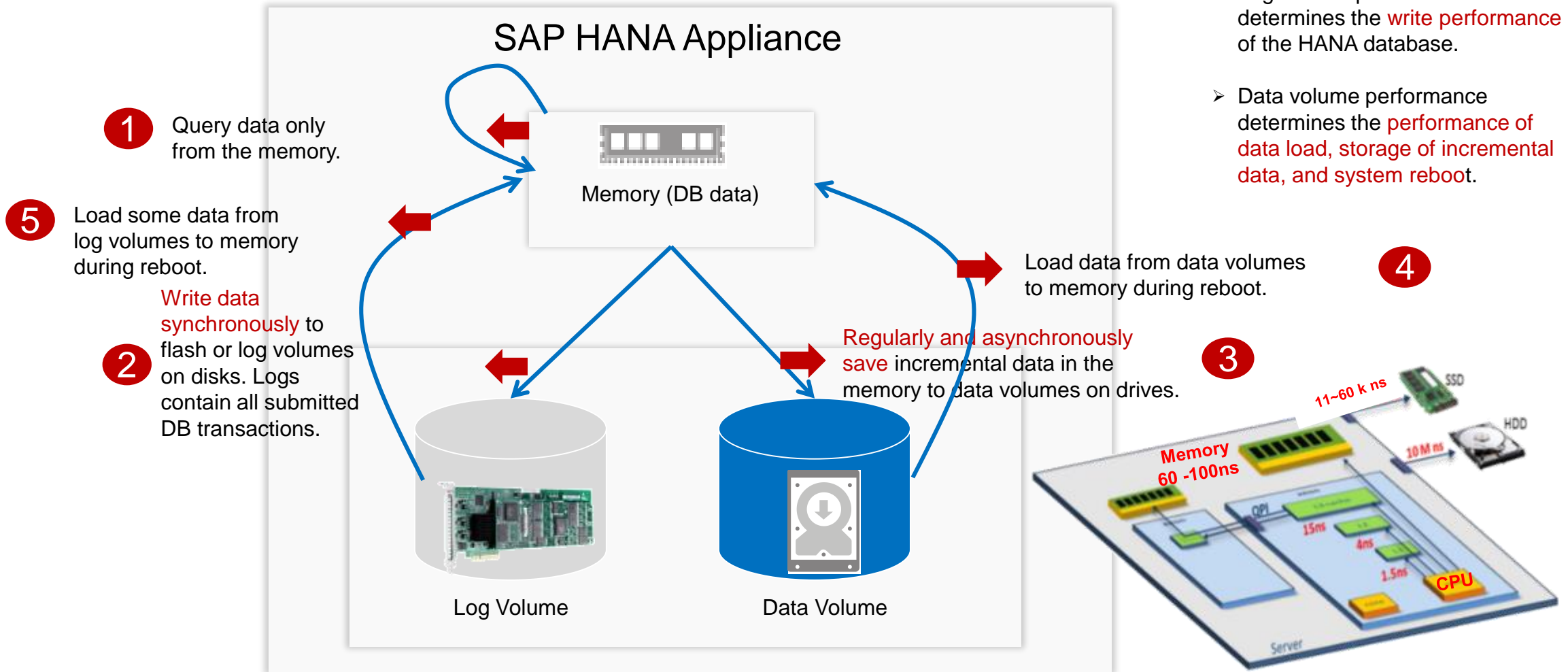
Source: SAP SD Standard Application Benchmark



# Optimized Data Persistence Layer

— Further Accelerating SAP HANA

Agile Reliable Trustworthy



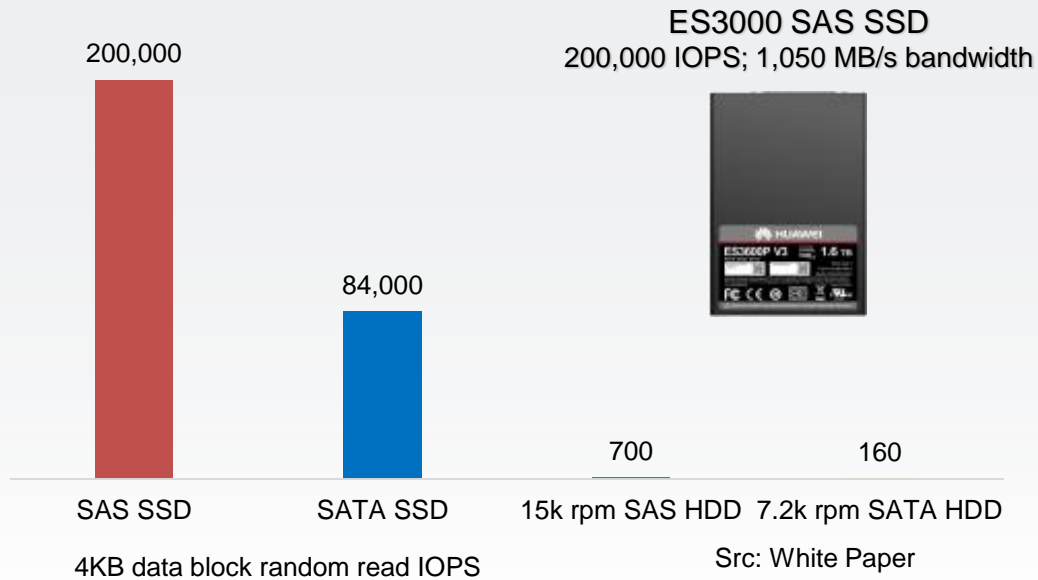
- Log volume performance determines the **write performance** of the HANA database.
- Data volume performance determines the **performance of data load, storage of incremental data, and system reboot.**

# All-Flash SAP HANA Appliance Boosts Performance by 3–6x

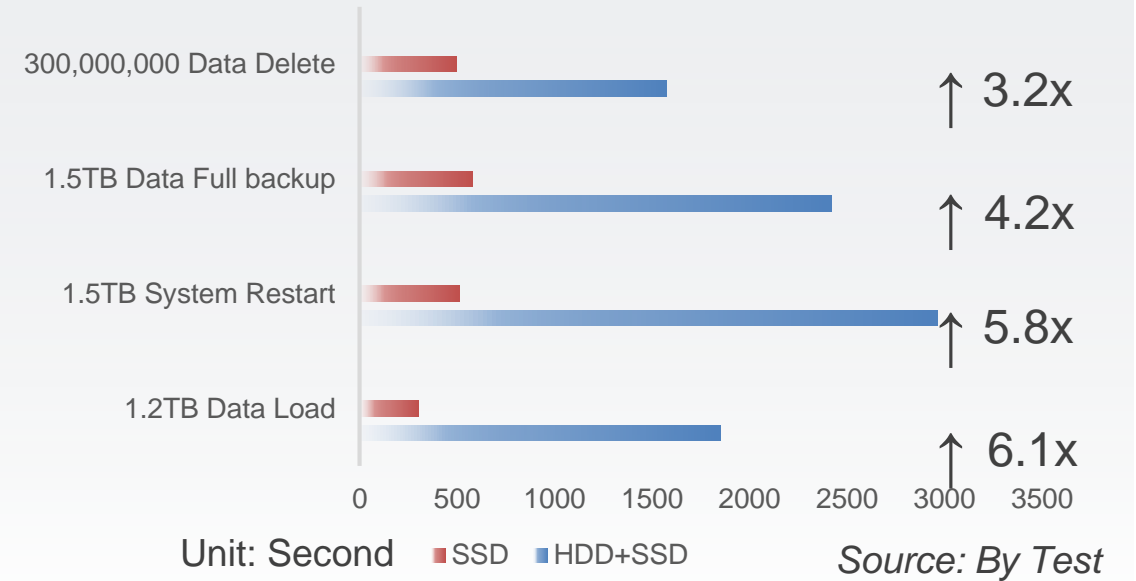
— More Storage I/O Bandwidth Boost the HANA System Performance

Agile Reliable Trustworthy

## 240x faster (SSD VS. HDD)



## HANA I/O performance improved by 3–6x O&M time reduced by 0.5–4 hours



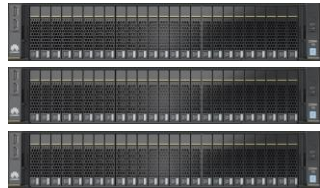
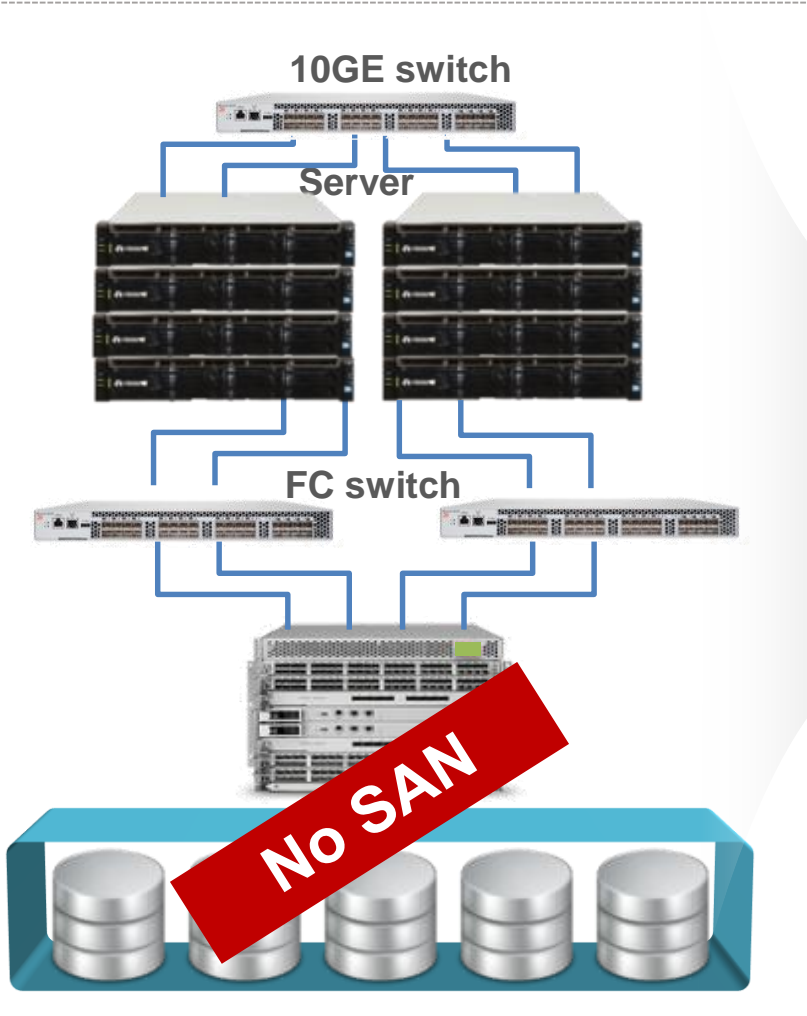
# FusionCube SA Infrastructure Convergence Solution

— Unified Management, Smooth Expansion

Agile

Reliable

Trustworthy



FusionCube 2000



FusionCube 6000



CV Backup Appliance



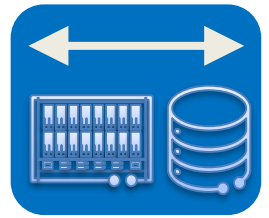
2488H V5 HANA DB



KunLun 9008 V5 HANA DB



Automatic discovery of devices  
**Unified management** of compute, storage, and network resources



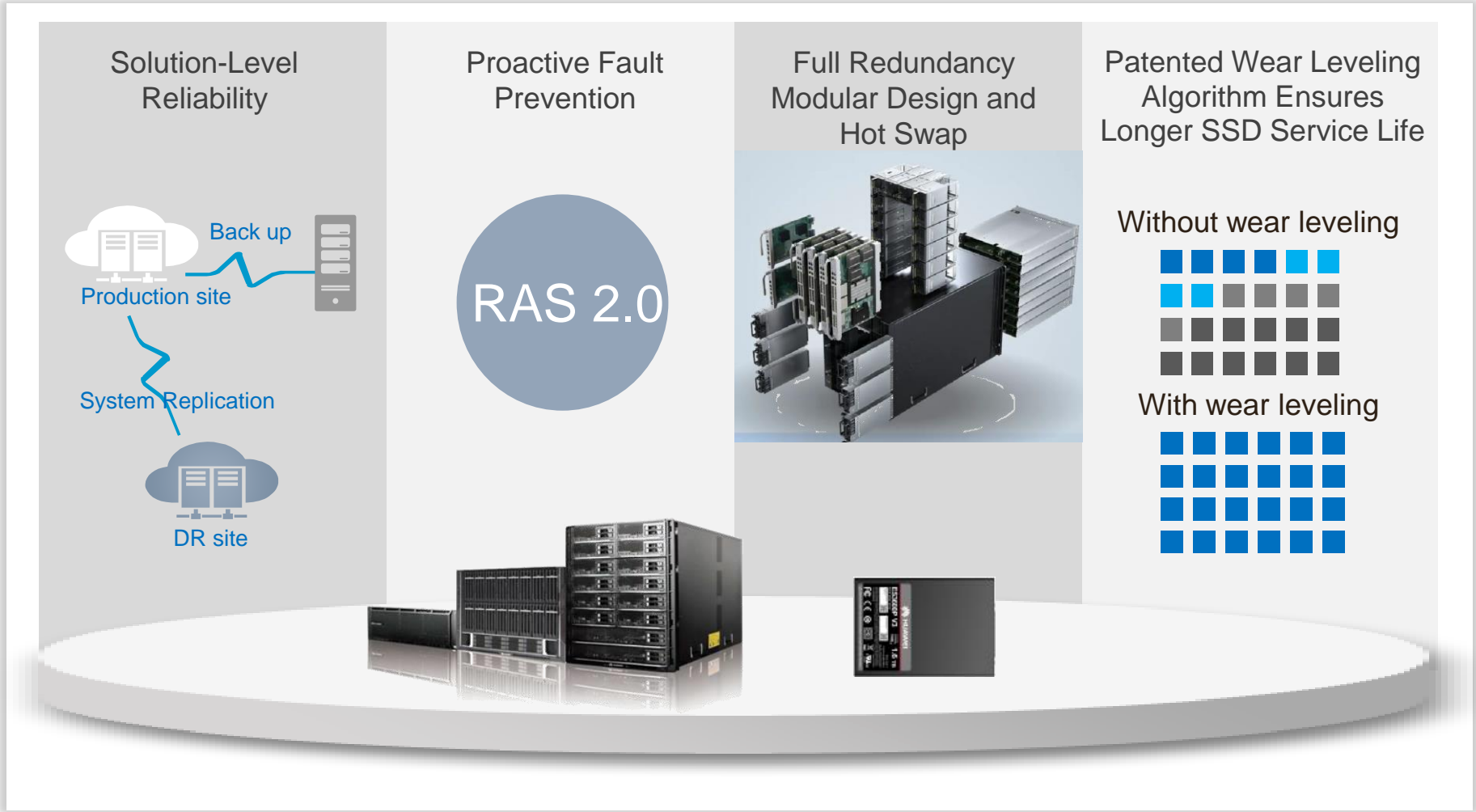
**Smooth expansion** of compute and storage nodes based on service requirements  
Linear performance improvement

# Enterprise-Level Reliability Ensures Stable Service Running

Agile

Reliable

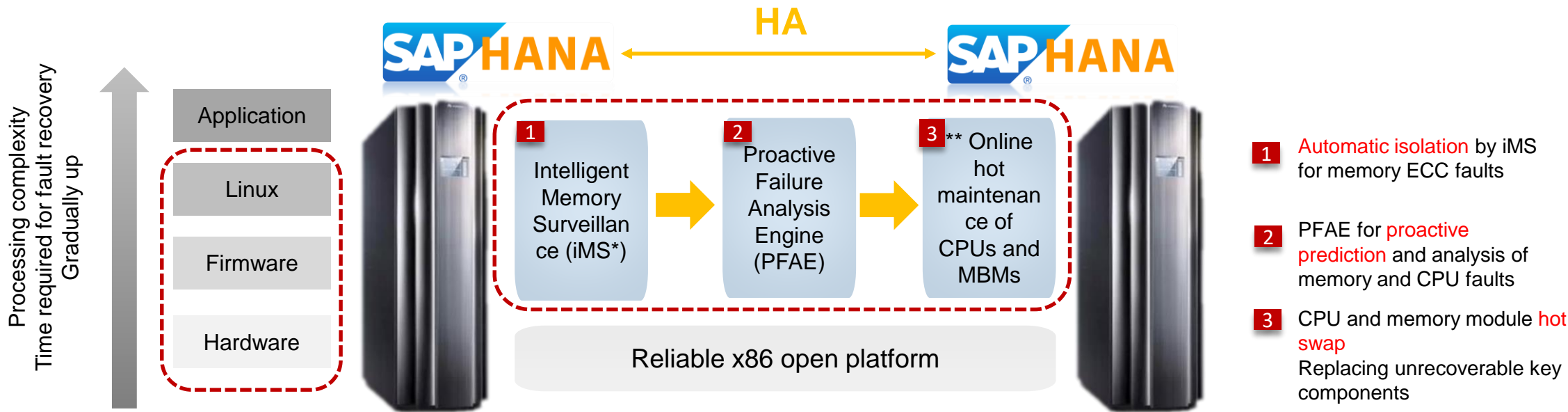
Trustworthy



# Reliable KunLun HANA Appliance Maximizes Service Uptime

Agile Reliable Trustworthy

Maximizing Service Uptime  
 8 hours 6 TB SAP HANA system O&M Long downtime → 0 downtime With CPU and memory module hot swap



Minimum impact

More-underlying measures, more responsive, lower impact on services

Dual protection

Reduces HA failovers  
 After the HA system is switched to the single-node system, the memory remains highly reliable.

\* Note: The intelligent protection suite iMS based on KunLun v4 CPUs will be delivered on June 30. iMS based on KunLun 9008 V5 will be delivered by Q3 2018.

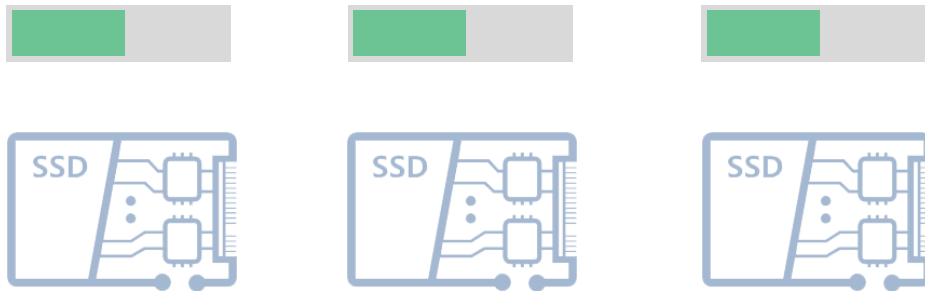
\*\* Note: The CPU and memory module hot swap feature depends on the cooperation development progress of Intel, OS, and upper-layer applications, and will be delivered by Q3 2018.



# Global Wear Leveling & Global Anti-Wear Leveling

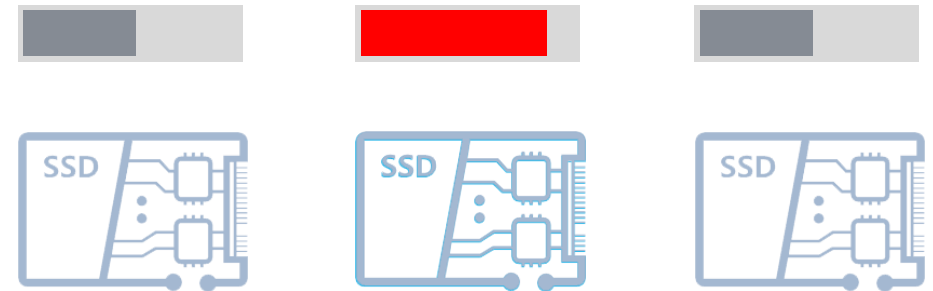
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## Early life of SSD: global wear leveling



RAID 2.0+ technology disperses data based on fingerprints and evenly distributes the data on SSDs to level SSD wear, improving SSD reliability.

## Near-Ending life of SSD: global anti-wear leveling (Huawei patent)



When the wear limit of all SSDs is reached, increase the amount of data on one SSD to prevent multiple drives from failing.

**Prolong SSD service life and improve system reliability**

# High-Reliability HA and DR Solutions Ensure Business Continuity

Agile Reliable Trustworthy

— HA Solution Composed of Huawei + SUSE/Red Hat + SAP HANA

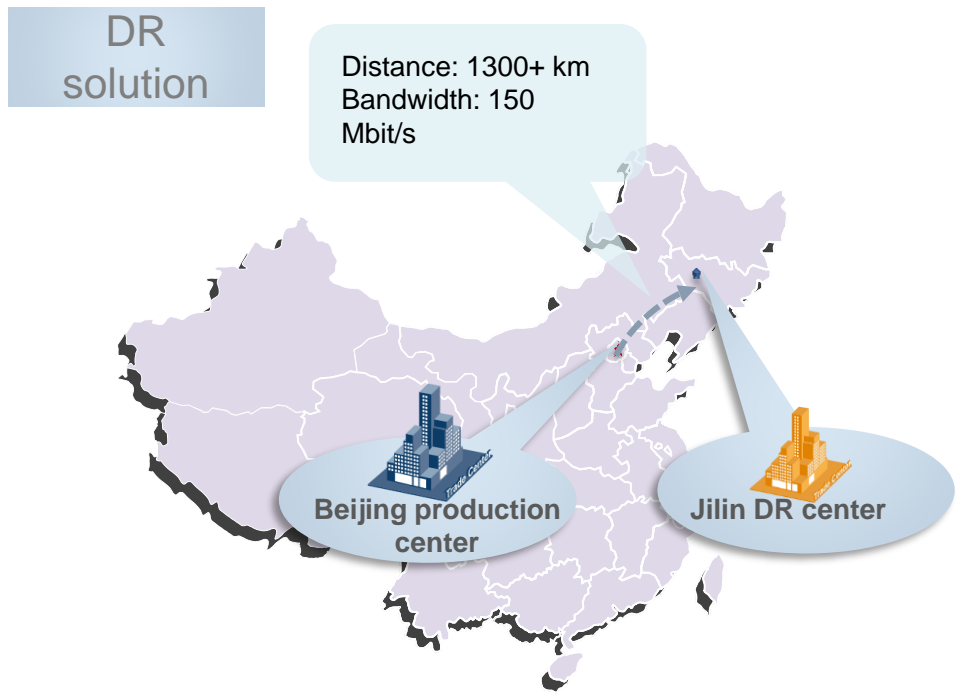
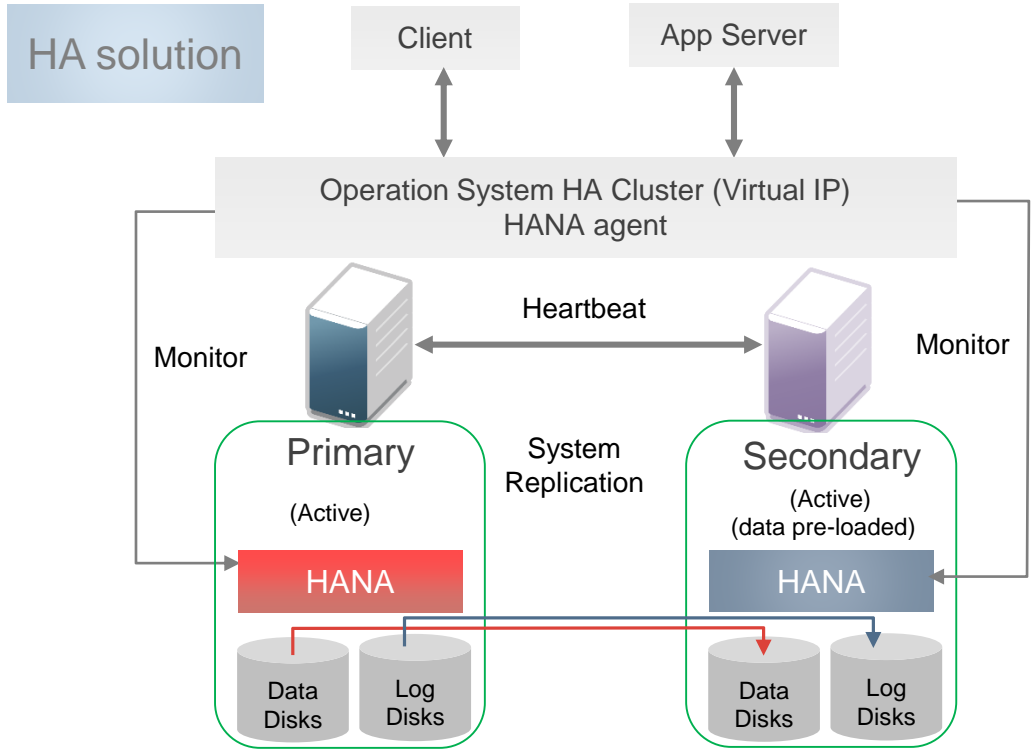
**Full-automatic**  
Avoid manual misoperations

**Quasi-real-time**  
Major leap in reliability

**Low TCO**  
No need for third-party HA software

**Easy deployment**  
Professional HA implementation services

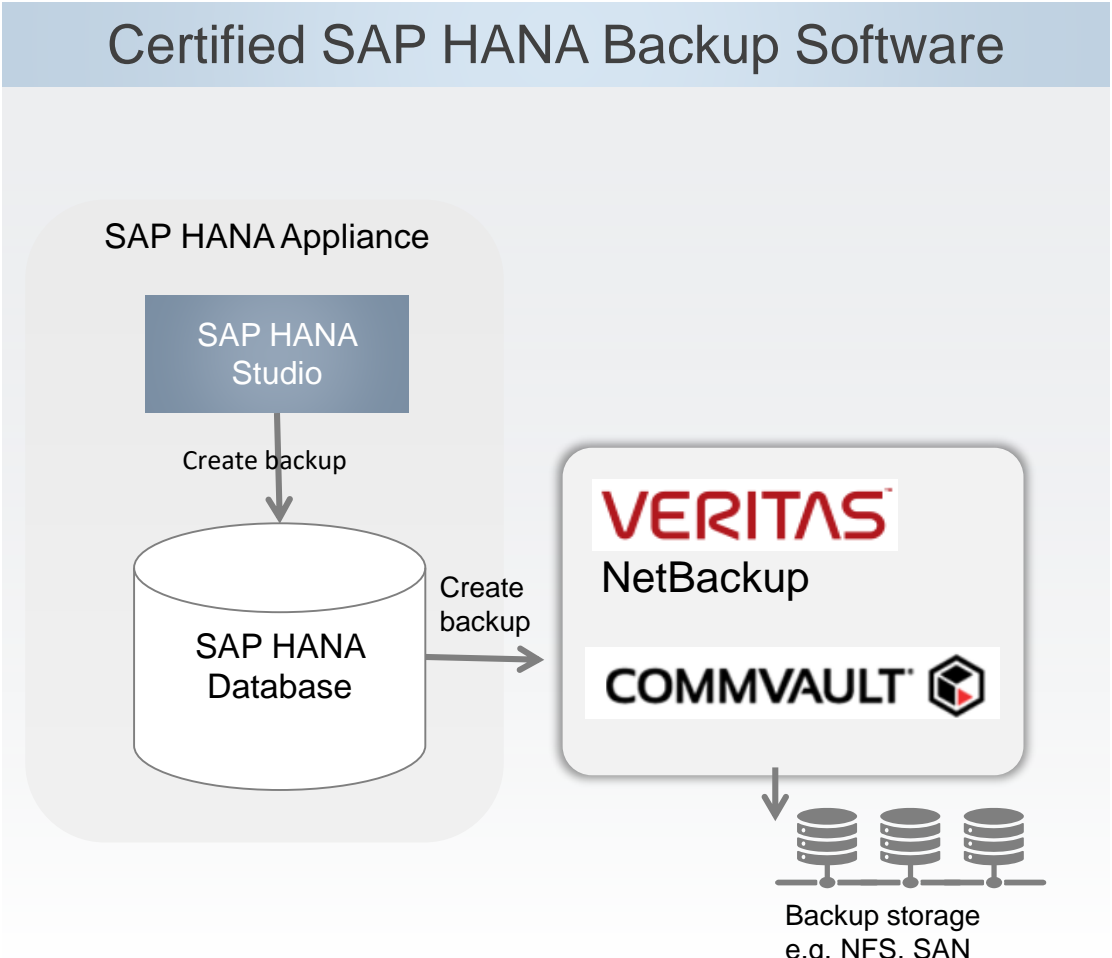
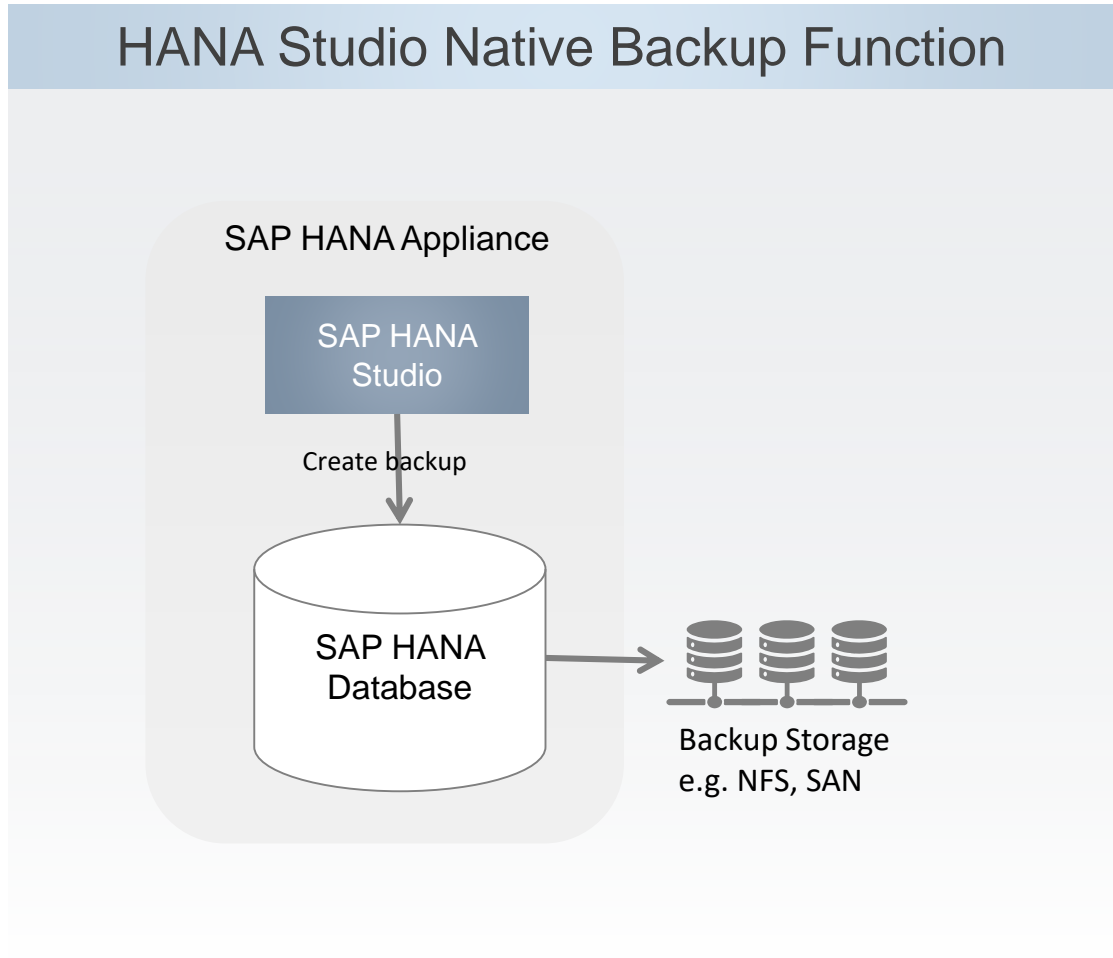
**Rich experience**  
DR experience with over 1300 km delivery





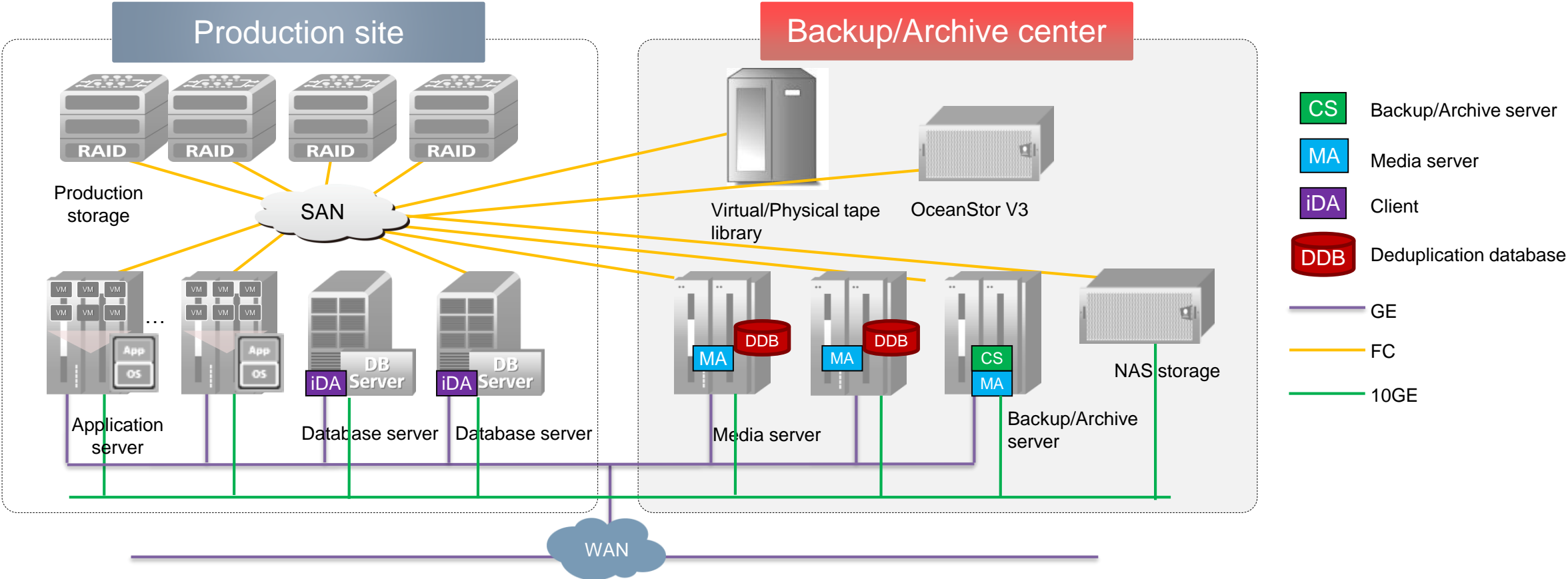
# Business Continuity Solution: Professional Enterprise-Level Backup Solution

Agile Reliable Trustworthy



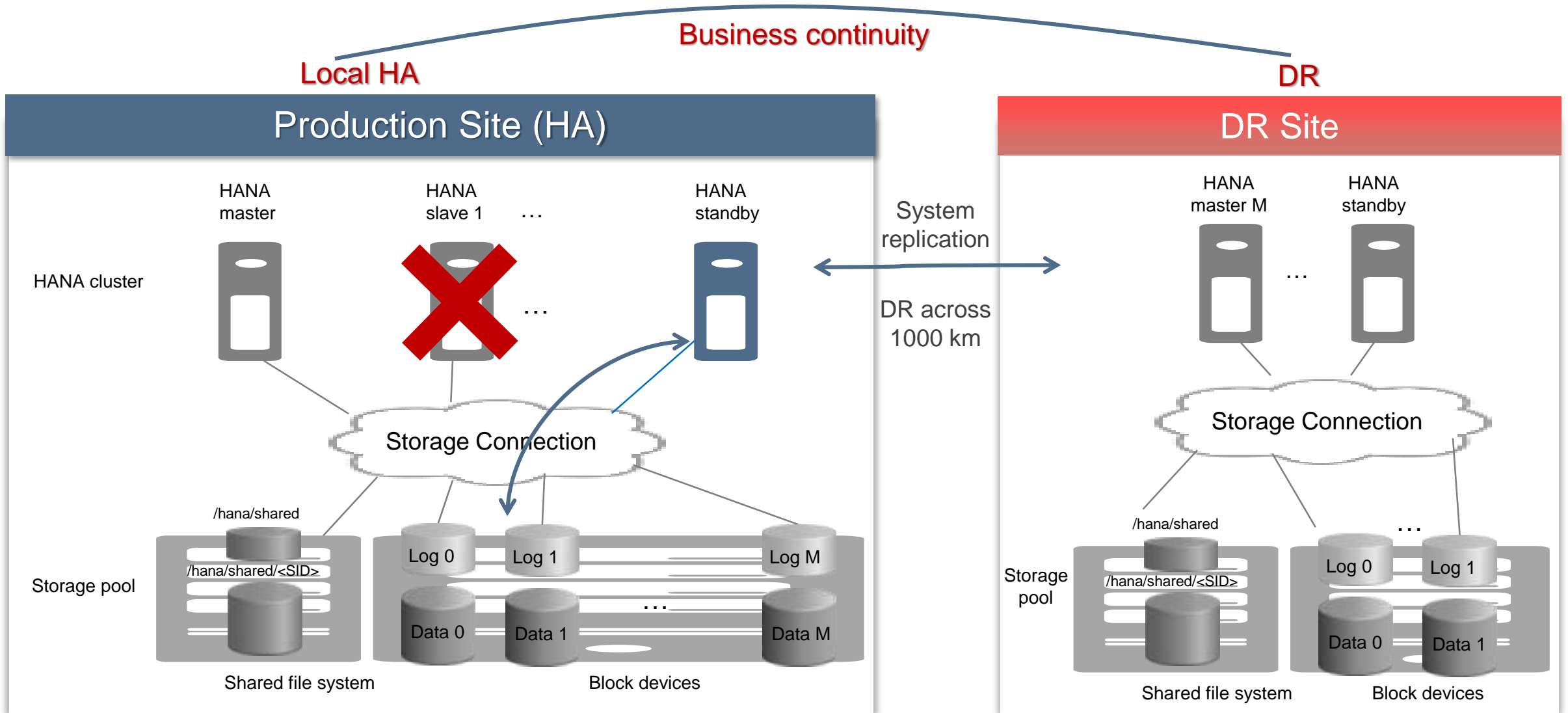
# Business Continuity Solution: Overall System Backup Solution

Agile Reliable Trustworthy



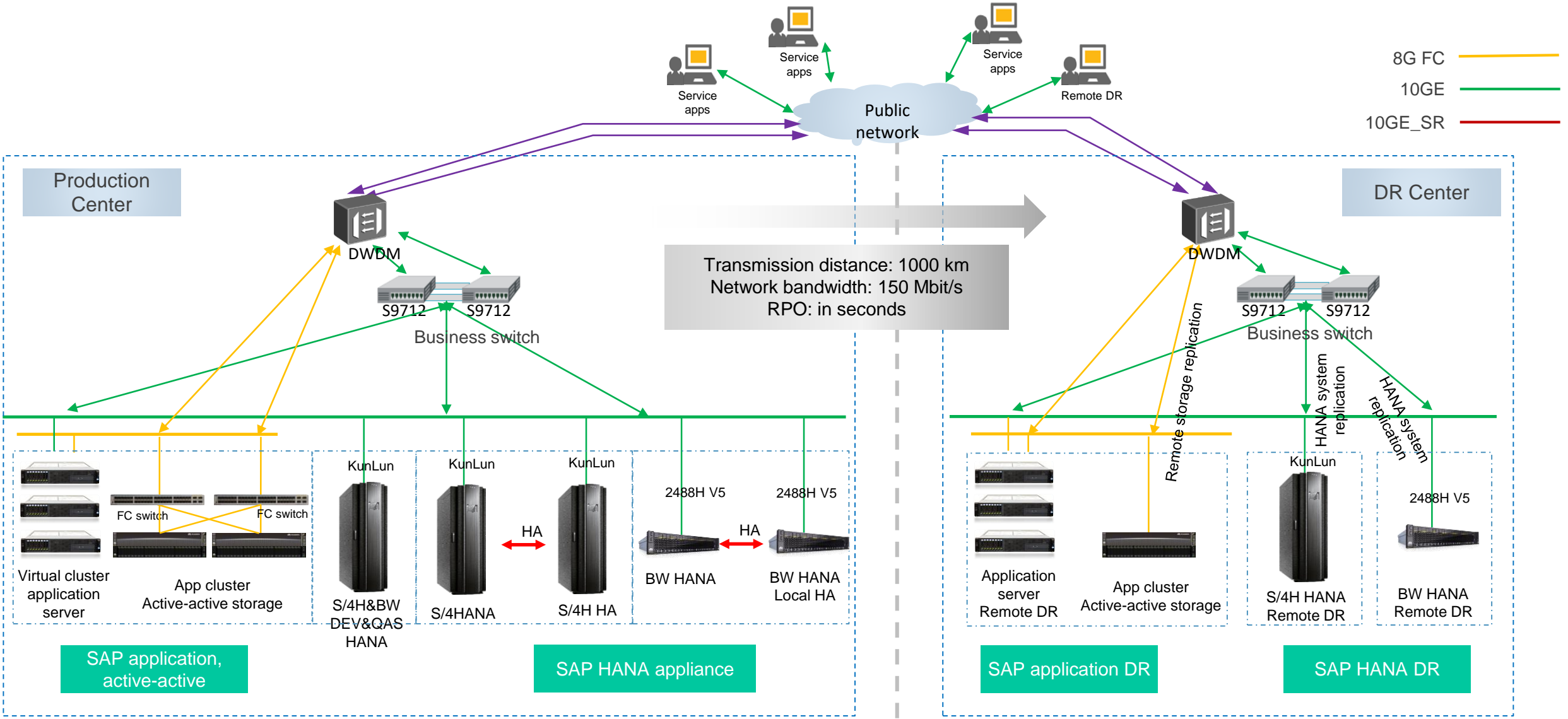
# Business Continuity Solution: Cross-Data Center DR Solution

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# Trustworthy SAP System One-Stop Solution

Agile Reliable Trustworthy



# Self-Help HANA Deployment Tool

— 1-Hour Configuration, 1-Click Batch Deployment, Saving Manpower and Time

Agile Reliable Trustworthy

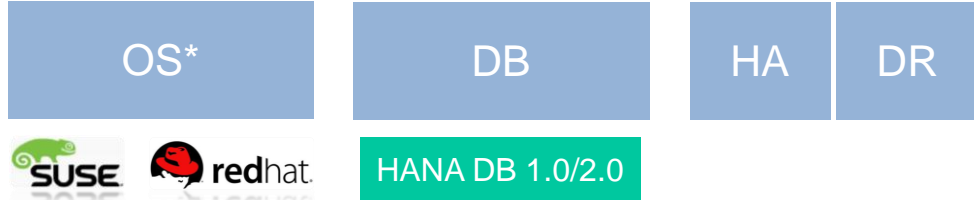


Web UI



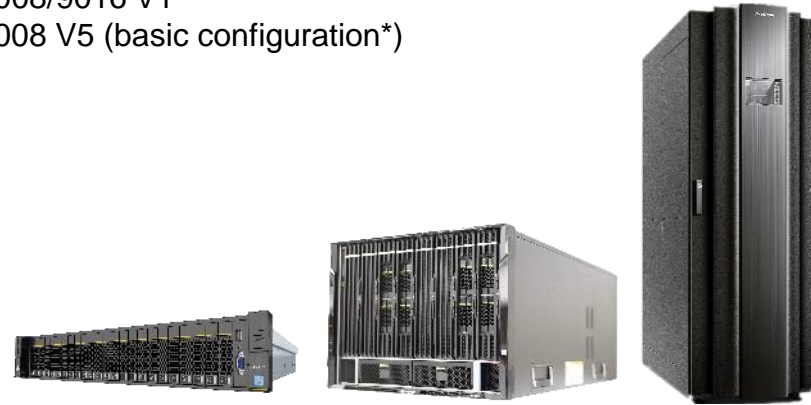
Windows® 7

PC ready to run  
Mainstream OS support



SAP HANA Appliances

KunLun 9008/9016 V1  
KunLun 9008 V5 (basic configuration\*)  
2488H V5



\*Note 1: SLES is supported. RHEL is planned to support in the next version. \*Note 2: Basic configuration does not include the management enclosure and L-Par feature.

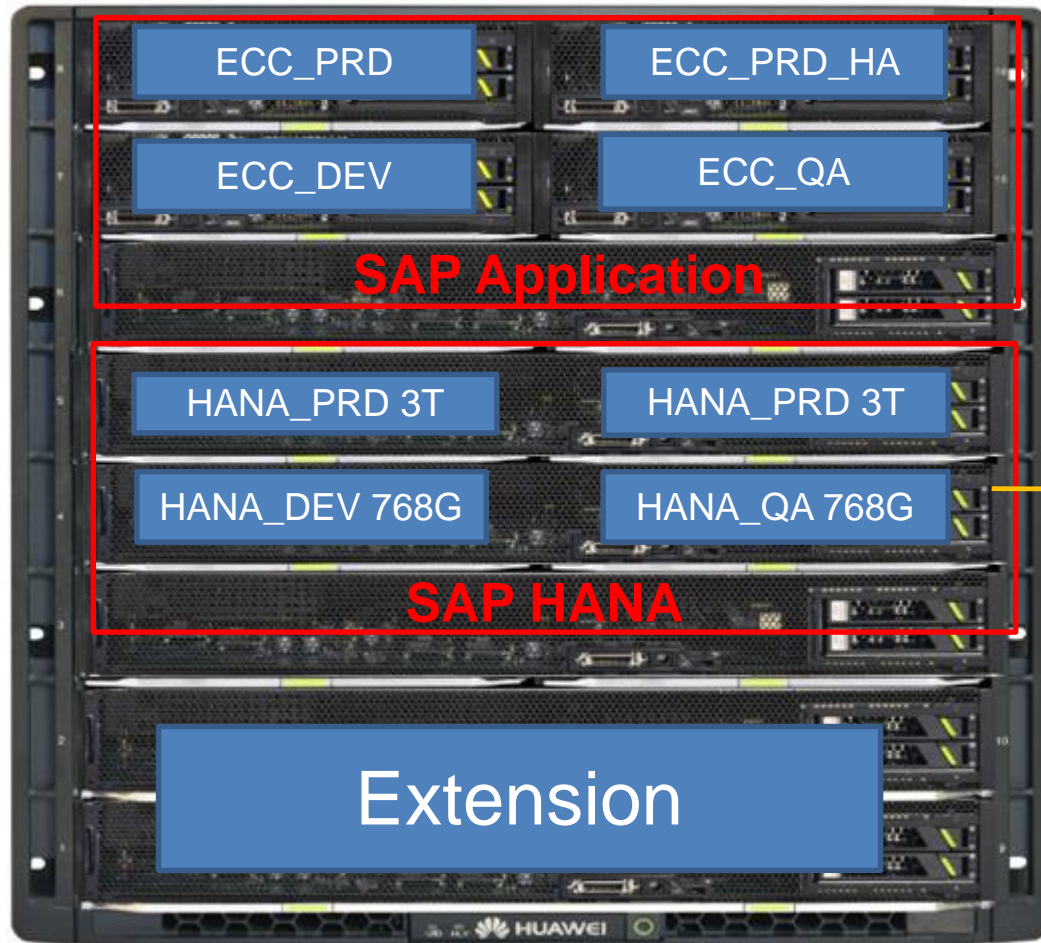
## One-Stop SAP Infrastructure Solution

Agile

Reliable

Trustworthy

## E9000



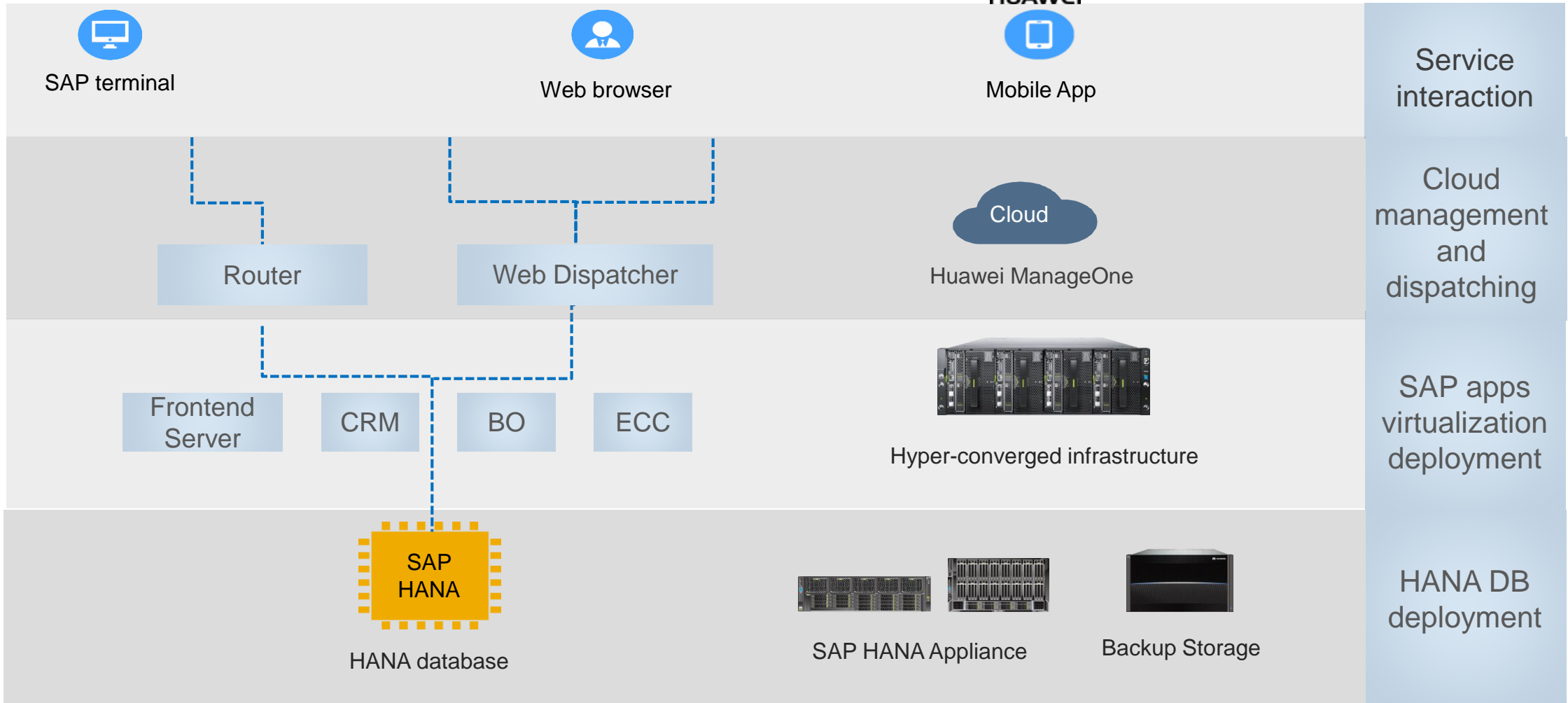
- Integrates all applications and HANA appliance compute nodes into one blade chassis (scalable to multiple chassis).
- Significantly simplifies network connections.
- Significantly reduces rack footprint.

A blade chassis supports **5 x 6 TB HANA appliances (30 TB in total)** and **6 x 2S application servers**, meeting 70% enterprise requirements.



# SAP-Certified Huawei Cloud-Enabled Solution for SAP System

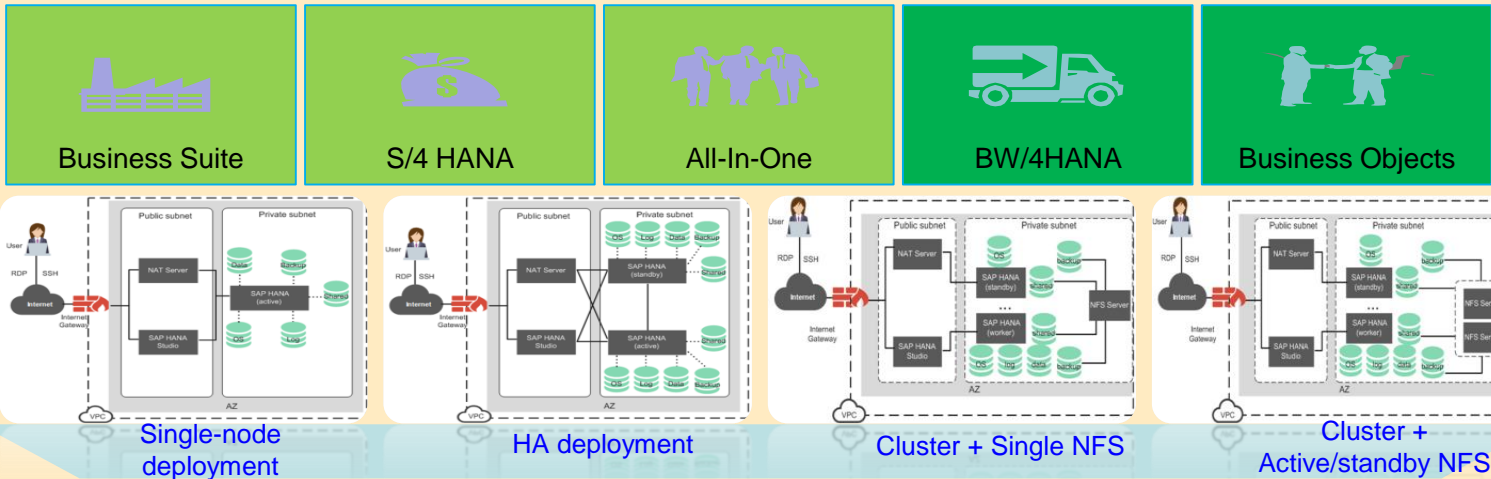
Agile Reliable Trustworthy





# Huawei SAP Cloud Solution (Private Cloud)

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## End-to-End Solution

Covers infrastructure, virtualization resource pools, cloud management platforms, service OSs, best practices, and delivery implementation.

## Flexible Delivery Forms

Provides large-specifications ECS and BMS to support the stable and reliable running of HANA databases.

Supports multiple deployment modes, such as single node, HA, and cluster.

## Rich Cloud Services

Meets the flexible service requirements of SAP applications and traditional applications.

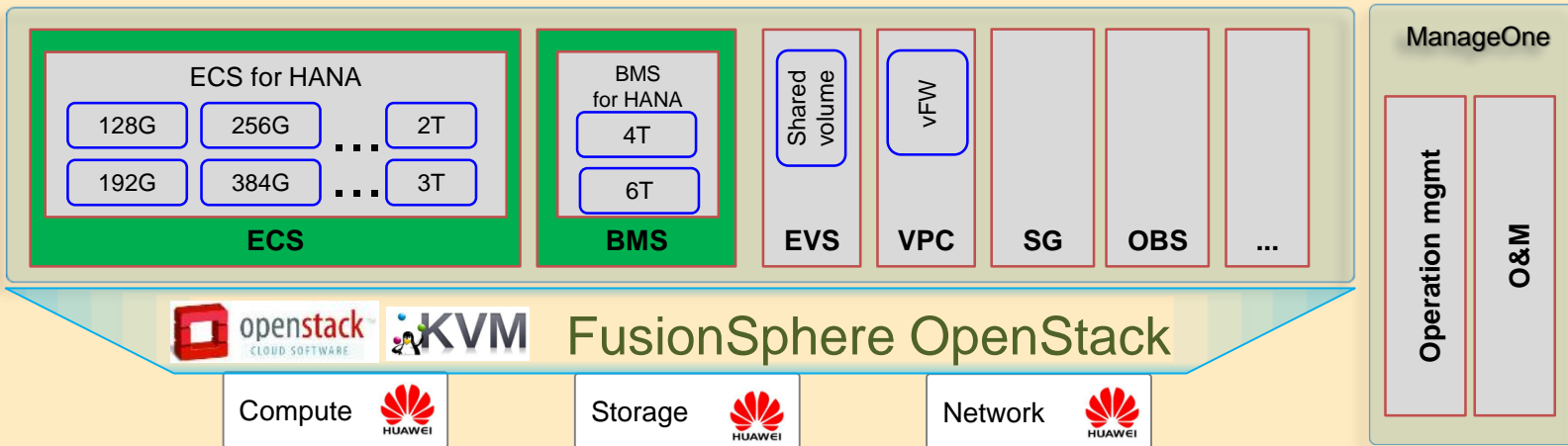


### Easy Cloudification

Quick delivery

Typical configuration

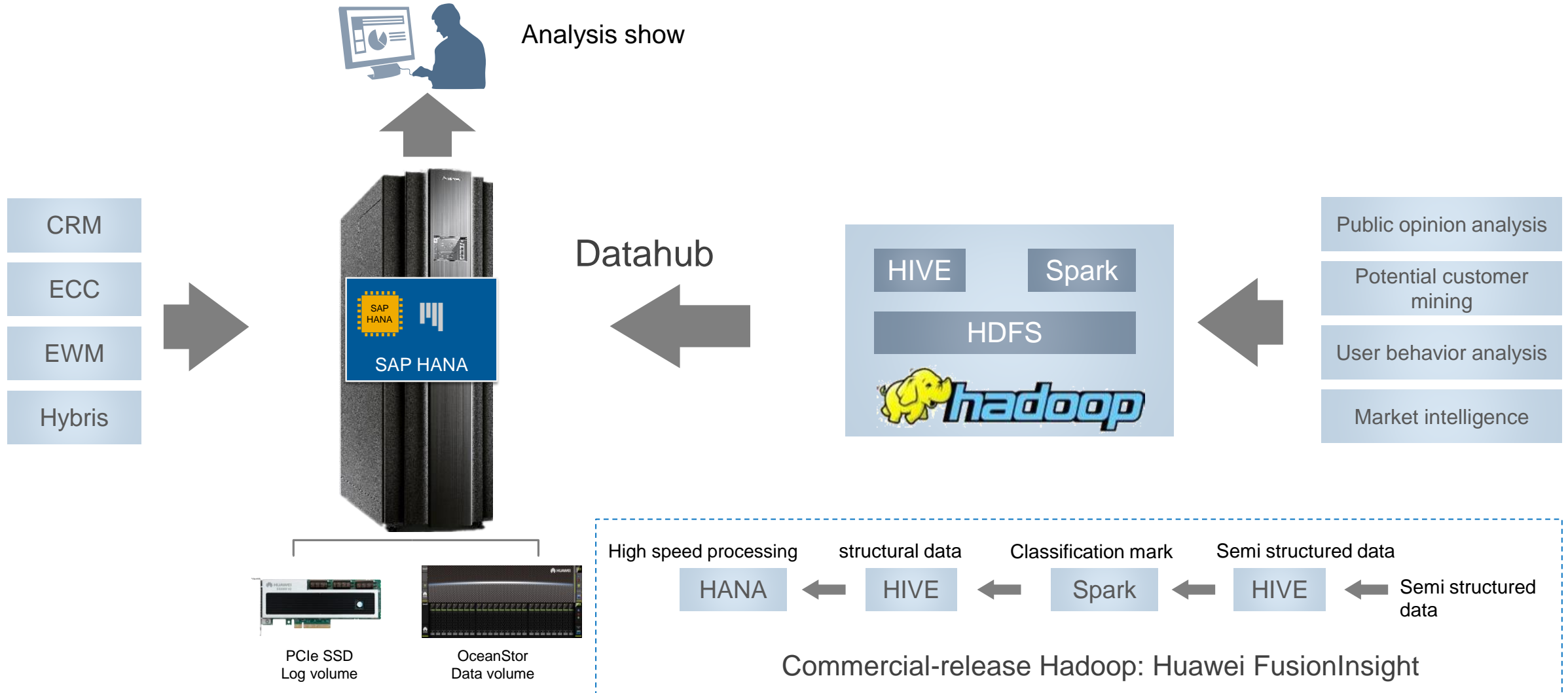
Best practices



# HANA Data Tiered Deployment Solution with Better Economics

— Huawei FusionInsight-based HANA Data Tiering Solution

Agile   Reliable   Trustworthy



# Huawei Provides Professional Services to Ensure Successful Implementation

Agile

Reliable

Trustworthy

1. Huawei provides installation and maintenance of hardware and software (marked orange in the preceding figure).
2. Software includes SUSE OS (3-year warranty, SUSE OS can be provided by Huawei or purchased by the customer).
3. Installation services: hardware, OS, and HANA databases
4. Provides on-site installation.
5. **Provides HA configuration and implementation.**
6. Huawei provides one-stop maintenance for **all hardware.**

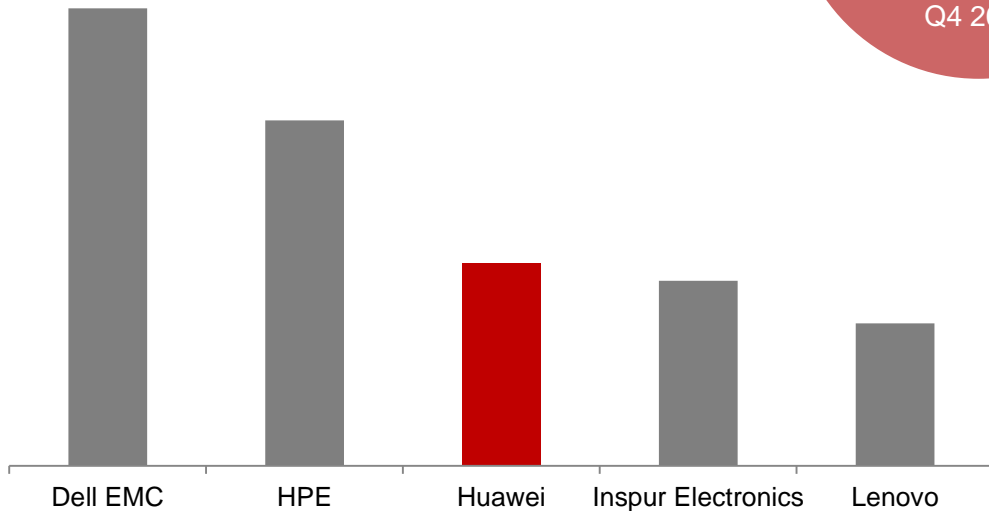


# Global No. 3 by Shipment and Positioned as a Challenger in Gartner's Magic Quadrant

Agile Reliable Trustworthy

## Shipments

**Top 3**  
Global Server  
Shipment  
Ranking  
Q4 2017



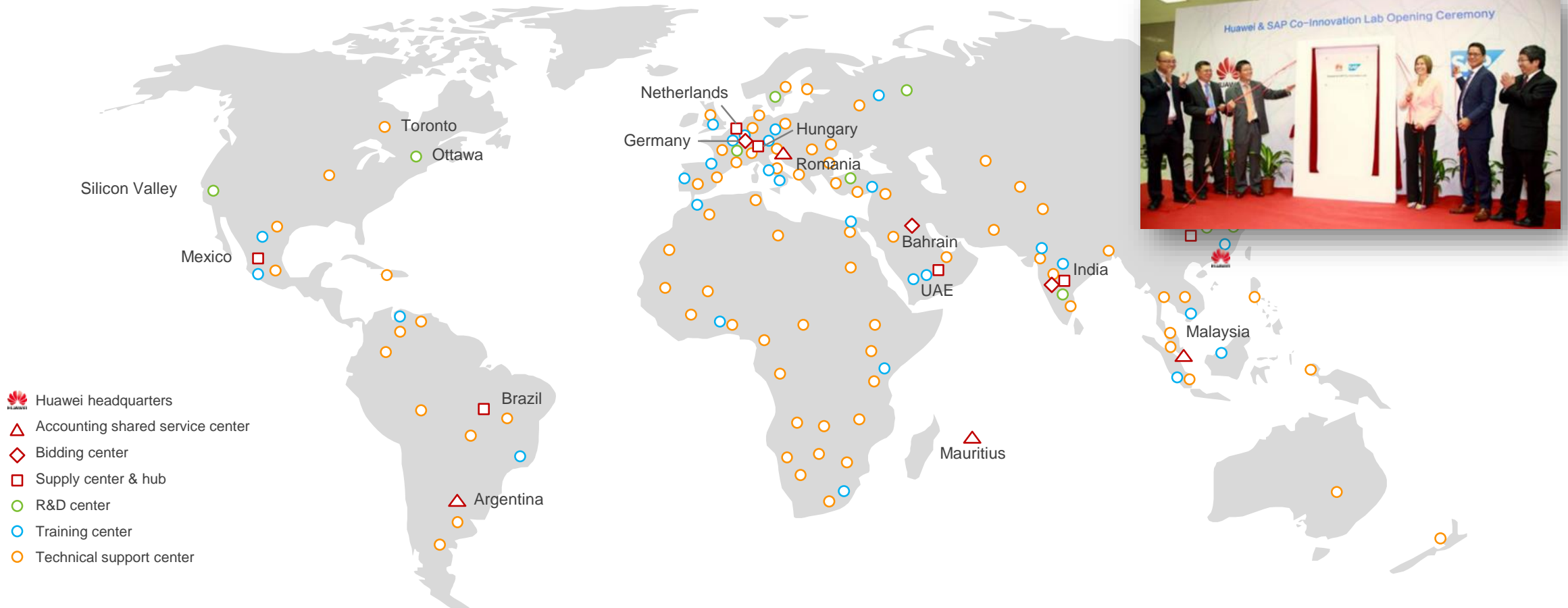
Source: Servers\_Marketshare\_WW\_by\_Region\_2017Q4

**Challenger**  
Magic Quadrant  
for  
Modular  
Servers



Source: MQ of Modular Server, Gartner, 2016

# Globalized R&D Resource and Localized Business Operations



- Operations in **170+** countries; **170,000+** employees comprised of **160+** nationalities worldwide; **75%** localization rate.
- Huawei's global value chain allows smooth capability transfer across the globe, develops and retains talent in local countries, and creates jobs and economic opportunities.

# Why Huawei?

**1000+**

SAP HANA customers

## Innovation Award

"Honorable Mention"

SAP HANA Innovation Awards 2017

## One-Stop Solution

Supports 512 GB to 32 TB memory and provides comprehensive SAP solutions with HANA appliances, TDI, SAP cloud, and big data.

## Top1 Performance

Industry-leading SAP BW edition for SAP HANA benchmark performance

## ~0 Downtime Maintenance

\*Industry's only server to support memory module hot swap

## 136 TB Cluster Deployment Experience

Ultra-large SAP HANA cluster deployment experience

**1300+ KM**

Ultra-long distance SAP HANA DR deployment experience

## All-flash HANA Appliance

HANA I/O performance is improved, and the O&M time is reduced by 0.5–4 hours.

## 25+ Industries

Provides industry solutions for 25 industries including retail, manufacturing, energy, science, and finance.

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# Huawei & SAP Joint-Innovation Solutions Serve Global Customers



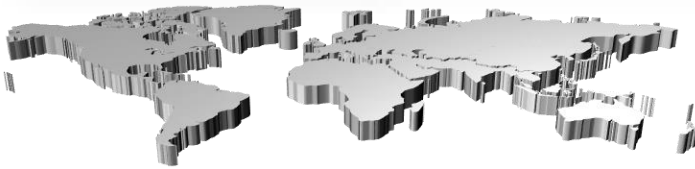
40+  
Countries

1000+  
Customers

25+  
Industries



Joint innovation  
center



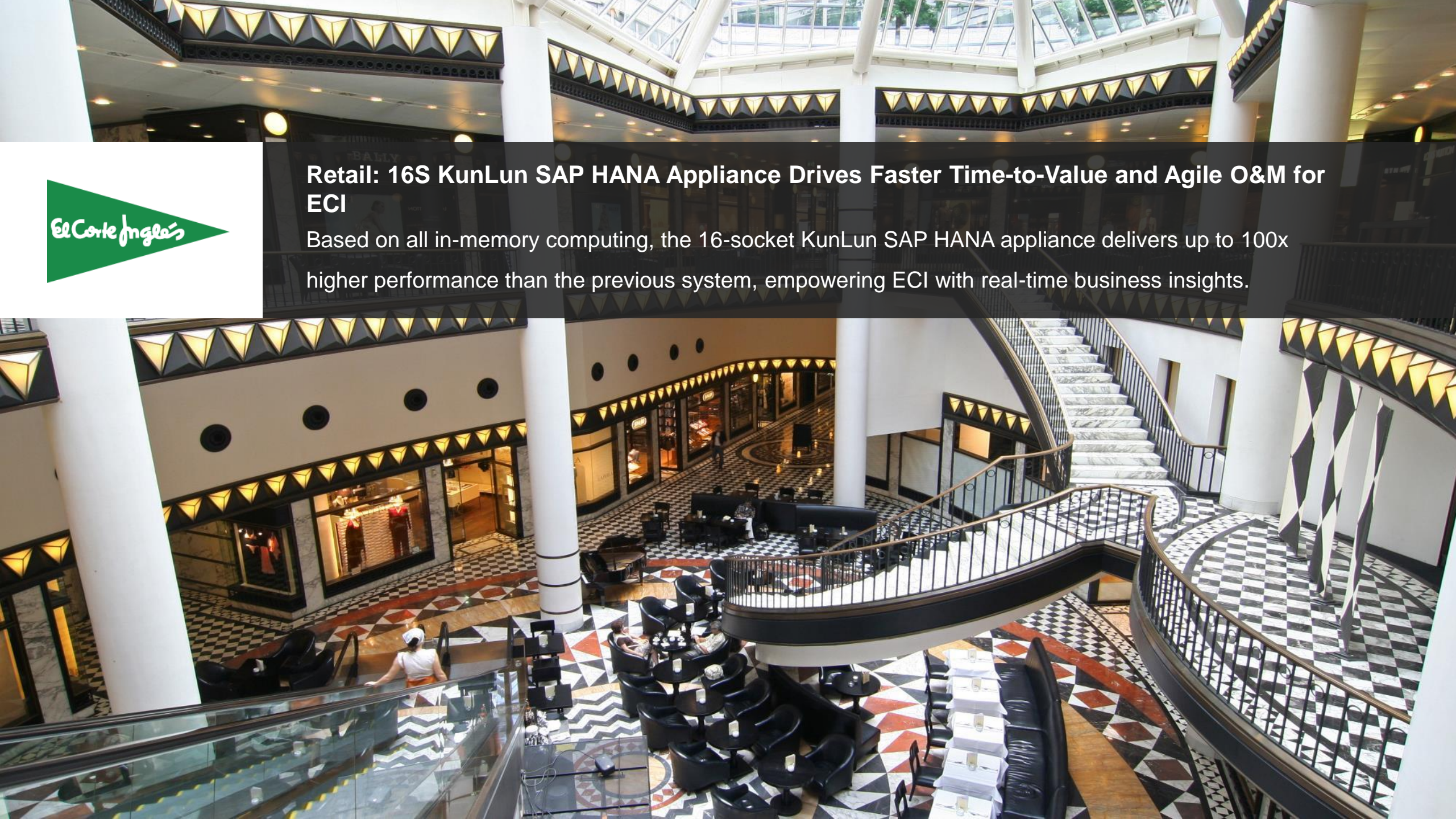
# Global Success Cases






## Retail: 16S KunLun SAP HANA Appliance Drives Faster Time-to-Value and Agile O&M for ECI

Based on all in-memory computing, the 16-socket KunLun SAP HANA appliance delivers up to 100x higher performance than the previous system, empowering ECI with real-time business insights.







## Newcastle University Migrates ECC System to Business Suite on HANA with Huawei HANA Solution

10 Sets of Two TB HANA DB + 60 RAS Features + Cover SAP ERP, BW, CRM, SRM, IDM Systems

Improve System Performance by 300 Times



CNPC Improves Business Warehouse Performance with Huawei Scale Out Solution  
136 TB HANA DB + 100,000 IOPS + Hyper-converged Infrastructure,  
Easy Adaption to Tens Times Performance Acceleration Business





# THANK YOU

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