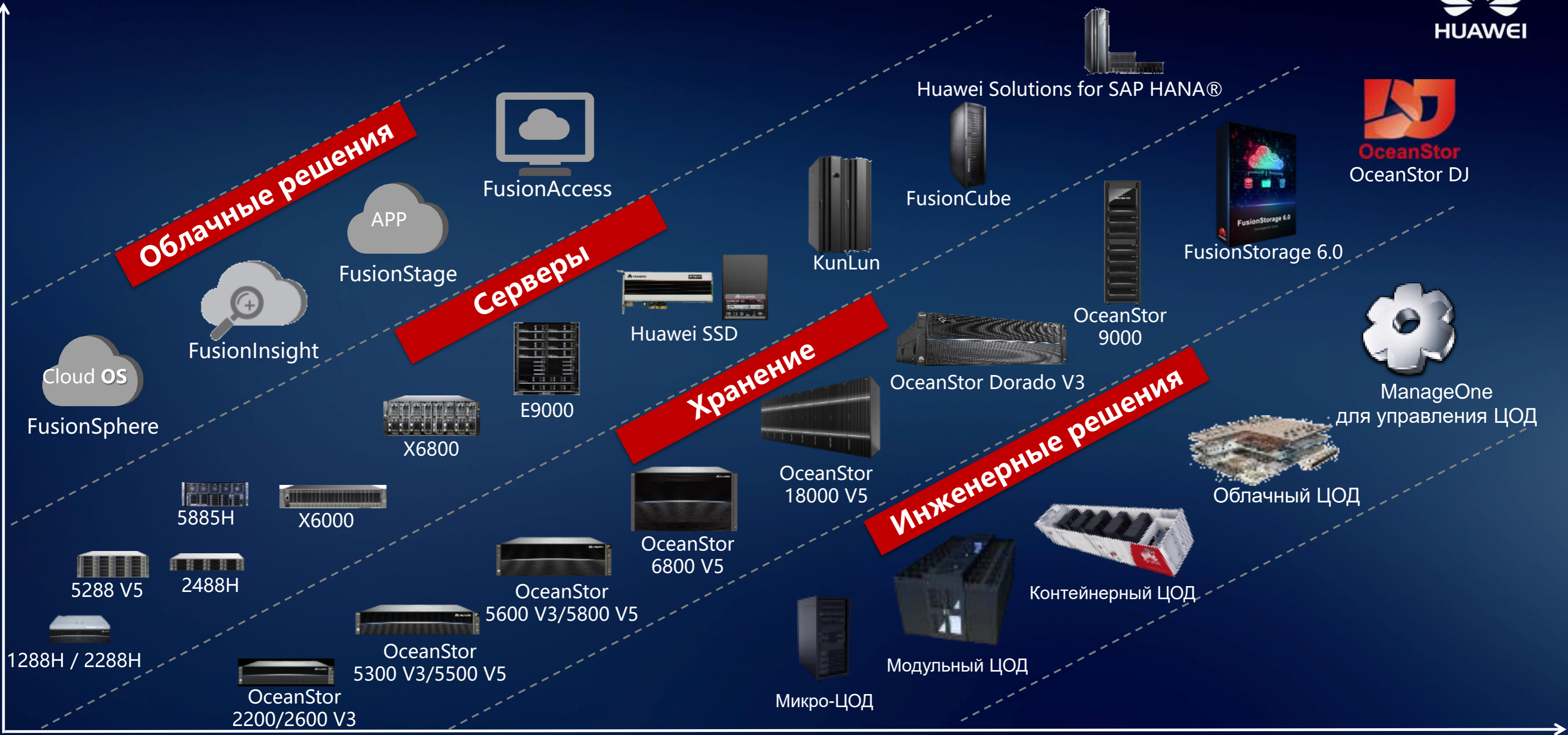




**Делая ИТ проще,  
бизнес – гибче**



# Huawei Enterprise IT: семейство продуктов и решений



**Облачные решения**

**Серверы**

**Хранение**

**Инженерные решения**



FusionAccess



FusionStage



FusionInsight



Cloud OS

FusionSphere

Huawei Solutions for SAP HANA®

FusionCube



KunLun



Huawei SSD



OceanStor Dorado V3



OceanStor 9000



FusionStorage 6.0



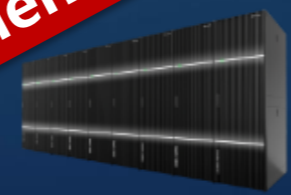
OceanStor  
OceanStor DJ



X6800



E9000



OceanStor 18000 V5



OceanStor 6800 V5



OceanStor 5600 V3/5800 V5



OceanStor 5300 V3/5500 V5



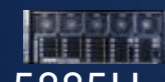
OceanStor 2200/2600 V3



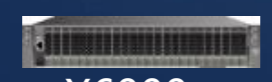
5288 V5



2488H



5885H



X6000

1288H / 2288H



Модульный ЦОД



Микро-ЦОД



Контейнерный ЦОД



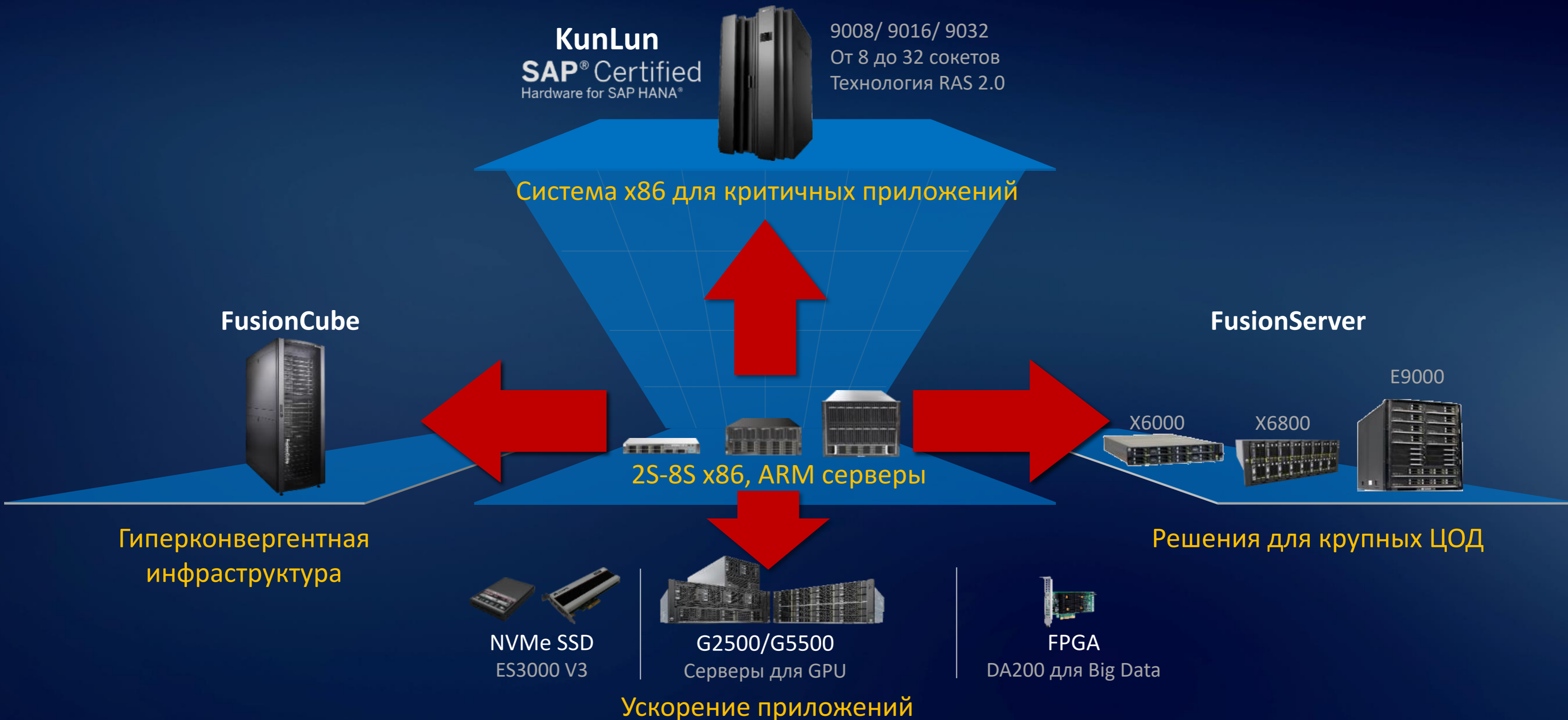
Облачный ЦОД



ManageOne для управления ЦОД

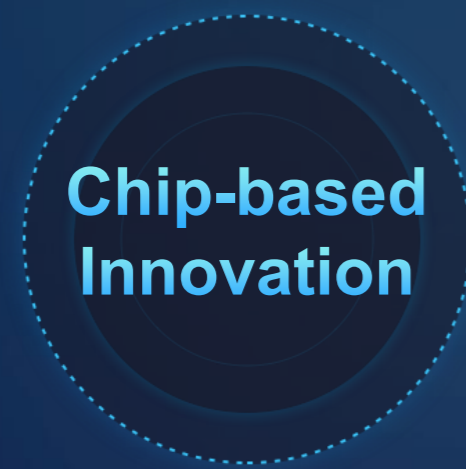
# Выход за границы CPU

Раскрытие потенциала вычислений: оптимизировано для реальных приложений



# Инвестиции Huawei в ARM архитектуру

## Building Diversified Computing



**Kunpeng**

CPU



**TaiShan**

servers based on Kunpeng



**Kunpeng Ecosystem**

Associations, industry partners, and developers

# Kunpeng 920

## Самые производительные CPU



### SPECint®\_rate\_base2006

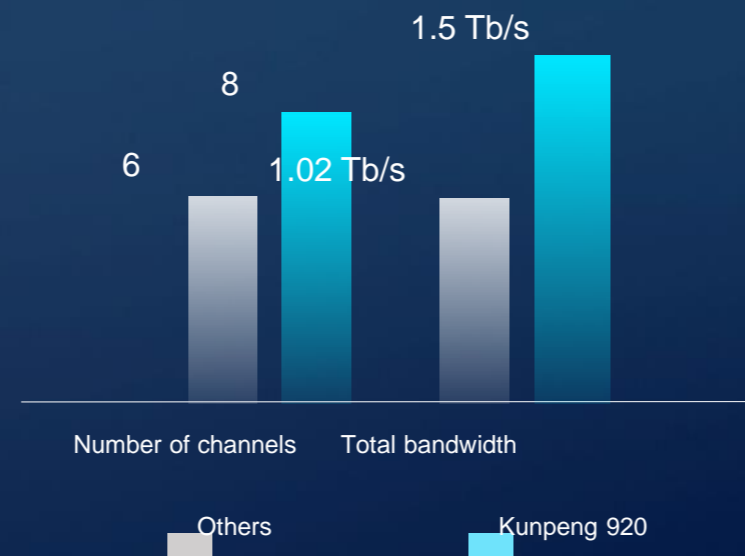
Surpasses industry benchmark by 25%



\* Evaluated based on the Kunpeng 920-6426  
SPECint®\_rate\_base2006 test results

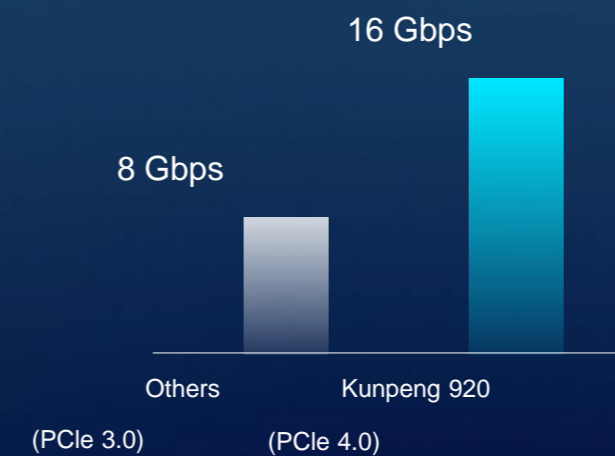
### 8-channel memory

Enhances memory bandwidth by 46%



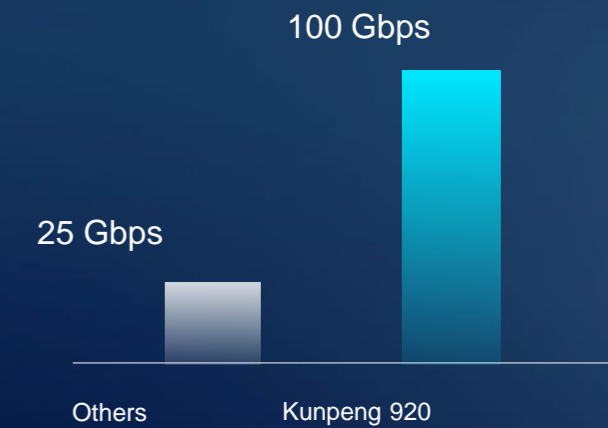
### PCIe 4.0

Doubles I/O bandwidth



### 100GE RoCE LOM

Enables 4x network bandwidth



# Kunpeng 920

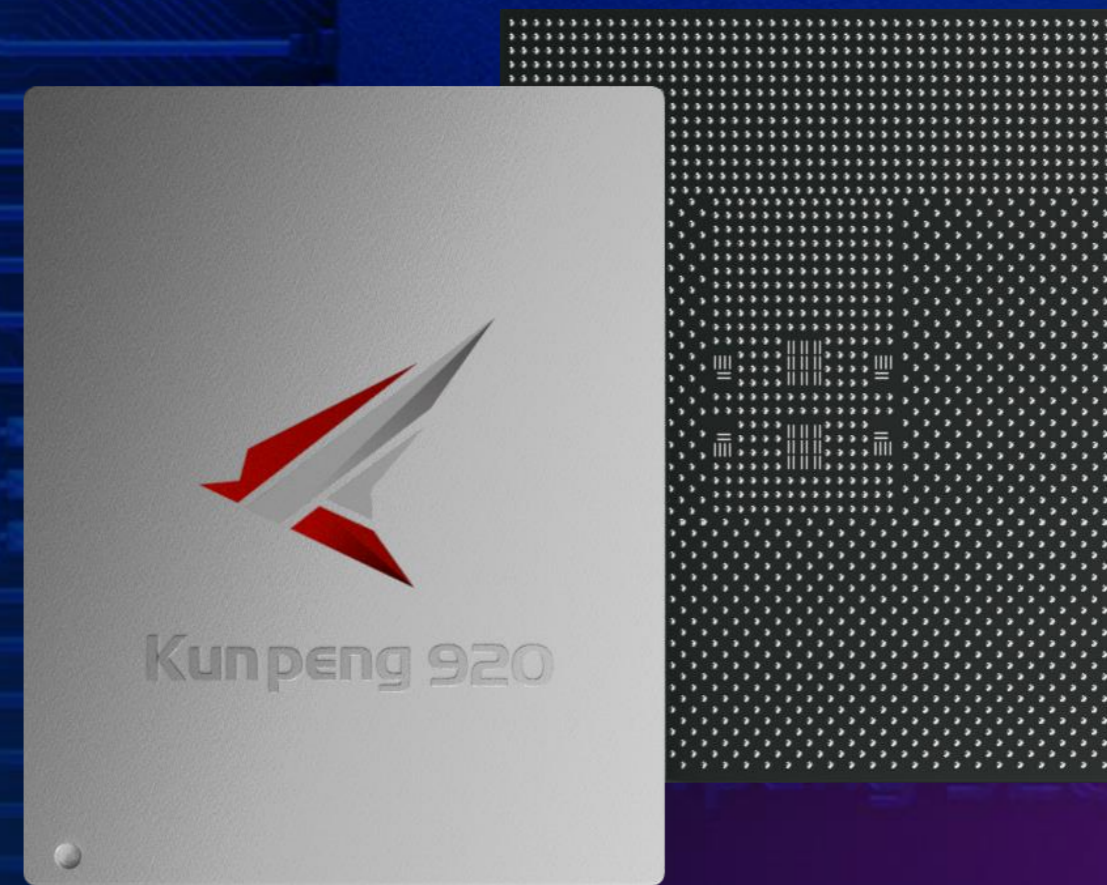
**High performance** **930+** **3x ↑**  
Estimated score in SPECint®\_rate\_base2006

**High throughput** Memory bandwidth: **2.4x ↑**  
Total I/O bandwidth: **1.7x ↑**  
Network bandwidth: **10x ↑**

**High integration** **4** chips in 1  
(CPU, southbridge, NIC, SAS controller)

**High efficient computing** **30% ↑**

\*Tested in Huawei lab with Kunpeng 920-6426 vs Kunpeng 916. Results may vary in different environments.



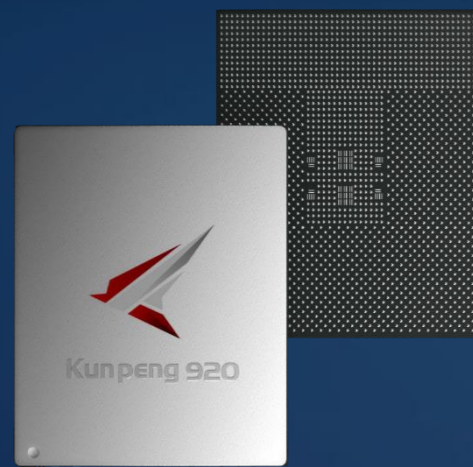
64 cores

8 channels

PCIe 4.0

100GE

# Модели Kunpeng CPU



**Ultimate Performance**

25%+ ↑

Kunpeng 920 64-core model



**Ultimate Energy Efficiency**

30%+ ↑

Kunpeng 920 32-/48-core model

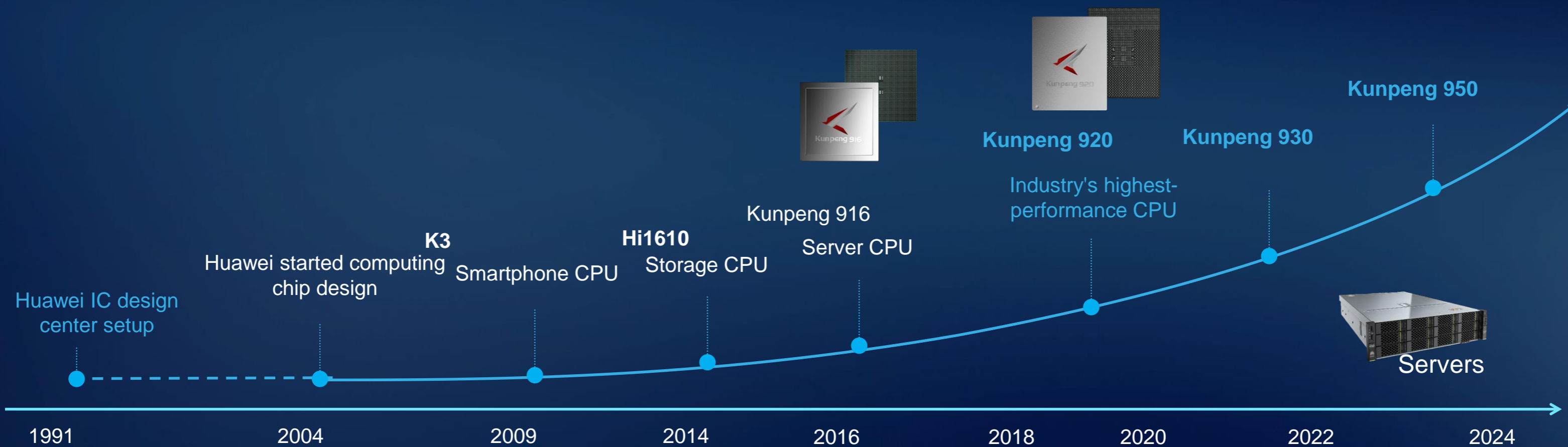


**Ultimate Low Power**

11% ↓

Kunpeng 916 32-core model

# Последовательные инвестиции и сотрудничество





# Серверы TaiShan и решения на базе ARM процессоров



## Five Core Chips

### Compute



Kunpeng 920  
CPU

### Storage



Hi1812  
Intelligent SSD Controller  
Chip

### Network



Hi1822  
Intelligent Converged  
Network Chip

### Management



Hi1710  
Intelligent Management  
Chip

### AI



Ascend 310/910  
AI Processor

## TaiShan Servers

### TaiShan 2280 Balanced Server



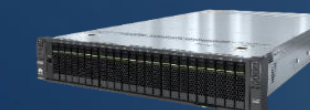
- 2U 2-socket rack server
- 32 DDR4-2933 DIMM slots
- 8 PCIe 4.0 expansion slots

### TaiShan 5280 Storage Server



- 4U 2-socket rack server
- 40 LFF drives
- Up to 5.6 PB per cabinet

### TaiShan X6000 High-Density Server



- 2U 4 nodes
- 10240 cores in a single cabinet
- 100GE LOM ports

# Серверы TaiShan



2280  
Balanced Model



5280  
Storage Model



X6000  
High-Density Model



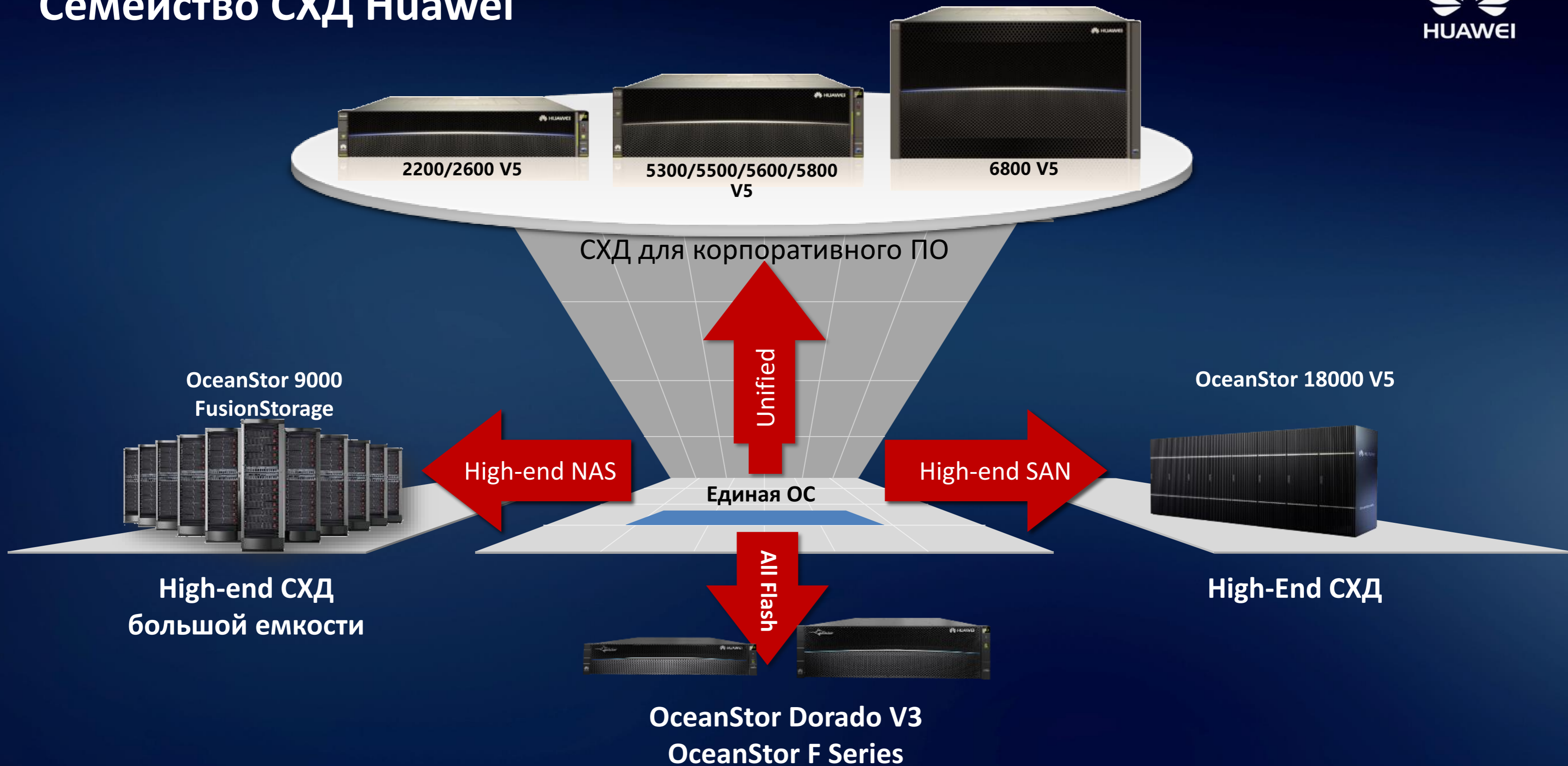
For diversified workloads

5.6 PB per rack

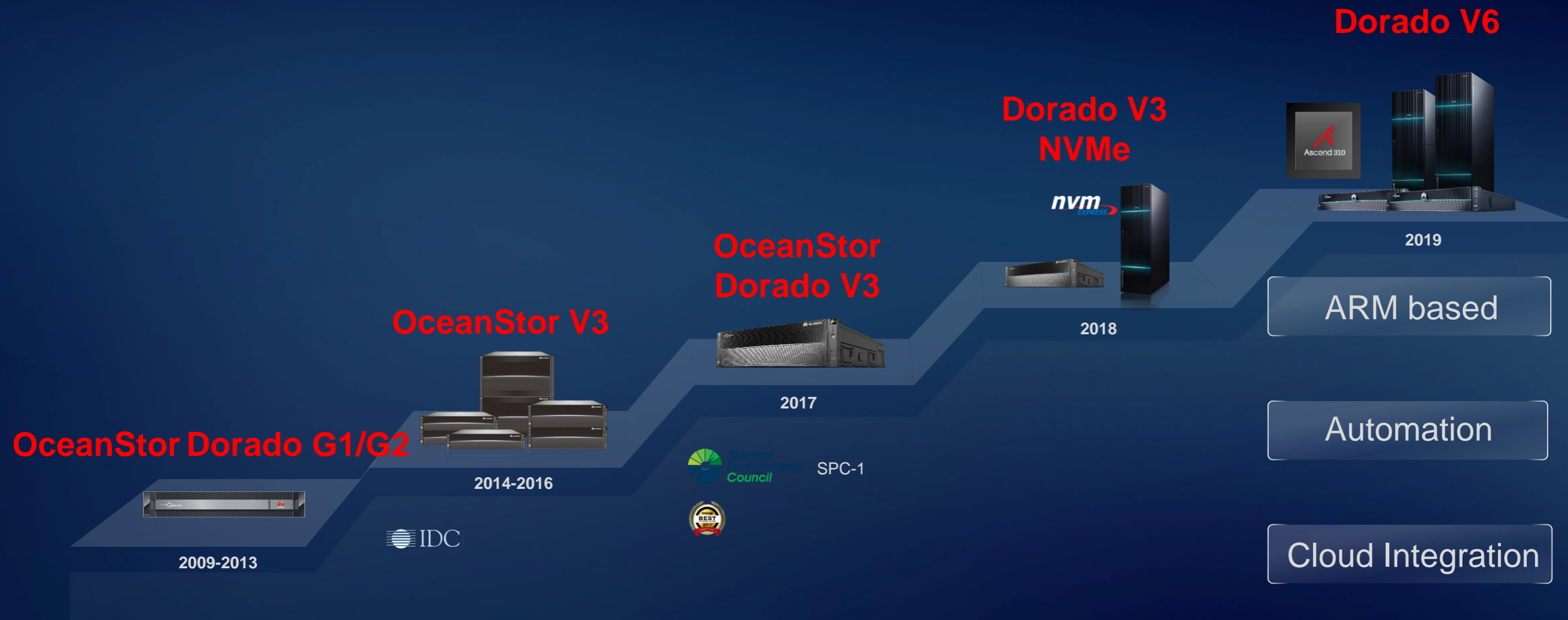
10240 cores per rack

2U rack server	4U rack server	2U 4-node server
2-socket	2-socket	2-socket
32 DDR4-2933 MHz	32 DDR4-2933 MHz	16 DDR4-2933 MHz
27 x 2.5" HDDs or 16 x 2.5" NVMe SSDs	40 x 3.5" HDDs	6 x 2.5" HDDs or NVMe SSDs
CCIX, 8 PCIe 4.0	CCIX, 8 PCIe 4.0	CCIX, 2 PCIe 4.0
GE/10GE/25GE	GE/10GE/25GE	GE/100GE
Air-cooled	Air-cooled	Air- or liquid-cooled

# Семейство СХД Huawei



# Эволюция Dorado



# Новая СХД OceanStor Dorado V6



## OceanStor Dorado V3

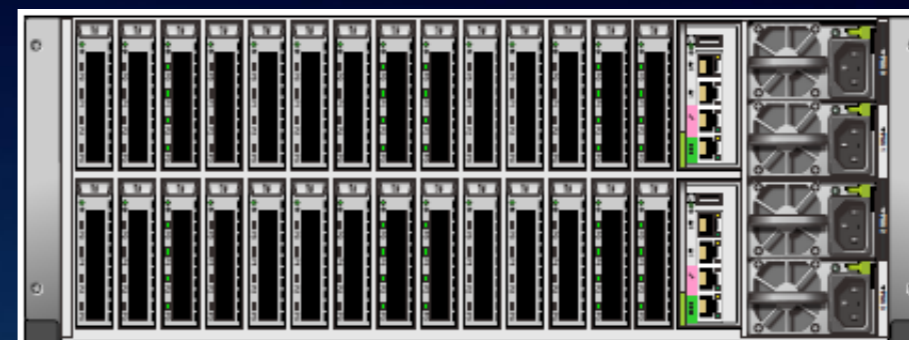
Dorado 18000 V3

## OceanStor Dorado V6

Dorado 18000 V6

Dorado 8000 V6

Дисковые полки с микросхемами Kunpeng



Устойчивость к потере двух контроллеров пары одновременно

Устойчивость к потере 7 из 8 контроллеров

High-End

Mid-Range

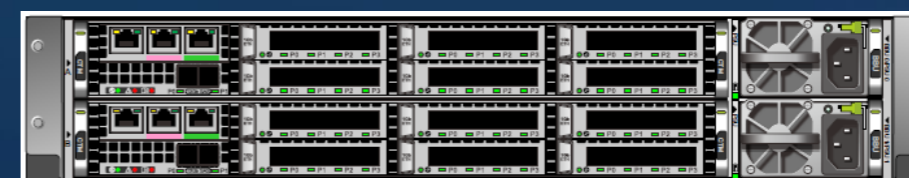
Dorado 6000 V3

Dorado 5000 V3

Dorado 6000 V6

Dorado 5000 V6

Дисковые полки с микросхемами Kunpeng



8/16/32 Gb FC/FC-NVMe, 10/25/40/100 Gb ETH

Back End 100G RDMA

Entry-Level

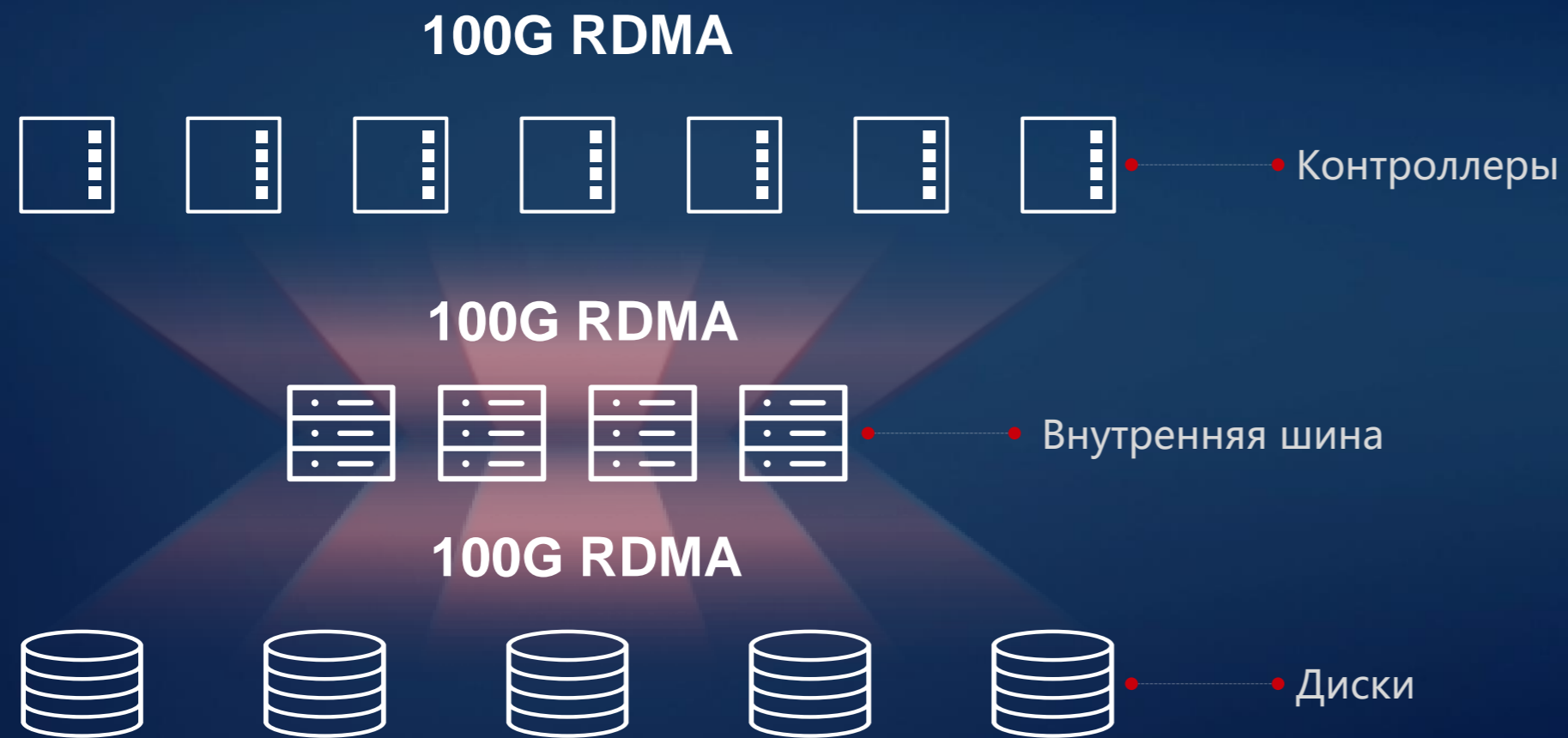
Dorado 3000 V3

Dorado 3000 V6

Дисковые полки SAS

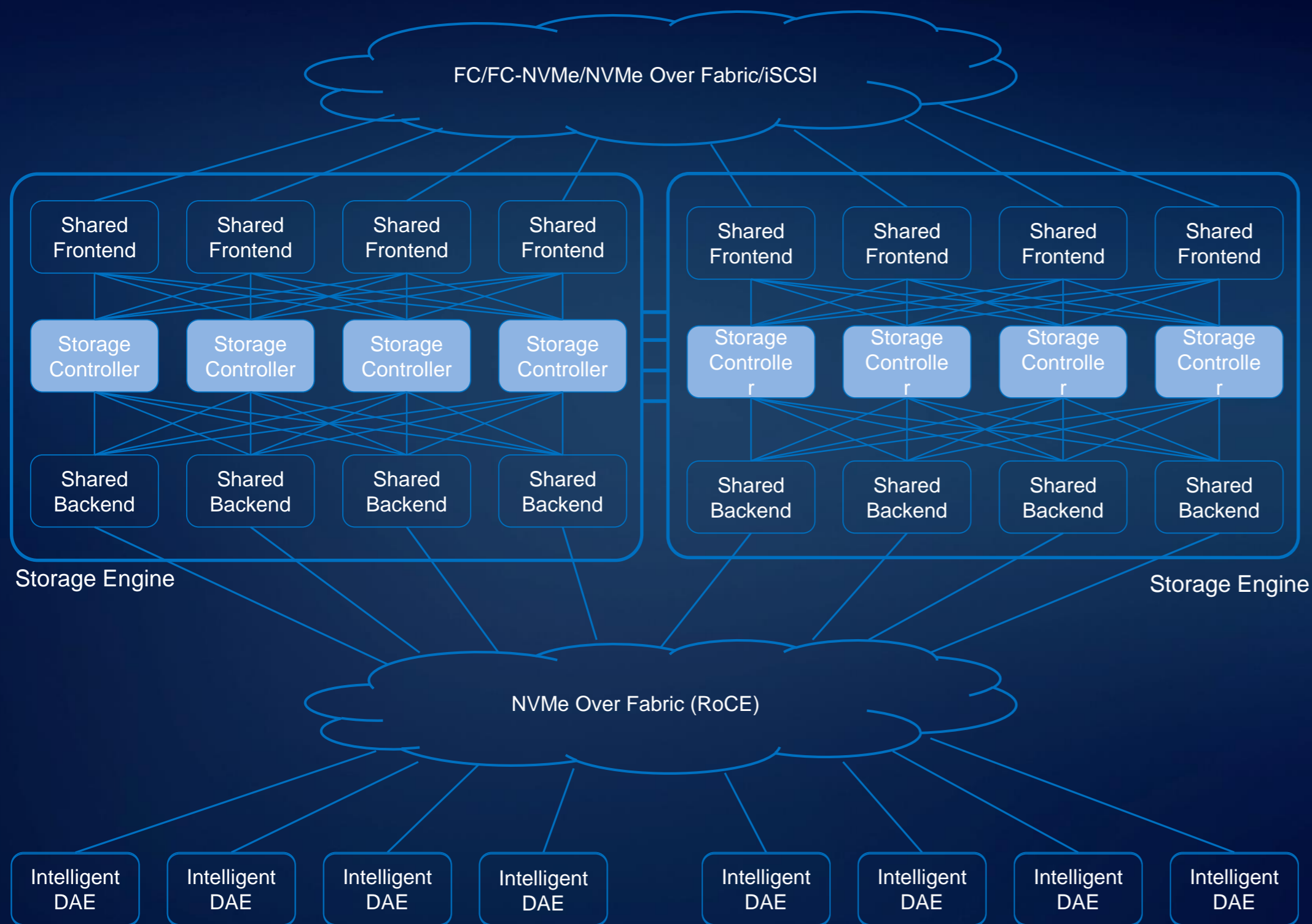


# OceanStor Dorado V6: SmartMatrix



# SmartMatrix

# Внутренний Дизайн



## Distributed Architecture

- Consistent Distributed Architecture for High-end/Mid-range/Entry-level series of OceanStor Dorado V6.
- Symmetric Active-Active Cluster(supports symmetric access by the hosts).
- Load-balancing between all the controllers and auto-rebalancing upon scale-out, failover and failback.

## End-to-End NVMe

- Front-end: NVMe over FC(32G)/NVMe over Fabrics(RoCE).
- Back-end: NVMe SSD/Intelligent DAE.

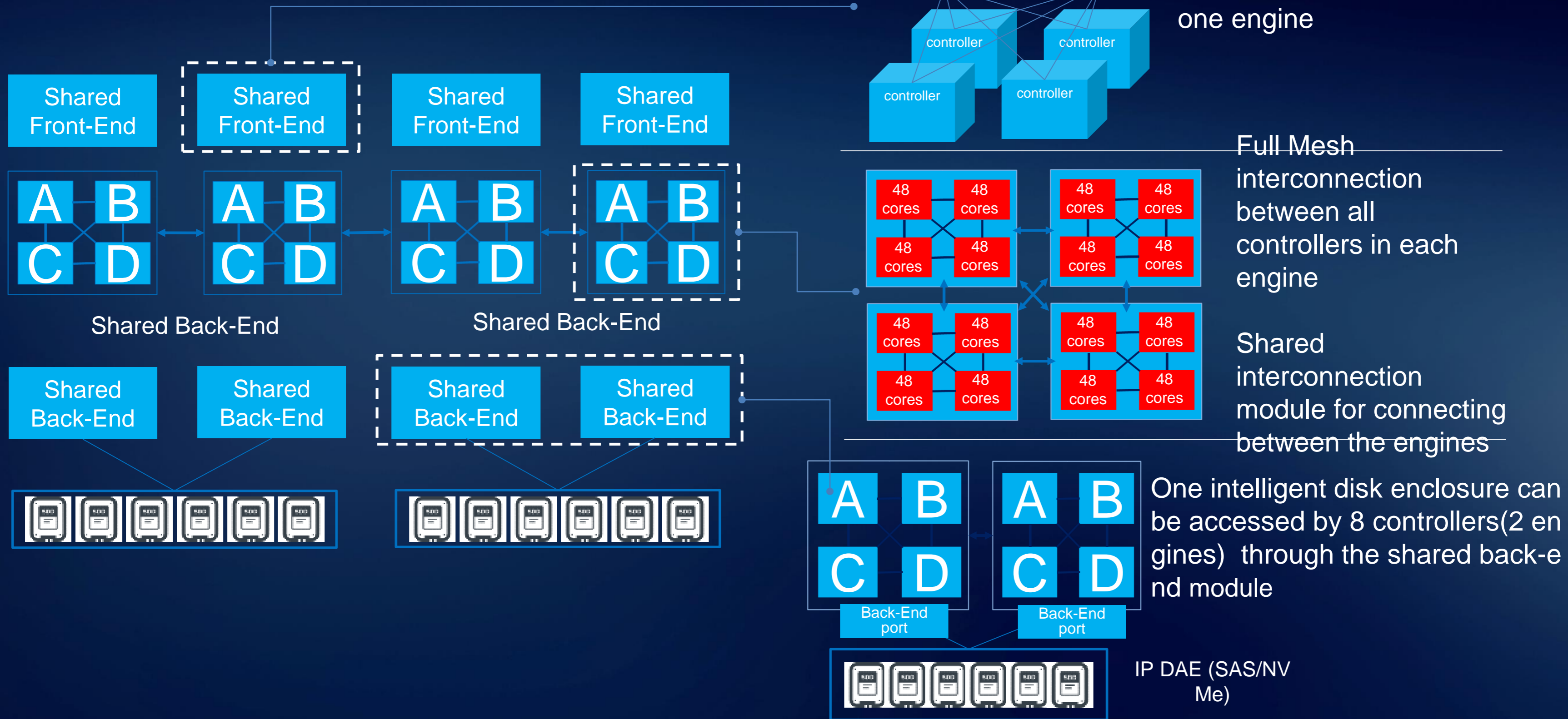
## Global Shared Resource

- Global cache and global storage pool for all LUNs
- High-end series support Shared Frontend module, Shared Backend module(100GE RDMA)

# Сбалансированная архитектура



## SmartMatrix Technology over 100GE RDMA



Every physical port connects to all the four controllers in one engine

Full Mesh interconnection between all controllers in each engine

Shared interconnection module for connecting between the engines

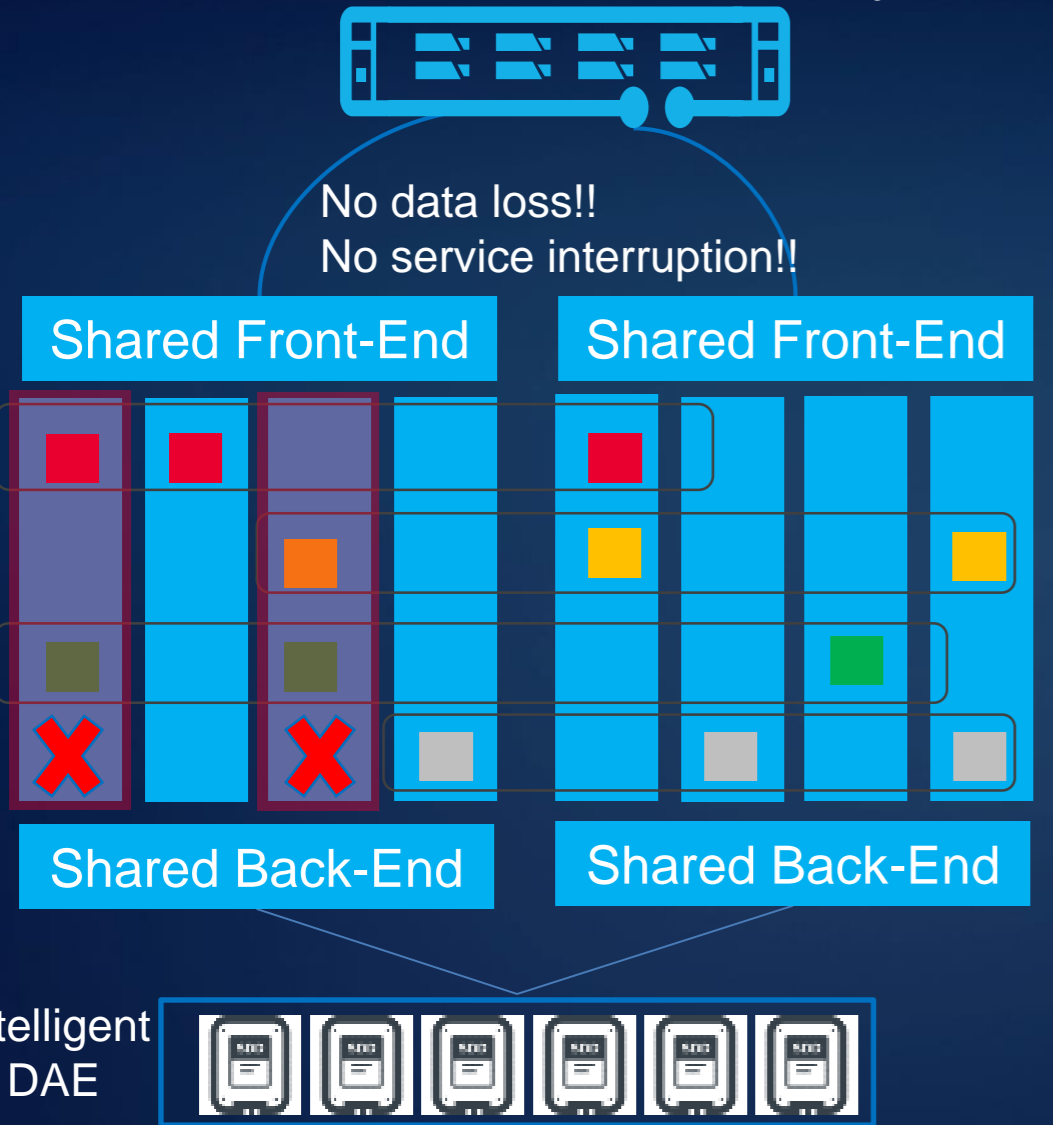
One intelligent disk enclosure can be accessed by 8 controllers(2 engines) through the shared back-end module

IP DAE (SAS/NV Me)



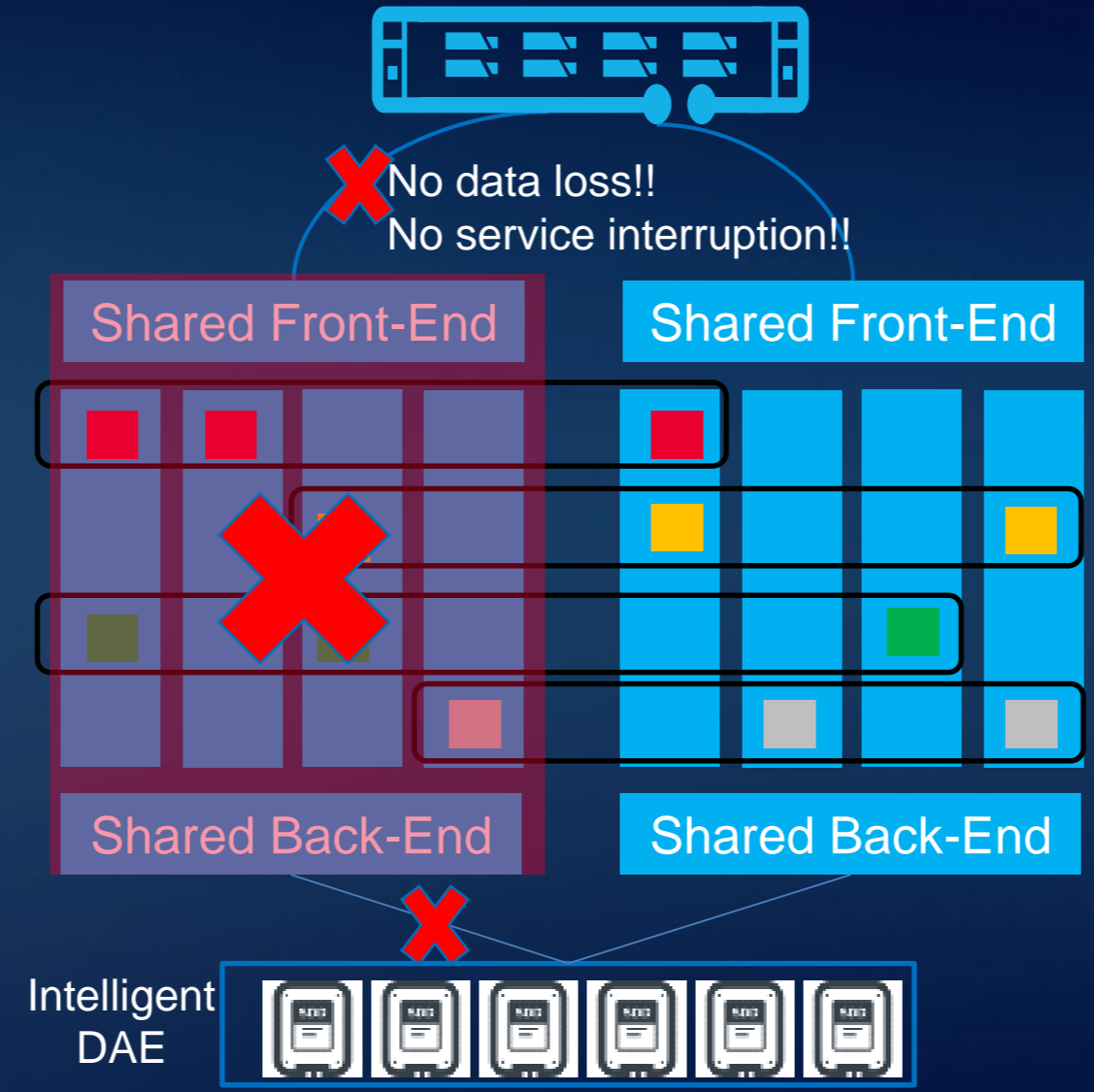
# Высочайшая надежность

## Tolerance of 2 controllers failure simultaneously



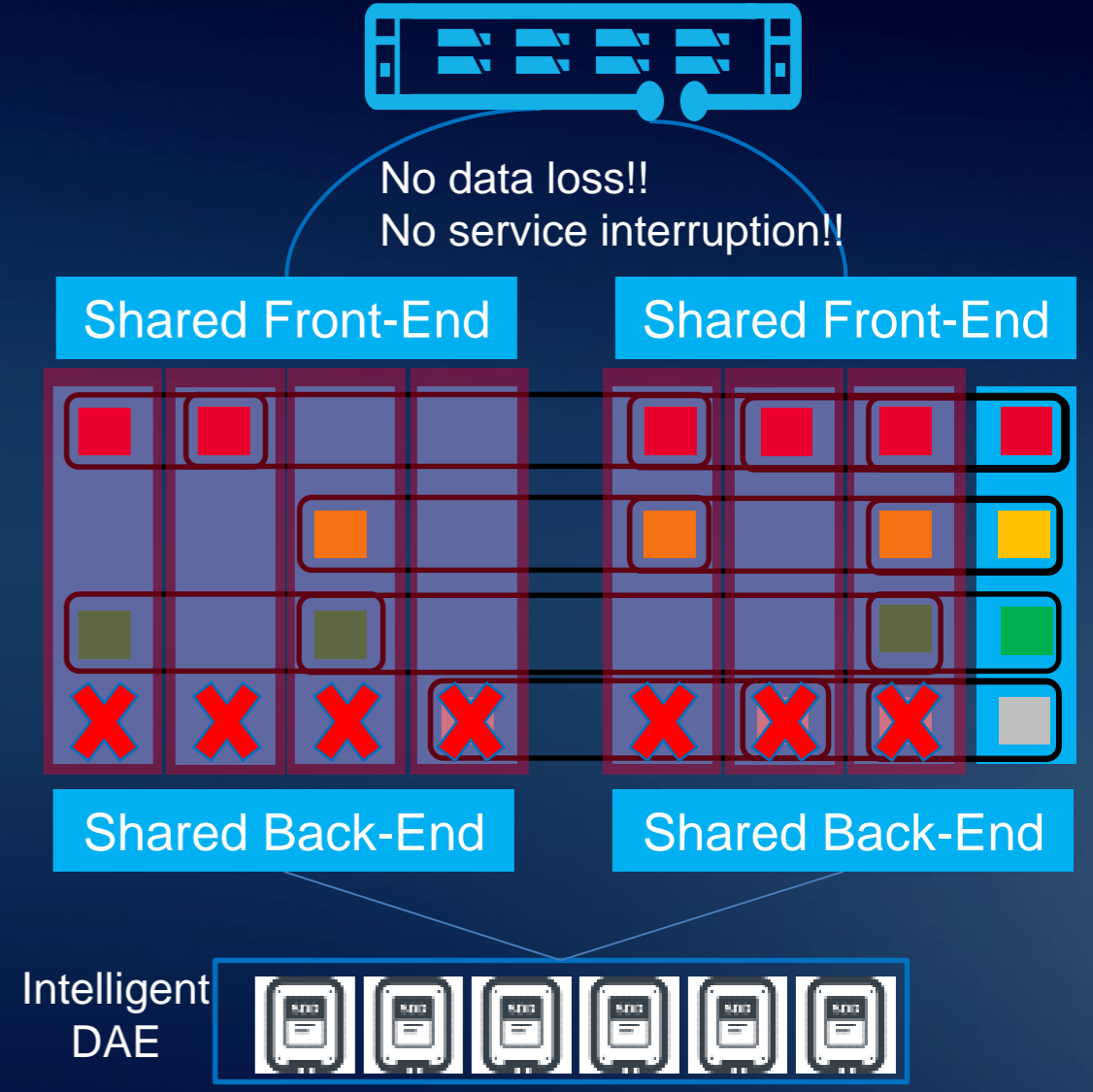
- Global Cache supports 3 copies across two engines.
- Guarantee at least 1 cache copy available if 2 controllers failed simultaneously.
- Only one engine can also tolerate 2 controllers failure at the same time with 3 copies Global Cache

## Tolerance of 1 engine failure



- Global Cache supports 3 copies across two engines.
- One disk enclosure can be accessed by 8 controllers(2 engines) through the shared back-end module
- Guarantee at least 1 cache copy available if one engine failed.

## Tolerance of 7 controllers failure

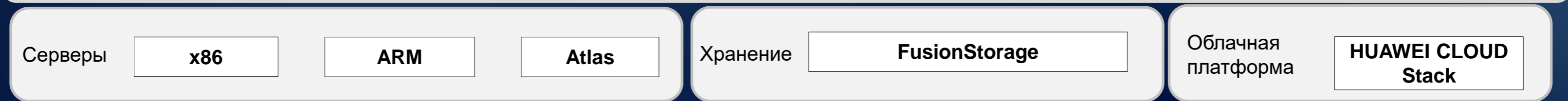
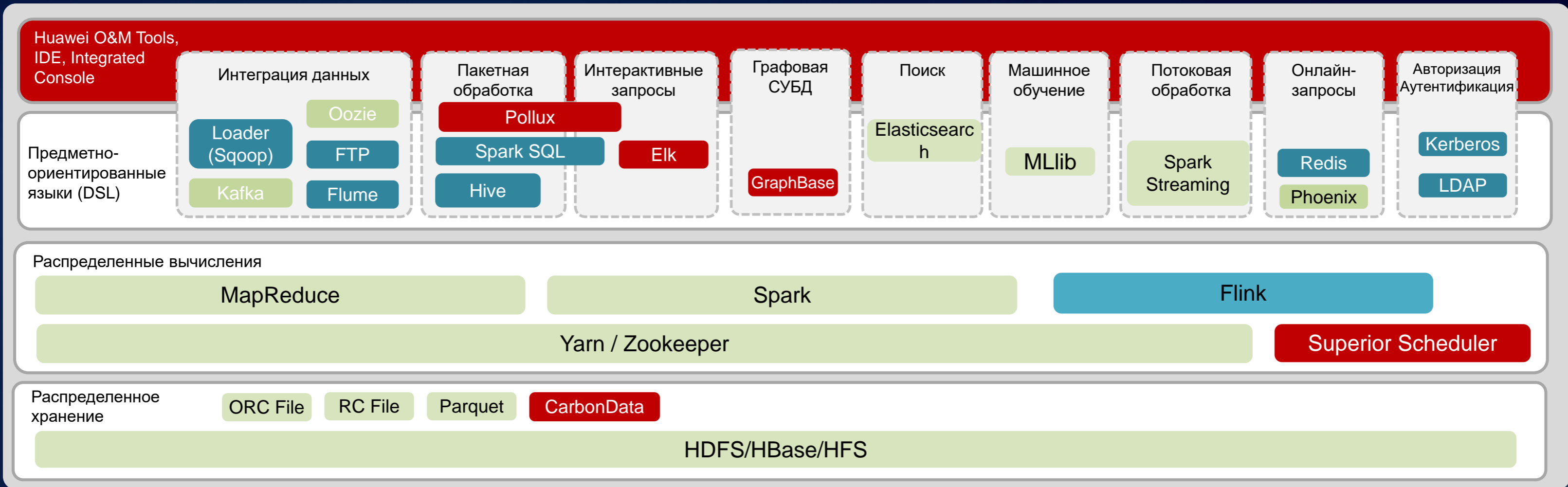


- Global cache provides continuous mirroring technology
- Tolerates 7 controllers failure one by one of 8 controllers(2 engines)

# FusionInsight HD: архитектура



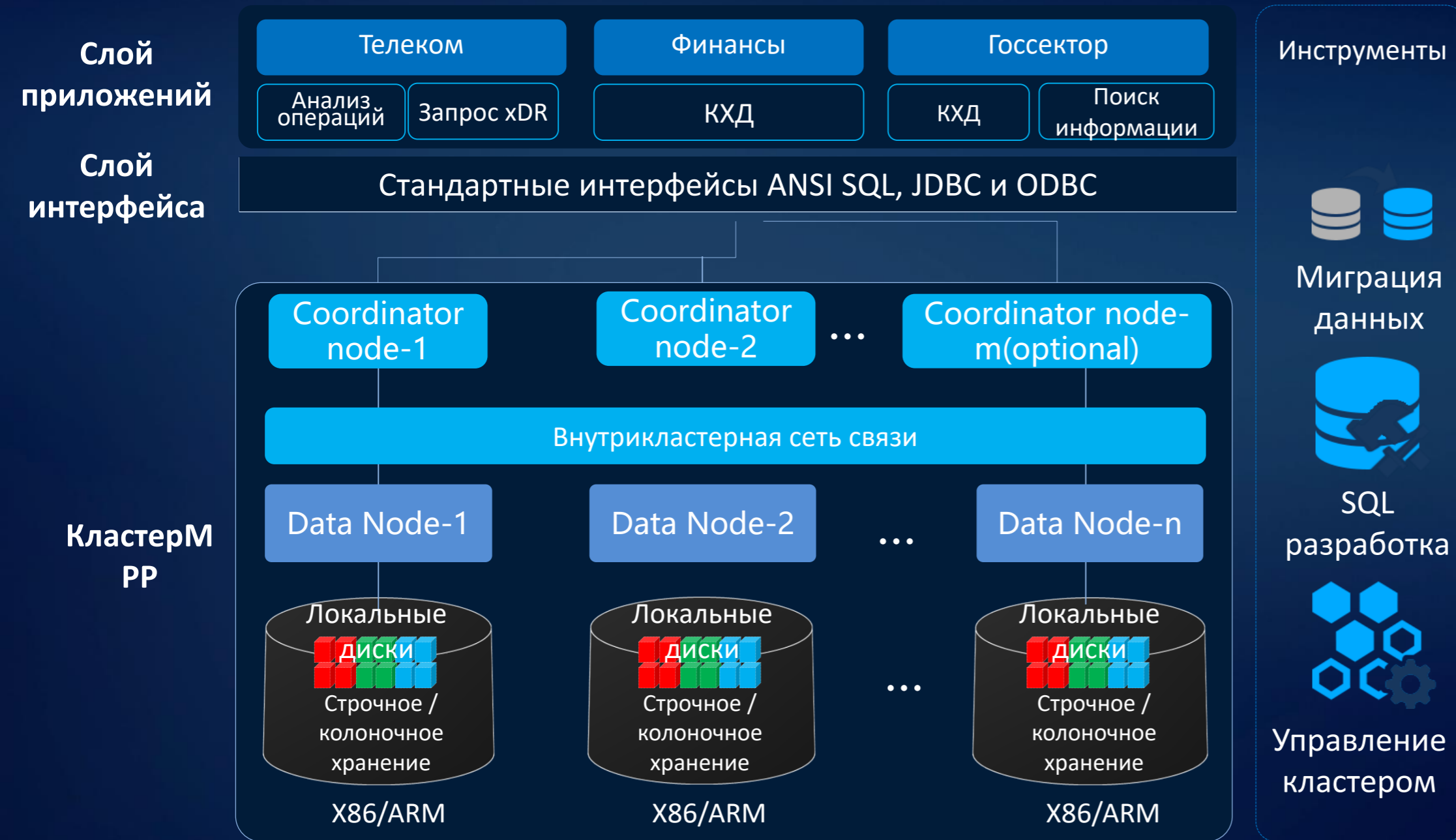
■ Открытый код (небольшие доработки Huawei)   ■ Открытый код (глубокие доработки Huawei)   ■ Проприетарный код / разработка Huawei



- ✓ SQL на Hadoop
- ✓ Multi-tenant
- ✓ Гетерогенные среды
- ✓ Возможности корпоративного класса
- ✓ Упрощенная разработка



# GaussDB 200: КХД петабайтного уровня



## Масштабирование

- Расширение до **2048 узлов**
- Линейность до **0.9**

## Производительность

- Рост производительности на **30%** в сравнении с существующими ПАК
- Полный параллелизм, в **5-10 раз** быстрее традиционных СУБД

## Надежность

- Отказоустойчивость **всех** компонентов
- Толерантность к сбоям любого узла

## Простота использования

- **Стандартный SQL** и механизмы простой миграции
- **Онлайн-расширение** без остановки бизнес-задач
- Обновление **100 узлов** за **1 час**



# Портфель программных продуктов Huawei



IaaS

PaaS

DaaS

VDC

Resource/Manage/Application

VDC

Resource/Manage/Application

VDC

Resource/Manage/Application

ManageOne

Computing Pool

Storage Pool

Network Pool

BigData Pool

FusionSphere

FusionStage

FusionStorage

Agile Controller

FusionInsight

FusionAccess

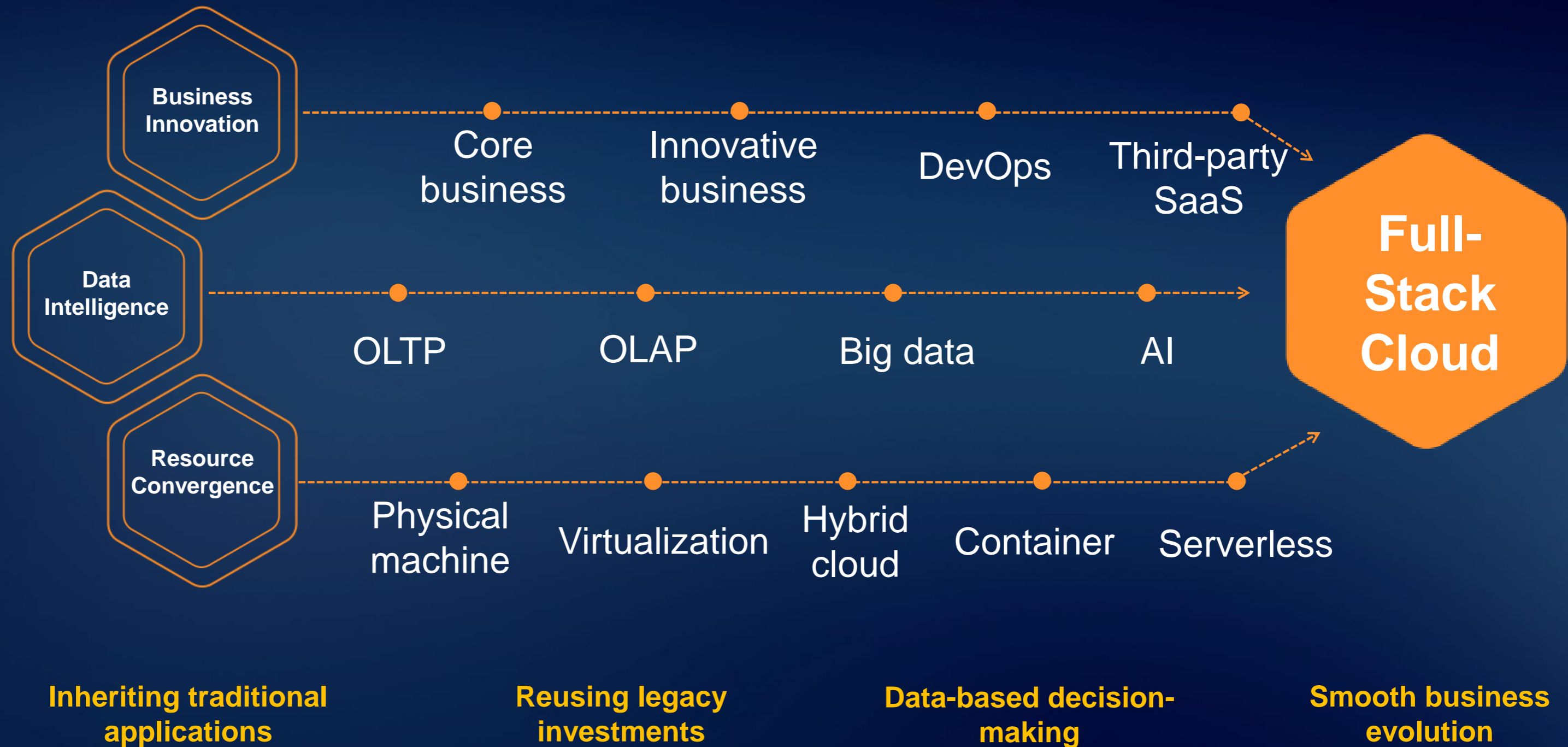


# 61 сервис в 9 категориях



Computing services	Elastic Cloud Server (ECS)	SAP HANA	GPU-accelerated Cloud Server	Bare Metal Server (BMS)	Image Management Service (IMS)	Auto Scaling (AS)	VMware Auto Scaling			
Storage services	Elastic Volume Service (EVS)	Object Storage Service (OBS)	Scalable File Service (SFS)							
Network services	Virtual Private Cloud (VPC)	Elastic Load Balance (ELB)	Virtual Private Network (VPN)	Elastic IP (EIP)	Virtual Firewall (VFW)	Security Group (SG)	Direct Connect (DC)	SNAT	VPC EndPoint	
DR & backup services	Volume Backup Service (VBS)	Cloud Server Backup Service (CSBS)	Cloud Server Disaster Recovery (CSDR)	Cloud Server High Availability (CSHA)	Volume High Availability (VHA)	DR as a Service (DRaaS)	Backup as a Service (BaaS)			
Security services	Host Security Service (HSS)	Database Security Service (DBSS)	Edge Firewall (EdgeFW)	Security Situation Awareness (SSA)	Security Index Service (SIS)	Application Recognition Service (ARS)	Web Tamper Protection (WTP)	Web Application Firewall (WAF)	Cloud Bastion Host (CBH)	
PaaS services	Cloud Container Service (CCE)	Cloud Service Catalog (CSC)	Distributed Cache Service (DCS)	Distributed Message Service (DMS)	Distributed Database Middleware (DDM)	APIG	Cloud Service Engine (CSE)	Vulnerability Scan Service (VSS)	Key Management Service (KMS)	Data Encryption Workshop (DEW)
Big data services	Hadoop Service (HDS)	Analytical Database Service (ADS)	Hadoop Cluster Service (HCS)	Predict service				Cloud Firewall (Microsegmentation)	Database Audit	Comprehensive Log Audit
Database services	RDS for MySQL	RDS for SQL Server	RDS for PG SQL	Oracle Database Service	Data Replication Service (DRS)			Cloud-based Defense System (Cloud WAF)		
Management services	vAPP	Simple Message Notification (SMN)	Mailbox as a Service (MailaaS)							

# Полнофункциональное облако значительно упрощает трансформацию компании





# Спасибо!

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