Towards a More Diversified Computing World

Introduction to Huawei TaiShan Servers & Solutions

Security Level:

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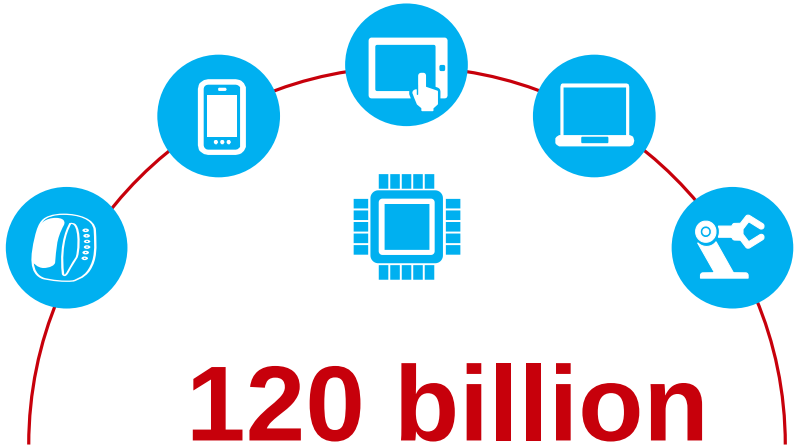
From mobile, to edge, to cloud, ARM is spreading in computing domain



120 billion

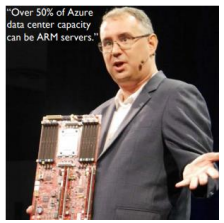
ARM-based chips shipped to date

Distributed storage

ARM-native applications

Big data

Hyperscale Data Centers

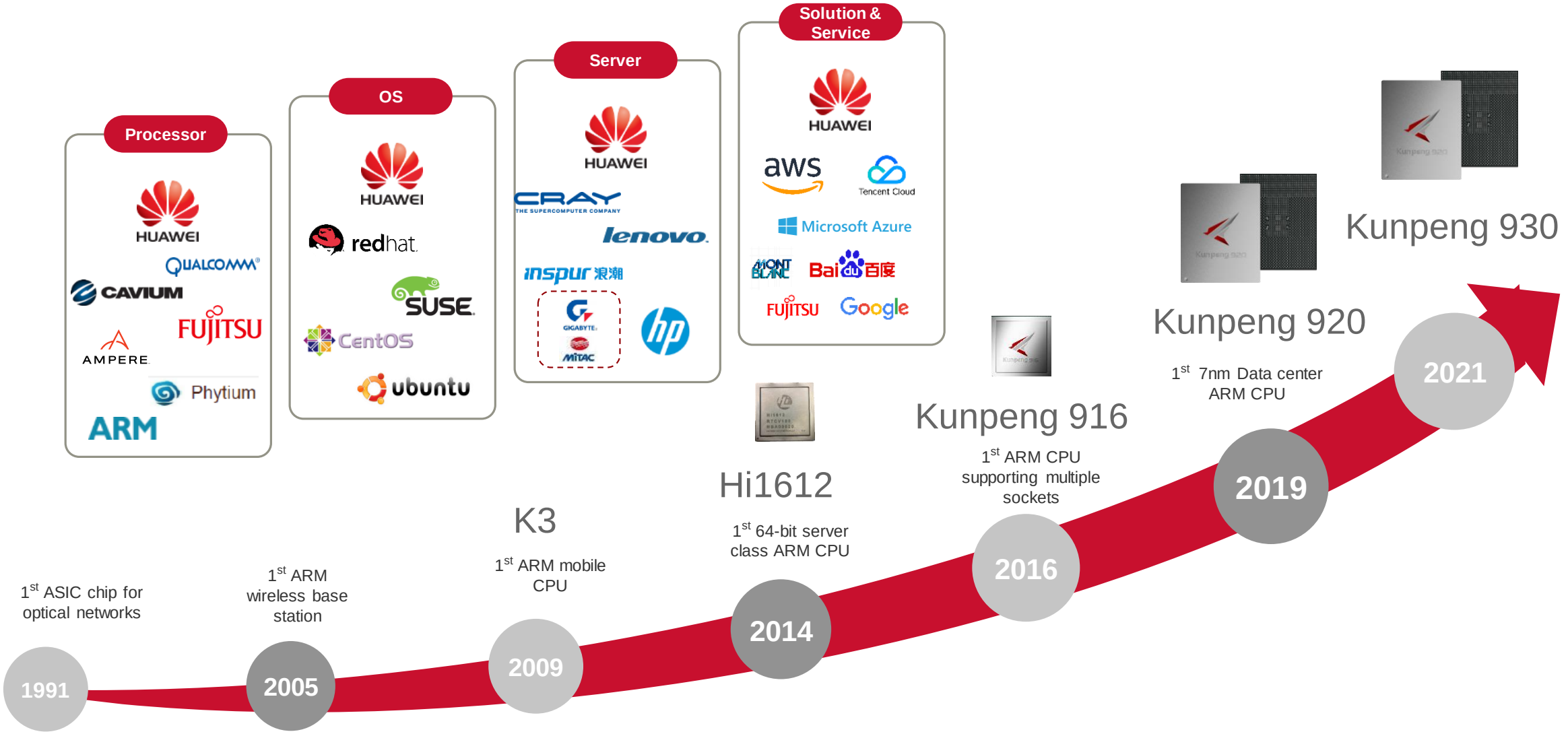


Microsoft aws

Exascale Supercomputers

Source: Linley 2017

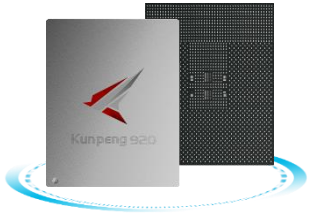
Huawei's Continuous Investment in ARM



Huawei TaiShan Server: Bring Pervasive Intelligent Computing with Chip Innovation

More Than Moore's Law

Compute



Kunpeng 920

ARM-based CPU

First 7nm processor for ARM-based servers, 48/64 cores, 2.6 GHz

Management

Hi1710

Intelligent management chip

Built-in intelligent management engine
Intelligent fault management

AI

Ascend 310/910

AI chip

Da Vinci architecture, ultimate energy efficiency and performance

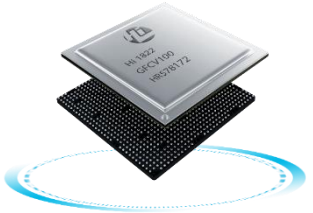
Storage

Hi1812

Intelligent SSD controller chip

PCIe NVMe and SAS converged
Intelligent acceleration
Effective wear leveling algorithm

Network



Hi1822

Intelligent converged network chip

Ethernet and FC converged
Protocol acceleration
Programmable

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Kunpeng 920: ARM-based CPU with the industry's highest performance

Huawei officially Unveils Kunpeng 920 CPU & TaiShan Servers

2019, Jan 7th, William Xu, Director of the Board and Chief Strategy Marketing Officer of Huawei, unveils Kunpeng 920 CPU

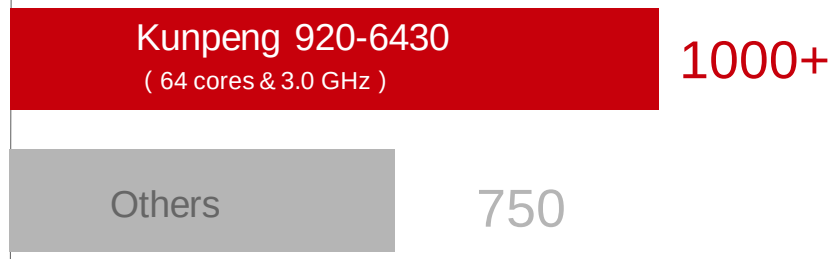
Official PR :
https://www.huawei.com/en/press-events/news/2019/1/huawei-unveils-highest-performance-arm-based-cpu

High Performance

SPECint®_rate_base2006 estimated score

1000+

SPECint®_rate_base2006 estimated score

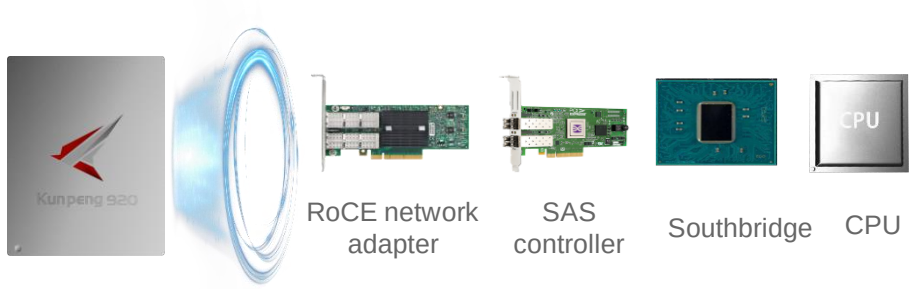


*Tested in Huawei lab. Results may vary in different environments.

High integration

7 nm Technology

4 chips in 1



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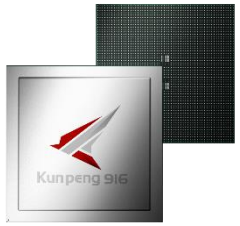
Kunpeng CPU Technical Specifications

Kunpeng 916

The World's First ARM Processor Supporting Dual Sockets



Processor	Kunpeng 916
Core	ARM v8 architecture 2.4 GHz, 32 cores per socket
Cache	L2: 1 MB per 4 cores L3: 32 MB shared for all (1 MB/core)
Memory	4 DDR4 channels per socket, up to 2400 MHz
Coherent Interconnect	Coherent SMP interface for 2S 2 ports, up to 96 Gbit/s per port
I/O	46 PCIe Gen 3.0 lanes 8 x 10GE, 2 x GE x2 USB 3.0, x8 SAS/SATA 3.0
Package	57.5 mm x 57.5 mm, BGA
Process	16 nm
Power	TDP: 75W

Kunpeng 920

ARM-based CPU with the industry's highest performance

Processor	Kunpeng 920
Core	ARM v8.2 architecture, TaiShan core 2.6/3.0 GHz, 32/48/64 cores per socket
Cache	L1: 64 KB instruction cache and 64 KB data cache L2: 512 KB private per core L3: 24–64 MB shared for all (1 MB/core)
Memory	8 DDR4 channels per socket, up to 3200 MHz
Coherent Interconnect	Coherent SMP interface for 2S & 4S 3 ports, up to 240 Gbit/s per port
I/O	40 PCIe Gen 4.0 lanes 2 x 100GE, RoCEv2/RoCEv1, CCIX x4 USB 3.0, x16 SAS 3.0, x2 SATA 3.0
Package	60 mm x 75 mm, BGA
Process	7 nm
Power	TDP: 120/150/180/200 W

Kunpeng 920 CPU - More Powerful Computing

New

- **Doubled** number of computing cores*, up to 64 cores
- **2x boost** in SPECint performance*, raising the bar to new level
- **Doubled** number of memory channels with 8-channel*
- Support PCIe 4.0 and CCIX
- Integrated **100GE LOM** and encryption and compression engines
- Support **2- or 4-socket** interconnects

*Compared with Kunpeng 916 CPU

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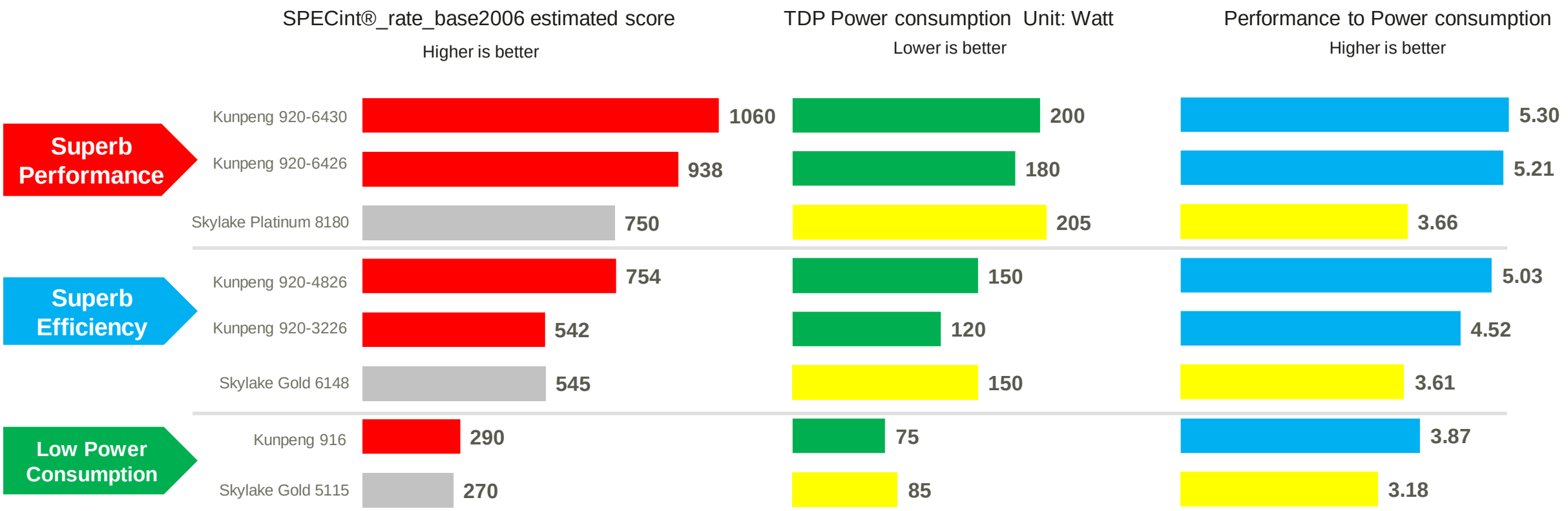
Kunpeng CPUs vs Industry's Mainstream CPUs



Low Power Consumption

Kunpeng 916: 75 W

Superb Efficiency

Kunpeng 920-4826 30% higher

Superb Performance

Kunpeng 920-6430 40%+ higher

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TaiShan Sever Family

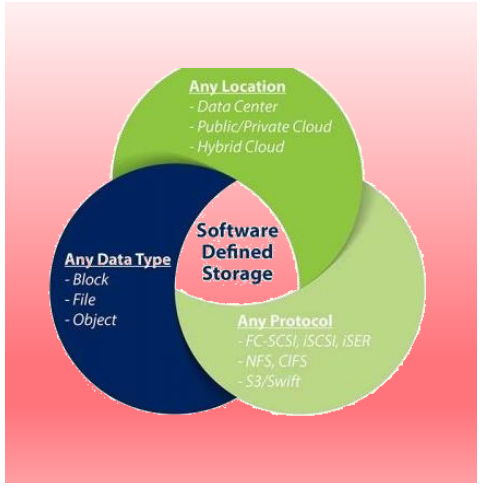
TaiShan 2280 Big Data Balanced Server	TaiShan 5280 SDS Storage Server	TaiShan X6000 HPC High-Density Server
		
For diversified workloads	**5.6PB per rack**	**10240 cores per rack**
2U Rack Server	4U Rack Server	2U 4-nodes Server
2-Socket	2-Socket	2-Socket
32*DDR4-2933 MHz	32*DDR4-2933 MHz	16*DDR4-2933 MHz
27*2.5” HDDs or 16*2.5” NVMe SSDs	40*3.5” HDDs	6*2.5” HDDs or NVMe SSDs
CCIX, 8*PCIe 4.0	CCIX, 8*PCIe 4.0	CCIX, 2*PCIe 4.0
GE / 10GE / 25GE / 100G IB	GE / 10GE / 25GE / 100G IB	10GE / 25GE / 100GE RoCE & IB
Air-cooled	Air-cooled	Air or liquid-cooled

TaiShan Server Technical Specifications

Form Factor	2U 2-Socket Rack Server (Balanced Model)		4U 2-Socket Rack Server (Storage Model)		2U 4-Node (2S Node) High-Density Server	
Product Name	**TaiShan 2280**	**TaiShan 2280 V2**	**TaiShan 5280**	**TaiShan 5280 V2**	**TaiShan X6000 XR320**	**TaiShan X6000 XA320 V2**
Processors	2 Kunpeng 916	2 Kunpeng 920	2 Kunpeng 916	2 Kunpeng 920	2 Kunpeng 916	2 Kunpeng 920
Memory	16 DDR4-2400 slots	32 DDR4-2933 slots	16 DDR4-2400 slots	32 DDR4-2933 slots	16 DDR4-2400 slots	16 DDR4-2933 slots
Local Storage	Up to 16 x 3.5" or 27 x 2.5" SAS/SATA HDDs or SSDs	Up to 16 x 3.5" or 27 x 2.5" SAS/SATA HDDs or SSDs, or 16 x 2.5" NVMe SSDs	Up to 40 x 3.5" SAS/SATA HDDs or SSDs	Up to 40 x 3.5" SAS/SATA HDDs or SSDs and 4 x 2.5" NVMe SSDs	Up to 6 x 2.5" SAS/SATA HDDs or SSDs	Up to 6 x 2.5" SAS/SATA HDDs or SSDs, or NVMe SSDs
RAID	RAID 0, 1, 5, 6, 10, 50, or 60, supercapacitor for power failure protection* * The liquid-cooled TaiShan X6000 XA320 V2 supports only RAID 0, 1					
PCIe Expansion	Up to 5 PCIe 3.0 x8 slots	Up to 8 PCIe 4.0 x8, or 3 PCIe 4.0 x16 + 2 PCIe 4.0 x8 slots	Up to 5 PCIe 3.0 x8 slots	Up to 8 PCIe 4.0 x8, or 3 PCIe 4.0 x16 + 2 PCIe 4.0 x8 slots	Up to 2 PCIe 3.0 x8 slots	Up to 1 PCIe 4.0 x16 and 1 PCIe 4.0 x8 slots
LOM ports	2 x GE electrical ports + 2 x 10GE optical ports	2 flexible LOM cards, supporting up to 8 x GE electrical ports, 8 x 25GE/10GE optical ports, or 4 x GE electrical ports + 4 x 25GE/10GE optical ports	2 x GE electrical ports + 2 x 10GE optical ports	2 flexible LOM cards, supporting up to 8 x GE electrical ports, 8 x 25GE/10GE optical ports, or 4 x GE electrical ports + 4 x 25GE/10GE optical ports	2 x GE electrical ports + 2 x 10GE optical ports	2 x GE electrical ports + 1 x 100GE optical port, or 2 x GE electrical ports + 2 x 10GE/25GE optical ports
Power Supply Units	2 x 460 W or 750 W hot-swappable AC PSUs, supporting 1+1 redundancy	2 x 1500 W or 2000 W hot-swappable AC PSUs, supporting 1+1 redundancy	2 x 1200 W hot-swappable AC PSUs, supporting 1+1 redundancy	2 x 1500 W or 2000 W AC PSUs, hot-swap, 1+1 redundancy	X6000 general-purpose chassis: 2 x 1500 W AC PSUs, hot-swap, supporting 1+1 redundancy	X6000 super chassis: 2 hot-swappable 3000 W PSUs, supporting 1+1 redundancy
Power Supply	100 V to 240 V AC; 240 V DC					
Fan Modules	4 hot-swappable fan modules, supporting N+1 redundancy					
Operating System	Red Hat Enterprise Linux, SUSE Linux Enterprise Server, Ubuntu, CentOS					
Operating Temperature	5°C to 40°C (41°F to 104°F)	5°C to 40°C (41°F to 104°F)	5°C to 35°C (41°F to 95°F)	5°C to 35°C (41°F to 95°F)	5°C to 35°C (41°F to 95°F)	5°C to 35°C (41°F to 95°F)
Heat Dissipation	Air cooling	Air cooling	Air cooling	Air cooling	Air cooling	Air cooling and liquid cooling* * The liquid cooling system occupies one PCIe x16 slot.
Dimensions (H x W x D)	86.1 mm x 447 mm x 748 mm (3.39 in. x 17.60 in. x 29.45 in.)	86.1 mm x 447 mm x 790 mm (3.39 in. x 17.60 in. x 31.10 in.)	175 mm x 447 mm x 748 mm (6.89 in. x 17.60 in. x 29.45 in.)	175 mm x 447 mm x 790 mm (6.89 in. x 17.60 in. x 31.10 in.)	X6000 general-purpose chassis: 86.1 mm x 436 mm x 805 mm (3.39 in. x 17.17 in. x 31.69 in.) XR320 node: 40.5 mm x 177.9 mm x 545.5 mm (1.59 in. x 7.00 in. x 21.48 in.)	X6000 super chassis: 86.1 mm x 436 mm x 819 mm (3.39 in. x 17.17 in. x 32.24 in.) XA320 V2 node: 40.5 mm x 177.9 mm x 545.5 mm (1.59 in. x 7.00 in. x 21.48 in.)

TaiShan Solutions

Big data analysis



Software defined storage

ARM Native

HPC

Industry's Mainstream OS Supports TaiShan Server

RedHat ® Enterprise Linux 7.4 and plus version supported

redhat CUSTOMER PORTAL Products & Services Tools Securi

Products & Services › Ecosystem › Certified Hardware › Taishan 2280

Taishan 2280

Certifications

Product	Versions	Level
Red Hat Enterprise Linux for ARM 64 (aarch64)	7.5 - 7.x	Certified [1]
Red Hat Enterprise Linux for ARM 64 (aarch64)	7.4	Certified [2]

https://access.redhat.com/ecosystem/hardware/3405241
https://access.redhat.com/ecosystem/hardware/3456681#note1

SUSE ® Linux Enterprise 12 SP3 and plus version supported

TaiShan 2280
Network Server
Huawei Technologies Co., Ltd

15 Aug 2018
146997

YES CERTIFIED with the following products:
Operating Systems:
SUSE® Linux Enterprise Server 12 for Arm Service Pack 3 for SUSE® SLES 12

Product Description
TaiShan 2280 Arm Based Server.

Tested Configuration:

Computer Type:	Rack Mount
Mother Board Revision:	BC11SPCD
BIOS/uEFI:	UEFI: 1.50 (U94)
CPU:	2 Huawei Technologies Co., Ltd Hi1616 Processor 2.4 GHz
RAM:	64 GB
Ports and Bus Types:	8 PCI Express X8
Video Adapter:	Huawei Technologies Co., Ltd Hi1710
Host Bus Adapter:	Huawei Technologies Co., Ltd Hi1616 Integrated SAS Controller , Serial SCSI (SAS)
Hard Disk Drive:	Seagate® ST1200MM0007 - Enterprise Performance 10K HDD v7 , Serial SCSI (SAS)
Test Kit:	System Certification Kit 7.7.0-25.2

https://www.suse.com/nbswebapp/yesBulletin.jsp?bulletinNumber=146997

Ubuntu 16.04/18.04 and plus version supported

Ubuntu 运行于 Huawei Technologies Co., Ltd.

Taishan 2280

反馈

如果此系统的信息有问题，请向我们反馈。

采用下列组件的 Huawei Technologies Co., Ltd. Taishan 2280 server 的 Ubuntu 认证状态为：certified。

Ubuntu 16.04.3 arm64

可从 ubuntu.com 获取

下载

测试详情

此系统已在 16.04 LTS 下经过测试，运行的是 4.10.0-30-generic 内核。

认证备注

此发行版本没有备注。

BIOS
HUAWEI: 1.29 (UEFI)

Ubuntu 18.04 LTS arm64

可从 ubuntu.com 获取

下载

测试详情

此系统已在 18.04 LTS 下经过测试，运行的是 4.15.0-20-generic 内核。

https://certification.ubuntu.com/hardware/201812-26732/
https://certification.ubuntu.com/hardware/201807-26351/
https://certification.ubuntu.com/hardware/201807-26353/

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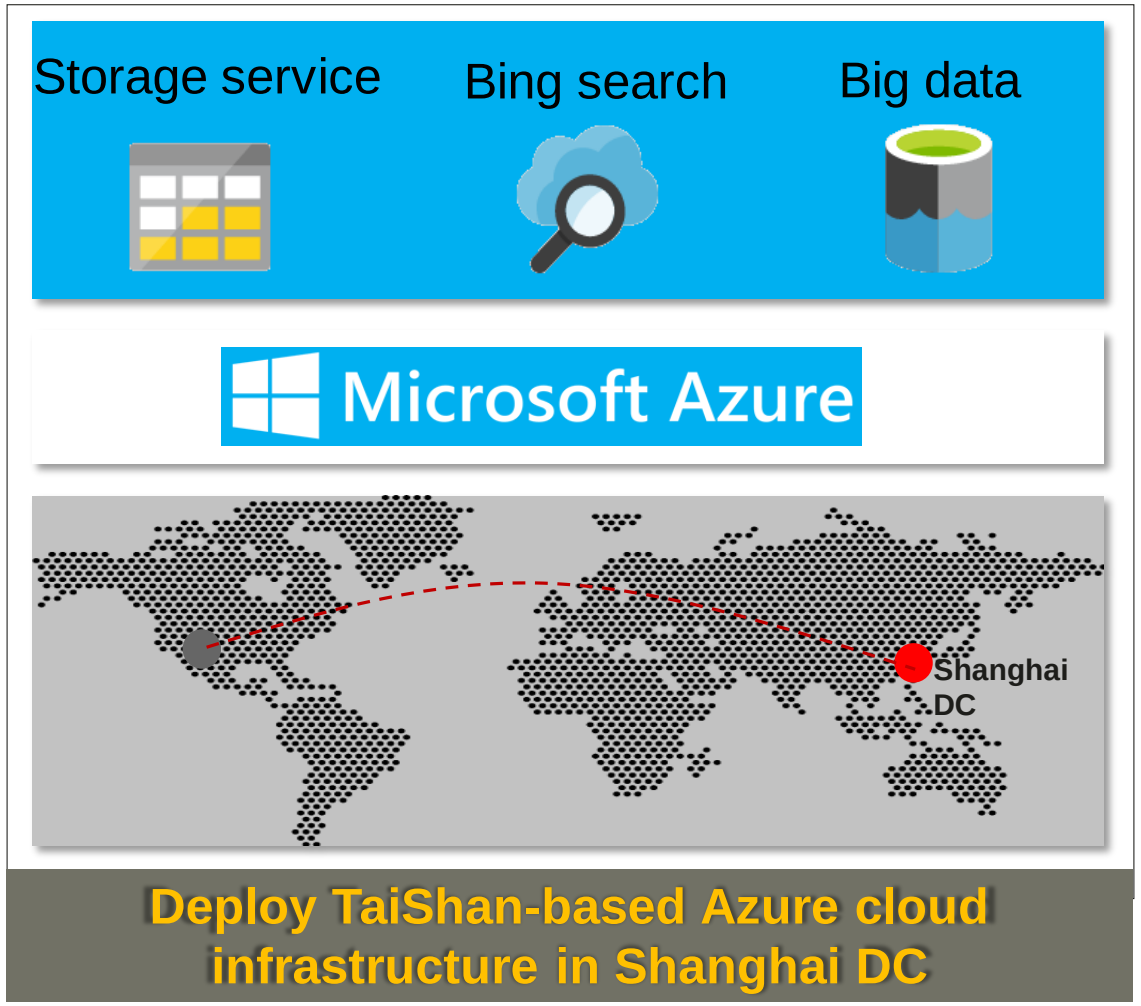
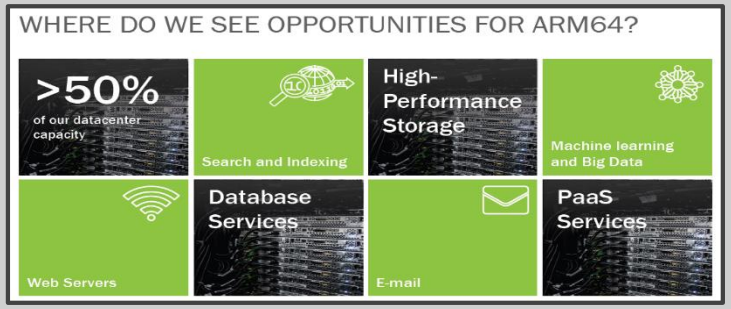
Microsoft Azure Data Center: Use TaiShan Servers to Support Three Types of PaaS Service



Microsoft Azure



- Deployed **200** TaiShan storage servers
- Based on CentOS and Windows Server
- Provides three types of **PaaS** services storage, search, and Big Data

Why does Microsoft choose TaiShan?

- Open ecosystem, providing powerful customization capabilities
- Complies with the mobile service cloudification trend

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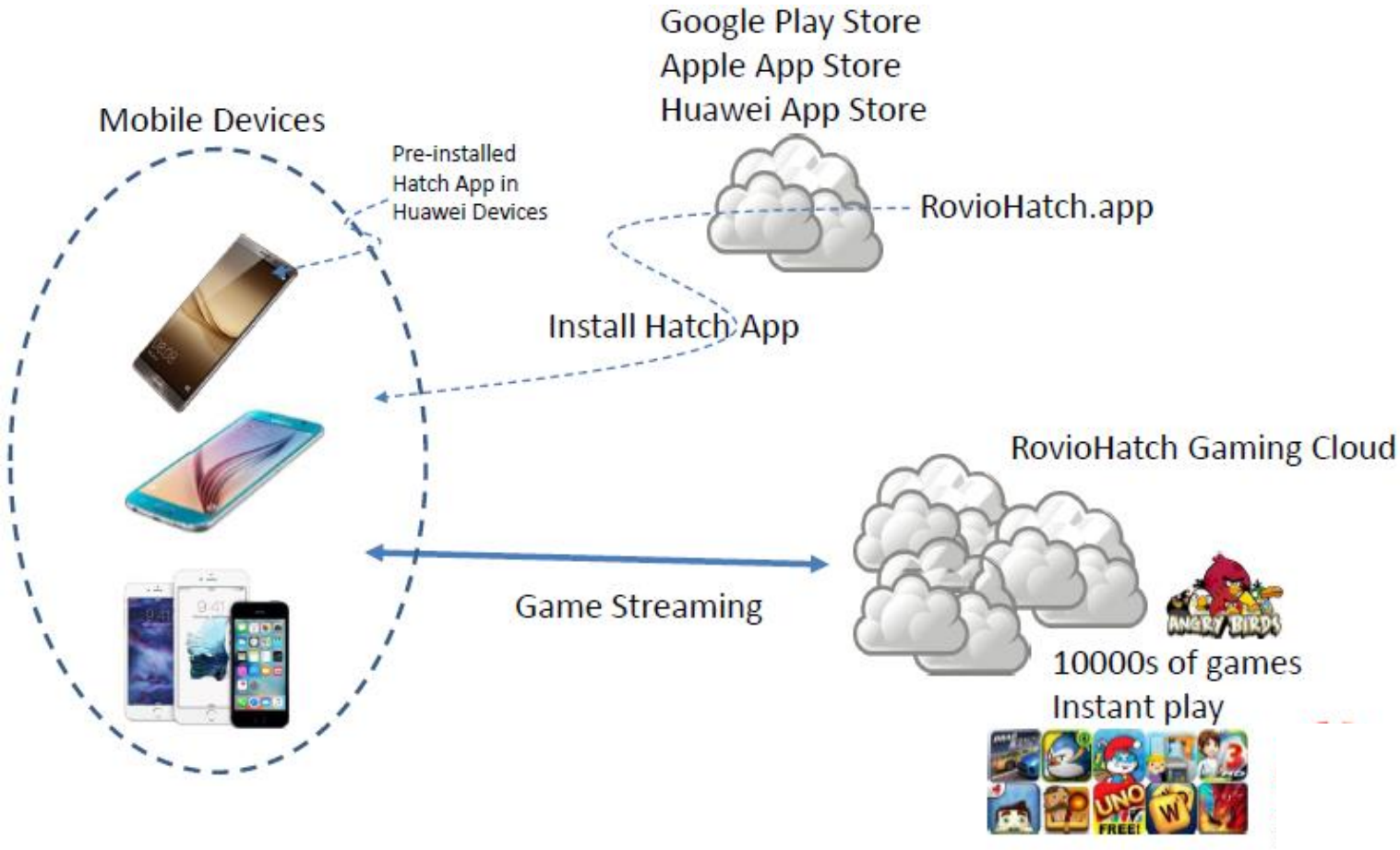
Hatch Gaming Cloud: The Annual Revenue Is Expected to Double Thanks to the Cloud Gaming Community Service



Business model: The gaming social platform is moved to cloud, and user data generates value. Precise advertisement pushing and subscription bring sustainable revenue sources.

- Average number of active users every day: 100M
- Revenue from commercial advertisement push: USD8/1,000 users
- Daily revenue: USD800K
- Annual revenue: 292M$ (142M€ in 2015)

Data source: Hatch

- **Deployed 100 TaiShan compute servers**
- **Performance 4x that of x86 servers**
- **The system has been running stably for more than one year after the system went live.**

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