

鲲鹏展翅，助力多样性边缘计算

Kunpeng Powers Diversified Edge Computing

卢广

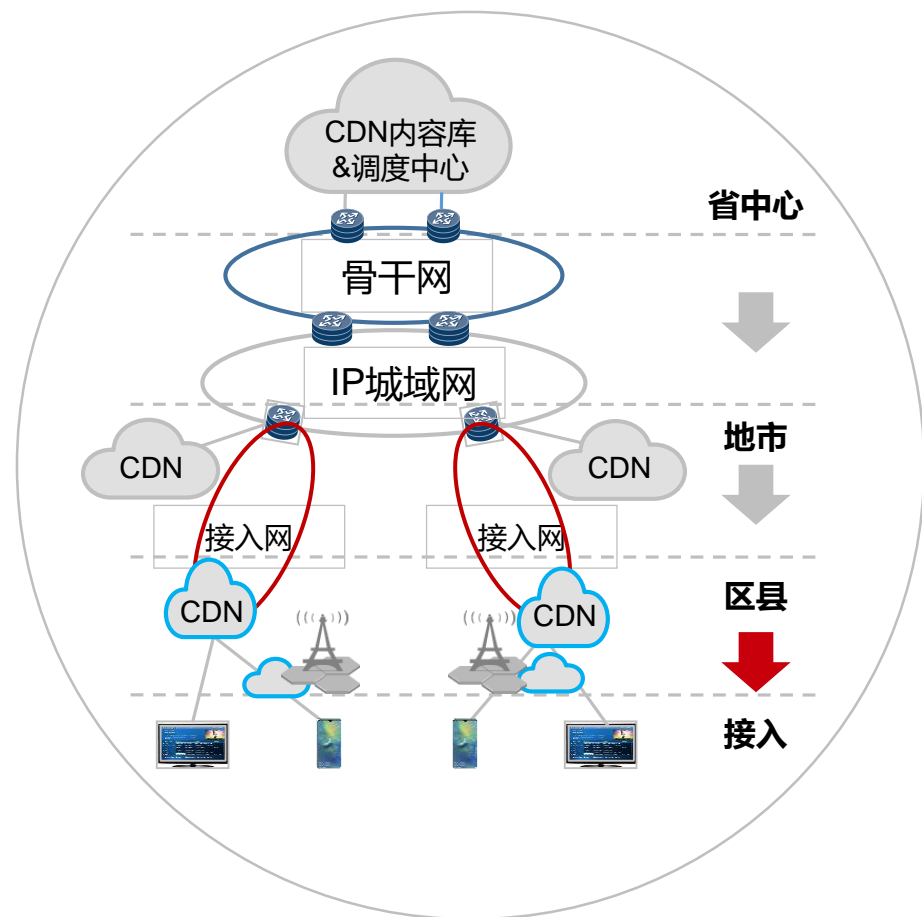
Lu Guang

华为智能计算业务部TaiShan服务器总经理

General Manager, TaiShan Server PDT,
Huawei Intelligent Computing Business Dept

4K/8K超高清视频驱动CDN继续下沉，节省网络带宽

4K/8K UHD Videos Drive CDN Deployment Closer to End Users, Saving Network Bandwidth



浙江移动实现全球首个鲲鹏架构的CDN商用

China Mobile Zhejiang launches the world's first commercial CDN based on the Kunpeng architecture

4K视频带宽需求
22.5~75 Mbit/s

4K video bandwidth
22.5–75 Mbit/s

10G网络带宽仅能
服务130~440个用户

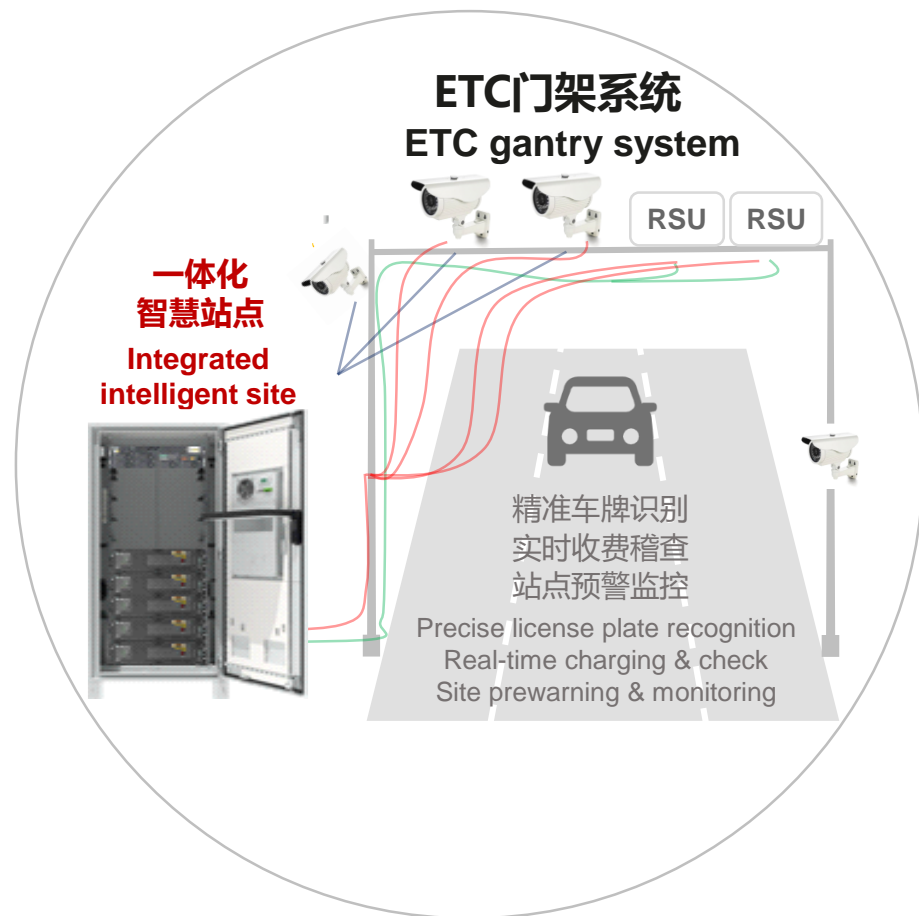
10 Gbit/s network bandwidth
serves only 130–440 users

CDN部署到基站机房
节省网络带宽

CDN in base station equipment room
saves network bandwidth

全国省界高速自由流，通过实时分析让交通更通畅

Real-Time Analytics Enables Free-Flow Highways Across Provinces



通行速度
客车 15秒 → 2秒
货车 29秒 → 3秒

Pass speed
Bus: 15s -> 2s
Truck: 29s -> 3s

车牌识别 40ms
应收费率实时精准核算
车型、颜色、行使行为检测

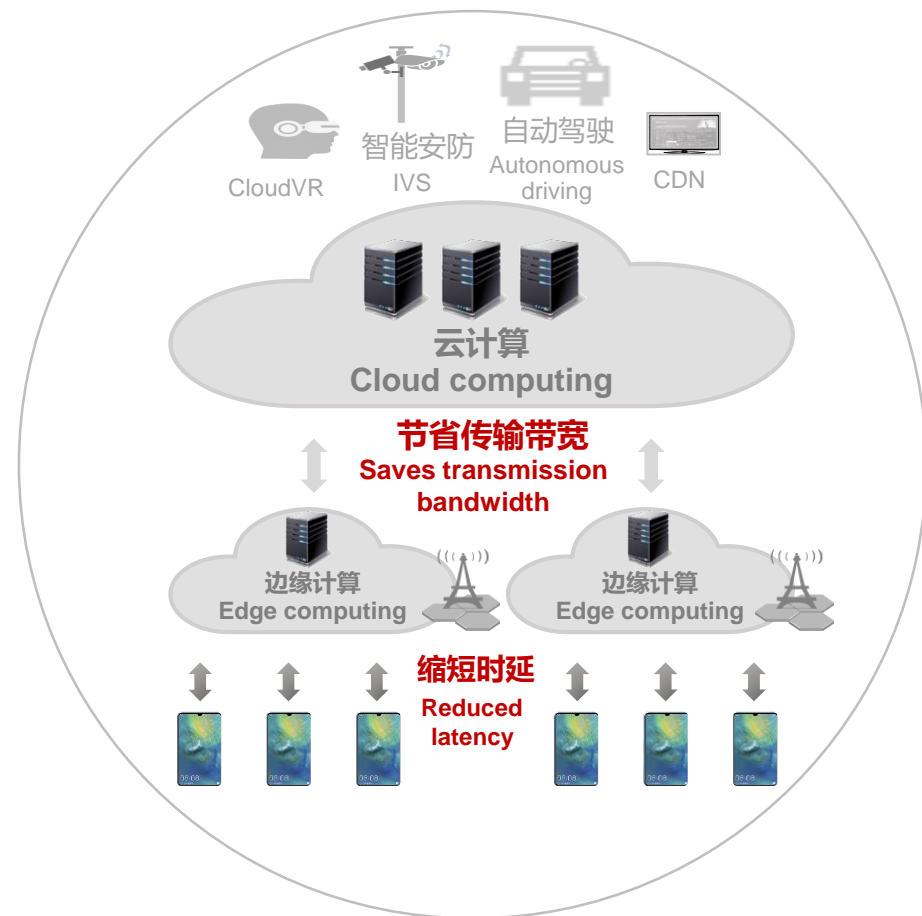
License plate recognized in 40 milliseconds
Real-time, accurate charging
Vehicle type, color, & behavior detection

TaiShan边缘服务器: 3400+台
Atlas 智能小站: 15000+套

TaiShan edge server: 3,400+ units
Atlas AI edge station: 15,000+ units

面向5G业务创新，构筑智能边缘的三大需求与挑战

Three Requirements & Challenges to Building Intelligent Edge in 5G Innovation Context



5G应用端边云协同部署，驱动计算架构创新

Device-Edge-Cloud Collaborative Deployment of 5G Apps Drives Computing Architecture Innovation

230亿 2018年ARM芯片发货量
23 billion Arm chip shipment in 2018

< 0.3亿 2018年DC通用CPU发货量
< 30 million DC general CPU shipment in 2018

Source: Linley, Gartner, Huawei MI



ARM具有“云边端算力同构”的天然优势，正在打破数据中心与边缘、终端间的界限，为开发者提供统一架构的计算平台

Arm has the natural advantage of homogeneous computing for cloud-edge-device. It is breaking the boundaries between data centers, the edge, and terminal devices, and providing developers with a unified computing platform.

多样性计算满足边缘计算差异化业务要求

Diversified Computing Meets Differentiated Service Requirements of Edge Computing

边缘业务多样, 数据多样, 高实时

Diversified edge services, diversified data, real-time demands

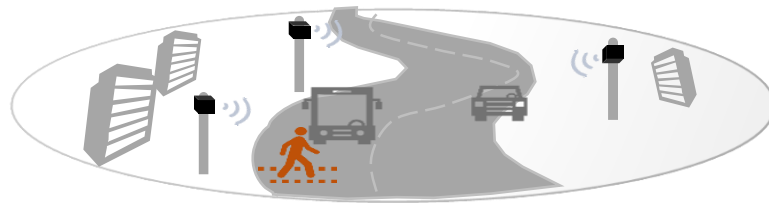
边缘计算平台尺寸、功耗、散热有诸多环境限制,
同时要求业务流的高速分析、转发和处理

智能安防
Intelligent security
protection



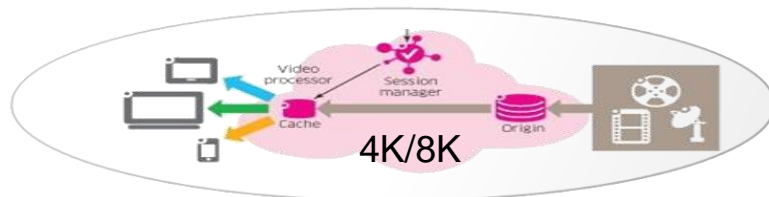
视频: 非结构化数据分析
报警: 结构化数据分析
Video: unstructured data analysis
Alarm: structured data analysis

自动驾驶
Autonomous
driving



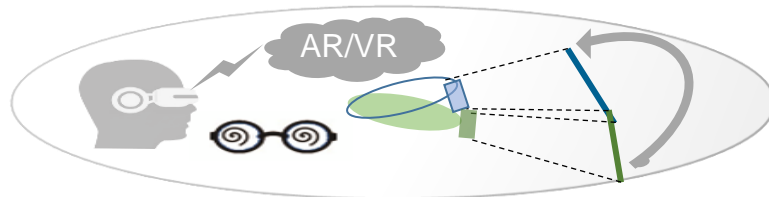
高强度计算
实时决策, 周期 < 10ms
Intensive computing
Real-time decision, cycle < 10 ms

CDN

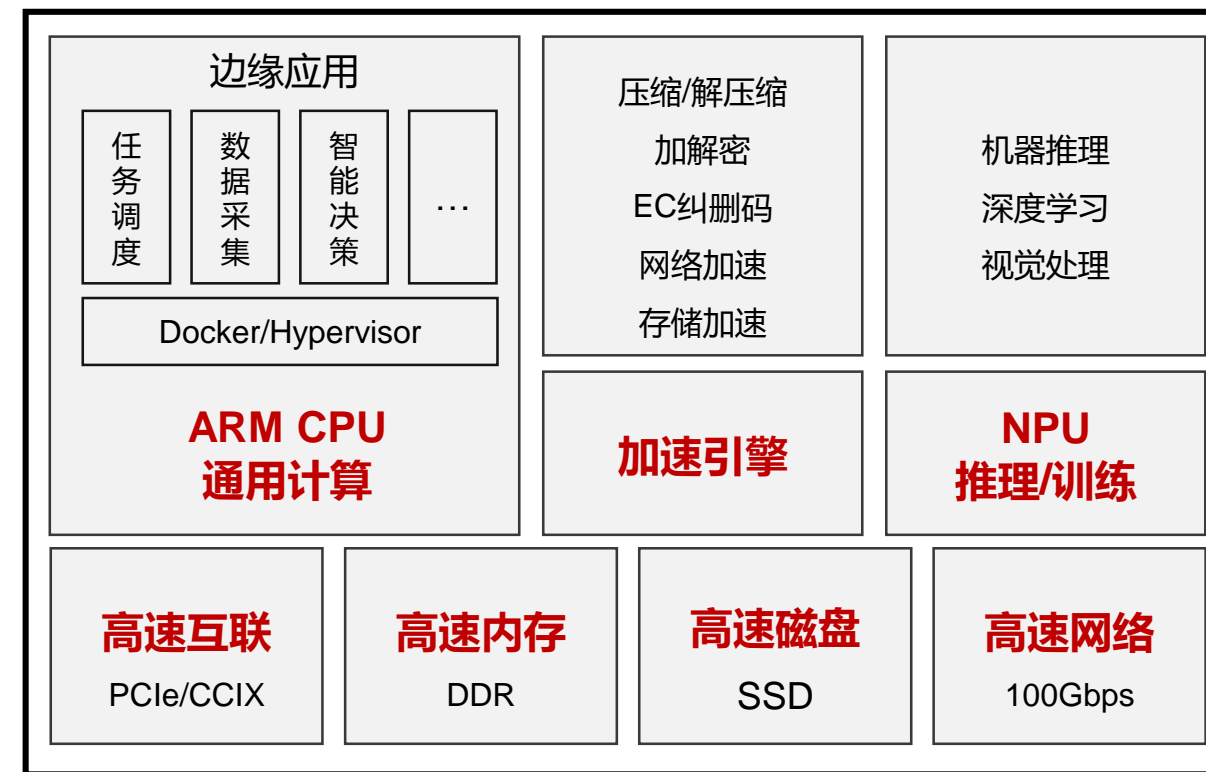


I/O 密集, 高通量
200+ Gbps 高速网络
Intensive I/O, high throughput
200+ Gbit/s high-speed network

CloudVR



VR/端游渲染
VR/Client gaming rendering

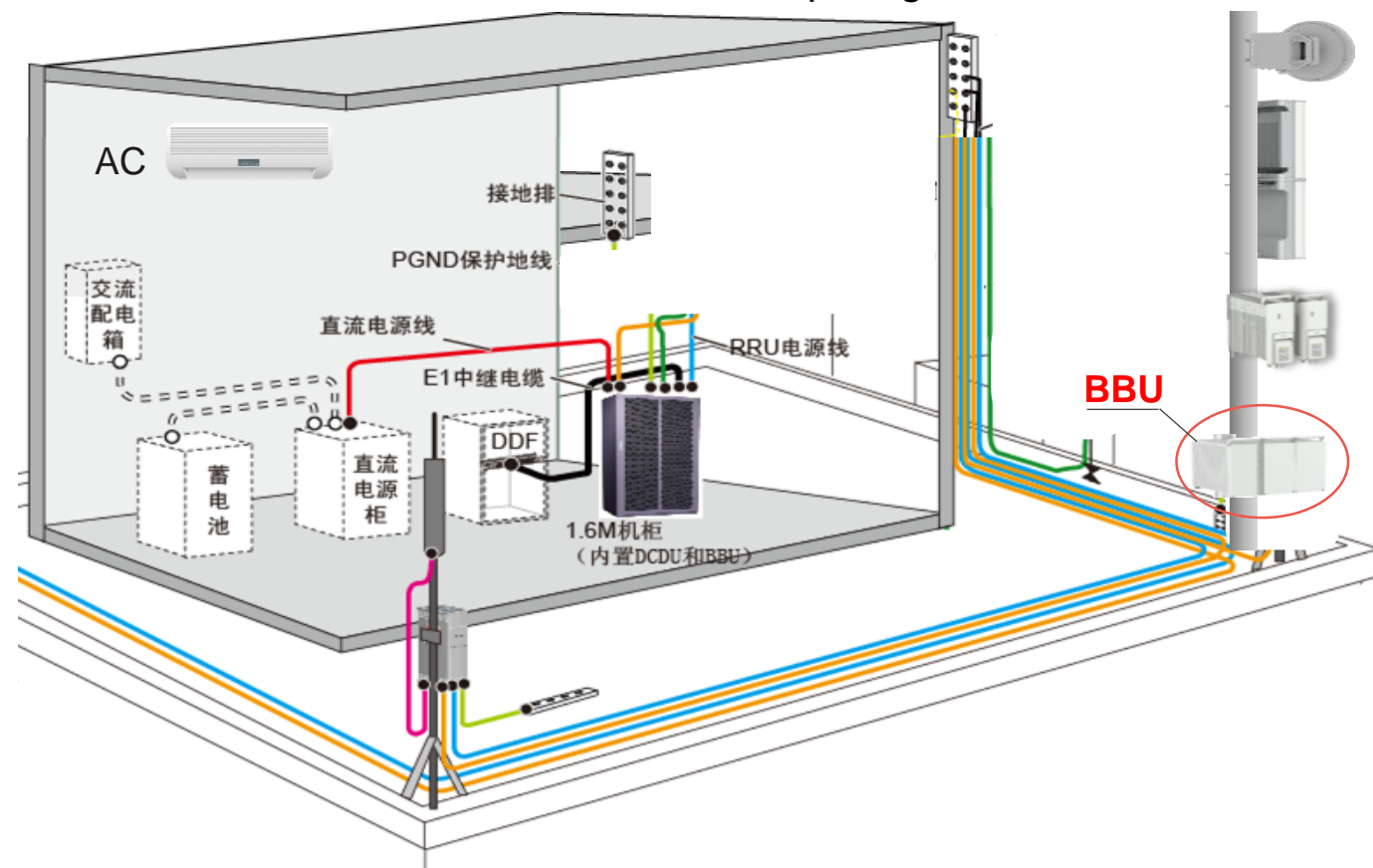


克服严苛边缘环境挑战，充分发挥5G站点资源优势

Overcome the Challenges of Harsh Edge Environments and Fully Leverage 5G Site Resources

接入站点 → 计算站点

Access site -> Computing site



- **运营商基站接入机房密集**

Dense base station equipment rooms of carriers

全国640万个移动基站，市区间距500米，郊区间距2公里

6.4 million mobile base stations in China (every 500 m in urban areas and 2 km in suburban areas)

- **5G基站演进，免机房部署，释放站点资源**

5G base station evolution frees up site resources for edge servers

刀片式基站，BBU池化等

Blade base stations and BBU pooling etc.

- **ECII标准的边缘服务器，最大化适应基站机房条件**

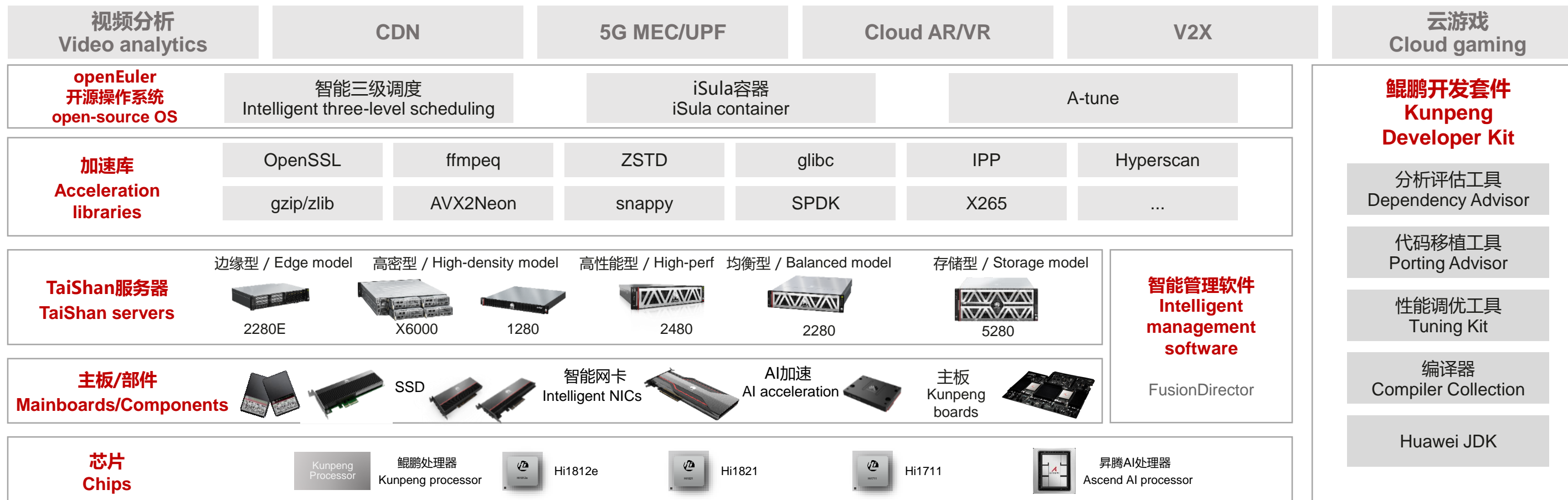
ECII standard edge server, maximized adaptability to equipment room conditions

机柜尺寸、供电、适应温度等

Cabinet dimensions, power supply, and temperature etc.

鲲鹏计算平台，把高性能计算带入边缘与数据中心

Kunpeng Computing Platform Brings High-Performance Computing to the Edge and Data Centers



全“芯”布局 Holistic Core Chip Layout

鲲鹏处理器 / Kunpeng processor

工艺: 7nm 多核: 64核 / Process: 7nm; multi-core (64 cores)

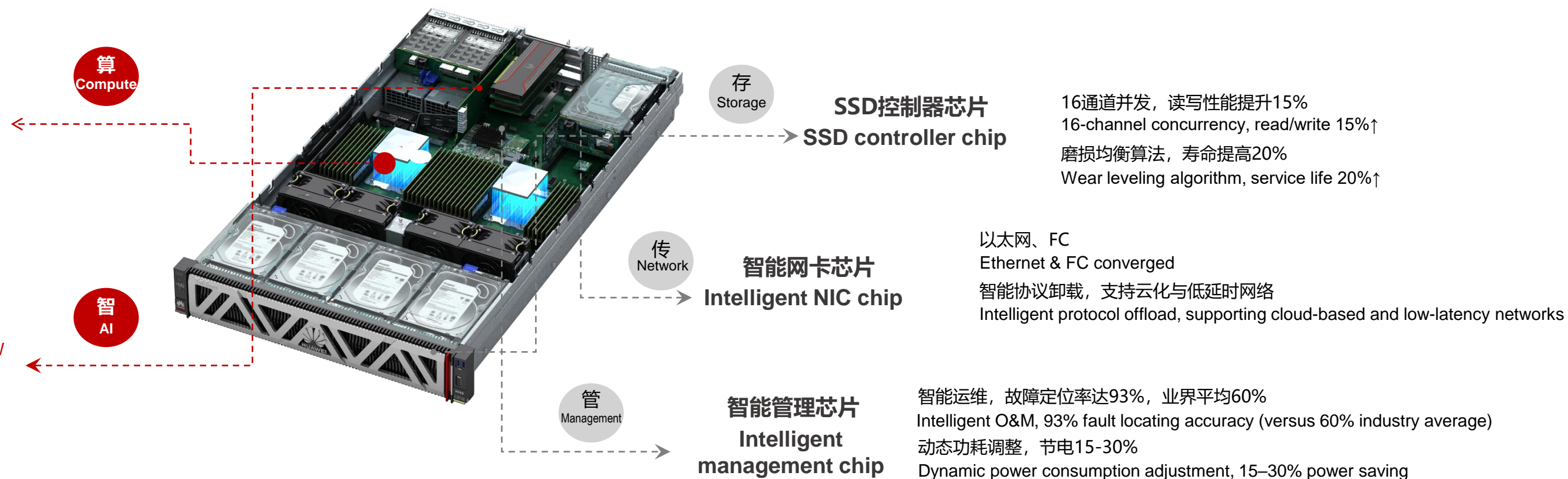
内存: 8通道 / Memory: 8 channels

接口: PCIe 4.0 & 100GE / Interface: PCIe 4.0 & 100GE

昇腾AI处理器 / Ascend AI processor

昇腾310: 极致高效AI SoC, 提供2TOPS/W高能效比
Ascend 310: AI SoC of ultimate energy efficiency, up to 2 TOPS/W

昇腾910: 算力最强AI处理器, 单芯片256FLOPS算力, 业界两倍
Ascend 910: the most powerful AI processor, 256 FLOPS per chip, twice the industry counterpart



面向5G创新，最强算力TaiShan边缘服务器 / The Most Powerful TaiShan Edge Server for 5G Innovation

满足ECII标准，支持MEC、CDN、云游戏/云手机、视频监控、智慧园区等智能边缘场景

ECII-compliant, for intelligent edge scenarios such as MEC, CDN, cloud gaming, cloud phone, video surveillance, and smart campus

TaiShan 200服务器 型号: 2280E
TaiShan 200 server, 2280E model



128核

100G网络

PCIe 4.0

128 cores

100G network

PCIe 4.0

类别		规格
处理器		2*鲲鹏920, 共128核, 2.6GHz
机箱		2U x 447mm x 490mm (前面板到电源插槽仅435mm)
风扇		4*8038+风扇
电源		1200W-2000W, 1+1冗余
内存		16*DDR4内存插槽
适应温度		短期-5°C~55°C; 长期0°C~45°C
接口	接口	6*PCIe 4.0
	板载IO	VGA, 2*USB 3.0、GE、串口
	扩展IO	(6*全高半长IO卡 或 2*全高全长IO卡) + 1*板载灵活插卡 (支持GPU加速卡, Atlas AI加速卡等)
硬盘	配置1	10*2.5" SAS/SATA/SSD硬盘
	配置2	8*2.5" NVMe SSD硬盘+2*2.5" SAS/SATA/SSD硬盘

Atlas 500智能小站，满足严苛的边缘部署场景设计，让AI无处不在

Atlas 500 AI Edge Station: Brings Pervasive AI, Even in Harsh Edge Environments



- 16 TOPS INT8
- 25-40 W
- 支持WiFi & LTE
Wi-Fi & LTE supported
- 16路高清视频实时分析
16-channel HD video real-time analytics
- 无风扇设计 | -40°C 至 +70°C
Fanless design, stable at -40°C to +70°C

低温 | 高温 | 沙尘

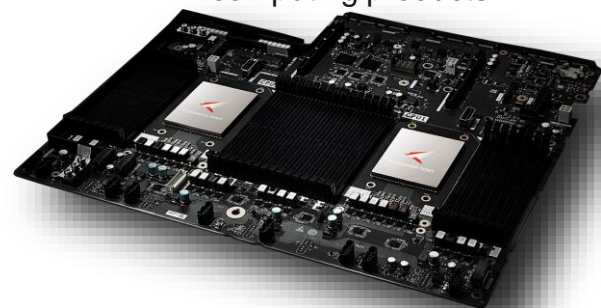
Extreme cold | Extreme hot | Heavy dust



构筑面向智能边缘的全场景生态 Build an All-Scenario Ecosystem for the Intelligent Edge

硬件开放、软件开源 Open hardware & Open-source software

鲲鹏主板开放，使能合作伙伴打造多样化计算产品
Open Kunpeng boards and enable partners to build diversified computing products



openEuler开源，
使能操作系统
Enabling open-source OS

<https://openeuler.org/zh/>

应用迁移，开发使能 App porting & Dev enablement

一站式鲲鹏开发者社区
One-stop Kunpeng Developer Community



- 应用迁移工具：90% C/C++和50%汇编自动移植
Porting Advisor: automatic porting of 90% C/C++ and 50% assembly
- 性能优化工具：调优效率提升5倍
Tuning Kit: 5x tuning efficiency
- 华为编译器：编译优化，程序性能提升15%
Compiler Collection: optimized compilation and 15% higher program performance

合作共赢生态 Win-win collaborative ecosystem

场景	5G	IoT	SDN/NFV	AI	边缘云	智能安防
应用	大数据	存储	Web	数据管理	HPC	
应用软件	hadoop, spark, TRANSWARP, FusionInsight	ceph, FusionStorage	NGINX, FusionStorage	SCUTECH, EISOO 爱数	OpenVFOAM, WRF, SU2, NEMO, GATK, CANU	
基础软件	操作系统	虚拟化	数据库	中间件		
	ubuntu, CentOS, deepin	openstack, KVM, FusionSphere	redis, GBASE 南大通用, 达梦数据库, GaussDB	Java, OpenJDK, Kingdee, 用友, 中创中间件, EICOS		

沃土计划：5年投入15亿美金，发展500万软/硬件开发者
Huawei Developer Program: Invest USD1.5 billion in 5 years to develop 5 million software/hardware developers

Key Take-Aways

1. **5G正在催生出更多大带宽、低时延的创新业务，边缘计算适逢其时。端边云算力协同、多样性计算诉求和快速部署落地是边缘计算发展三大挑战。**

5G is incubating more innovative services demanding high bandwidth and low latency, and edge computing comes in the right time. Edge computing development faces 3 challenges: device-edge-cloud collaborative computing, diversified computing requirements, and rapid deployment.

2. **华为鲲鹏全栈计算平台，把强劲算力和高性能带入边缘和数据中心。**

The Huawei Kunpeng full-stack computing platform brings powerful computing and high performance to the edge and data centers.

3. **面向5G创新的最强算力TaiShan边缘服务器，全面支持MEC、CDN、云游戏/云手机、视频监控等多种智能边缘场景。**

Huawei TaiShan server-2280E is the most powerful edge server for 5G innovation. It fully supports multiple intelligent edge scenarios such as MEC, CDN, cloud gaming, cloud phone, and video surveillance.



智联5G 绽放边缘

2019边缘计算产业峰会
Edge Computing Industry Summit 2019

THANK YOU