

DATA & STORAGE MATTERS FOR END USERS

Steven Tan

SODA Foundation Chairman
VP & CTO Cloud Solution - Storage, Futurewei



TOMOKO KONDO

DIRECTOR, CLOUD ENGINEERING DEPARTMENT





VEI

GENERAL MANAGER, IAAS PRODUCT DIVISION

中国移动
China Mobile



ABOUT CHINA MOBILE PUBLIC CLOUD - ECLCLOUD

Ecloud -The Fastest Growing Cloud Vendor in China

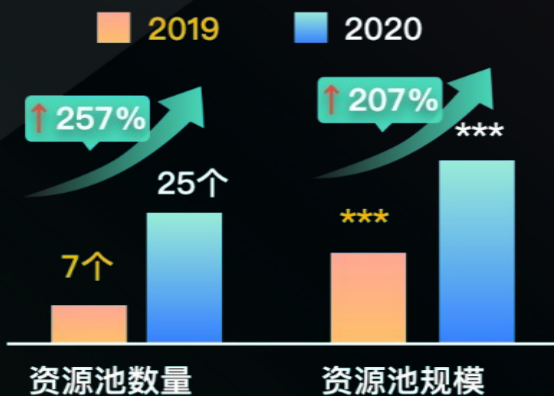
- Build for telecom - 5G+Cloud Dual-Engine/Cloud Network Coverage
- Work for everyone - High-Speed Market Growth



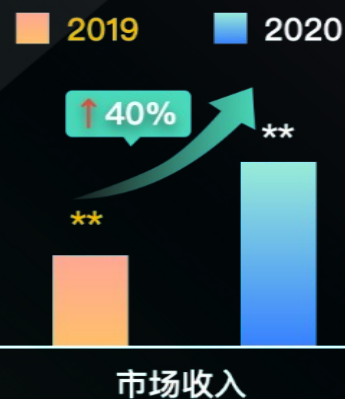
- **backbone** of digital industrialization
- the carrier of 5G+AICDE

- **enabler** of industrial digitization
- a starting point for cultivating the industry

AZs/Regions Expansion



Market Revenue



Product Launch



ECLOUD INFRASTRUCTURE OVERVIEW

With the "**Centralized Management, Unified Division, and Hierarchical Construction**" principle, China Mobile offers 25 regions across the mainland, and **the provincial coverage rate exceeds 80%** (As of December 2020, excluding Hong Kong, Macao and Taiwan).

Provide standard public cloud services across the mainland
(11 central regions + 2 low-cost regions)

Central Regions
Eastern Area, Southern Area, Western Area, Northern Area, Central Region, Low-cost Region

Provides dedicated cloud service (12 provincial regions)

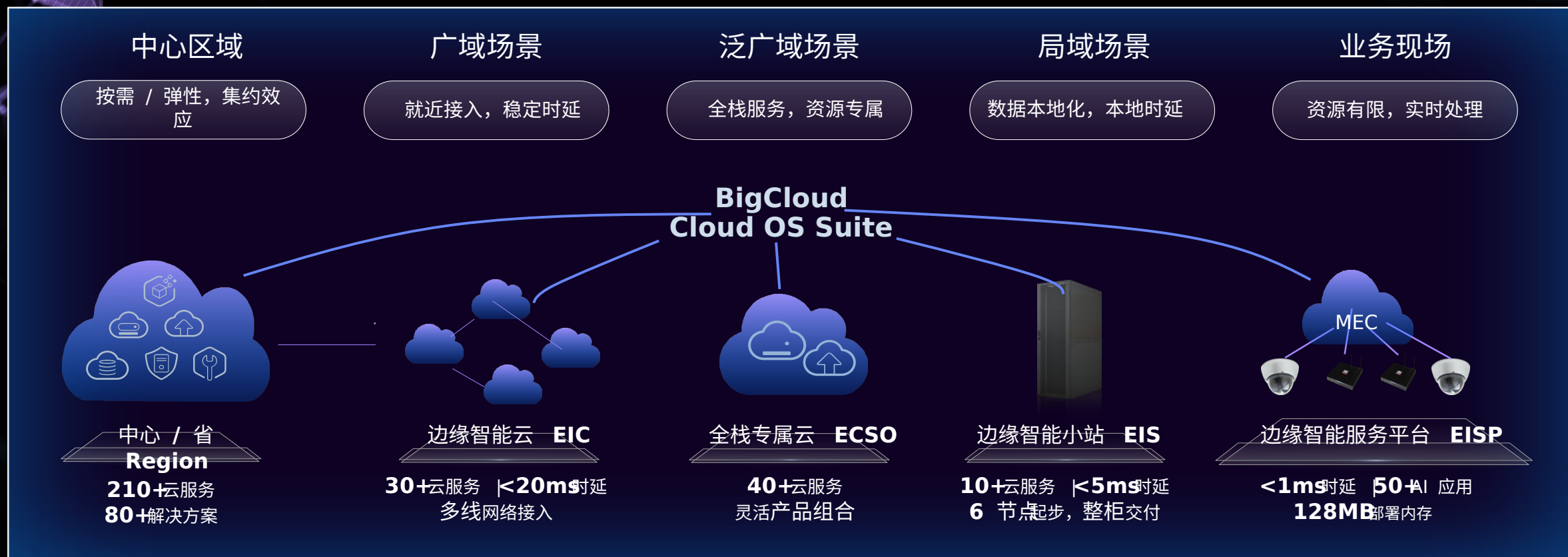
Provincial Regions
Liaoning, Anhui, Jiangxi, ...

Certifications



UNIFIED TECHNICAL STACK VIA BIGCLOUD Cloud OS Suite

- Taking independent development strategy by building Cloud OS Software Suite - BigCloud
- Targeting for central region/edge zone, and WAN/LAN scenarios



UNIFIED CLOUD STORAGE PERSISTENT LAYER via Megrez ENGINE

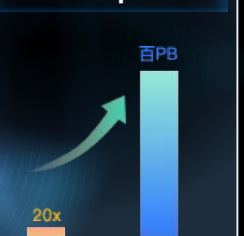
Multi-Purpose Storage Application

- block storage
- file storage
- object storage/archive storage
- table storage(2022 GA)

Purpose-Built Persistent Engine

- Optimizing for heterogeneous hardware characteristic
- Flexible tuning space for storage application characteristic

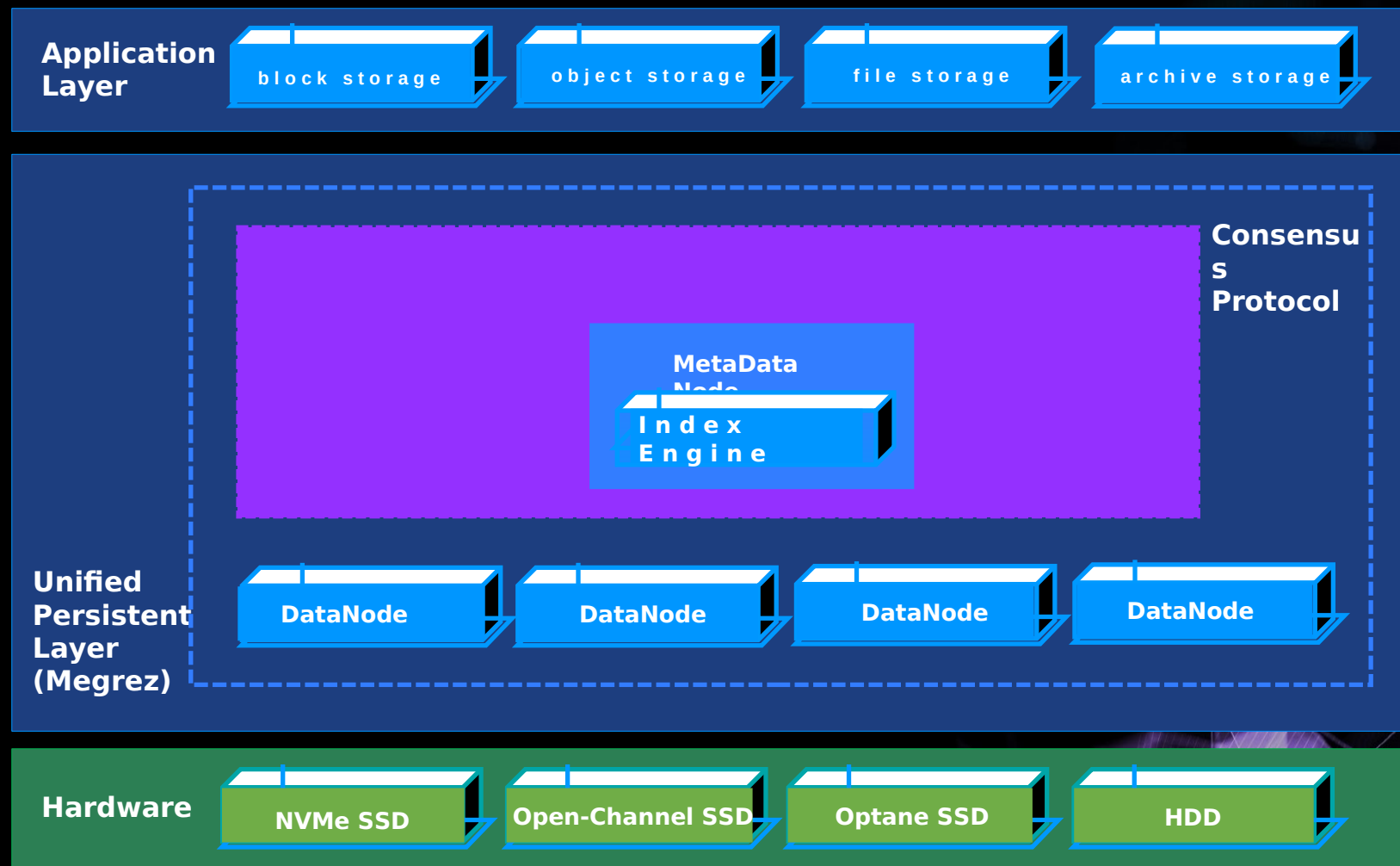
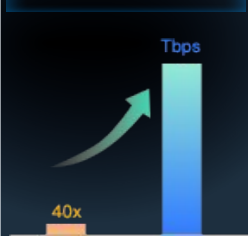
PB-level per bucket



10B-level per bucket



Tbps Level per bucket



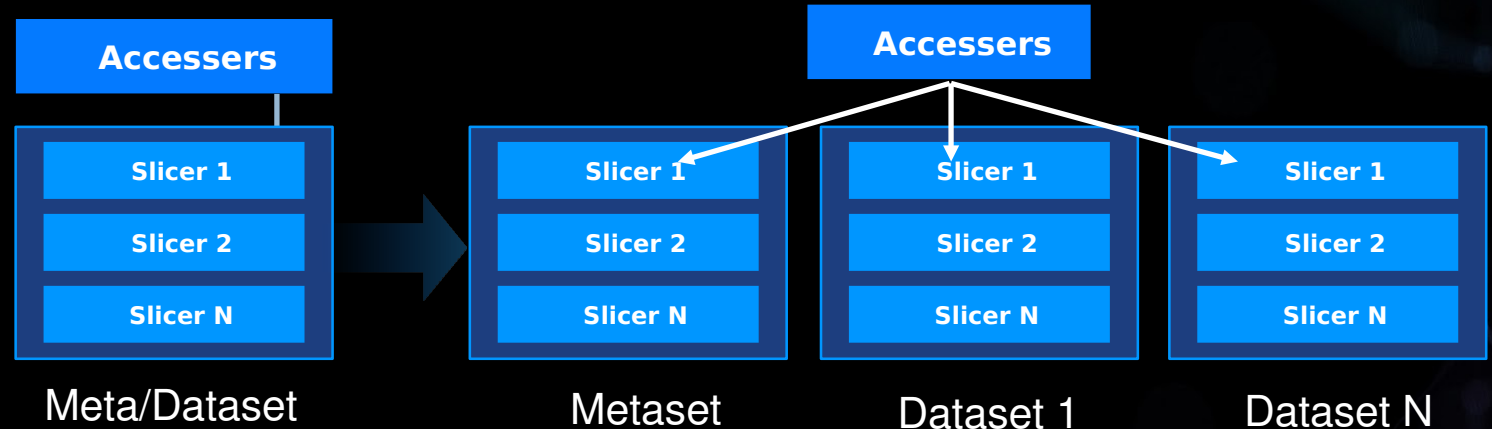
WE' BUILDING A TELECOM-LEVEL STORAGE MESH VIA OBJECT STORAGE

Scalability Challenge:

- Capacity is limited by DataSet size
- A single bucket can hold only several petabytes of data
- A single bucket can hold no more than one billion objects

Availability Challenge:

- AZ/Region Level disaster



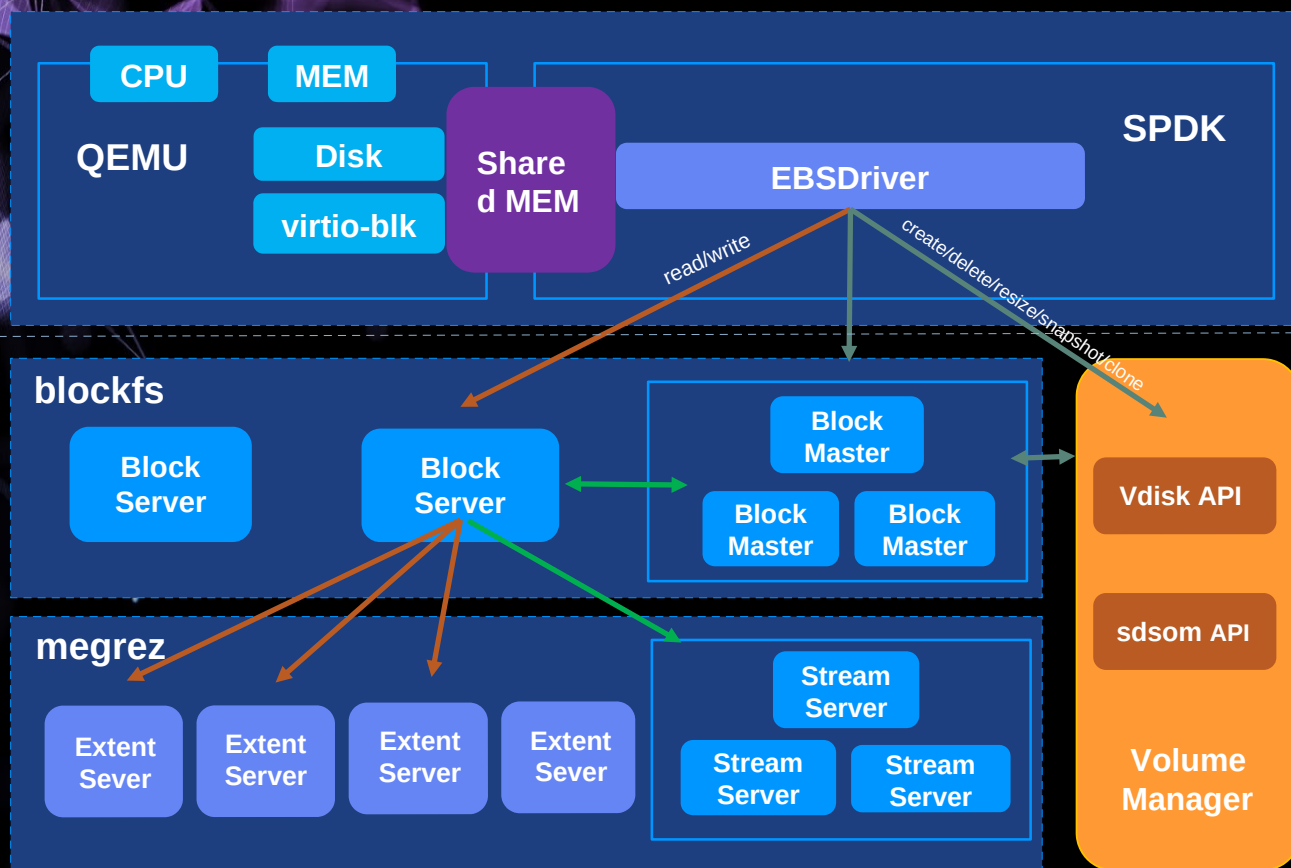
Scalability Solutions:

- ✓ Single Bucket can hold over 100 petabytes of data
- ✓ Single Bucket can hold over 10 billions of objects
- ✓ No data rebalance in expansion

Availability Solutions:

- ✓ Multi-region active-active architecture
- ✓ Erasure code across multiple AZs/regions

BLOCK/FILE STORAGE PROBLEMS & SOLUTIONS



Achievements:

- IOPS per vdisk: 1000000 IOPS
- Bandwidth per vdisk: 4GB/s
- Lantency per vdisk: 200 microseconds

Solutions

- Light-weight thread, lockless programming
- Asynchronous IO, auto concurrency QoS
- Network optimization, RDMA support
- Full path user space IO, vhost 、 VFIO 、 SPDK etc

data IO

metadata IO

USE CASE: END-USER HOME SECURITY PROTECTED BY ECLCLOUD



User Portal



Ecloud Master

Local Master

Service Center
(active-active)

Business platform

Operating platform

Business platform

Operating platform

Storage Management platform

Scheduling platform

Storage Management platform

Scheduling platform

Dual Center

sync

Ecloud



P2P

Media Forwarding



EOS

Devices Scheduling

Storage Node
(31 edge nodes)

Uploading video segments

Uploading video segments

Devices Layer



Devices in Hunan



Devices in Fujian

SmartHome Project Resource Usage

100+PB

800+Gbps

400+TPS/PB Delete

3200+ ECS

Instances

#sodacon2021

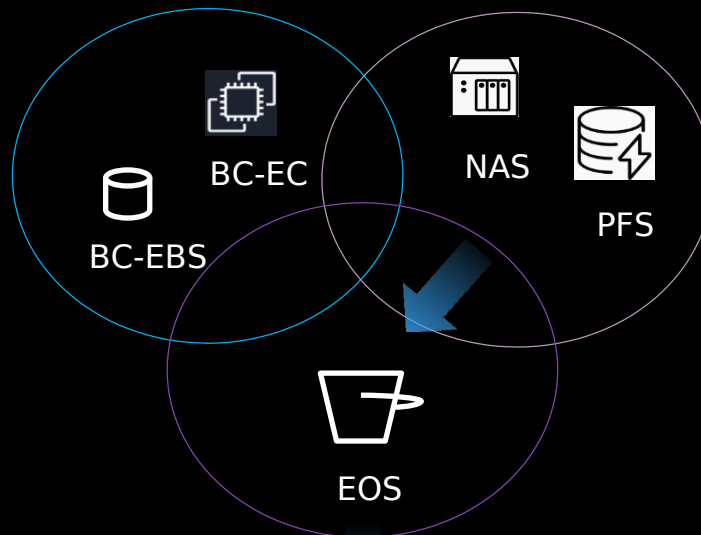
HOW CAN SODA HELP

BACKUP

Backup block/file storage to the object-based storage by S3 interface

REQUIREMENT

Provides more powerful disaster resilience ability (for example, backup block/file storage to multi-cloud s3 storage)



OBJECT STORAGE

- Standard Storage
- Low-frequency Storage
- Archive Storage

REQUIREMENT

Integrate China Mobile big cloud S3-compatible storage into SODA multi-cloud object lifecycle management



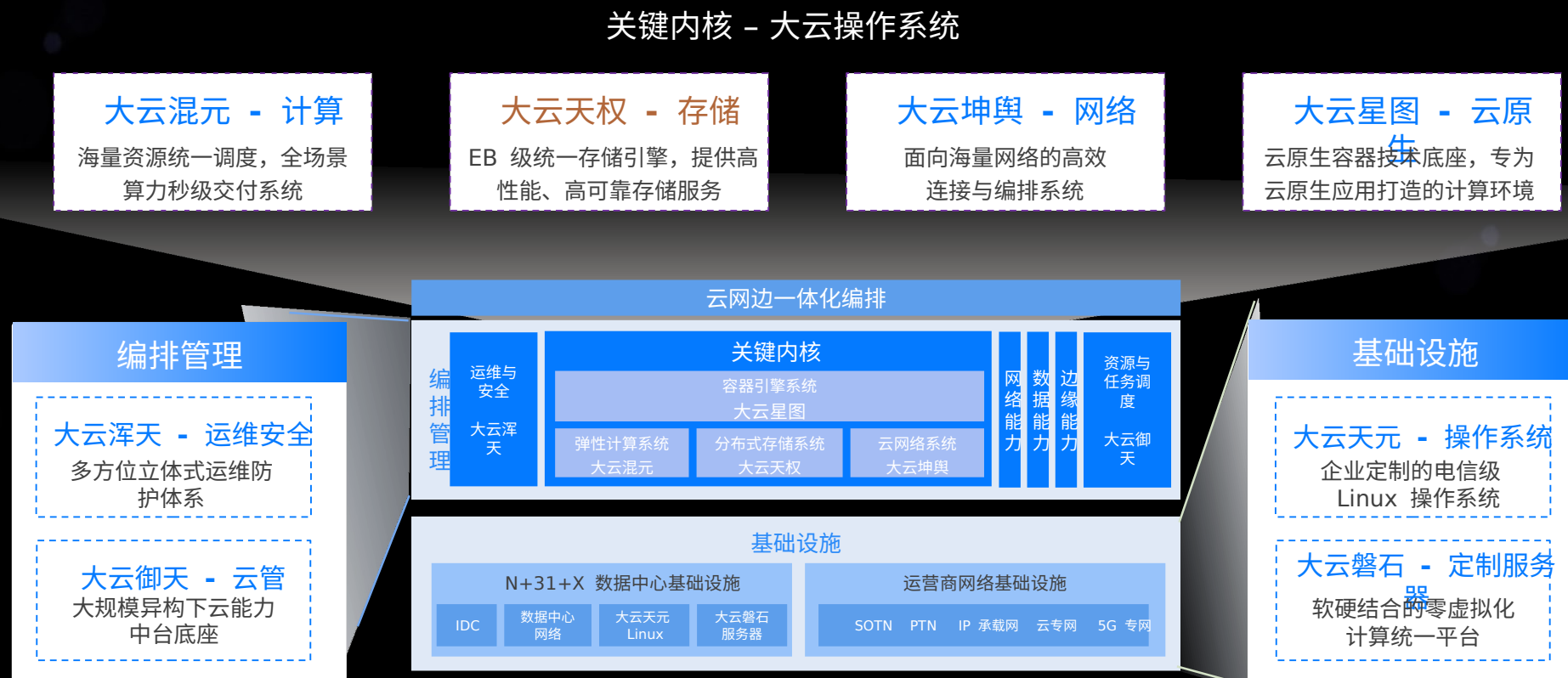
KEI KUSUNOKI

MANAGER, INNOVATION CENTER



ECloud powered by BigCloud Cloud OS Suite

云将全球百亿级设备打造成一台“超级计算机”，自主研发整合**芯片、虚拟化、分布式存储、软件定义网络、原生安全、资源调度**等关键技术的云操作系统将直接决定云计算领域的核心竞争力。移动云聚焦云操作系统关键技术，15 年深耕取得重大突破，已完成由“**基于开源的能力内化**”走向“**创新驱动的原创闭源**”的蜕变，围绕云网一体的理念打造**原生云计算核心架构和产品体系**，真正实现全面自主可控。





XIN ZHONG

CTO, SMART CLOUD BUSINESS UNIT





Thank You