OBSERVATION & INSIGHT

01

Economic Impact

GFLOPS per Capita is roughly proportional to GDP per capita

GFLOPS per Capita values (by country):
- India: 103
- Turkey: 307
- Brazil: 441
- Russia: 454
- Columbia: 457
- Thailand: 470
- Mexico: 489
- China: 553
- Saudi Arab: 683
- Italy: 799
- Japan: 956
- S Korea: 1,008
- Canada: 1,164
- Germany: 1,392
- UK: 1,522
- UAE: 1,784
- Singapore: 2,132
- USA: 2,522
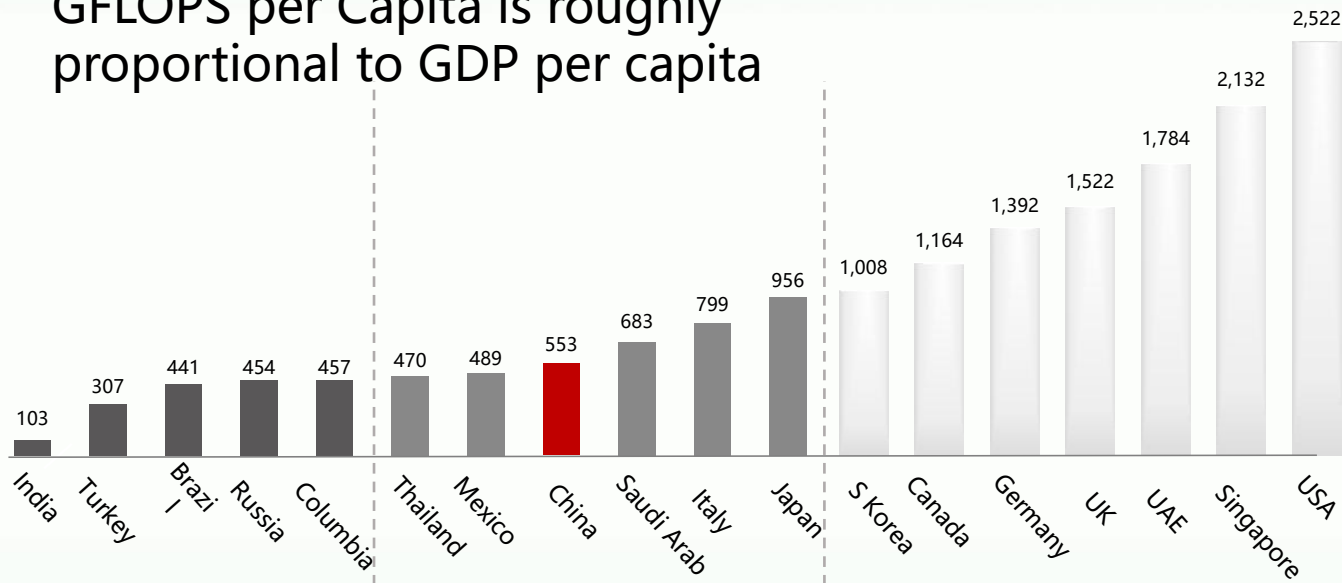
GFLOPS : Giga Floating-point Operations Per Second,

Typical ROI of Computational Capacity
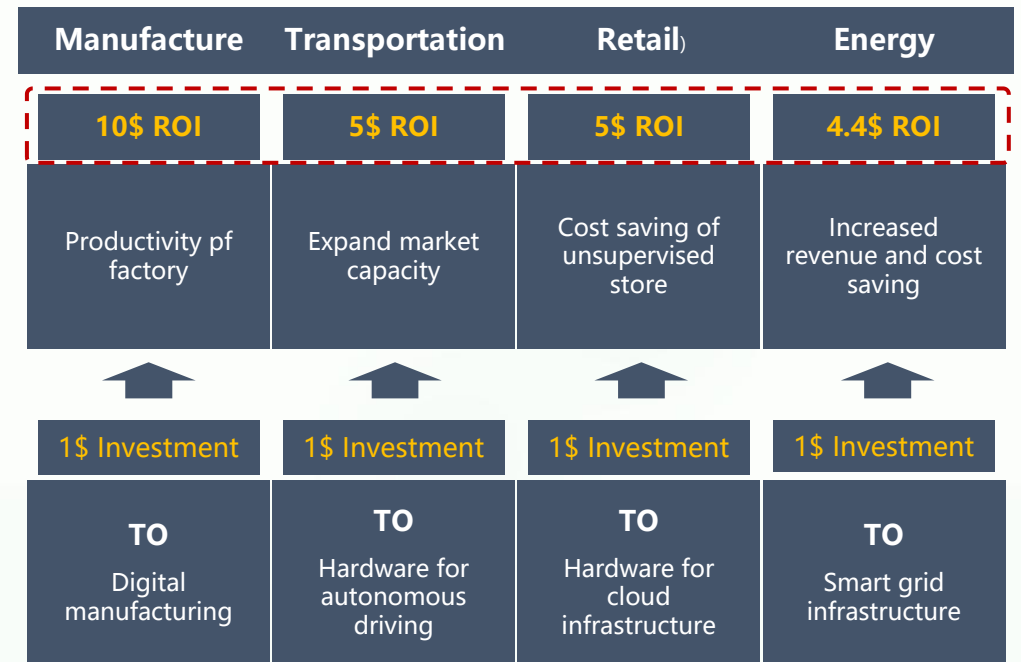
Manufacture	Transportation	Retail)	Energy
10$ ROI	5$ ROI	5$ ROI	4.4$ ROI
Productivity pf factory	Expand market capacity	Cost saving of unsupervised store	Increased revenue and cost saving
↑	↑	↑	↑
1$ Investment	1$ Investment	1$ Investment	1$ Investment
TO	TO	TO	TO
Digital manufacturing	Hardware for autonomous driving	Hardware for cloud infrastructure	Smart grid infrastructure

Source: <Ubiquitous Computational Capacity: Cornerstones for an Intelligent Society>(Link)

Investment Prediction of Global Computing Industry (in USD)

2023年全球计算产业投资额(美元)

Storage
31.1B

企业
存储
311亿

Infrastructure Software
152.5B

Server
112.1B

Database
56.9B

Public Cloud
IaaS
141B

服务器
1121亿

数据库
569亿

基础架构
软件
1525亿

公有云
IaaS
1410亿

CN: ~10%

Middleware
43.4B

中间件
434亿

大数据
平台
410亿

Bigdata Platform
41B

企业应用
软件
4020亿

数据中心
管理服务
1595亿

Database
Management Service
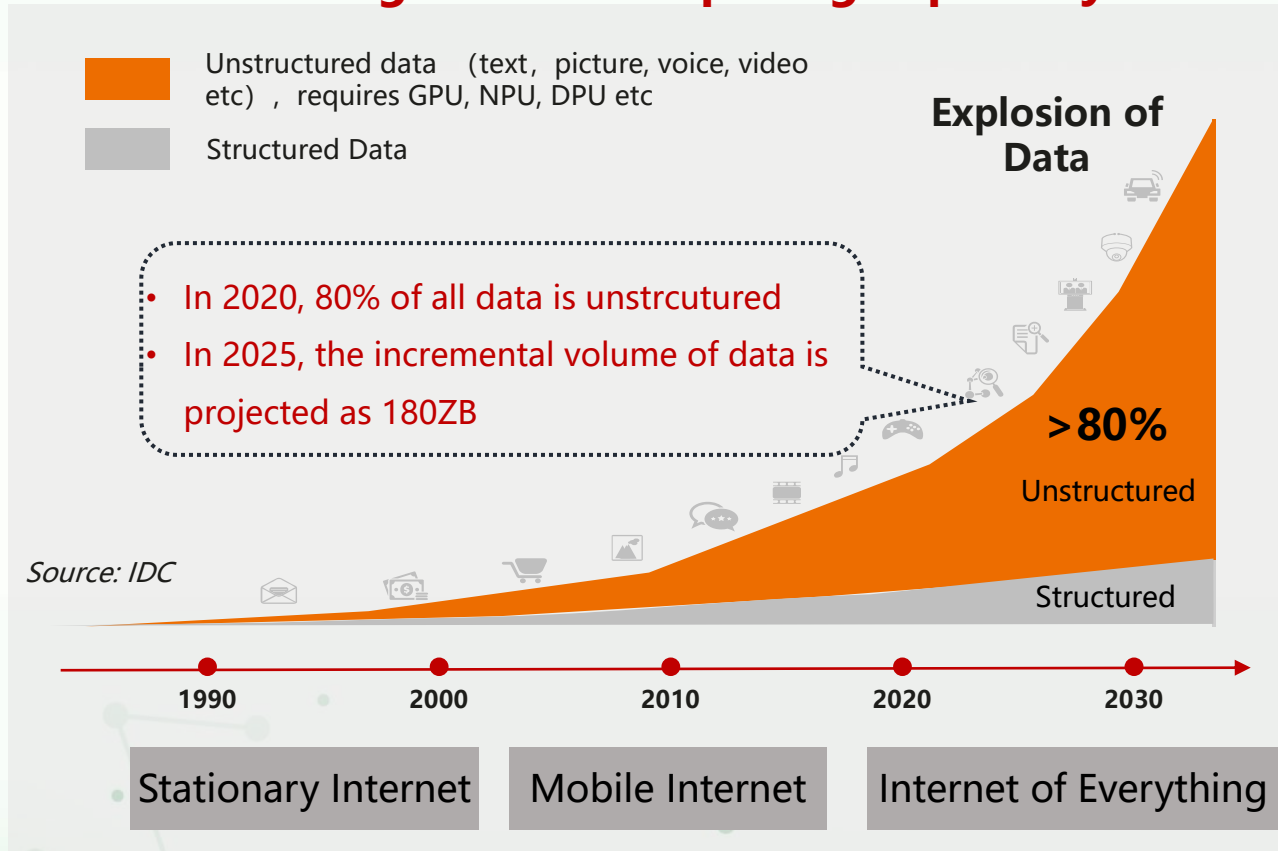159.5B

Enterprise
Application Software
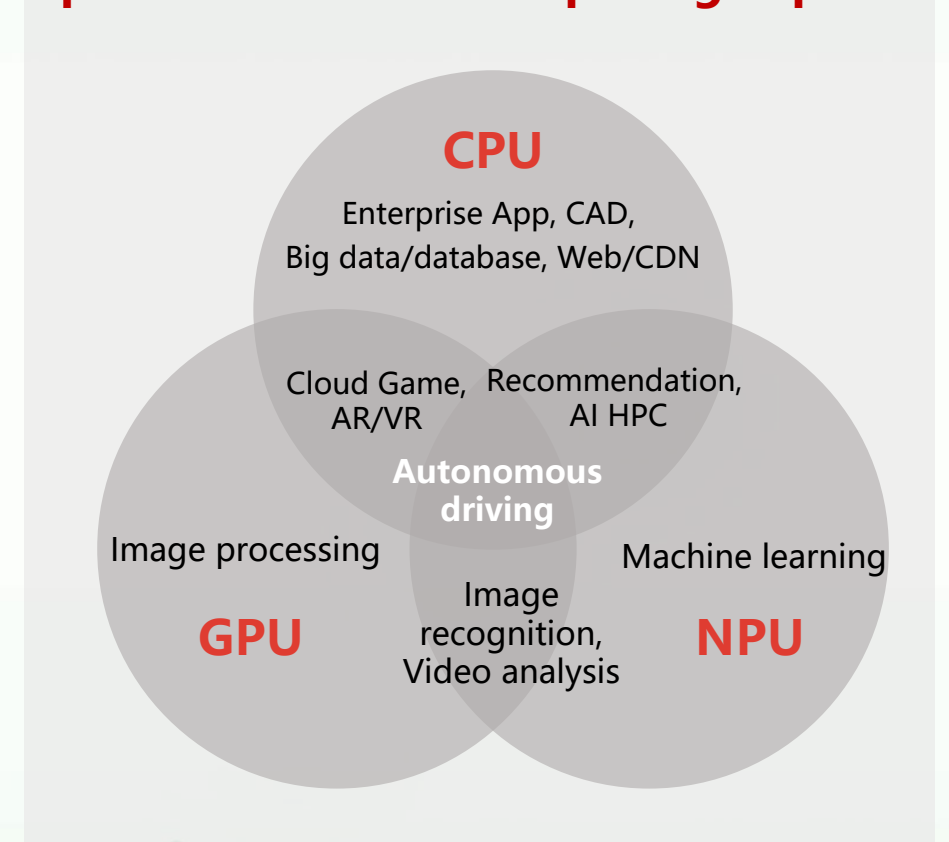402B
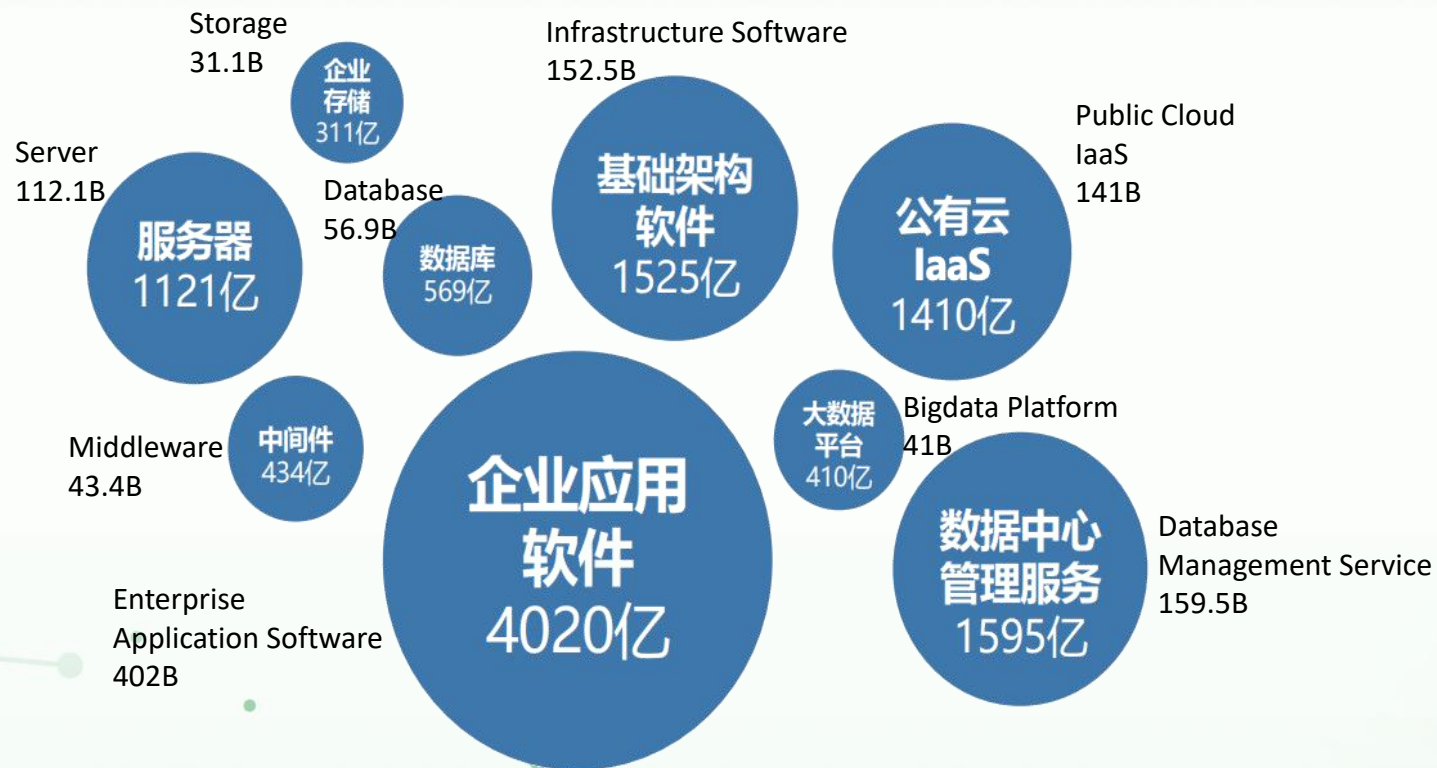
图 1-2 2023年全球计算产业投资额

Source: IDC report

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An Era of Diverse, Massive, Heterogenous

The rise of massive unstructured data drives growth of the heterogeneous computing capability

- Unstructured data (text，picture, voice, video etc)，requires GPU, NPU, DPU etc
- Structured Data

Explosion of Data

- In 2020, 80% of all data is unstrcutured
- In 2025, the incremental volume of data is projected as 180ZB

>80%
Unstructured

Source: IDC

Structured

1990　2000　2010　2020　2030

| Stationary Internet | Mobile Internet | Internet of Everything |

Diverse applications deployed together requires combined computing capabilities

CPU
Enterprise App, CAD, Big data/database, Web/CDN

Cloud Game, AR/VR　Recommendation, AI HPC

Autonomous driving

Image processing　　Machine learning

GPU　Image recognition, Video analysis　**NPU**

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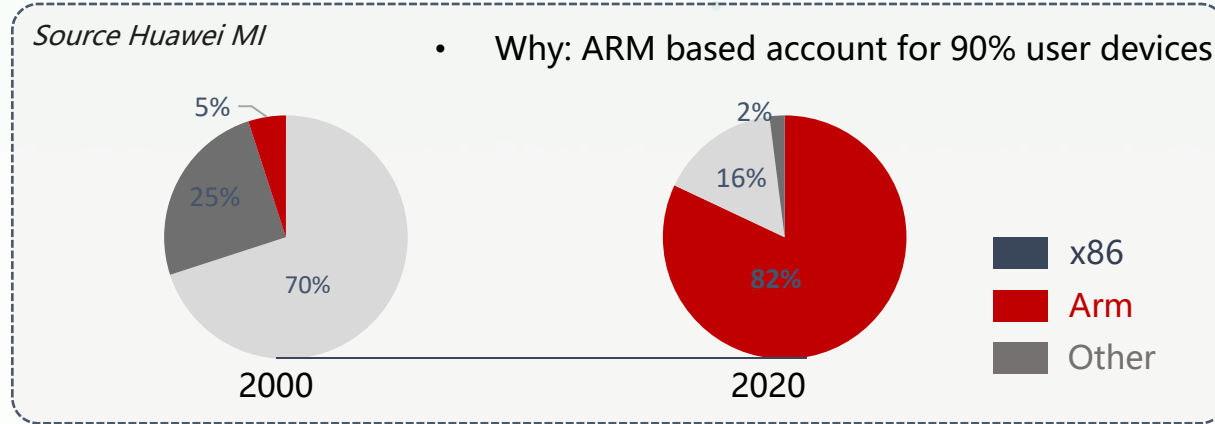
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Steady Growth of ARM based Computing Capacity

Source Huawei MI

- Why: ARM based account for 90% user devices

2000
- 5%
- 25%
- 70%

2020
- 2%
- 16%
- 82%

- ■ x86
- ■ Arm
- ■ Other

Capacity Growth: 5 time to X86

source Huawei MI

X86 Growth
60,000T MIPS per Year

Arm Growth
300,000T MIPS per Year
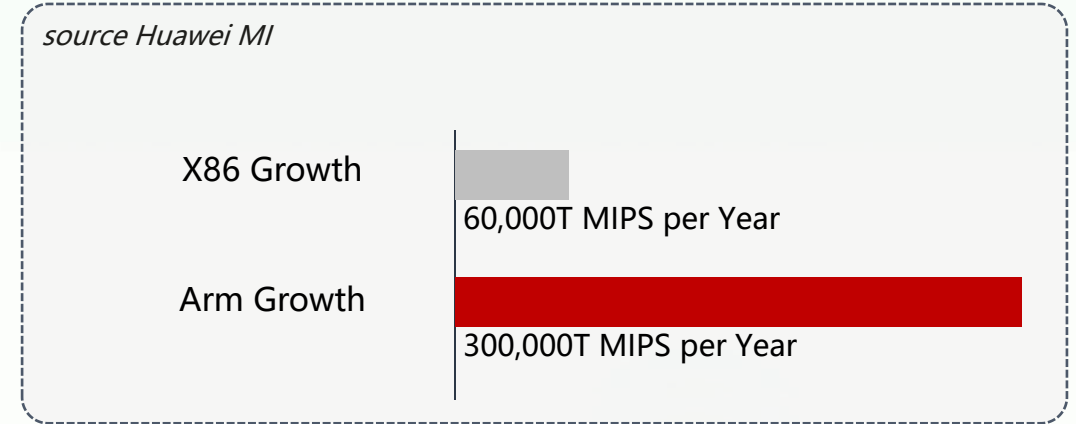
ARM based computing capability, a new choice of general purpose computing

Smart Phone

Tablet

AR/VR

Smart Watch

Smart TV

Wrist Band

ARM **95%**

ARM **98%**

ARM > **70%**

HPC — Fujitsu Fugaku, No.1 in Super Computer TOP500

Public Cloud — AWS, Azure, Huawei cloud deployment

Chips — Available in market: Huawei(64 cores), Phytium(64 cores), Ampere(80 cores), Marvell(96 cores)

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CONSORTIUM INTRODUCTION

02

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Launching

Established in 2016, under the supervision of MIIT of China. CESI accommodates the secretariat. Current there are 100+ members, including vendors of IP core, chip, box, OS, software, also engineering integrators, universities, institutes).

Vision

Under the trend of open source software and open hardware, aggregates global players, based on open ARM computing technology, brings value to user community by fostering energy-efficient and user-friendly products and ecosystem.

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GCC or OpenGCC for short

Value Positions

1. A platform for technology innovation and standards development
2. A Platform for global collaboration
3. A Platform to foster industry chain
4. A Platform to expand ARM based computing industry

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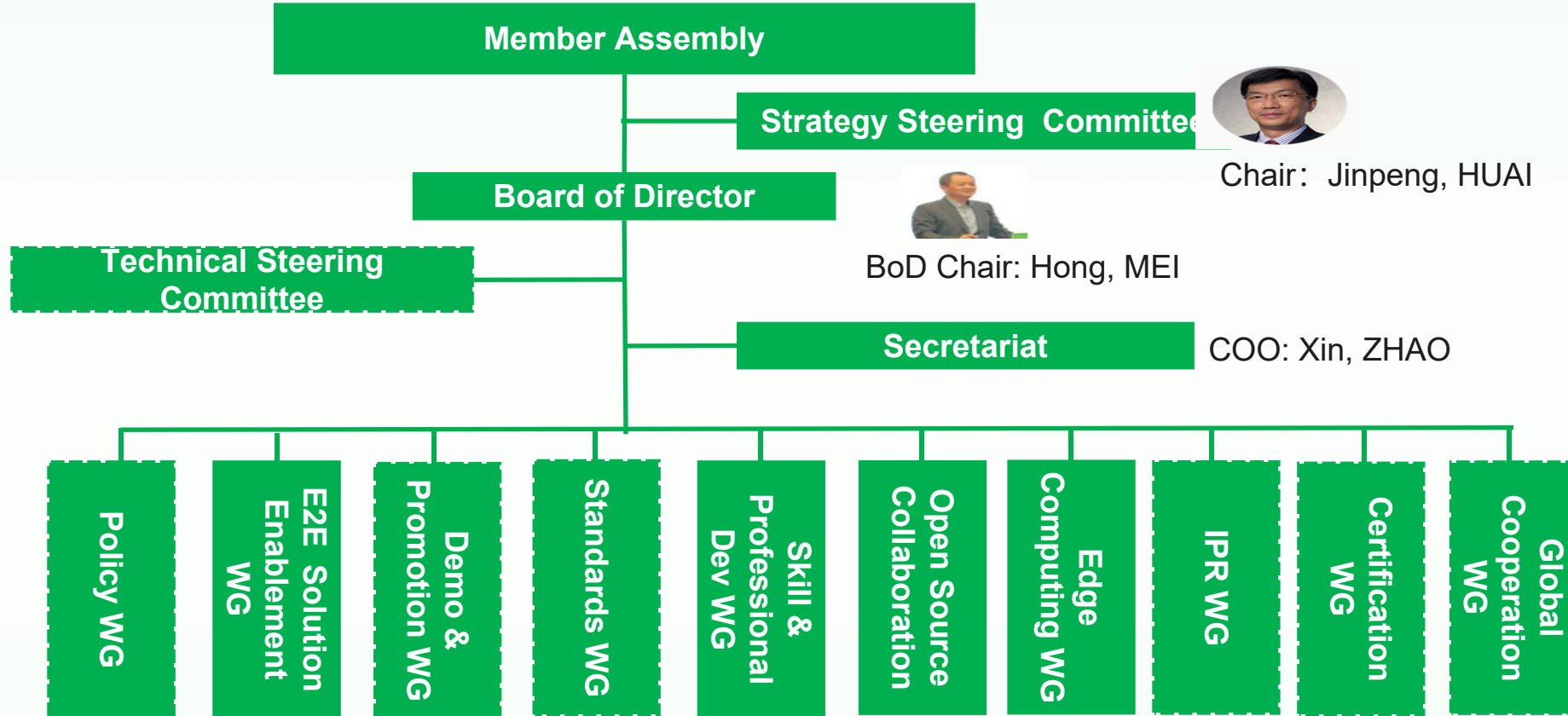**A Platform for Full Stack Ecosystem**
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Member Assembly

Strategy Steering Committee

Chair：Jinpeng, HUAI

Board of Director

BoD Chair: Hong, MEI

Technical Steering Committee

Secretariat COO: Xin, ZHAO

- Policy WG
- E2E Solution Enablement WG
- Demo & Promotion WG
- Standards WG
- Skill & Professional Dev WG
- Open Source Collaboration
- Edge Computing WG
- IPR WG
- Certification WG
- Global Cooperation WG

HUAWEI Lenovo CEC 中国电子 ESI 北京大学 PEKING UNIVERSITY 北京大学 PEKING UNIVERSITY 中国移动 China Mobile OpenGCC ESI OpenGCC

✓ **COO runs the consortium under supervision of BoD and BoD Chair**

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Consortium Actions	Standards	Testing	Developer Champion	Industry Summit	Certification
Industry Position	**Standardization** Standards system including hardware, software, benchmark etc	**Global Collaboration** Global IP/HW/SW vendors, users, testers, societies, communities	**Industry Promotion** Build common goal, strategy and actions, promote Arm solutions		**Industry Environment** Promote policy support, support open source, develop profession & skill
Value to Member	Up-to-date technology Standards Development -> **Technical Leadership**	3rd party certification Benchmarking test -> **Admission to market**	Collective marketing & global collaboration -> **Global influence**		Customer requirement User societies -> **Market Expansion**
E2E Ecosystem	Industrial Players	Users Community	Education	Researchers	Governments

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We Deliver

STANDARDS & WP

- 14 standards developed
- White papers

SKILL & PROFESSIONAL

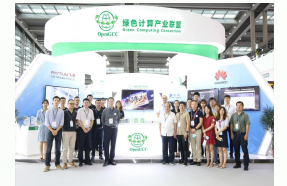- "GCC Developing Champion" program
- Trainings

CERTIFICATION

- Various scenarios: HPC, big data, web etc
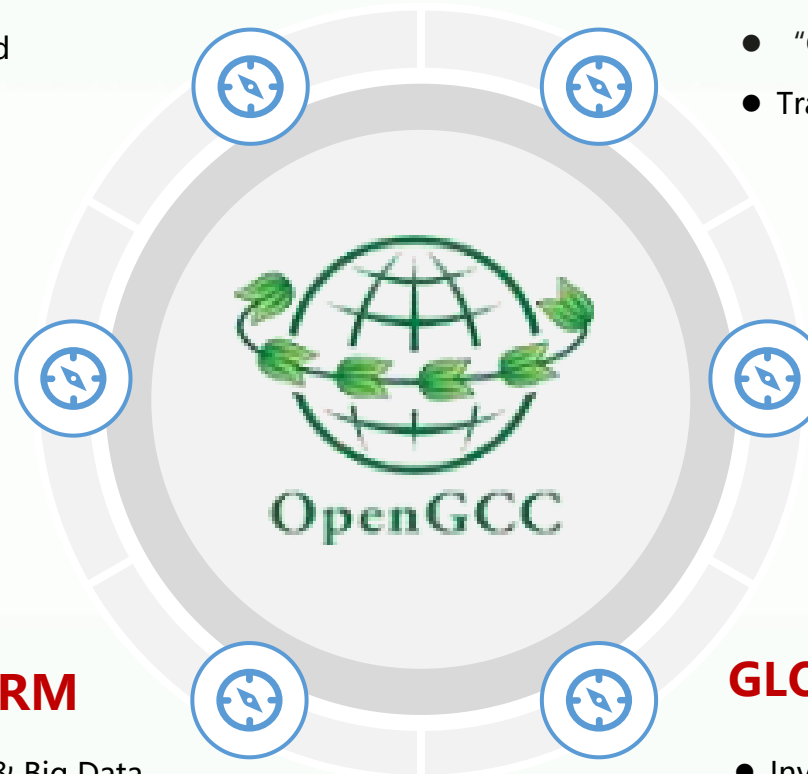- Box and software

BRANDING

- Conferences
- Media

PLATFORM

- Platform for Cloud Computing & Big Data Open Source Ecosystem

GLOBAL COLLABORATION

- Invite: CCIX、GEN-Z、DMTF、UEFI
- Join: TBA

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	RIGHTS	PLATINUM	GOLD	SILVER	ACADEMIC	USER
Nomination/Election/Vote	BoD Member delegation	1 BoD member for each platinum	1 BoD member for 3 gold	All silver delegate 1 BoD member	All academic delegate 1 BoD member	
	Initiate a new WG	V				
	Assign a WG leadership candidate	V				
Initiation	Initiate a discussion on specific topic	V	V			
	Initiate a standards or other topic in WG	V	V			
	Draft standards, white papers, spec etc	V	V	V	V	
Advertisement	On Website, wechat etc, to exhibit logo	V	V	V	V	V
	Exhibition on consortium's events	V	V	V	V	V
	To participate consortium's technical events	V	V	V	V	V
Meeting	To participate consortium's meeting	V	V	V	V	V
	To participate consortium's WG meetings	V	V	V	V	V
	To get working/final text of standards or other documents	V	V	V	V	V
FEE	FEE	1M/Y	300K/Y	50K/Y	Free	Free

Note：Subject to change for the sake of entity registration   OpenGCC

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Current Members

KEY INITIATIVES 03

★
① Standards Suite
- ✓ Develop standards on inter-op, compatibility, testing cases for box and software

★
② Benchmark
- ✓ Build ARM based benchmark on various scenario

★
③ Skill & Professional
- ✓ "GCC Developer Champion" event with university partners, develop university students' skill on ARM based programming

★
④ Events & Advocation
- ✓ "Green Compute Summit"

★
⑤ Certification
- ✓ Build GCC certification system, with objective of 500 products (OS/DB/middleware/app...) in 3 years

⑥ Global Collaboration
- ✓ Foster atmosphere to promote major global system software to migrate to ARM system

⑦ Demo Base
- ✓ Two demo bases in China (1 north, 1 south), to demo capability of ARM system to customers in various industries

⑧Policy Influencing
- ✓ Bridge the governments and companies

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![OpenGCC logo]

Thanks!

www.opengcc.org