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CASE STUDY

China Unicom Global supports enterprises in AI era

with intelligent
cloud data center

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Author:

Teresa Cottam
Contributing analyst

overview



China Unicom Global's upgraded internet data center (IDC) in Hong Kong – China Unicom Global Intelligent Cloud Data Center – is the latest step in its transformation from a telecoms operator into a leading digital services provider. It marks the company's transition from providing key data center capabilities (such as hosting and virtual machines) to the provision of intelligent computing and network integration to support enterprise needs in the era of generative AI. The data center brings together state-of-the-art compute, intelligent applications and international connectivity solutions to provide enterprises with full stack, verticalized products and solutions combined with the continuous computing power they now require.

China Unicom Global at a glance:

Business customers

2,000+ large enterprise customers

300+ carrier customers

Key verticals

Financial services, manufacturing, energy, logistics, TMT, government, e-commerce and healthcare

Service offerings

A wide range of B2B services such as big data, cloud, IoT, security and connectivity

Business challenges

In the era of generative AI, **China Unicom Global must provide the computing power and international connectivity** Chinese enterprises need for big model training, while also reducing energy consumption, maximizing security and supporting near 100% uptime for continuous operation

Solutions

China Unicom Global Intelligent Cloud Data Center, serving as a convergence hub for the Asia-Pacific region, with six cross-border network links, multi-cloud interconnection capabilities and connections to the world's major carriers via 13 directly connected PoPs and 15 submarine cables

Benefits

100% uptime with zero faults

60% improvement in overall efficiency

330,000 DDoS attacks thwarted in 2022



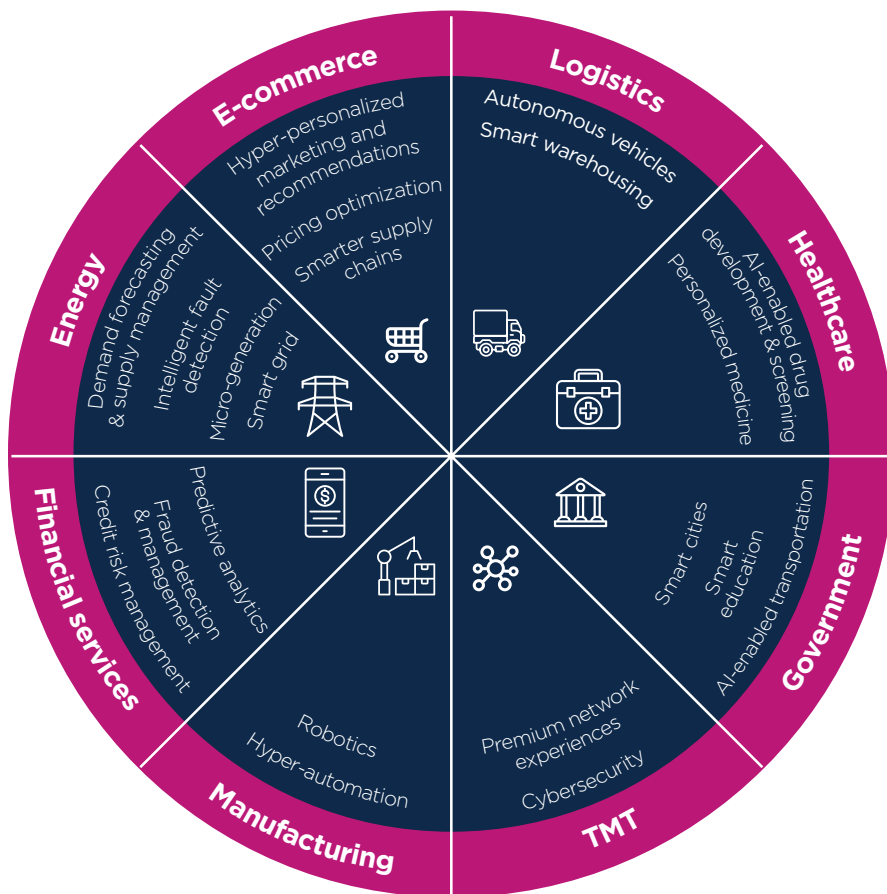
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meeting the requirements of computing 2030

China Unicom Global offers reliable, end-to-end integrated telecoms services and solutions – including global connectivity services, unified comms, content and security – to more than 2,000 large enterprises and 300 carrier customers. The company is headquartered in Hong Kong, and has more than 30 worldwide subsidiaries and offices. It also provides premium voice and mobility services.

The challenge for China Unicom Global is that the volume of data being produced by large enterprises is growing exponentially. For example, Huawei estimates that by 2030 organizations will be producing yottabytes of data each year, demand for general computing power will have increased tenfold, and AI computing power will have increased by a factor of 500. China Unicom Global needs to meet these demands while also ensuring continuous 24x7 operation, high levels of security and data privacy, and optimal efficiency to reduce the carbon footprint of computing and connectivity.

Drivers of computing demand across selected vertical markets



The solution is a new approach to data centers and cloud applications which will need to be:

- AI-enabled and optimized for computing and power efficiency
- Cross-regional, with distributed super data centers that aggregate and share computing power, data and applications, with the aim of maximizing energy efficiency and delivering high levels of resource utilization
- Supportive of converged cloud applications that integrate real-time and non-real-time data processing, model training and inference, IoT and information physics to form what Huawei terms a 'digital continuum'
- Highly connected locally and globally to support international supply chains, global research co-operation using massive data sets, training of advanced AI models and so on.

what's the role of the IDC?

To meet rising demand for data and enterprise services, China Unicom Global is creating a comprehensive, intelligent information infrastructure. This is intended to act as the foundation for China's future digital economy and meet the computational and connectivity needs of enterprises in the era of generative AI.

Meeting these needs required China Unicom Global to upgrade and extend its data center capabilities – to support a shift from providing hosting and virtual machines, to intelligent computing and network integration. A key step in achieving these aims is the deployment of new intelligent capabilities in its data center, which serves as a global cloud service convergence hub for the Asia-Pacific region and provides multi-cloud interconnection capabilities and connections to the world's top ten cloud companies.

The data center hosts China Unicom Global's Belt and Road Information Hub, as well as the International Financial Customer Service Center, the Global Cloud Service Center, the International Operation Service Center and the Low Carbon Computing Center. It uses state-of-the-art computing network convergence and cloud network integration to provide customers with full-stack products and solutions, and is richly connected both to mainland China and also via a cable landing station to IDCs and PoPs all over the world.

Dr Meng Shusen, Chairman and Chief Executive of China Unicom Global, says the IDC is designed to address a number of pressing B2B challenges:

- Delivering the continuous computing power and low-latency local and global connectivity enterprises require in the era of generative AI for big model training and other computing-intensive activities
- Power efficiency to meet green targets and to minimize costs
- Security by design to protect against growing cybersecurity threats.

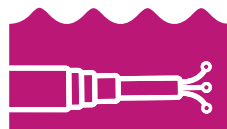
China Unicom Global Intelligent Cloud Data Center key capabilities



Connection to 60 countries and regions



6 cross-border connections to mainland China



Landing point with connection to 15 submarine cables



13 points of presence



Connection to top cloud providers

TM Forum 2023,
(source: China Unicom Global)

challenge 1: continuous, low-latency services

Today's enterprises operate 24x7 and require continuous availability of computing resources. China Unicom Global says since it launched the data center has delivered a highly reliable service, with a near-perfect record of availability and zero faults. It is also able to deliver extremely high performance levels and seamless scalability.

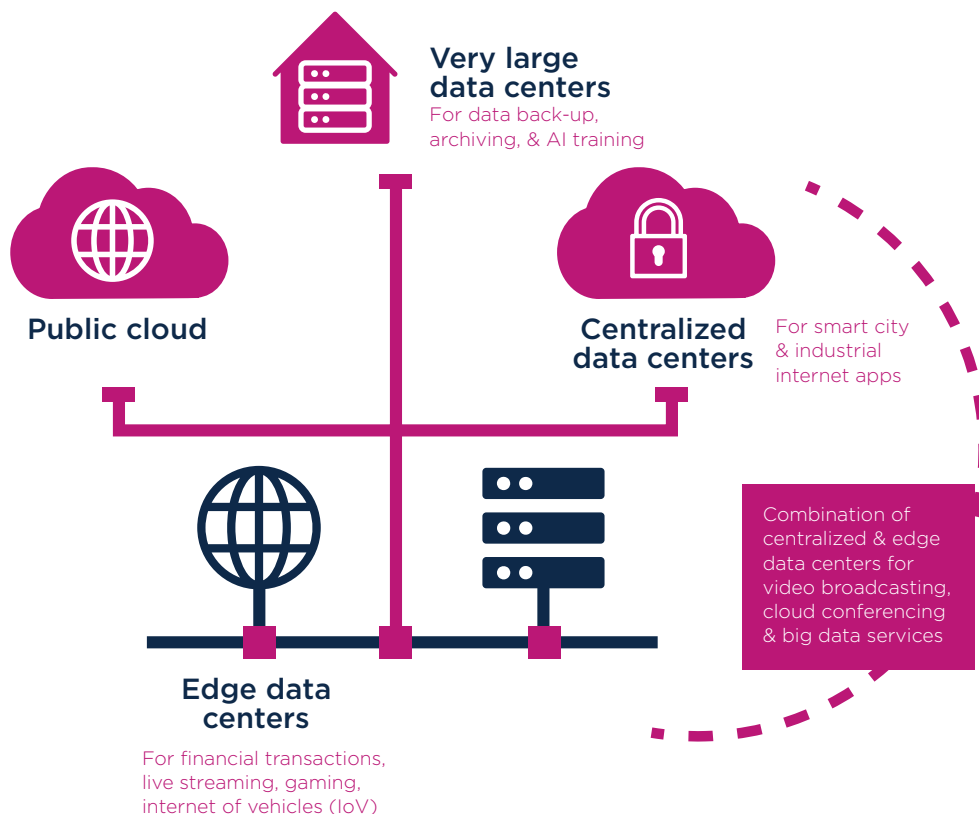
- **Reliability.** The China Unicom Global Data Center not only meets the highest standards for a global communications hub but is collocated with a submarine cable landing station, and is a core node for domestic and overseas communications, providing customers with a fast and reliable backup network.
- **High performance.** To ensure high performance the Hong Kong IDC uses high-density cabinets, with flexible designs to maximize the use of resources such as power, air conditioning and space to meet customers' high-power requirements of 20kW per cabinet.
- **Scalability.** The data center recently added another 1,400 high-density cabinets. The modular design makes the overall architecture customizable and allows for expansion and elastic scaling. The cabinets can be customized and built in phases based on specific industrial scenarios to accurately meet customers' requirements. For example, scalable and customized services have

been provided to an internet finance company, supporting its growth from a start-up to a Wall Street listed business, meeting its data center service requirements at different stages of development.

- **Low latency.** China Unicom Global offers customers ultra-low-latency connections. For example, the latency for data transfer from the Hong Kong IDC to the Shenzhen Stock Exchange has been lowered to 1.45 milliseconds. And the end-to-end latency from the data center to China Unicom Global's data center in Frankfurt is less than 140 milliseconds.

An intelligent operation management platform is used in the China Unicom Global Data Center to provide functions such as AI diagnosis, intelligent optimization and data simulation. This allows China Unicom Global to continuously optimize facility usage and energy efficiency. Meanwhile patrolling robots can monitor customer devices 24x7 to ensure high service availability.

China Unicom Global provides both centralized and edge data centers for different needs



challenge 2: maximizing energy efficiency

Data centers are estimated to consume around 3% of all global power currently, and this is expected to rise to 4% by 2030. China Unicom Global is taking an holistic approach to make its Hong Kong data center as energy-efficient as possible – reducing both costs and carbon footprint in the process.

For example, the center has an advanced cooling system that uses chilled water intelligently and frequency converter energy-saving technology. These technologies are combined with a sealed hot aisle design and energy-saving UPSs, inter-row air conditioning and low-power refrigerator to reduce the facility's energy consumption. It can analyze customer usage and device operation in real time with its smart operation management platform to allocate power and cooling capabilities accurately, which improves energy efficiency even more. The center also has a certified energy-saving architectural design.

challenge 3: ensuring ultra-high security by design

Digital trust and data security are key challenges facing enterprises as they become increasingly connected and adopt powerful new technologies such as AI. Not only will the volume of cybersecurity threats continue to proliferate exponentially, but they will also become ever-more challenging to detect and block as cyber criminals incorporate AI into their techniques. In 2022, for example, the China Unicom Global Data Center successfully thwarted more than 330,000 distributed denial of service (DDoS) attacks on its networks and infrastructure.

To address such challenges, China Unicom Global focuses on five key aspects of security:

- **Physical security.** The China Unicom Global Data Center has adopted a robust eight-layer security system, covering site security, video surveillance, access control and anti-tailgating measures to ensure zero error in identity and access checks.
- **Cybersecurity.** All submarine and terrestrial cable backbone channels connected to the data center have dual backup and multi-route protection plus a network and data security risk monitoring system. Security protection measures include host security hardening, container mirroring security, traffic protection and intrusion prevention.
- **Operational security.** The data center complies with ISO 9001 and ISO 27001 standards. Leveraging the core capabilities of local security operation teams, it has adopted a “network operation center plus security operation center” (NOC+SOC) operation mode, providing customers with one-stop network security and information security services. In addition, the network management service can reduce the cost of network management and achieve a monitorable, manageable and controllable network for customers.
- **Data security.** The China Unicom Global Data Center has PCI DSS certification issued by Trustwave, as well as TVRA certification issued by i-TotalSecurity, and information security system certification issued by SGS. China Unicom Global says it ensures that customer data assets are unknowable, untouchable and unchangeable by any unauthorized entity.
- **Ecosystem security:** China Unicom Global has established long-term strategic and secure ecosystem partnerships. Global warehouses have also been built to enhance the security, integrity and reliability of product and service supply.

next steps: moving from general to intelligent computing

China Unicom Global intends to provide its customers with more tailored solutions to meet the requirements of individual industries and use cases. It will continue to offer full stack products and solutions that combine computing power with network and applications based on computing-network convergence and cloud-network integration, and will deploy additional data centers to deliver its customers' needs.

This includes building multiple integrated data centers worldwide, as well as ultra-large centers – similar to the China Unicom Global Data Center – in Singapore, Tokyo and Frankfurt. “This will enable us to provide customers with distributed computing and networking services that are professional, secure, trustworthy, sustainable, smart and responsible,” says Dr Meng Shusen, Chairman and Chief Executive of China Unicom Global.

The company will focus on optimizing network latency, improving computing power, implementing intelligent operations and maximizing power efficiency. To this end it has joined forces with Huawei to establish an AI computing power center within the China Unicom Global Data Center and is working with the Hong Kong Science Park to explore using a central seawater refrigeration system. It also plans to use more renewable energy – such as solar power – to reduce its carbon footprint further.



“Our future data centers will enable us to provide customers with distributed computing and networking services that are professional, secure, trustworthy, sustainable, smart and responsible.”

Dr Meng Shusen
Chairman and
Chief Executive
of China Unicom Global.

key learning points

- **Green energy and power efficiency.** While AI can aid greater data center efficiency by analyzing temperatures, determining the optimal placement of equipment and identifying where energy consumption can be reduced, AI algorithms are resource-intensive and power-hungry and could drive up data center power consumption. This will challenge data center providers to become even more efficient, not just for environmental reasons but also to keep costs down.
- **Cybersecurity.** Data centers store and manage enterprises' most sensitive data, making them a honeypot for cybercriminals and a core element of corporate data security. AI is transforming the threat landscape by enabling cyber criminals to rapidly increase the scale and speed of their attacks; but on the defensive side it helps automate processes, spot patterns and act as an intelligent assistant to those working in the SOC, helping them triage and stop problems far faster. The NOC+SOC model helps to close gaps between network security and information security, and offers a one-stop-shop to enterprises. It is also a way for data center operators to add value.
- **Connectivity and availability.** Cloud services increase dependency on the data center and reinforce the importance of data center connectivity. A connectivity-rich data center is vital to provide the scalability and resilience enterprises now need, with low latency vital to ensure resources are as responsive as possible. The requirement for ultra-high levels of robustness and reliability to support 24x7 operation means that reactive fault fixing is no longer sufficient – data center providers need to anticipate, predict and fix any problems before they impact on performance.