Building a Fully Connected, Intelligent World

HUAWEI

HUAWEI CLOUD
Global Success Stories 2020

HUAWEI

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HUAWEI CLOUD
Grow with Intelligence

Technology advances

In leaps and bounds

We advance towards

An intelligent world

More pleasant experiences

Smarter decision-making

Faster responses

Better performance

Cloud is everywhere

Advancing intelligence

Exploring new value

Discovering insights

Driving industry growth

Building a better world

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Beijing e-Gov Cloud

Beijing e-Gov Cloud, a Cloud for Citizens, Developers, and City Managers

Beijing has made great progress in economic development and city services in recent years. These achievements are backed by technologies such as cloud, IoT, big data, AI, and mobile Internet. Now, Beijing's urban development is shifting from a focus on data to a focus on intelligence. Beijing is building a more efficient social governance system. The city is integrating and sharing big data to pursue targeted, collaborative, and law-based governance. The blueprint is a smart city powered by intelligent, integrated digital assets.

Challenges

Complex architecture and siloed data centers

Beijing e-Gov Cloud runs on distributed nodes in multiple data centers. This multi-branch, multi-layer architecture creates challenges for cloud O&M and performance bottlenecks for cloud services.

Poor support for application innovations

Beijing is home to 35% of the unicorn startups and 1/3 of the top 100 AI and Internet enterprises in China. These companies can use data and open APIs made available by Beijing e-Gov Cloud to develop apps that are in the public interest. However, Beijing e-Gov Cloud used to have limited number of IT cloud resources, and what they did have was too outdated to gather useful data or provide easy-to-use APIs for developers to design innovative applications.

Inadequate data sharing

In 2006, Beijing built a data sharing platform for municipal government departments and district branches. However, this platform was not powerful enough to break through departmental silos.

Building an integrated cloud platform

- In 2015, Beijing e-Gov Cloud used HUAWEI CLOUD Stack to build an efficient and integrated cloud platform. This platform connects all the pipes of their IT infrastructure for free data flow and offers a variety of powerful cloud services for big data and AI innovation. HUAWEI CLOUD Stack combines the public cloud with on-premises data centers, integrating resources and capabilities to fit organizational structure and service processes. Resources in multiple data centers are centrally managed, and can be flexibly provisioned to each commission, administration, and office using Virtual Data Center (VDC) for each deployment.
- Beijing e-Gov Cloud used HUAWEI CLOUD blockchain to build a catalog that maps the government department responsibilities, systems, and data to each other. With this blockchain, data changes can be detected in real time, data access can be traced at any point, and data sharing pipelines are streamlined. Rules are set for data collection, sharing, and management, turning data into a powerful digital asset.

Improving city services with HUAWEI CLOUD

- HUAWEI CLOUD Stack provides Beijing e-Gov Cloud with excellent compatibility and high-performance compute resources. Resources in multiple data centers can be centrally managed and flexibly provisioned and scheduled to each organization using Beijing e-Gov Cloud.

  HUAWEI CLOUD Stack also provides the active-active DR solution to supplement the traditional network and host security measures.
- A trusted data exchange system has been established. 53 commissions, administrations, and offices in Beijing have been connected to this unified system. 44,000+ data items and 8,000+ responsibility catalogs (4 PB in total) are efficiently shared among 1,900+ information systems, and thanks to this blockchain, they are 100% traceable. It takes less than 10 minutes to apply for, authorize, confirm, share, and use a data item.
- During the COVID-19 pandemic, the Beijing government quickly released an app named Health Kit developed based on the HUAWEI CLOUD blockchain service. As of this writing, 38 million users have used this app (opened 1.6 billion times) for health information report and query, greatly reducing manual workloads and allowing city managers to make data-driven decisions in response to the COVID-19 pandemic.

Shenzhen Intelligent Twins

A Digital & Smart Shenzhen

Shenzhen aspires to be a smart city with a digital government and a digital economy. In service of their ambition to become one of the smartest cities around the world, they plan to build City Intelligent Twins capable of deep learning by 2025.

Challenges

- Like almost every other megacity around the world, Shenzhen faces the following problems: a large and diverse population, high population density, a shortage of public services and resources, and complexity in city governance.
- A city on the forefront of China's reforms and opening up, Shenzhen is bestowed with the responsibility of exploring best practices in megacity governance and developing a modern city governance system.
- Years of IT buildout across different phases of information technology has resulted in a large number of isolated resource pools that need to be connected to form a unified cloud, so as to facilitate sharing of capabilities and resources, city-wide centralized deployment, and unified management and O&M.
- After years of digitization efforts, the Shenzhen government had built many application systems, many of which were monolithic and fragmented. Many applications provided duplicate functions. Application, data, and device integration were inefficient, complex, and manpower-intensive.

Shenzhen Intelligent Twins Powers a Smart Shenzhen

Building Shenzhen Intelligent Twins

A digital foundation for Smart City needs to leverage the latest information technologies, such as 5G, cloud computing, IoT, big data, AI, and blockchain. The goal is to promote further service convergence and build a data-driven, integrated, intelligent collaboration system capable of deep learning, aka, Shenzhen Intelligent Twins, fueling a Smart Shenzhen.

A unified cloud for the entire city, cloud infrastructure for Shenzhen Intelligent Twins

Shenzhen e-Government cloud is an important part of the cloud infrastructure for Shenzhen Intelligent Twins. Powered by HUAWEI CLOUD Stack, the Shenzhen e-Government cloud provides shared, on-demand compute, storage, and network resources plus general software support for all agencies and bureaus of the Shenzhen municipal government. This unified cloud also connects smaller clouds of different departments as well as 11 district-level e-Government clouds, allowing resource sharing and mutual DR between clouds of different levels.

Building the "Brain" of Shenzhen Intelligent Twins

Shenzhen Intelligent Twins powers a unified city governance platform capable of intelligent monitoring, unified command and control, real-time dispatching, and streamlined collaboration. It also enables data-driven optimization of government service processes. HUAWEI CLOUD ROMA handles the application and data integration, connection, and orchestration needed.

Advancing intelligence and innovation across industries

Through industry coordination and data enablement, Shenzhen Intelligent Twins powers intelligent applications in many industries and domains, including government, transportation, public security, electric power, water conservancy, meteorology, and airport. The Peng Cheng Cloud Brain provides the computing power needed to build and run an open innovation platform for exploring next-gen AI theories and practices.

A city that senses, thinks, and evolves

An integrated, intelligent collaboration system that can sense, learn, and evolve

- Over 50 government agencies and other public institutions in Shenzhen have migrated over 400 important application systems to the cloud, including the iShenzhen app, the Shenzhen health code app, and a number of enterprise and citizen service apps. These apps provide convenient mobile services to citizens and businesses alike, with unified identity management. Businesses and citizens can quickly access the services they need when they need them, all through an online platform.
- The Shenzhen city governance & command center connects 11 districts, 39 government agencies, bureaus, and offices, and 63 service systems from all over the city, and aggregates data of 110 different categories, plus over 300,000 channels of video data. It also integrates 3D maps that cover the entire city, allowing the municipal government to keep an eye on the real-time distribution of urban population, as well as the status of city infrastructure and facilities. It allows governments of all levels to provide intelligent services to businesses and citizens and to coordinate operations more efficiently.
- Shenzhen has over 23 billion data records on population, legal persons, housing, geo-locations, and more. Leveraging the data openness innovation challenge it jointly hosted with HUAWEI CLOUD, the Shenzhen municipal government was able to promote data integration and sharing between the public and private sectors, powering intelligent city governance with data.

Testimonials

The Shenzhen municipal government and Huawei jointly proposed a five-year plan for the Shenzhen Intelligent Twins, a grand project that will power Shenzhen's ambition to become one of the smartest cities in the world. By 2025, Shenzhen Intelligent Twins will have deep learning capabilities.

-Liu Jiachen, Director of the Government Services Data Bureau of Shenzhen Municipality

Zhangjiagang

Building a Benchmark in Refined City Governance with HUAWEI CLOUD ROMA

Zhangjiagang, a county-level city in Jiangsu province, China, aspires to boost both social and economic development by letting digitalization play its role. With a unified digital platform running new applications that offer improved government services to both businesses and residents, Zhangjiagang is committed to building a benchmark of county-level Smart City in China and a digital economy with sustainable growth.

Challenges

Siloed application systems, inefficient data sharing and collaboration

Over 130 independent application systems were built by different departments of the Zhangjiagang government, but with poor data governance. This led to poor data availability, inefficient data sharing, and poor collaboration.

Lack of a unified interface

Each user had an average of eight IDs for different systems. Each system may have some of the data, but mostly incomplete data. Many departments were in urgent need of new technologies and capabilities, such as big data, GIS, AI, and a multi-screen command and control center.

Repeated construction of siloed systems with duplicate functions, vendor lock-in

A common platform was needed to support the deployment, management, and sharing of shared services. 35% of the systems provided duplicate functions. If they could be consolidated, many wasteful investments could have been prevented. It was difficult to migrate applications and data, and it took an average of 6 months or even more to roll out a new service.

Poor operations management

16% of the systems had fewer than 20 users, and some applications had less than 10 active users.

Building a digital city platform that improves collaboration and data sharing

Building a digital city with agile, streamlined collaboration

Using ROMA Factory and ROMA Connect, which are part of HUAWEI CLOUD's application enablement platform, Zhangjiagang upgraded or redesigned the city's legacy systems, with more efficient connection or integration between applications, resources, and data. The new systems allow efficient sharing of common capabilities via a large platform. Unified data aggregation, management, and sharing accelerate application development and innovation. Government service processes can be redesigned for optimal efficiency. With AppCube, OneMobile, and OneRender, visual applications and mobile mini-apps can be quickly developed for screens of all sizes to offer more accessible data insights. All these have improved government efficiency, allowing the Zhangjiagang government to provide better services to businesses and residents alike.

A unified digital identity management system

OneAccess, the identity management solution provided by HUAWEI CLOUD ROMA, unifies the user and rights management systems of different applications. This allows for centralized user authentication and authorization, with a single ID per user. Permissions are assigned based on user roles and their job positions. This system provides solid support for risk control and compliance management. ROMA Exchange, the application asset center, provides a standardized, visual operations management platform for digitization projects. This platform also supports continuous development of industry capability suites, facilitating sustainable development and innovation of local industries.

Faster innovation, converged data sharing, and more efficient collaboration

One portal for all services

The city provides a one-stop platform where you can obtain information and receive services. Accurate per-person and per-company profiles allow the platform to make precise service recommendations to residents and businesses alike. Frequently used processes and services are optimized so that users can access and use them more easily and with higher efficiency.

One network for coordinated management

Services and functions are streamlined both horizontally (between different departments) and vertically (city-town-community). A unified platform that provides big data and AI video analysis services supports real-time sensing of any events that occur in the city, plus intelligent warning, prediction, real-time reporting, unified event acknowledgement and dispatching, ensuring that each and every event gets responded to in a timely manner. This improves overall city governance and management. The estimated case closure rate now exceeds 95%, and timely closure rate exceeds 80%.

Single pane view

With unified data integration and aggregation, and proper data governance, massive datasets can be quickly made available for fast retrieval and analysis via open interfaces. Data can be organized around themed models and further processed to offer real-time insights via screens of all sizes or provided upon ad hoc queries. City managers can have a clear understanding of how their city is operating. This helps them make well-informed decisions and coordinate operations city-wide.


2020
Finance

China Merchants Bank

China Merchants Bank Builds Asia's Best Retail Bank with HUAWEI CLOUD FusionInsight MRS

With the rapid pace of fintech innovation, financial services companies can now interact more closely with their customers, and massive datasets generated in daily operations have turned out to be a significant source of value creation. In recent years, China Merchants Bank (CMB) has been actively exploring ways to extract value from its vast data assets, accelerate innovation, and improve customer experience. One example has been CBM's financial big data platform built using HUAWEI CLOUD's FusionInsight MRS cloud-native data lake solution. This platform helped CMB build Asia's "Best Retail Bank" powered by big data.

Challenges

CMB is using financial big data to power many of its operations, such as credit card services, wealth management services, marketing, and customer insight. A conventional big data solution, however, faces the following challenges:

- Traditional systems have data silos, so cross-source collaborative data analysis is inefficient. For example, several steps of a credit card application require human intervention, which slows down the process.
- A traditional big data system typically has multiple components, uses multiple languages, and iterates fast. Financial analysts need to have a certain skill level to be able to use such a system.
- Traditional big data systems do not handle capacity expansion well in the face of rapid data growth.

FusionInsight MRS-based big data analysis

CMB built a financial big data platform based on FusionInsight MRS, HUAWEI CLOUD's cloud-native data lake solution. This platform supports real-time big data analysis, interactive analysis, offline processing, and real-time query, allowing CMB to extract insights from massive datasets and using such insights to improve customer loyalty and make informed, timely decisions in response to new opportunities and risks.

- FusionInsight MRS provides the HetuEngine interactive analysis engine that allows converged analysis of data from multiple sources, making cross-source data analysis more efficient and also reducing the need to move data around.
- HetuEngine provides a unified data access interface, instead of the multiple complex interfaces typical with conventional systems. The use of SQL makes it easier to use big data.
- FusionInsight MRS supports clusters with up to 21,000 nodes plus unlimited capacity expansion through cluster federation. It also supports online rolling upgrade and fault isolation to ensure a hitless upgrade.

Stable services, happy customers, and monetized data

Better customer experience, actionable insights from data, guaranteed business continuity

CMB has rebuilt its decision-making and service systems to base them on financial big data powered by HUAWEI CLOUD FusionInsight MRS. Take credit card issuance for example.

- Card issuance, credit limit review, and bill query are all automated, improving customer experience as well as data accuracy.
- A credit check used to take about a week. Now it is almost real time.
- The new financial big data platform is easy to use, allowing more people to perform data mining.
- The big data cluster can be scaled up or down to keep up with changes in demand. There is no need to dismantle the cluster or migrate applications during an upgrade, ensuring 24/7 business continuity. The big data platform can evolve continuously while remaining rock-solid the entire time.

Testimonials

The HUAWEI CLOUD FusionInsight big data platform has significantly contributed to business innovation at China Merchants Bank. Customers can now access CMB's online services in a self-service manner. In the past, we could only query detail records of the past 13 months online. Now, we can query seven years of records. With more precise customer targeting, now we send 82% fewer SMS messages to promote our wealth management products, yet we still manage to cover all our potential customers.

-Liu Jing, Manager of Next-Gen Cloud Computing Project, Information Technology Department, China Merchants Bank

Shenzhen Stock Exchange

How SZSE Speeds Up Digital Transformation with Cloud Native Infrastructure

As a national securities exchange approved by the State Council of People's Republic of China, the Shenzhen Stock Exchange (SZSE) has become one of the world's most important capital markets.

SZSE implemented virtualization in 2011, marking the start of its digital transformation endeavor. In 2019, this endeavor was directed toward cloud native architecture, which entailed a complete upgrade of its infrastructure and application architecture.

Challenges

- SZSE has more than 300 systems that fall into three categories. The sheer scale of the service systems requires IT to deliver not only high availability, fault tolerance, and high performance, but also fast response, smart analysis, and intelligent supervision.
- In the fast-changing capital markets, legacy technologies struggle to keep up with service innovation and regulatory changes. Moreover, regulation and system security concerns have led to an increasingly strong demand for stable, reliable, and secure systems.Driven by both service development requirements and advances in cloud computing, big data, and AI, a technology upgrade at SZSE is materializing.

HUAWEI CLOUD Cloud Container Engine (CCE)

This round of upgrades at SZSE focus on a cloud native infrastructure, compute and storage resource pooling, and application architecture upgrade.

Based on HUAWEI CLOUD CCE, SZSE developed an efficient cloud native infrastructure and pooled its compute and storage resources. SZSE used a hybrid cluster consisting of Arm-based bare-metal servers and x86-based virtual machines. The CCE cluster supports multi-project deployment, so internet applications, office applications, business process management, and data analytics can be separated. In addition, CCE delivers fine-grained resource allocation. Its storage resource pool provides abundant storage options, including block storage, object storage, and file storage.

Containerization makes it possible for the infrastructure to allocate compute and storage resources based on actual application requirements. Standard delivery of container images and the microservice architecture improve deployment efficiency and scalability of applications.

More agility, more efficiency, more security

Efficient resource utilization

More fine-grained resource allocation meets the performance, cost, and reliability standards of a variety of applications.

Agile application delivery

Microservice-oriented applications that run on the cloud native infrastructure facilitate efficient deployment and elastic scaling of systems such as OA. Dark launch, circuit breaker, flow control, and link monitoring accelerate application delivery.

Secure services from end to end

Security technologies ensure that both the code and images are secure, and facilitate fine-grained security control, such as access control, storage security, health check, network security, and comprehensive monitoring.

Testimonials

HUAWEI CLOUD CCE has helped SZSE develop an efficient cloud native infrastructure and pool our compute and storage resources. The combination of independent technological innovation and cloud native technologies improved our automatic O&M, resource utilization, and allocation efficiency. The migration of legacy applications to the cloud native architecture has boosted the delivery of application systems such as OA.

-Yu Jin, Deputy Director of Technology Planning, Shenzhen Stock Exchange

Yong An Insurance

Insurance on Cloud: Faster and More Reliable

Yong An Insurance has always been embracing new technologies such as cloud computing, big data, mobile Internet, and cloud database to build a future-ready IT infrastructure that is highly reliable, secure, scalable, and responsive to changing needs. Working with HUAWEI CLOUD, Yong An Insurance has recently moved all its systems, from internal operations to sales, to the cloud, significantly improving efficiency in sales, policy issuance, claim settlement, and more processes.

Challenges

High performance requirements

As Yong An Insurance's business maintained rapid growth, data stored in the company's on-premises databases reached dozens of terabytes, stretching the performance and scalability of these databases.

Security and reliability

The company needs to provide 24/7 services to policy holders via its online channels, and it must meet regulatory requirements on data security and DR.

Agile innovation

An open, cloud-based architecture plus a distributed architecture are the future. Yong An Insurance needed to transform its financial cloud platform using these architectures for more agility.

Reduced operational expenditure

Closed-architecture commercial databases are expensive to operate and maintain. Frequent data synchronization, if performed manually, takes up a lot of time for DBAs, driving up OPEX.

Yong An Insurance rebuilt core application systems using HUAWEI CLOUD GaussDB

After a careful evaluation of Yong An Insurance's database needs, HUAWEI CLOUD's database team quickly developed a secure, reliable database migration solution for the customer. This solution guaranteed safe and smooth migration from the customer's legacy databases to HUAWEI CLOUD databases. The benefits include:

Handling peak demand with rapid elasticity and ultra-high performance

GaussDB(for MySQL), HUAWEI CLOUD's distributed database, supports rapid elasticity by creating multiple replicas for each primary instance. This allows the database to scale up to support terabytes of data in minutes. GaussDB(for MySQL) delivers 7X the performance of native MySQL databases when handling concurrent requests in billions. This helps the customer handle surges in demand with ease, ensuring a stable performance.

Meeting regulatory requirements by migrating the entire personal accident and health insurance systems to the cloud

Huawei's database team helped the customer split the personal accident & healthcare insurance service from their other core insurance services, allowing the former to expand rapidly while meeting requirements on reliability and ease of use. GaussDB supports fault recovery within seconds and zero data loss, meeting regulatory requirements for the insurance industry.

High availability and reliability on the cloud, 7X performance

Brand-new architecture and lower costs

By redesigning the company's core systems and switching to cloud databases, Yong An was able to reduce the total costs by 25%, including O&M, while meeting regulatory requirements.

7X performance

Yong An Insurance has a huge amount of data on insurance policies, which demands high-performance, high-concurrency databases. The new GaussDB database delivers 7X the performance of the old databases, ensuring fast responses in the face of massive concurrent requests.

Wapi Pay

Wapi Pay Drives Africa-Asia Trade with HUAWEI CLOUD

Wapi Pay is the first and leading Africa-Asia financial solution provider. Founded in 2019, Wapi Pay delivers platform-to-platform integration and virtual accounts (wallets) to offer convenient global payments and other FinTech services for their partners and customers. Their currency exchange and payment capabilities have benefited many companies. Wapi Pay production systems need to have fast service rollout while meeting high security requirements.

Challenges

- Building a data center takes a long time and incurs a high TCO. Database and security software needs to be purchased and deployed. This type of a self-built deployment is not a good fit for internet finance customers. Furthermore, Kenya's electricity supply is unstable, and frequent power outages cause network instability and poor service continuity.
- Wapi Pay seeks to work with a cloud service provider that has local network nodes and local technical support teams in Kenya because they require local network coverage, low latency, and professional service support.
- Wapi Pay has representative offices in Kenya, West Africa, Singapore, and China. Local host vendors are unable to help Wapi Pay run businesses in multiple regions around the world.

Wapi Pay built a secure, stable financial system with HUAWEI CLOUD Web & Mobile Solution

Wapi Pay built Kenya's first software for converting money from Chinese Yuan (CNY) to Kenyan Shilling (KES) on the HUAWEI CLOUD platform. The Wapi Pay system allows for CNY payment in Kenya, facilitating currency exchange and business expansion for individuals and enterprises in both Kenya and China.

HUAWEI CLOUD's Web & Mobile solution helped Wapi Pay quickly build an elastic, scalable, high-availability platform. This greatly accelerates development and rollout and improves the stability and reliability of software services.

In Kenya and South Africa, the POP nodes built by HUAWEI CLOUD and the cloud connection services between these regions help Wapi Pay provide more stable network services for users in Kenya.

The global layout of HUAWEI CLOUD, together with cloud-specific elastic features, also ensure Wapi Pay can smoothly expand services down the road.

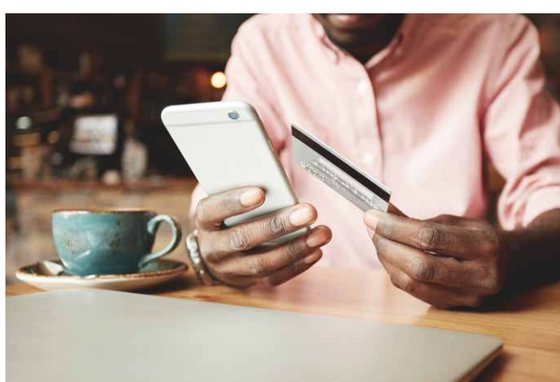
Faster innovation, lower O&M costs

- Global layout and local support: The cross-region layout and extensive network connection services enable Wapi Pay to enjoy a consistent experience regardless of where customers access Wapi Pay services from.
- Lower O&M cost: Cloud products reduce CAPEX. Centralized O&M helps reduce the cost of O&M by about 30% each year.
- Continuous innovation: AI and big data products from HUAWEI CLOUD lay a solid foundation for future service innovation and helps Wapi Pay create more value for their customers.

Testimonials

Wapi Pay has offices in many places around the world, including Kenya, Nigeria, Singapore, and China. HUAWEI CLOUD has been deployed around the world to meet our global business plans. In addition, reliable infrastructure and security certification provide us with a secure and reliable infrastructure platform, which is trustworthy enough for even the financial industry. In addition, Huawei has a representative office in Kenya, providing us with more convenient support services. In the future, we will develop more innovative services based on Huawei's AI products.

-Mr. Ndichu, co-founder of Wapi Pay



Caitong Securities

Efficient Collaboration Ensures Smooth Business Operations

Caitong Securities is a comprehensive securities company approved by China Securities Regulatory Commission (CSRC). The company has six subsidiaries, more than 140 securities agencies, and nearly 4,300 employees. With branches all over the country, remote collaboration has become an urgent issue. Caitong Securities has been looking for a leading online communication platform to improve communication and collaboration efficiency and promote their digital transformation.

Challenges

- They hold a large number of meetings at both the headquarters and at branch offices each year, including over 20 meetings of their entire staff. These meetings demand powerful audio and video processing capabilities, image definition, and stability.
- The constant emergence of new financial market hotspots requires quick and efficient delivery of information and services to customers and to small and medium shareholders. They often need content shared in real time.
- High employee turnover, frequent recruitment activities, and the high cost of onsite interviews are pushing them towards an online interview process.

More efficient collaboration with HUAWEI CLOUD Meeting

After careful consideration of their needs and budget, Caitong Securities chose HUAWEI CLOUD Meeting and built an intelligent conference room solution. The device-cloud synergy provided by HUAWEI CLOUD Meeting streamlined online and offline conferences. Participants could conveniently join conferences through a smart screen, video conferencing terminal, or mobile terminal. HD video conferences, 4K ultra-HD video sharing, and multi-party annotation made internal management and collaboration smoother and easier. Powerful software capabilities and the packet loss concealment technology ensured the stability and reliability of large meetings with 1,000 attendances or even more. Live streaming conferencing allowed for interaction between tens of thousands of participants.

HUAWEI CLOUD provides professional services for important online conferences, including pre-conference network diagnosis and evaluation, commissioning, and practice runs, monitoring and emergency handling during conferences, and after-action summaries once the conferences have concluded.

Growth fueled by communication

- Efficient internal and external communication: Caitong Securities staff and outsiders can join internal meetings using links sent via SMS, email, or WeChat. All it takes is a single click. No special accounts need to be created. Passwords, special invitations, and video watermarks help secure shared content.
- Uninterrupted operations: The integration of HUAWEI CLOUD Meeting and the online transaction system allowed staff to work from home and ensured that the A-shares market was successfully opened on February 3, 2020, even against the background of the coronavirus outbreak.
- Remote collaboration: HUAWEI CLOUD Meeting not only makes remote business, work assignment, and collaboration possible, but also provides valuable experience how the company can continue with digital transformation moving forward.
- Communication and training: HD reports, data charts, and K-lines can be presented to customers and investors online, anytime, and from anywhere. New service requirements can be quickly conveyed from the headquarters to the branch offices through online training and exchange. Conferences are held flexibly, participants can interact with each other easily, and information is shared and presented through ultra-HD videos in real time.
- Online interviews: Online interviewing reduces recruitment costs, simplifies the interview process, and improves recruitment efficiency. In addition, online recruitment presentations help promote the corporate culture and their vision for development, which helps attract more talent.

Testimonials

With HUAWEI CLOUD Meeting, our company efficiently combined the talent and the data needed to cope with the epidemic and keep up with market competition. HUAWEI CLOUD Meeting has become a necessity for daily communications between our employees. Caitong Securities will continue to leverage techniques and capabilities of HUAWEI CLOUD to enhance our platform for online collaboration, to complete digital transformation, improve our ability to innovate, and expand the scope of our services for faster growth.

-Cao Kai, Deputy Director of the General Office of Caitong Securities


2020
Internet+

Mogu Street

Redefining Livestream Shopping on a Cloud Native Architecture

Mogu Street is a social media and e-commerce platform specializing in fashion content, products, and services. The company's mission is to "make fashion accessible to everyone". Mogu Street used cloud-native infrastructure, Spark big data, and machine learning capabilities to enhance interaction with users in livestream shopping, greatly improving user experience.

Challenges

Slow scaling and long task queues

Mogu Street's platform needed to support multiple algorithm teams. Thousands of container tasks were sent every day and would queue up during peak hours.

Isolated resource pools and poorly scalable storage and compute resources

Mogu Street's Spark big data service and machine learning service ran on different platforms and could not fully utilize resources. Compute and storage resources were on the same machines and could not be separately scaled. Mogu Street had to pay for unnecessary compute resources when scaling storage resources.

Difficult, costly O&M and hot/cold data migration

Spark big data and machine learning services had different O&M requirements and a large number of big data components. As open-source systems developed, the upgrade and O&M workload became heavy and costly. To reduce costs, two clusters were deployed to store hot and cold data, respectively. Cross-cluster data analysis and hot/cold data migration involved a large number of engineering operations, which were complex and error-prone.

Cloud-native upgrade of the big data and machine learning platform

Mogu Street used HUAWEI CLOUD's big data storage-compute decoupling and high-performance computing (HPC) solutions to comprehensively upgrade its big data and machine learning platform.

Highly elastic compute resources

HUAWEI CLOUD Cloud Container Engine (CCE) and Cloud Container Instance (CCI) can be flexibly scaled to provide compute resources required for machine learning and Spark big data analysis. CCI can be scaled up to 1,000 instances within 30 seconds.

Flexible resource scheduling on a unified platform

HUAWEI CLOUD built a cloud-native, high-performance compute platform based on Volcano to process Spark big data services and machine learning services, schedule multilevel queue (MLQ), allocate exclusive or shared resources, and ensure high performance in high-throughput scenarios.

Kunpeng + decoupled storage-compute for big data largely reduced costs

Based on the HUAWEI CLOUD big data MapReduce Service (MRS), Mogu Street's services were smoothly migrated to cloud and powered by cost-effective Kunpeng compute resources, unaffected by differences between underlying chips. The BigData Pro solution completely decouples compute and storage resources, reducing the total cost by 30%.

Agile resource scheduling and intelligent service innovation

High compute efficiency

Tasks can be intelligently scheduled and resources quickly scaled to facilitate compute and avoid deadlocks. Spark big data and machine learning tasks can be quickly executed. All data is stored in OBS and can be used for both big data and machine learning services without being transferred between systems. Hot and cold data migration can be configured in one click to improve compute efficiency.

Low resource costs

Agile, elastic containers enable Mogu Street to automatically scale resources during service peak and off-peak hours. Compute and storage resources are decoupled, and can be separately scaled and fully utilized. The total number of CPU cores used was reduced by 10%, the storage efficiency improved by 40%, and the overall costs reduced by 30%.

Low O&M costs

The HUAWEI CLOUD cloud-native big data and HPC solutions reduce routine infrastructure O&M workloads for Mogu Street. MRS provides rolling patching and elastic scaling capabilities, simplifying O&M operations. Out-of-box Spark and TensorFlow platforms greatly reduce installation and O&M costs.

Faster service innovation and upgrade

Mogu Street worked with HUAWEI CLOUD to develop a virtual clothing try-on service, improving shopping experience and enhancing user loyalty.

Testimonials

We have fully upgraded our platform. We combined our Spark big data and machine learning services with HUAWEI CLOUD's cloud-native high-performance compute platform. This greatly accelerated our data analysis, AI training, and O&M, and enabled us to focus on service innovation.

- Yang Naiyin, CTO of Mogu Street

Netease Games

Reinventing Mobile Gaming on HUAWEI CLOUD

NetEase Games is a leading provider of self-developed PC and mobile games for worldwide users. NetEase Games describes itself as a "passionate gamer". It is a game platform, a service provider, and a player that enjoys and is inspired by games as well.

NetEase used HUAWEI CLOUD's cloud gaming solution to provide players with more freedom to customize characters in its mobile game Revelation Online.

Challenges

Costly compute power

Many PC and mobile games were demanding on hardware. Players could not enjoy smooth operation and high-quality graphics unless they invested heavily in high-end PCs or mobile devices. To cover R&D costs, games were sold at high prices. These issues made it difficult for games to attract users.

Slow game download

Players wanted to immediately start playing when a game caught their eyes. However, game packages were often large and took a long time to download and install, driving away many potential users.

Platform restrictions

PC, mobile, and console games all ran on specific types of devices, which prevented them from attracting users across platforms.

Fantastic gaming experience on HUAWEI CLOUD

NetEase believes that cloud gaming powered by 5G, cloud, and edge compute can be revolutionary, and was the first to integrate these technologies with their games. HUAWEI CLOUD's gaming solution provides powerful cloud infrastructure, cloud rendering, encoding and decoding, and network transmission capabilities to improve game development efficiency and enhance gaming experience. Players can enjoy AAA games anytime on any device. In the future, NetEase will continue to explore new forms of applications in the gaming industry, develop gaming experience evaluation models, and promote the development of the cloud gaming ecosystem.

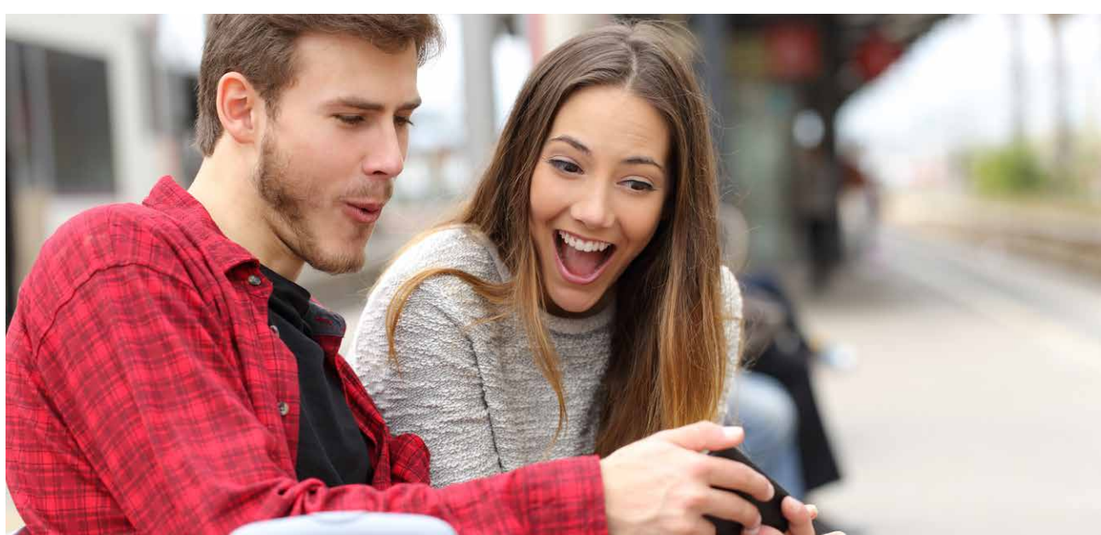
3x higher efficiency and smoother gaming experience

High cost-effectiveness

Popular NetEase games, such as Justice, Qian Nv You Hun, Meteorite Assassin, and Revelation, are deployed on HUAWEI CLOUD's Kunpeng-powered cloud gaming platform. There is no need for instruction set conversion, hence less compute resource overhead. The architecture efficiency is increased by three times, and the development cost-effectiveness is improved by 20%.

Smooth gaming experience

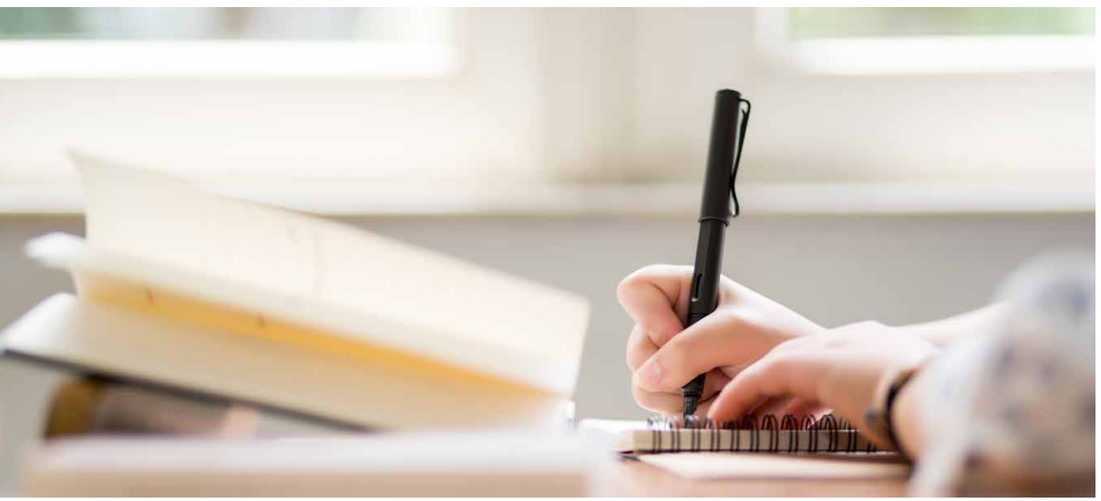
End-to-end network optimization reduces the latency between devices to less than 120 ms, making cloud gaming smoother.



Zhihu

Accelerating Knowledge Sharing with HUAWEI CLOUD OBS

Zhihu is a question-and-answer website where users can create, answer, and edit questions, and conveniently share their knowledge, experience, and insights. Zhihu hopes its users can fully express themselves and see more of the world from each other's posts. With this goal in mind, Zhihu launched its user-generated content (UGC) video services.



Challenges

Complex service processes

A video posted on zhihu.com needed to be parsed, transcoded, associated with rules in a library, and checked for illegal content. This process was complex and took a long time to complete. Zhihu was looking for a way to automate and accelerate the process of video uploading, storage, analysis, and posting.

Heavy O&M workload

Video services needed the collaboration of multiple systems, including event listening, task triggering, and video processing systems. There was no platform to monitor or troubleshoot these systems in a unified manner, and O&M engineers had to spend considerable time on problem detection, location, and fixing.

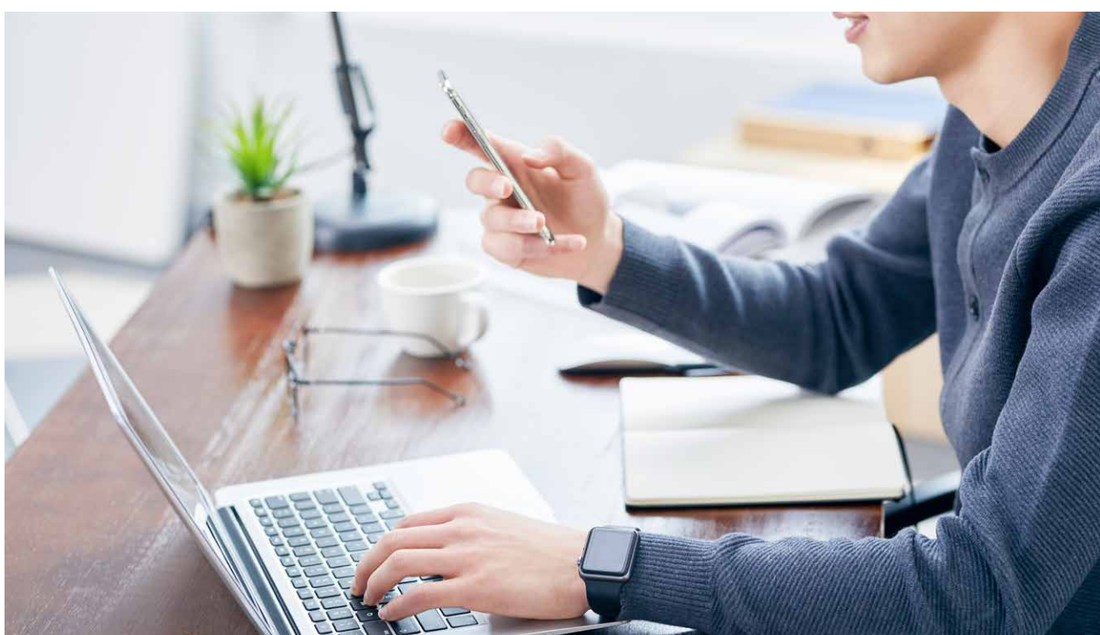
HUAWEI CLOUD OBS accelerates video release

HUAWEI CLOUD Object Storage Service (OBS) provided Data+, an intelligent service that automatically orchestrates data processing. Users can register APIs for data services in a few clicks, and can easily integrate HUAWEI CLOUD or other third-party video processing capabilities into their own platforms without coding.

Data+ provides intelligent orchestration capabilities and templates. Zhihu can use drag-and-drop tools and templates to build a new service within a week and roll it out quickly. NDP operators are moved close to data, working with function-based APIs to reduce calling duration by about 60%. Data+ also provides a set of O&M APIs and a platform that visualizes O&M statistics, helping Zhihu monitor every API and precisely locate problems, reducing O&M time by 40%.

Higher R&D efficiency and shorter wait time

The intelligent data processing capabilities of HUAWEI CLOUD OBS Data+ helped Zhihu quickly launched their UGC services, achieving 50% higher R&D efficiency and 30% shorter wait time before video release.



Douyu

Real-time, Cloud-rendered Special Effects, Cooler Interactive Experience

Douyu is a leading video live streaming platform serving 280 million young Internet users in China. Its main focus is game streaming but it also covers entertainment, variety shows, sports, and other outdoor events.

Challenges

- Live-streamed content is becoming increasingly homogeneous. The only way to break from the pack is by providing differentiated content, such as innovative special effects, to attract and retain users.
- Users expect cooler special effects from live content, in addition to smooth playback, low latency, and interactive experience, which are now no more than basic requirements to play in the online video market.
- Storage and compute resources need to be highly scalable to keep up with the changing demand of a live streaming platform. A traditional big data platform typically uses coupled storage and compute resources, meaning the two types of resources need to be scaled up or down at the same time, which may lead to low resource utilization and slow response to changes.

Real-Time Communication (RTC)-powered special effects rendering

By deploying HUAWEI CLOUD's cloud-native, real-time audio & video service, Real-Time Communication (RTC), Douyu was able to move real-time special effects rendering from end user devices to the cloud, where they could deliver a real-time interactive experience with close to zero latency. Leveraging HUAWEI CLOUD's leading cloud-native technology, Douyu can now focus on cloud-based innovation, accelerate proof of concept (PoC), and greatly improve R&D efficiency. There is no more need for multi-device adaptation, and there is no need for frequent SDK updates. That means fewer update downloads interrupting the end user's viewing experience. In addition, with a big data solution that uses decoupled storage and compute plus a serverless architecture, compute and storage resources can be scaled independently based on their respective usage, improving resource efficiency.

Combining the algorithms of HUAWEI CLOUD and Douyu, the two companies are also trying to build an algorithm ecosystem that will power AR/VR innovation in the future. The algorithm store on HUAWEI CLOUD will give streamers more options to build a more diverse, more interactive experience.

More effects, more interaction, less waiting, more fun

- **Enhanced interaction:** User interaction improves engagement. For example, if a live streamer loses a challenge, they still get to improvise a dance to entertain viewers. On-screen streaming comments have been enhanced as well.
- **Better user experience:** The end-to-end latency is less than 400 ms, and special effects rendered on the cloud can be updated in one click. Users can experience and tune special effects in real time, from basic face and body beautification functions, stickers, and background blurring or virtual backgrounds, to compute-demanding virtual imaging.
- **More innovative features:** 3D stickers and voice changers can turn an online streamer into a Jedi knight instantly. A streamer can appear to be anywhere simply by replacing the background.
- **Reduced costs:** Compute and storage resources can be scaled independently based on their respective usage, greatly improving resource efficiency. Overall, the cost of big data cluster resources used for cloud-based special effects rendering is reduced by 50%, and performance is improved by 218% compared with on-premises solutions.

Testimonials

Thanks to the HUAWEI CLOUD video cloud team, Douyu now has the ability to deliver real-time, cloud-rendered special effects based on HUAWEI CLOUD's cloud-native RTC service. We believe in the future, Douyu will continue to deliver ground-breaking innovations in live content creation that deliver richer, cooler interactive experiences to our customers.

-Xiao Zhisong, owner of the recognition service middle-platform, Douyu

Meitu

Bringing AI Image Processing Magic to Over 2 Billion Users

Meitu is a leading image processing and social networking platform in China. It has 2.08 billion users worldwide and over 295 million monthly active users (MAU), processing more than 6 billion photos and videos every month. Meitu worked with HUAWEI CLOUD to reduce core service latency to 1s and increase O&M efficiency by 70%.

Challenges

Unstable databases

Most Meitu databases consist of a primary node and multiple secondary nodes. The nodes balanced loads based on DNS but could not eliminate hot spots or load imbalance issues. Databases were unable to automatically perform full backup, full restoration, incremental synchronization, or rate limiting, thus could support few service scenarios.

Poorly utilized big data clusters

Big data accounted for about half of Meitu's data and was increasing rapidly. Meitu required different amounts of compute and storage resources, but the resources were on the same physical machines and could not be decoupled for elastic scaling. Data had multiple copies and was frequently transferred, occupying much storage space and bandwidth.

Heavy O&M workload and cost

Each database administrator in Meitu maintained more than 100 databases and instances on average, busy with tiresome, repetitive O&M work. Meitu used Hadoop for big data analysis and paid a high price to fix bugs, improve performance, and scale the system.

Smooth migration to a cloud-native platform

Meitu signed a strategic cooperation agreement with Huawei and upgraded its infrastructure to cloud-native infrastructure. HUAWEI CLOUD designed a solution that used cloud databases and decoupled compute and storage resources, smoothly migrated Meitu's seven major service modules to HUAWEI CLOUD, and achieved significantly higher database performance, scalability, and stability.

Strong RDS capabilities and diverse DR modes

HUAWEI CLOUD Relational Database Service (RDS) uses a distributed HA architecture, and is highly stable and reliable. RDS splits read and write requests, distributes requests, and balances loads to enhance database performance. Routine O&M was automated on the database management platform to greatly reduce database administrators' workloads. A range of DR solutions were tailored for migration, synchronization, subscription, and disaster recovery (DR) scenarios to guarantee data security.

Storage-compute decoupling on the cloud big data platform

The HUAWEI CLOUD BigData Pro solution helped Meitu use the same cloud native infrastructure for AI and big data. Compute and storage resources were completely decoupled and could be separately scaled. The big data MapReduce Service (MRS) provided cost-effective multi-core CPUs, and was fully compatible with the open-source ecosystem. Meitu's services were migrated to the cloud without modifying code or interrupting services. Data using different protocols was all stored in an Object Storage Service (OBS) data lake, thus was widely accessible and did not need many copies.

Higher productivity and security

Higher performance

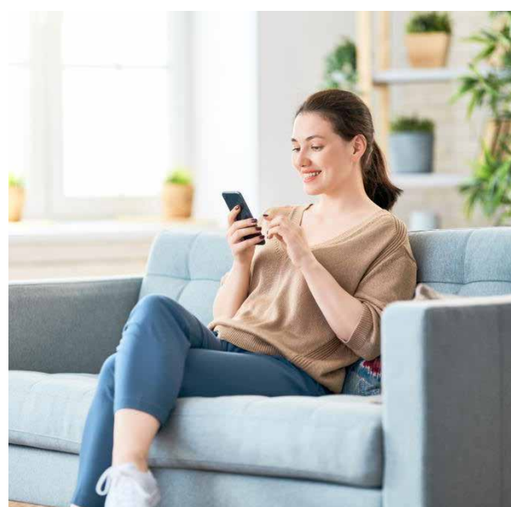
The cloud native infrastructure achieves high performance and scalability, able to guarantee database stability even in high concurrency scenarios. QPS is increased by 3.5 times. Meitu can efficiently handle massive service requests of more than 2 billion users in unexpected peak hours.

Lower cost, higher quality

A cloud-native infrastructure platform centrally manages real-time online services and offline compute services and simplifies O&M. The database O&M efficiency is increased by 70%, and the average time for accessing core service databases is reduced by about 67%. Compute and storage resources can be scaled on demand, increasing resource utilization rate by 40% and reducing costs by 30%.

Secure and reliable

Multiple DR modes are available for Meitu to choose. The backup reliability reaches 99.999999999%. Terabytes of data can be restored within minutes.



Nestia

Nestia Grows Lifestyle App Business Faster with HUAWEI CLOUD

Nestia Pte Ltd is an emerging startup based in Singapore. Available on Android and IOS, Nestia is a top downloaded all-in-one lifestyle app that is adding thousands of new users daily. Since its release in 2015, the app has been iterated many times, adding new functions popular with users such as news articles, F&B deals, movie bookings, and most recently, a preloved goods marketplace. Staying true to its commitment to “making life simple”, Nestia aspires to be a one-stop platform that simplifies the lives of Singaporeans.

Challenges

With the rapid development of services, original cloud vendors can only passively respond to service requirements. The response is slow and the planning is backward-looking. The diverse range of services needed drive up deployment costs, and service data processing is not flexible. These issues are difficult for Nestia to manage.

Robust business growth under Huawei HMS program

After gaining an understanding of Nestia's business and requirements, HUAWEI CLOUD provided stable IaaS and PaaS products and solutions. Nestia used high-performance IaaS services from HUAWEI CLOUD to run their lifestyle app. They also used the Cloud Search Service (CSS) to provide powerful search capabilities, making it easier for app users to find what they need. The app images are centrally stored in the Object Storage Service (OBS) while Content Delivery Network (CDN) minimizes the delays in loading webpage content. Log Tank Service (LTS) helps to aggregate, structure, visualize, and analyze log data to provide actionable insights into O&M.

The key point is that HUAWEI CLOUD has enabled Nestia to promote their business under the Huawei Mobile Services (HMS) program. Now, Nestia can reach over 700 million Huawei mobile users worldwide through the Huawei App Gallery and also benefit from over 1.8 million developers in the HMS ecosystem.

HUAWEI personnel also provide helpful suggestions, professional and efficient pre-sales support, and respond to problems at any time during proof of concept (POC) tests. HUAWEI CLOUD has earned recognition for professionalism and high-quality services.

Faster apps and lower costs

By adopting the services of HUAWEI CLOUD, Nestia has improved application performance by 20% and has reduced costs by 30%. Nestia can also develop and grow their business channel within the HMS Ecosystem.

Energy 2020 & Manufacturing

Henan Electric Power Company, State Grid

Building the Energy Internet and Harnessing the Power of Data

Henan Electric Power Company (State Grid) is building an Energy Internet that enables deep integration of energy production, transmission, storage, and consumption across different types of power networks. In support of this strategy, Henan Electric Power Company has set up a dedicated organization to manage IT buildout and data management. Cloud and data middle platform architectures are also used to accelerate digitization of the company.

Challenges

Management mode: Henan Electric Power Company independently procured, built, and maintained its own cloud platform. With the single-tier, centralized management typically used by traditional cloud vendors, it is not easy to allow HQ to have the central oversight they need while still allowing subsidiaries to handle O&M details.

Enterprise operations: Data sharing is inefficient due to lack of coordination and inconsistent data standards between different departments. There is still a long way to go before the company can have streamlined data sharing.

Power grid operations: The grid is not ready for large-scale integration of renewable energy, partly due to delays in data sharing.

New services: The company's ability to leverage data to quickly respond to changes and serve customers as well as external entities is limited.

A digital platform powered by HUAWEI CLOUD Stack and Data Lake Governance Center

A "One-level Operations + Two-level Maintenance" management architecture based on HUAWEI CLOUD Stack

Based on HUAWEI CLOUD Stack, the State Grid has built a unified electric power cloud covering the HQ plus 14 provincial subsidiaries, aligned with its pre-existing "one-level operations and two-level maintenance" architecture. The HQ operations platform handles service provisioning and resource management for all subsidiaries, whereas the level-2 maintenance platform of each subsidiary is autonomous and handles routine O&M details of its own cloud.

Data enablement: DGC helps you get the most out of your data assets

HUAWEI CLOUD's Data Lake Governance Center offers a data enablement platform that streamlines data ingestion, conversion, and consolidation. The solution breaks down barriers to data sharing, expands and enriches data models, and continuously improves data quality; unifies data standards and standardizes call and service interfaces, implementing Data as a Service (DaaS); supplies a data governance system for enhanced, lean data management; supports unified development of information systems and digital products, accelerates big data adoption, and provides analytical services, powering data-driven operations.

Smarter power grid, greener energy, and better services

Big data analytics improves utilization of renewable energy

For the first time, solar and wind power were included in the calculation for power balancing. With big data analytics, province-wide solar and wind power reliability were improved by 15% and 10%, respectively. The cost savings during the company's 14th Five-Year Plan are expected to reach CNY 15 billion.

Unified cloud management reduces IT CAPEX

With HUAWEI CLOUD Stack ManageOne, the production and operations teams were able to quickly identify idle resources and resource bottlenecks and dynamically adjust resource quotas. This improved the overall resource utilization by 55.48%, saved CNY13.91 million in IT investment, and also improves data sharing and development efficiency. In total, data development and O&M costs are reduced by CNY32.5 million.

Data-powered innovation improves enterprise service

Under the umbrella of the "Energy + Internet" strategy, Henan Electric Power Company launched financial services powered by electric power data. These services have so far provided CNY440 million in loans to 1,629 certified enterprises. This helps small and micro businesses reduce energy costs, increasing their chances of success.

Government data sharing helps provide improved citizen services

Improved government data sharing has simplified the process by which electric power consumers request services from the power company. For example, the application one submits to State Grid for a high-pressure liquid tank is now much simpler.

Testimonials

Leveraging the big data solution of HUAWEI CLOUD Stack, for the first time, Henan Electric Power Company was able to precisely calculate a new power-balance model for large-scale integration of renewables into the power grid. Big data analysis is performed by combining the real-time output of renewable power stations, local weather forecasts, as well as historical data in Henan province. The analysis helped improve photovoltaic power output certainty by 15%, and that of wind power by 10%. The contribution of renewable energy power is expected to reduce new power grid investments by CNY15 billion over the next five years.

-Xing Ziya, Deputy Director of the Data Office, Internet Department, Henan Electric Power Company, State Grid

Yantai Walsin Stainless Steel Co., Ltd.

Adding AI in Steelmaking

Yantai Walsin Stainless Steel Co., Ltd. (Walsin for short), a subsidiary of Walsin Lihwa, is based in Yantai, Shandong Province. Founded in 2007, Walsin specializes in producing stainless steel billets and has an annual output of 200,000 tons. It is one of the top enterprises in stainless steel and alloy steel. Walsin is now transforming from batch production to refined production, aiming to develop advanced stainless steel rolling techniques.

Challenges

Alloying elements are key to producing alloy steel. These elements were added manually, which was prone to human error and could be labor-intensive as different batches of iron ores require different mixtures of alloying elements to produce stainless steel.

Walsin needed to add alloying elements multiple times a day. Even when mixtures were adjusted multiple times, the success rate of producing stainless steel from melted iron ores was only about 80%. This experience-dependent mode could no longer support production innovation.

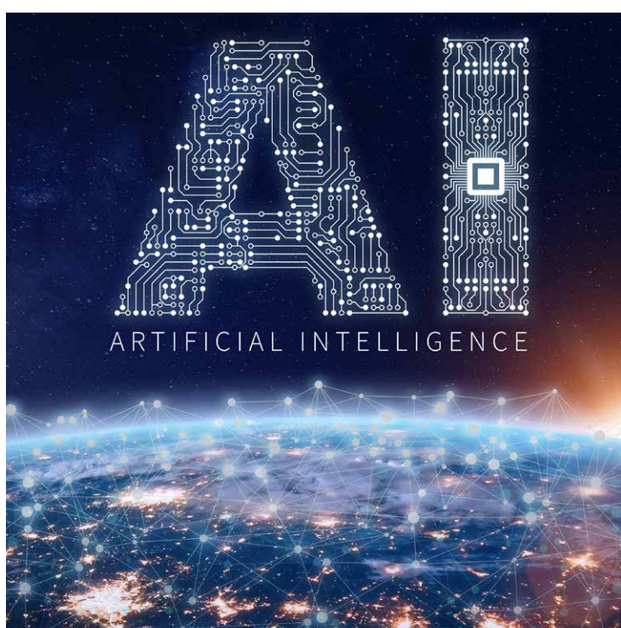
HUAWEI CLOUD Industrial Intelligent Twins

Walsin uses HUAWEI CLOUD Industrial Intelligent Twins to add AI in steelmaking. Industrial knowledge is injected into AI, including expert experience and the law of conservation of matter for alloy ingredients. An AI model for soft measurement of components was built based on multi-modal data perception and the historical data of the past year. With Industrial Intelligent Twins, alloying element engineers can make better decisions on how much of each element is needed at the lowest cost.

AI takes the guesswork out of alloy steel production

Industrial Intelligent Twins can calculate the optimal ratio of alloying elements within 10 seconds and predict the components in the melted iron ores with an accuracy improved from 80% to over 95%. Now, Walsin only needs to add elements once a day and these can be synthesized during production.

Costs can be reduced by $15.5 USD per ton. Walsin's annual production capacity is 200,000 tons, which means they can save $3.1 million USD every year.



PTT Digital

PTT Digital Automatically Identifies Device Labels on Technical Drawings with HUAWEI CLOUD OCR

Thailand Petroleum Corporation (PTT) is a national energy and petrochemical company controlled by the Thai government. It is responsible for oil and gas exploration, processing, and refining, and downstream production, storage, transportation, and trade. It is the only Thai company in the Fortune Global 500.

Challenges

There are a large number of technical drawings for oil pipelines for which engineers need to identify device labels. Many of them are complex and hard to read. Manual identification is slow and error-prone. PTT needed AI to automatically identify device labels and perform further logic processing.

HUAWEI CLOUD OCR, making it easier to identify technical drawings

Huawei has full-stack AI capabilities and is committed a long-term strategic investment in AI. Huawei delivers one of the best end-to-end solutions and enterprise-level local services to a variety of industries.

HUAWEI CLOUD customized an OCR model to identify the numbers on technical drawings and worked with partners to provide a web UI for PTT engineers to read and manage technical drawings. HUAWEI CLOUD OCR makes it easier for PTT engineers to identify technical drawings also and automates labelling to improve work efficiency.

Precise, efficient, cost-effective

After PTT Digital officially adopted the HUAWEI CLOUD OCR service

- The identification rate has increased to over 98%.
- The labor cost has been reduced by 30%.
- The efficiency has improved by 50%.

ZhongChuangHanWei

Automatic Rubber Tapping Solution Provides Comprehensive Support for the Industry Transformation

ZhongChuangHanWei works with rubber groups such as Hainan Rubber to build smart rubber plantations with automatic rubber tapping, tailor-made machine design, and big data-oriented refined operations, greatly improving the production yield and leading the industry transformation.

Challenges

China's growing dependence on imported rubber

Natural rubber is an essential production resource, just as important as steel, coal, or oil. Of the nearly 8 million tons of natural rubber consumed in China annually, only 1 tenth of it is home-grown.

Poor working conditions cause serious workforce loss

To obtain more rubber latex, the tapping process is mostly done at midnight or in the early morning. While working overnight, workers have to endure the raging mosquitoes, one reason why 15% to 20% of the workers quit the job every year, leading to 50% of the native rubber gardens going to waste.

Customized rubber production was unrealistic for traditional tapping machines

Each rubber tree varies a lot in trunk size and bending degree. To customize the rubber tapping procedure, the cost would be extremely high.

Smart rubber tapping with unified management, machine customization, and real-time data ingestion

HUAWEI CLOUD and ZhongChuangHanWei jointly developed a smart rubber tapping solution that automated the rubber tapping process. Leveraging the all-scenario IoT services of HUAWEI CLOUD IoT and cloud big data advantages, each rubber tree is configured with an automatic tapping machine. And after the rubber has been collected, precise mechanical profiling technology and cloud-based real-time sensing and control ensures latex is produced with a standard thickness of 0.01 mm. For more efficient management, the status of each machine and the basic information about the trees are collected in real time.

This automatic tapping method has increased the output of the natural rubber production in China. This solution is leading transformation throughout the industry.

Boost rubber production with fine-grained operations

Real-time high concurrency, not a single tree missed

Each tapping machine is tailor made for the tree it taps and comes with a cloud connection that ensures remote one-click startup. Tens of thousands of or even hundreds of millions of rubber trees can be tapped at the same time. The tapping process can be done in 5 minutes.

Cloud-based automatic tapping, improving productivity by more Than 60%

Generally, rubber trees can be cut once every other day, but manual tapping takes three days for every 1,000 trees. There's tremendous waste involved. Using the automatic tapping solution, the entire process is completed within 5 minutes, improving the production capacity by at least 60%.

Rubber plantations fine-grained operations

With IoT and industry know-how, the tree damage caused by cutting the trees when tapping them is minimized, and the trees live longer. The vast amount of data collected also serves as a foundation for more refined operations in the future.

Testimonials

To implement automated customized rubber tapping of 630 million rubber trees in China, we needed a stable and reliable platform to support our solution, connecting tens of thousands or even hundreds of millions of rubber trees and providing unified management. HUAWEI CLOUD IoT suits our needs, enabling one-click rubber tapping with no packet loss. The excellent support for hundreds of millions of devices proves HUAWEI CLOUD is a partner we can trust.

-Xu Zhenkun, President of ZhongchuangHanwei


Transportation
2020

Shenzhen Airport

Shenzhen Airport Delivers an Efficient Airport Experience with HUAWEI CLOUD

Shenzhen Bao'an International Airport is the gateway to Shenzhen and a key airport in the powerhouse province of Southern China, Guangdong. In 2017, the Shenzhen Airport was chosen by the International Civil Aviation Organization (ICAO) to build a worldwide showcase for future-ready airports. Shenzhen Airport Group successively signed a strategic cooperation agreement with Huawei and embarked on a path towards comprehensive, systematic digital transformation.

Challenges

As the core transportation hub of China's Greater Bay Area, Shenzhen Airport faces great challenges in terms of aircraft stand allocation and flight support.

Limited usage of aircraft stands

Shenzhen Airport, China's 4th busiest and world's 24th busiest airport in terms of cargo traffic, urgently needed to improve aircraft stand usage to offer a more pleasant experience for travelers. The aircraft stand allocation requires skilled specialists with a deep understanding of the requirements and restrictions for every aircraft stand, but no matter how experienced they are, there are always surprises just around the corner. Even specialists find it difficult to take full advantage of all of the aircraft stands. The near stand usage stood at 70% and the remote stand usage was sometimes even as low as 30%.

Human errors in flight support services

The data of 33 flight support services needs to be manually recorded every 15 minutes. Some data is not recorded timely or inaccurately, resulting in some problems in flight support services.

AI-powered aircraft stand allocation and flight support tracking

Shenzhen Airport used Aviation Intelligent Twins from HUAWEI CLOUD to build more than 60 AI-powered aircraft flight scheduling rules to allocate aircraft stands automatically and intelligently.

Shenzhen Airport also used the AI video service from HUAWEI CLOUD to analyze multiple video feeds to automatically identify whether each flight support action was completed and how long it took to complete each action. The automatic detection and recording minimizes errors and ensures the highest possible quality of flight support services.

Stand allocation made easy

- Aircraft stands are now allocated intelligently. The bridge docking rate was increased by 3% to 5%. 2.6 million more passengers can board without taking a shuttle bus every year.
- All flight support work is automatically detected using video and AI technologies. Airfields are comprehensively analyzed using computer vision. Airport operations are efficiently monitored for the highest possible security at the Shenzhen Airport.

Testimonials

Shenzhen Airport is undergoing an important period of large-scale development. It is planning and building a satellite hall, third runway, and a fourth terminal. The aim is to build a large aviation industry group with assets in excess of CNY100 billion. The strategic cooperation with Huawei will be beneficial to these goals.

-Mr. Chen Jinzu, Chairman of Shenzhen Airport Group

Northwest Air Traffic Management Bureau

Digging up the Value of Data for Intelligent Air Traffic Control

Northwest Air Traffic Management Bureau, a branch of the Air Traffic Management Bureau (ATMB) under the Civil Aviation Administration of China (CAAC), is responsible for air traffic control, communication, and navigation in Northwest China.

Challenged by the need to integrate traditional industries with digital technologies, Northwest Air Traffic Management Bureau built an air traffic management system that is secure, efficient, intelligent, and collaborative by leveraging Huawei's proven data methodology and extensive data tools, and started exploring digital transformation together with HUAWEI CLOUD.

Challenges

No standardized architecture and unified data standards

The IT infrastructure was not standardized, business systems were siloed, and data was scattered across various applications. Know-how could not be accumulated, and decision-making was overly dependent on personal experience.

Inadequate digitalization and intelligence

Without emerging technologies in place, such as cloud computing, Internet of Things (IoT), big data, and artificial intelligence (AI), they were slow to respond to new requirements and struggled to improve their management, security, and efficiency.

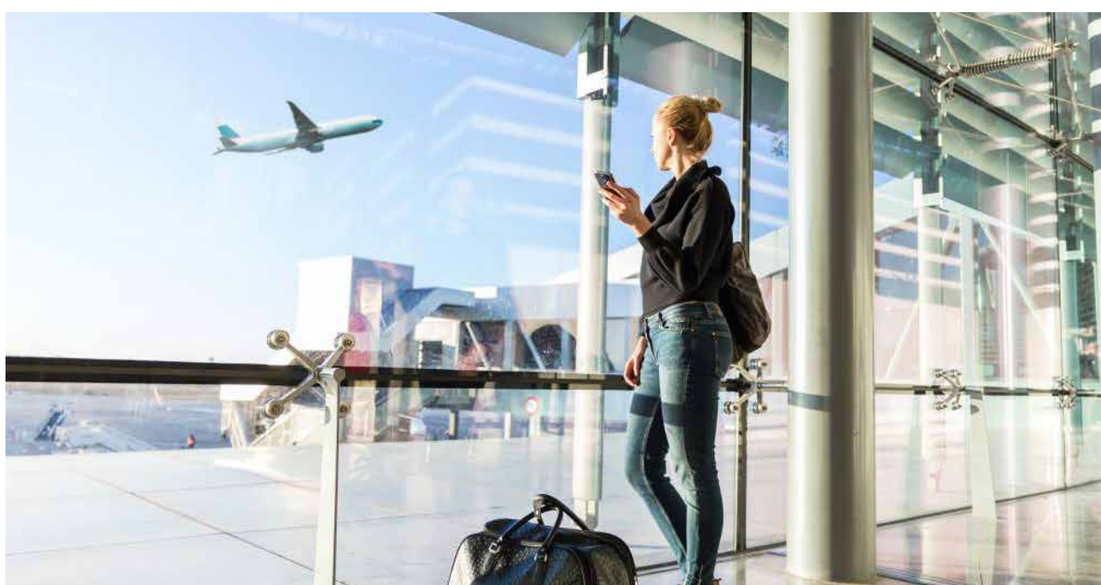
DAYU-powered data enablement

To build a secure, efficient, intelligent, and collaborative system and implement strategies for development over the next 3 to 5 years, Northwest Air Traffic Management Bureau built an intelligent data center together with HUAWEI CLOUD.

By using DAYU, Northwest Air Traffic Management Bureau unified their data standards and built an intelligent data lake and a platform for application development. They also migrated legacy information systems to the cloud, streamlined the data of their physical infrastructure devices, and built data asset models to convert experience into rules. This greatly improved the efficiency of their air traffic management system and was a great step forward for intelligent air traffic control.

Centrally managed data, monetized data

- All data is centrally managed throughout the lifecycle. Automatic device awareness, data collection and analysis, and data visualization make data search, management, and use more efficient.
- The value of data is now more fully leveraged, allowing them to increase the air traffic control precision from minute-by-minute management to second-by-second control, and their flight operations and air space utilization are more efficient than ever before.



Highway Monitoring & Response Center

Connecting National Highways and Accelerating Payment with ETC

The Highway Monitoring & Response Center of China is responsible for monitoring highways, handling road emergencies, and providing travel information services.

At 00:00 on January 1, 2020, the 487 toll stations in 29 provinces across China stopped services and were replaced by Electronic Toll Collection (ETC) toll gates. Time taken for highway fee payment were significantly reduced. ETC toll gates can also help calculate road pricing, track vehicle travel paths, and monitor road traffic, vehicles on road, and driving speed.

Challenges

- **Massive applications:** It was difficult to manage 100,000 edge nodes in 29 provinces and respond to connections from more than 300,000 edge applications.
- **Complex scenarios:** Traditional solutions could not update algorithms quickly to identify complex road and vehicle conditions.
- **Heterogeneous edge devices:** There was no platform to manage heterogeneous hardware and OSs in the provinces in a unified manner.

Edge-cloud synergy powered by HUAWEI CLOUD Stack and IEF

The center worked with HUAWEI CLOUD to develop an edge-cloud synergy solution based on HUAWEI CLOUD Stack and Intelligent EdgeFabric (IEF). All the toll stations at provincial borders were replaced with ETC toll gates. The solution provides the following capabilities:

- **Large-scale access:** A single tenant can manage up to 100,000 nodes and millions of applications.
- **Fast image distribution:** Image acceleration sites were deployed in the provincial data center to reduce network congestion, distributing images to tens of thousands of nodes within seconds.
- **One-stop management:** IEF can manage edge services throughout their lifecycles, including heterogeneous device access, image management, upgrade, O&M, and distribution.

AI-assisted vehicle passthrough and management

- **Quick pass:** The time taken for a vehicle to pass through an ETC toll gate is reduced from 15 seconds to 2 seconds.
- **Smart and efficient management:** Nearly 100,000 edge nodes and more than 300,000 edge applications are managed on a single network and assisted by AI. Service efficiency is increased by 10 times.
- **Continuous evolution:** The scalable edge-cloud synergy architecture lays a solid foundation for future revolution of video cloud networking, V2X vehicle-road synergy, and autonomous driving.

Sichuan Duwen Expressway

First 5G Intelligent Expressway in Southwest China Suitable for Vehicle-Road Collaborative Test in All Weather and Road Conditions

Sichuan Duwen Expressway, an important part of the G4217 Rongchang Expressway, runs from Dujiangyan to Wenchuan, traversing the mountainous areas of Southwest China. This expressway provides safer and more comfortable travel through the region. It also helped deliver a great number of first aid supplies during the Wenchuan Earthquake, saving people's lives.

Challenges

Complex geology and weather conditions threaten road safety

Passing through numerous plains, canyons, fault layers, and the Minjiang River, 76.3% of the expressway needs to traverse some 50 different bridges and 11 tunnels. Sichuan is also known for dense fogs, earthquakes, and other natural disasters, causing expressways to close for days on end. These are all major threats to highway safety and major challenges for highway management.

Collecting data in the face of such complex road conditions is difficult

Sunny days are rare in southwest China. Traditional roadside cameras cannot effectively monitor abnormal road conditions in limited sunlight.

Frequent traffic warnings reduce driver safety

Generally, the driver receives a traffic message every 10 seconds when driving on an ordinary highway. However, due to complicated road conditions of Duwen expressway, traffic messages are constant, distracting drivers and affecting safety.

HUAWEI CLOUD IoT empowered intelligent expressway

Empowered by HUAWEI CLOUD IoT technologies, Longchi road section of Duwen expressway is connected to a 5G intelligent network, available for vehicle-road integrated administration. This is the first expressway in southwest of China connected to a 5G network, and also the first mountainous test field in China for 5G-based automated driving studies.

Based on the digital road network service provided by HUAWEI CLOUD IoT, the expressway system uses cameras and radars to collect data. In this way, the system can detect the location and speed of vehicles in real time around the clock without being affected by rain or fog and without having to add street lamps. The solution also includes 310+ traffic incidents and runs simulation tests of complex road conditions in the Longchi road section to allow for more precise warnings. Cloud-edge integrated algorithm training and edge computing, part of IoT V2X Edge, ensure that traffic accidents are handled as fast as possible, and provides data for better traffic policies down the road.

Shorter shutdowns, fewer accidents, and less interference

Shorter shutdowns

All-weather real-time sensing, the roadside cameras that are 95% accurate, even in rainy and foggy conditions, greatly reduce the amount of time the Duwen expressway has to be shut down for.

Fewer accidents

In mountainous areas, where the weather can be capricious, dangerous road and weather warnings, tunnel safety tips, and alerts when there are existing traffic incidents on the road ahead all work together to reduce the highway accidents.

Less interference

After quickly filtering out unimportant traffic information, improved, more relevant messages can be prepared with 100 ms and forwarded to drivers through multiple channels such as 5G and LTE-V.

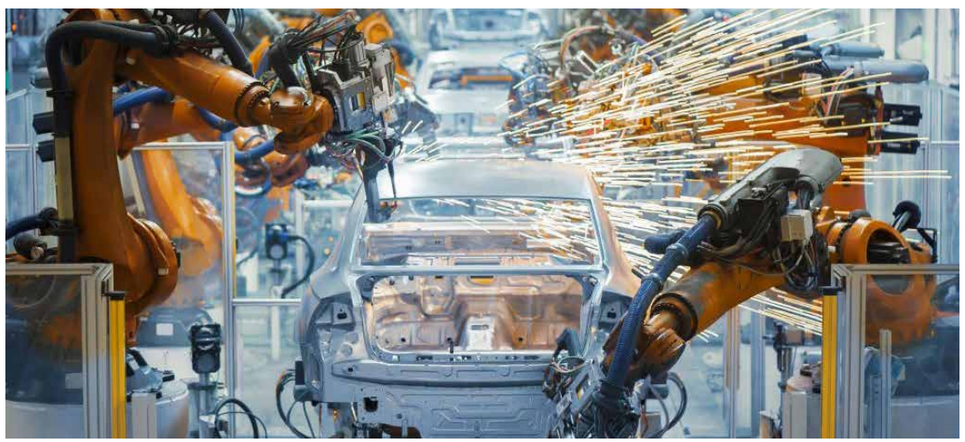

2020
Automobile

China FAW Group

China FAW Group Accelerates Intelligent Transformation with Knowledge Computing

We are witnessing a technology driven revolution in the automobile industry. Both the products and ecosystems are changing in surprising ways. Digitalization has become the core driving force for the transformation and development of the automobile industry.

Under China's New Infrastructure initiative, FAW Group plans to build a knowledge computing platform to help employees quickly grow into experts and, more importantly, accelerate knowledge-driven transformation inside the group.



Challenges

They urgently need to improve employee skills.

FAW Group needs to quickly build up employee skills to ensure they are ready to ride the coming wave of digital transformation and remain competitive in the automobile industry.

Expert experience is hard to pass on.

The automotive industry is highly technical. Much industry knowledge is either locked away in technical manuals or locked away in the minds of a few experts. It typically takes at least three years to develop a skilled maintenance expert. FAW Group hopes to build a scenario-specific knowledge platform to develop R&D and maintenance experts faster.

Using knowledge computing from HUAWEI CLOUD to build a digital platform

FAW China used a knowledge computing solution from HUAWEI CLOUD to build a digital platform to help acquire, accumulate, and apply knowledge to empower services and unleash more value from data.

Data-driven knowledge acquisition: This platform provides a digital knowledge pipeline to extract knowledge from various data silos, improving the data structuring efficiency by 30% and keeping labor costs down. In addition, a number of powerful algorithms are provided to support agile knowledge modeling.

Fast application: FAW Group used the Graph Engine Service (GES) from HUAWEI CLOUD to link all of their data together and present knowledge graphs for employees to study and gradually grow into subject-matter experts.

A more efficient digital architecture, less reliance on experts

Less pressure on domain specialists

Knowledge graph entities are generated 30% faster than before and fewer errors are produced. The small-shot learning can generate the industry's best possible training models from only a small number of training images. Subject-matter experts are relieved from many burdensome, low-value tasks. The workload on a domain specialist can be reduced by more than 60%.

More efficient vehicle maintenance

The maintenance experience library arms technicians with expertise for faster troubleshooting, faster maintenance, and increased productivity, which empowers them to deliver an improved customer experience. The one-time repair rate was increased by 4%. The customer wait time was reduced by 23% on average. The factory support required and the time needed to train a technician were both slashed by 30%.

Testimonials

We will continue to apply knowledge computing to more aspects of the automobile supply chain. For example, we can apply the quality knowledge gained from after-sales, production, and drive tests to Design Failure Mode and Effects Analysis (DFMEA) to help improve R&D quality and efficiency.

-Guo Yongfeng, General Manager of the Digital Dept of the China FAW Group (tentative)

UCARS

UCARS Makes Buying Cars Easier with HUAWEI CLOUD

UCARS, one of the fastest-growing online car marketplaces in Singapore today, began with a vision to make buying a car easier. UCARS was founded in 2019 by a consortium of renowned car dealers and car-related service providers who came together with the common goal of creating innovative ways for dealers to better connect with consumers. Partially in response to the recent forced closure of many showrooms across Singapore, UCARS developed an online car marketplace where dealers and consumers alike can enjoy a seamless end-to-end experience when buying and selling new or used cars.

Challenges

- UCARS has a portal and a mobile app. The volume of customer visits varies widely. Resources need to be scaled out on demand and scaled in when pressure on the system returns to normal.
- The system needs to provide 24/7 customer service. When a production site goes down for any reason, another site needs to be ready to take over instantly.
- Web applications are constantly vulnerable to potential online attacks, so web application firewalls need to be regularly updated to keep up with the latest developments in Internet security.
- UCARS is growing rapidly, so they need to accelerate application rollout. UCARS is determined to provide more and more value-added capabilities to make car dealing work better for salespeople and customers alike.

Using HUAWEI CLOUD to develop applications faster and monitor applications more efficiently

HUAWEI CLOUD provides a combination of ECS, AS, CCE, CCI, AOM, and APM services to help UCARS develop applications faster and monitor their applications more efficiently. In addition to these IaaS and PaaS services, HUAWEI CLOUD also provides ModelArts and ImageSearch to map car pictures uploaded by their customers to cars in the UCARS inventory, which greatly improves business opportunities for both customers and dealers.

With 4 AZs in Singapore, HUAWEI CLOUD can provide scalable, reliable services to the region and guarantee that all customer data is kept locally in Singapore. HUAWEI CLOUD offers customers both online and offline support. Issues arising during everyday development, or in the course of regular O&M, can be quickly resolved.

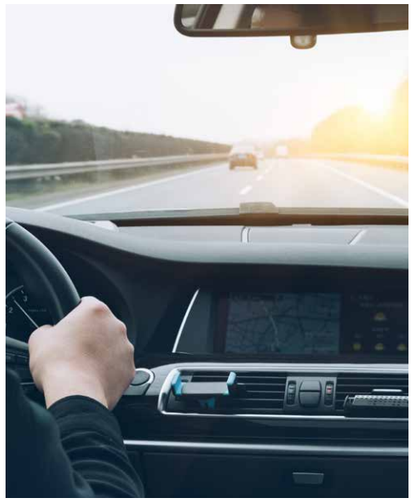
Faster rollout, lower costs

- Application rollout that previously took a week can now be completed in 1 day.
- TCO is down by 30%.
- Intuitive application monitoring makes O&M more efficient.

AASA

AASA Moves to HUAWEI CLOUD for Increased Flexibility

The Automobile Association of South Africa (AASA) is a non-profit organization with about 5 million registered users and 700,000 paying subscribers. They provide a wide range of vehicle-related services, including road security, trailers, and roadside assistance. They are well known in South Africa, where they work with transportation, logistics, road administration, police, finance, and insurance agencies.



AASA initially used hosted infrastructure in a local data center. As their business expanded, the need for computing resources increased, and AASA faced scaling, availability, and cost challenges. Their IT department found that constantly expanding their infrastructure to support business growth was delivering diminishing returns on investment. AASA was unable to scale up efficiently and cost-effectively. Dealing with the scalability and availability challenges was putting an increasing operational and maintenance burden on AASA. AASA has multiple types of apps for their services, but most of these services are consumer facing. Generally, service volume peaks on holidays and weekends. During those peak hours, website and app traffic placed a heavy strain on AASA's limited resources.

Challenges

Instability

Self-built environments suffer from frequent power outages, affecting service continuity and resulting in complaints from end users.

Underperformance

With the traditional virtualization environment they were using, their CPU utilization was often lower than 20%.

Expensive O&M

Purchasing devices from multiple vendors and outsourcing services are complicated processes, resulting in delayed response times and overly expensive O&M.

Outdated architecture

With a traditional Enterprise Service Bus (ESB) architecture, services are tightly coupled, and there is not enough flexibility.

Using HUAWEI CLOUD to build and manage systems and applications

AASA chose HUAWEI CLOUD to build and manage its systems and applications, including compute, storage, database, and monitoring services. After adopting HUAWEI CLOUD IaaS services, AASA can run their workloads without having to maintain their own hypervisor and control planes.

The network, O&M, and security services from multiple outsourcing companies are integrated into a single cloud platform and are centrally managed and maintained, significantly improving the efficiency.

By using services across multiple HUAWEI CLOUD Availability Zones, AASA can enjoy on-demand, zero-downtime upgrades and know that they will always be running the latest security patches.

AASA also plans to use container, serverless, application modernization, and direct connect services, laying a strong foundation for their digital, containerized, and serverless transformation.

Smarter O&M, more reliable services

- Compared with self-built data centers, HUAWEI CLOUD provides superior and more highly available services, increasing the service robustness and improving customer experience for AASA.
- Since completing its migration, AASA has taken advantage of the flexible scalability that HUAWEI CLOUD provides to keep costs down. When more computing resources are needed, HUAWEI CLOUD automatically adds nodes to expand resources to meet growing business demands.
- AASA's O&M was simplified and the workload performance was optimized, resulting in significant cost savings. Their TCO has been reduced by at least 10% per year.
- Deploying applications on HUAWEI CLOUD is easy. There is no need to set up infrastructure.

Testimonials

Through face-to-face training and workshops with the Huawei Cloud South Africa team, we learned that Huawei Cloud is easy to use and can fully support our production environment right there.

-Jaco van der Merwe, CTO of AASA


2020
Carriers

China Mobile Guangdong

Big Data Platform with Hitless Upgrade Helps You Handle Data Surges with Ease

Since its completion in 2016, the big data platform of China Mobile Guangdong has been providing big data analytics and data processing services for all China Mobile branches in Guangdong province as well as external organizations. The big data platform now has over 1,500 nodes and serves 282 tenants. On average, it runs over 210,000 jobs every day. The platform supports data analysis needs during major holidays and events as well as those for COVID-19.

With the rapid growth of 5G, the Internet, and AI, data has continued to grow exponentially, both in terms of diversity and volume, and the accuracy and timeliness of data analysis and processing are more critical today than ever before. Their big data platform urgently needed an upgrade in order to keep up with demand.

Challenges

Cross-version upgrade for China Mobile Guangdong's 1,500-node big data platform (largest among peers) faces the following challenges:

- Big data technology iterates quickly. The code needs to be updated after each community version upgrade.
- The upgrade of a large cluster takes a long time and requires power-offs and restarts, which may interrupt services.
- Any unexpected faults can easily interrupt the upgrade process. The stability and reliability being delivered were unacceptable for enterprise-class services.

HUAWEI CLOUD FusionInsight allows hitless upgrade for a big data cluster, with zero downtime

China Mobile Guangdong used HUAWEI CLOUD's FusionInsight intelligent data lake solution to ensure hitless upgrade for their big data cluster. A rolling upgrade was performed, that is, they upgraded cluster nodes batch by batch to keep services uninterrupted.

While some components from open-source communities do not support rolling upgrades across major versions, HUAWEI CLOUD FusionInsight has resolved the compatibility issues caused by inconsistent community protocol versions and metadata formats as well as API changes. This way, during a rolling upgrade, services can continue to be handled by nodes that are waiting to be upgraded. This alleviates the impact of a cross-version upgrade on the service continuity of a big data cluster.

In addition, FusionInsight provides the ability to isolate faulty nodes and to suspend nodes based on upgrade batches, ensuring that troubleshooting and upgrade can be performed in a manner that does not interrupt key tasks.

As an enterprise-class, one-stop big data platform, HUAWEI CLOUD FusionInsight also provides a visual management portal. It also supports one-click partition migration and capacity expansion, greatly improving O&M efficiency.

Improving government services by unleashing the power of data

Underpinned by the digital foundation and rapid innovation empowered by HUAWEI CLOUD FusionInsight, the big data platform of China Mobile Guangdong supports a variety of projects, such as government services and efforts to improve people's livelihoods.

- **Government applications:** Government agencies and other public institutions can precisely push SMS messages to specific users or user groups.
- **Tourism applications:** Data from tourist attractions can be parsed in real time, with heat maps periodically generated, and data passed on to tourist service systems.
- **Poverty alleviation:** An e-commerce platform was built for poverty alleviation. Currently, this platform has 6.7 million users and has closed 7.23 million transactions worth CNY220 million in total.
- **Anti-fraud:** Sources of telefraud can be identified by counting the outgoing calls per number, and then fraud related calls can be traced and blocked in a timely manner.
- **A smoother Spring Festival travel season:** Heat maps are periodically generated for traffic hubs and the data shared with transportation control systems.

Testimonials

During the COVID-19 outbreak in early 2020, China Mobile Guangdong provided a data query service via an open API, facilitating data queries by authorities in charge of pandemic control. The big data platform was able to assemble a Health Code app within 24 hours. The app can respond to 2 million concurrent queries each day (the peak can reach 4 million) and return query results within 1 second, greatly facilitating the efforts to curb COVID-19.

- Tan Lili, General Manager

2020 Healthcare & Education

Beijing Hospital

Building a Smarter Hospital Using HUAWEI CLOUD Stack

Founded in 1905, Beijing Hospital is helmed by a highly experienced team of healthcare professionals. The hospital excels in medical treatment, education, research, and prevention, and aims to provide online medical services for patients by employing Internet and cloud technologies.

Challenges

Migrating medical services to the cloud

Beijing Hospital wanted to move the entire treatment process online, from registration, consultation, inspection, to prescription, so that patients can access high-quality medical services at home, especially for those living in remote and underdeveloped areas.

Building the cloud platform

Beijing Hospital wanted to build a reliable and high-performance hybrid cloud platform that can provide services online, secure medical information, and adapt to new developments over the next five years.

HUAWEI CLOUD Stack, a hybrid cloud architecture

Beijing Hospital migrated all of its service systems onto HUAWEI CLOUD Stack, a hybrid cloud architecture that allows layered service deployment. Treatment services, such as online consultation and inspection, are deployed on HUAWEI CLOUD, and the medical information is stored and managed locally within the hospital. In this way, service spikes are taken care of by cloud resources that can be automatically scaled, and sensitive data is safeguarded by comprehensive security measures and active-active design.

Future-proofed, security that evolves

Efficient and secure layered deployment

Treatment services and services involving sensitive data are deployed separately. The auto scaling and on-demand provisioning features of the public cloud ensure smooth running of services and reduce IT costs. The security measures and boundary mechanism of the hybrid cloud prevents risks and data leakage.

Adapting to new developments

With access to 200+ services on HUAWEI CLOUD, Beijing Hospital is able to develop intelligent, structured applications such as electronic medical records and cloud-based PACS (picture archiving and communication system).

Testimonials

In 2020 Q1, due to the COVID-19 pandemic, the online registration rate of Beijing Hospital increased from 28% to 82%, and we saw a 100% increase in online diagnosis and treatment cases. The hybrid cloud platform perfectly supports online medical services thanks to its elasticity.

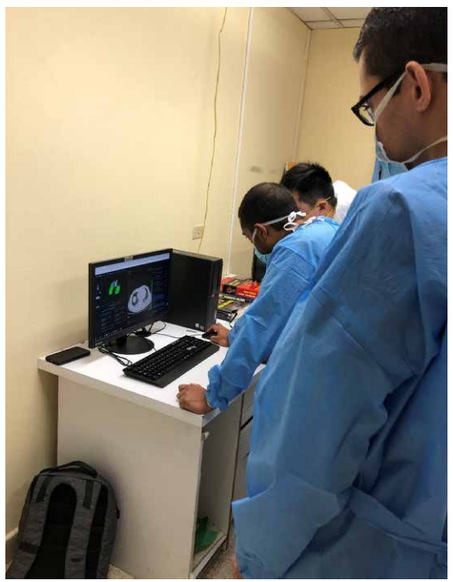
Modern information technologies allow more people to access high-quality medical resources, and improves the internal management of hospitals, such as evaluating medical performance, managing medical devices, and using advantageous resources in a more efficient way. These technologies can also support decision-making, warning, and diagnosis, helping hospitals treat patients faster and smarter.

-Du Yuantai, Deputy Dean of Beijing Hospital

Latin America

Fighting COVID-19 with HUAWEI CLOUD AI

The worldwide spread of COVID-19 continues to impact every aspect of our lives. During the early days of COVID-19, many hospitals in several Latin American countries including Panama, Guatemala, and Dominican Republic deployed HUAWEI CLOUD's AI-assisted diagnostic platform to speed up COVID screening, which helped these countries curb the spread.



Challenges

It takes time and expertise to diagnose COVID-19

A typical chest CT image consists of 100 to 400 slices, and it takes an experienced radiologist 20 to 30 minutes to examine a single image. The radiologist team was overwhelmed by the sheer volume of CT scans during the COVID-19 outbreak.

Radiologists have uneven levels of skills

COVID-19 is a novel coronavirus. Most doctors lack the experience needed to diagnose it.

Using AI to improve the speed and accuracy of COVID-19 screening via CT scans

During the pandemic, HUAWEI CLOUD worked with multiple organizations to develop solutions for fast, accurate, fully automated CT scan reading. Leveraging HUAWEI CLOUD's leading AI technology, such as computer vision and medical imaging, these solutions help clinical doctors quickly screen COVID-19 using CT scans. With superb AI computing power, the quantitative results of a single case can be obtained within seconds.

In the wake of the COVID-19 outbreak in several Latin American countries, HUAWEI CLOUD worked with ISV partners from China to quickly launch the AI-assisted COVID-19 diagnosis platform in Latin America. The algorithm used by the platform was trained using data from 4,000+ confirmed COVID cases in China. The platform was able to scan a CT image in 3 seconds and generate a diagnosis in 15 seconds, with an accuracy higher than 96%.

Hospital Complejo Hosp.CSS of Panama, Hospital General de Enfermedades of Guatemala, Hospital General Regional Dr Marcelino Vé lez Santana and Hospital Regional Jose Maria Cabral y Baez of Dominican are the largest public hospitals in their respective countries and were under intense pressure in the fight against COVID-19. By using HUAWEI CLOUD's AI-assisted COVID-19 diagnosis platform, these hospitals quickly acquired the ability to screen and diagnose COVID-19.

Improving Covid diagnosing efficiency and advancing intelligent healthcare

- HUAWEI CLOUD AI helps doctors quickly and accurately diagnose COVID-19 from CT scans (time needed reduced from 30 minutes to just 1 minute).
- The high scalability of the platform's algorithm provides a convenient way for full-scale digitalization and intelligent transformation of local medical imaging systems.

Testimonials

The platform makes it possible to predict the spread of the virus as the quick results it generates allow doctors to isolate patients who have been tested positive before the diagnosis is confirmed by PCR. This method is not yet commonly used around the world, but it is a promising tool to shorten the diagnosis time and slow the spread of the virus.

-Enrique Lau Cortes, General Director of the Social Security Fund, Panama

Aixuexi

Ultra-low-latency Online Interactive Classroom Accelerates Online Education

Aixuexi Education is an industry leader in B2B online education. With more than 20,000 cooperating branch locations covering 1,600+ cities and counties in 31 provinces across China, they have brought online education to over 25 million learners.

Cloud, 5G, AI, and real-time audio and video have sparked a revolution in online education. Aixuexi delivers online-to-offline (O2O) education. They create online classes that offer a rich interactive experience, and they are always upgrading. To date, Aixuexi has helped more than 10,000 education institutions successfully implement online one-on-one, small class, and double-teacher teaching methods.

Challenges

Difficulties in online teaching:

- Students can learn from nearly any location and using almost any sort of network, but that network has to support stable high-quality video streaming or interaction with the students suffers.
- For classes demanding student-teacher interaction, a single online class cannot handle more than 16 microphone needs. Some of the connections fail, and when student interaction is limited, so is the student's sense of belonging. For live streaming classes with large number of students, time delays are inevitable, sometimes as long as 3 to 5 seconds, and it is hard to teach well when the video freezes or lags.
- After Content Delivery Network (CDN) is combined with Real-Time Communication (RTC), there can still be delay, especially when new streams are added to a class as students switch between listening to a class lecture and class Q&As. Too much delay ruins the experience.
- Live streams used for interaction rely on a different SDK from traditional streaming video, so live streams are more expensive and more complicated to set up. When combining CDN with RTC, troubleshooting can be a challenge.

RTC-based online interactive education with utra-low latency

There are Aixuexi locations throughout China. As long as you have good network coverage, low latency, and a way to deal with packet loss, you can support interactions and live chats between thousands of online users.

RTC takes full advantages of HUAWEI CLOUD to provide Aixuexi with full-scenario real-time interactive video capabilities.

Ultra-low latency: <200 ms end-to-end streaming video latency, <30 ms operation instruction latency

Network-native: A single network supports live streaming, microphone connections, interaction, and online conferencing. You can also enjoy new services such as VR, AR, and holography.

The ultimate experience: 50% PLC for video and 80% PLC for audio

Smart encoding: Up to 4K video resolution, and advanced encoding technologies provide tolerance for a 30% bit rate reduction with no loss in quality.

Free massive interaction: Up to 1,000 students can join a single class; or a single, larger class can be broken up into groups, where students can interact freely, just like they would in a physical class room.

Massive coverage: The network includes over 2,500 nodes, deployed on every carrier's network so there is always nearby access available.

HD, low-latency online streaming for smooth teaching

- Students can enjoy almost the same experience online as they would in a traditional offline class. You can switch between lectures and class interactions in a flash, allowing more active student-teacher interaction. The quality of online teaching can be greatly improved.
- Teacher presentations are automatically synchronized with on-screen materials for a smoother educational experience.
- Any type of terminal can be used and packet loss on weak networks is minimized, so the video is always clear and the lessons smooth.
- The same SDK can be used for live streaming, microphone linkage, and stream pushing scenarios, which makes development and interconnection much less expensive. With a streamlined real-time audio and video network, troubleshooting is much easier, and O&M more efficient.

Testimonials

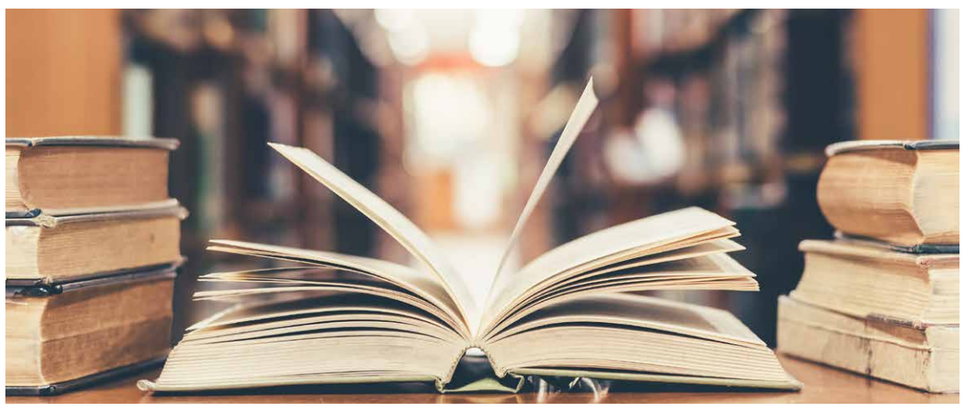
Since COVID-19 starts raging around the globe, people are trying to find new ways of studying. With the help of HUAWEI CLOUD real-time audio and video media network, and the unified architecture it runs on, Aixuexi has been able to combine the advantages of online and offline education together, creating a promising future for online education.

-Guo Xingrong, CTO of Aixuexi

University of Shanghai for Science and Technology

USST & HUAWEI CLOUD Organize a Smart Campus App Development Contest to Build up the Smart Campus

The University of Shanghai for Science and Technology (USST) has been promoting smart campus construction, and has made remarkable achievements in recent years. To further encourage teachers and students to work together to push forward smart campus construction, USST organized their first Smart Campus App Development Contest with HUAWEI CLOUD.



Challenges

Limited user engagement with the digital platform

Although USST has used the WeLink from HUAWEI CLOUD to integrate all university apps, such as smart classrooms, payments, and reporting apps, to connect people and things for digital, smart learning, students were not used to such digital apps.

Lack of smart campus apps

There were not enough apps for the nearly 100 services their teachers and students rely on, services like reserving a space or getting repairs done. They were also in urgent need of an operations team to integrate and maintain these apps.

Insufficient teacher-student collaboration

USST hopes to encourage teachers and students to jointly build and govern their own smart campus, a campus where everyone will be more excited to learn and to share.

HUAWEI CLOUD AppCube facilitates application development during the Smart Campus App Development Contest

- USST and HUAWEI CLOUD jointly organized the Smart Campus App Development Contest with the theme of "building innovative solutions for smart campus". The contest was warmly received by USST teachers and students alike. A total of 3,497 students from 44 different majors signed up for the contest. This contest is widely expected to create a technical training platform where anyone can be a developer.
- Contestants took advantage of the application packaging and deployment capabilities of HUAWEI CLOUD AppCube and efficiently developed several smart campus apps. AppCube is a low-code development platform that allows you to efficiently develop applications by combining modules. Thanks to the open integration capabilities of AppCube, excellent apps developed by the top six teams have already been released on the USST digital platform.

Faster infrastructure upgrade and effective talent development

Faster cloud upgrade of the digital campus

By leveraging the HUAWEI CLOUD AppCube, USST can move away from the traditional IT architecture and head faster towards a cloud architecture, a more effective way to accelerate the digital transformation.

Hands-on experience with digital technologies

Teachers and students acquire real skills while using cutting-edge digital technology to develop their own apps. USST is moving industry-oriented education to the next level.

Students and teachers, working together

Teachers and students work together to develop apps. The students and teachers at USST are now developers, personally invested in their own creations.

Testimonials

This Smart Campus App Development Contest is an important practice for teachers and students to participate in smart campus creation and governance. It improves the computer knowledge and the practical skills of our students. Thank you, HUAWEI CLOUD, for the excellent planning and guidance.

-Meng Zhilei, Deputy Director of the Smart Campus Promotion Office of the University of Shanghai for Science and Technology


2020
Scentific Research
& Public Welfare

Tongji University

Protecting Waterbird Habitats Using AI

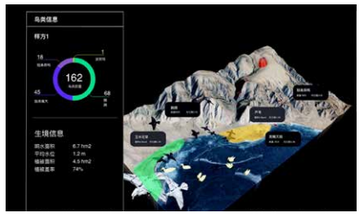
The Center for Digital Innovation (CDI) of Tongji University is dedicated to exploring and practicing technology-based innovations. CDI cooperates with enterprises such as Huawei to carry out research and practices in many fields, such as big data, AI, robotics, AR/VR, IoV, intelligent environment, city science, and interactive media.

Challenges

Over 3 million hectares of wetlands have been lost in China in the past decade, and more than 70 kinds of waterbirds are losing their habitats. Researchers could not accurately observe the distribution and behavior of waterbirds in the wetlands because of vast areas, no clear sight, and inadequate staffing. Waterbird monitoring needs to be assisted by technologies.

HUAWEI CLOUD AI-powered waterbird detection and recognition model

CDI applies the HUAWEI CLOUD AI solution to observe and protect waterbirds. Researchers upload bird pictures to ModelArts and label the pictures to train a waterbird detection and recognition model. Then they attach HiLens Kit cameras deployed with this model on drones, so that the drones can observe waterbirds in areas researchers cannot reach.



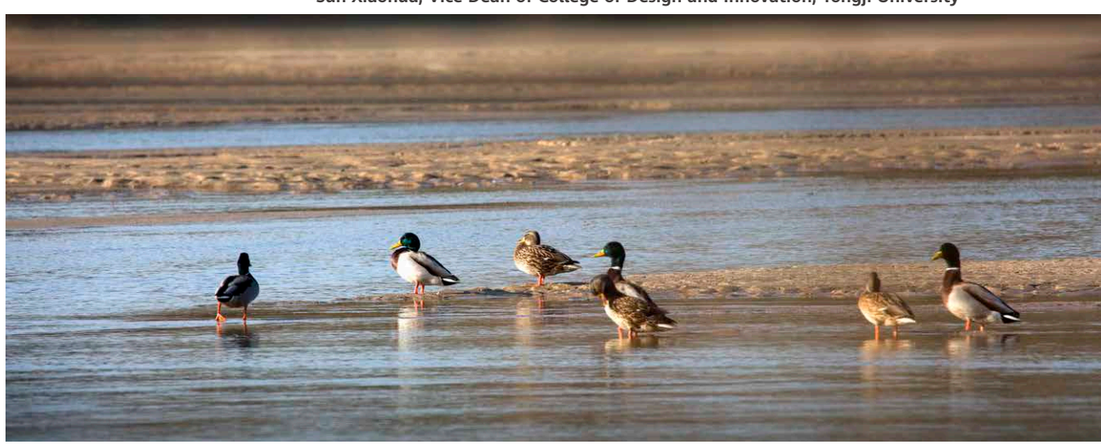
Waterbird protection made easier

With the AI training and computing on ModelArts, wetland protection researchers are freed from heavy workloads and can observe waterbirds dynamically. The data collected and sorted by ModelArts provides insights on how waterbirds live and how to protect their habitats.

Testimonials

I have been with this project since it was still an idea, and I'm very excited to see that we are getting real data. We will continue to use HUAWEI CLOUD to collect big data of waterbirds and study their distribution and migration to better support wetland planning and waterbird protection.

-Sun Xiaohua, Vice Dean of College of Design and Innovation, Tongji University



Center for Excellence in Brain Science and Intelligence Technology, the Chinese Academy of Sciences

HUAWEI CLOUD ModelArts Accelerates Zebrafish Brain Mapping

The Center of Excellence in Brain Science and Intelligence Technology (CEBSIT), an affiliate of the Chinese Academy of Sciences, is devoted to research in all areas of basic neuroscience. The center is currently leading the world in some important areas.

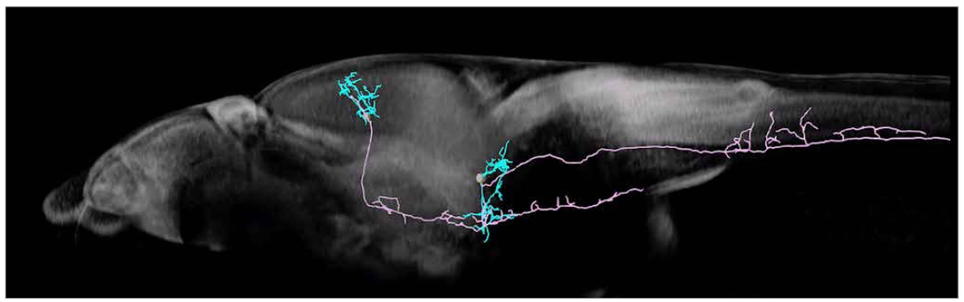
Big data related to neurons and synaptic connections is essential to understanding how the brain works and how to simulate brain functions. CEBSIT chose to first study the brain of the zebrafish, because it has a relatively small brain: approximately 100,000 neurons and 100 million connections. It is the only vertebrate species whose full-brain neuron connections humans are capable of observing while the observed object is still alive.

Challenges

Reconstructing the morphology of even a single neuron is both time-consuming and complex, let alone mapping the entire brain. The size of the zebrafish brain is less than 0.2mm^3, no bigger than a grain of sand, but still, it has 100,000 neurons and 100 million connections. Mapping the entire zebrafish brain will generate up to 130 TB of imaging data. If 3D morphological reconstruction were to be performed entirely manually, 125 persons will need to work for a full year, or you could spend 125 years on the project if you wanted to do it solo.

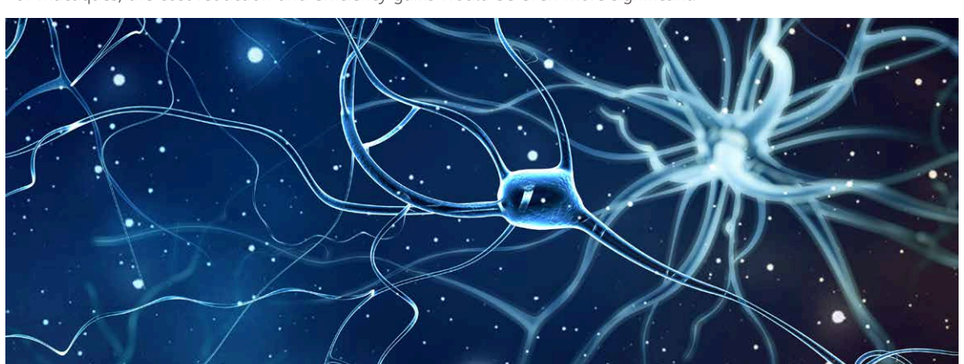
HUAWEI CLOUD ModelArts accelerates the tracing of neuronal pathways

CEBSIT used HUAWEI CLOUD ModelArts' ultra-large clusters and large-scale distributed training to accelerate the tracing of neuronal pathways. Observing the "gold standard" for data labeling, nearly 200,000 image blocks contained in 360 zebrafish image samples were used to train a whole set of models, from image segmentation in early stages to neuron morphology tracing later.



ModelArts helps map the entire zebrafish brain cost-effectively

ModelArts can automatically trace and reconstruct neurons with up to 95% accuracy and recall. Theoretically, using parallel computing enabled by the ultra-large clusters of ModelArts, the total time required for morphology reconstruction of 100,000 neurons can be reduced from 125 person-years to just 10 days, and the cost of reconstructing a single neuron can be reduced to 1/77 of the original cost. If the study were to be conducted on mice or macaques, the cost reduction and efficiency gains would be even more significant.



RFCx

RFCx Protects the Palawan Rainforest in the Philippines with HUAWEI CLOUD

Known for its beauty and for the promise of adventure it offers tourists around the globe, Palawan is a long, narrow island in the southwest Philippines that's home to a rich array of flora, fauna, and marine life.

The Department of Environment and Natural Resources (DENR), PLDT's wireless and mobile operator Smart Communications, Rainforest Connection (RFCx), and Huawei initiated a technology-driven protection project for the rainforest.

Challenges

With the continued encroachment of agricultural and residential land, the prevalence of commercial and illegal logging, and frequent forest fires, Palawan loses about 5,500 hectares of rainforest every year – the equivalent of 7,700 football fields. Moreover, forest rangers patrolling the rainforest have an extremely dangerous job as illegal loggers often carry weapons – it's estimated that from 2001 to 2019, the death of 18 rangers can be attributed to illegal loggers.

Building an intelligent AI model to accurately recognize the sounds of electric saws and trucks

A new monitoring system comprised of mobile devices and AI powered by HUAWEI CLOUD has been deployed to prevent illegal logging and animal poaching in five protected areas across Palawan: Cadlao Island, Maranlao, and Pasadena in El Nido, and New Guinlo and Pancol in Taytay. Based on the HUAWEI CLOUD AI services and ModelArts, an intelligent model is developed to accurately recognize the sounds of the electric saws and trucks used by illegal loggers.

Powered by solar panels, this Rainforest Guardian system comprises old cell phones that monitor and record sounds of human activity, like chainsaws and vehicles, and capture data on animal behavior patterns. Identified by AI, forest sounds and data are uploaded to cloud on the Smart Communications' network and then sent to forest rangers via RFCx's mobile app. DENR forest rangers receive real-time alerts of sounds from chainsaws, trucks, and other indicators of forest destruction so that they can take action quickly.

Saving the rainforest, saving the planet

Forest Guardian system can be quickly and easily adapted to more countries and more scenarios. In 2020, it is expecting that the system will more than double the amount of forest it covers from 2,500 km2 to 6,000 km2. RFCx estimates that the amount of forest protected by the system will boost CO2 absorption by 30 million tons, which is the equivalent of taking 6 million cars off the road. RFCx and Huawei will also continue to optimize the sound monitoring platform in 2020 by adding web and mobile interfaces and developing an API for aggregating sound data from various sources. This will help AI learning models capture and analyze audio on a much greater scale, so the solution can better monitor the health of the ecosystem and more effectively protect endangered species and their habitats.