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The Emerging Asia-Pacific Hybrid Cloud Market Report, 2022



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Emerging Asia-Pacific Hybrid Cloud Market Report

- As enterprises in the emerging Asia-Pacific region move toward in-depth cloud use, hybrid cloud, as a form of cloud service, is being widely used to improve users' cross-cloud resource utilization, thereby promoting users' digital transformation process and the development of the digital economy.
- In order to provide a more professional and in-depth perspective, this report analyzes the development and competitive landscape of the hybrid cloud market in the emerging Asia-Pacific region.

Key Objectives

Research Methodology

- **Report Overview**.....3
Presents classified statistics based on customer industry, regional coverage, company size and cloud vendor type
- **Overview of Emerging Asia-Pacific Markets**..... 4
Introducing different types of cloud services and eliciting the increasing demand for hybrid cloud from governments and enterprises
- **Overview of the emerging Asia-Pacific macro-environment**..... 5
Provide support for the emerging Asia-Pacific region to provide a favorable macro environment for the hybrid cloud market from policy, economic and other aspects.
- **Environmental Overview of Emerging Asia-Pacific Countries and Regions**..... 6
Clarifying official government support, capital flows and digital information technology in various countries and regions lay a solid foundation for the development of the hybrid cloud market
- **Market Definition, Classification and Value**..... 7
Clearly define hybrid cloud and its value: the security benefits of a private cloud with the flexibility of public cloud resource acquisition
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Further analysis of hybrid cloud applications: extensive applications in finance, communications, government affairs, transportation and other fields in the emerging Asia-Pacific region
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- **Competitive Landscape of Hybrid Cloud Providers in Emerging Asia-Pacific** 23, 24, 25, 26
Comprehensive ranking of hybrid cloud companies through comprehensive evaluation indicators such as applications, products and technologies, and services to evaluate the competitiveness of each hybrid cloud company

- **Primary Research:** Conducted in-depth interviews, with a mix of industry experts, hybrid cloud providers and other industry professionals.
- **Secondary Research:** Reviewed and analyzed the public information, such as annual reports, press releases, news articles, etc.
- **Note:**
 - This study analyzes the hybrid cloud market in the emerging Asia Pacific region, based on data as of December 31, 2022.
 - The geographical scope covers emerging Asia-Pacific countries and regions, including Hong Kong, Singapore, Thailand, Malaysia, Indonesia, Philippines, Sri Lanka, Bangladesh and Maldives.
 - The clouds covered in this study are defined as follows:
 - **Public cloud:** A public cloud service provider deploys IT infrastructure and perform operations and maintenance, and provides standardized and undifferentiated IT resources carried by the infrastructure to public customers.
 - **Private cloud:** A private cloud service provider builds IT infrastructure for a single customer, and the corresponding IT resources are only used by that customer. The corresponding IT resources can be deployed, operated and maintained by the user themselves, or outsourced to a professional service provider for hosting. The private cloud provides higher levels of security and privacy through the company's firewall and internal hosting.
 - **Hybrid cloud:** A hybrid cloud service provider provides users with a model of using public cloud and private cloud at the same time. Users build private clouds in local data centers to process most businesses and store core data. Users can obtain public cloud services through the network to meet peak demand of IT resource requirements. This report mainly studies cloud deployment products, platform and software. Pure virtualization deployment and HCI form products are not included in this study.

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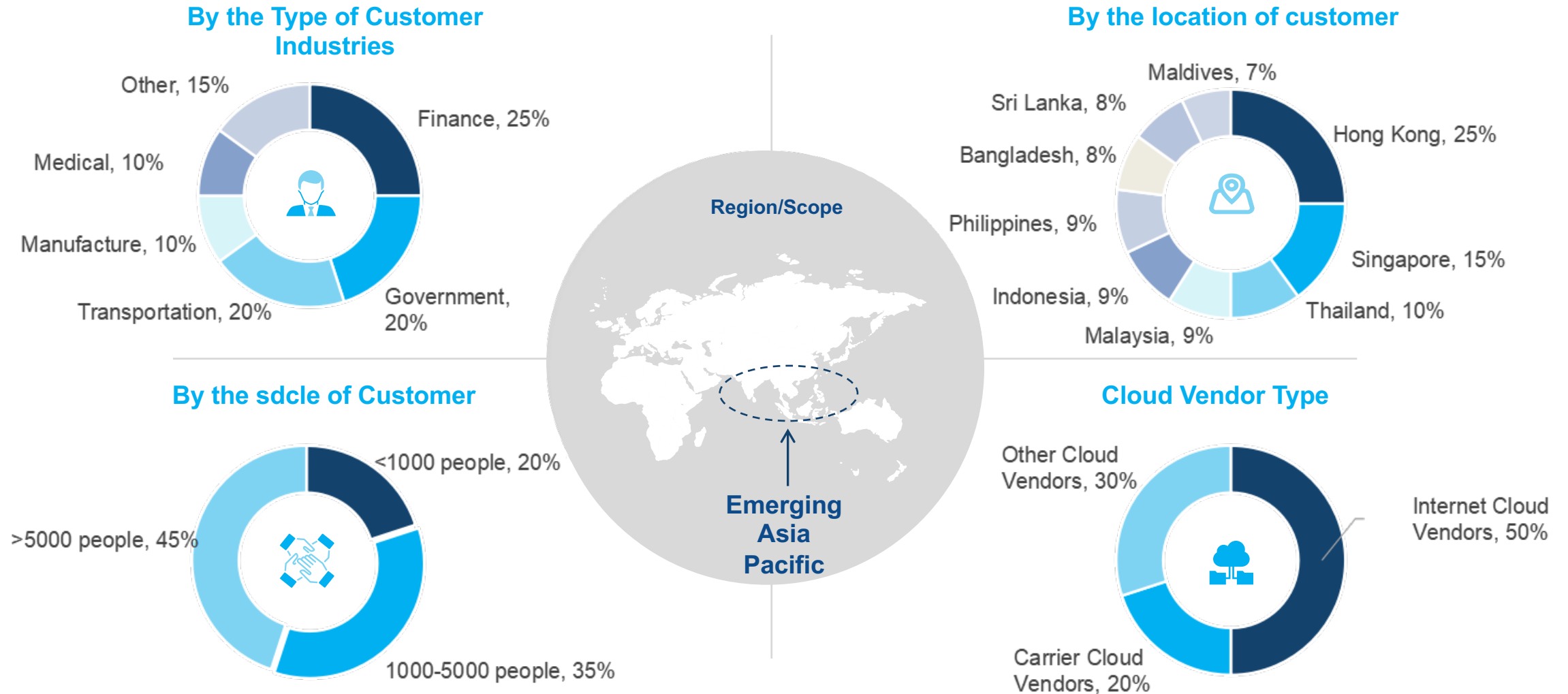
Market Analysis

2

Competitor Analysis

Report Overview

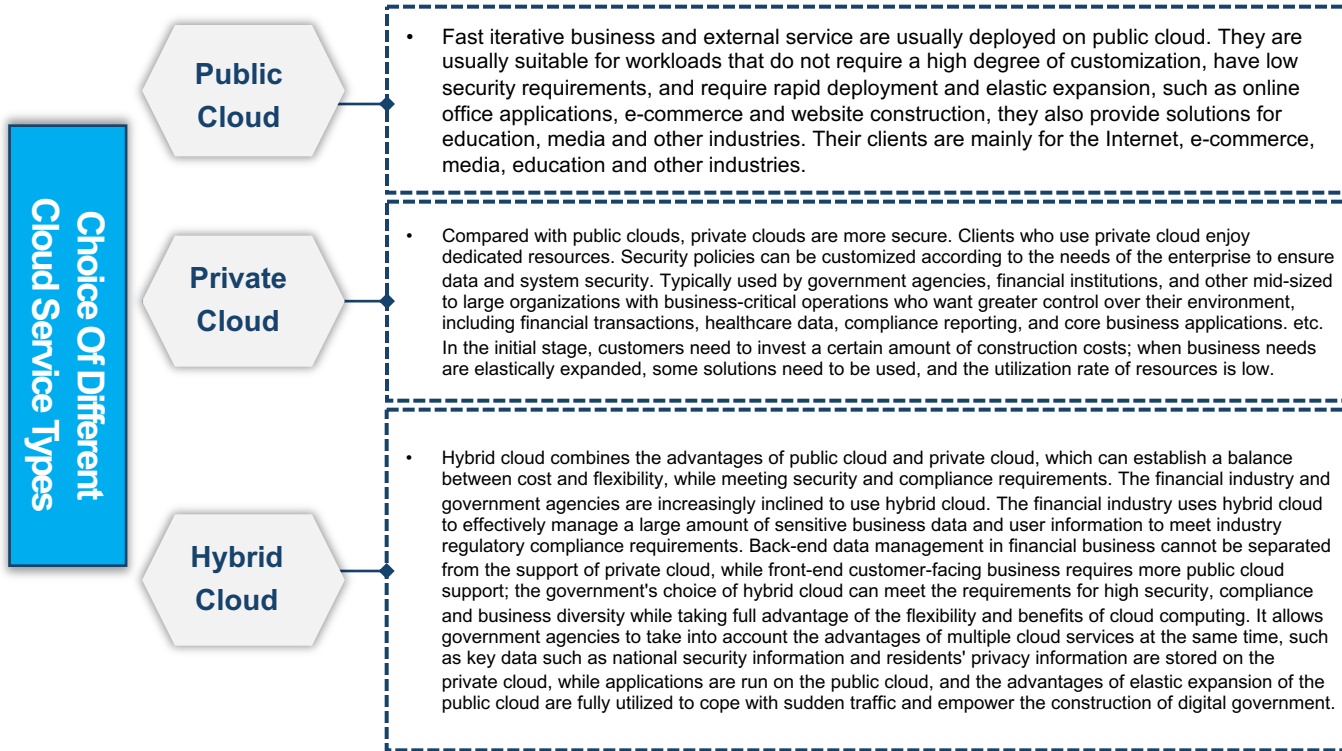
Conducting research based on A broad sample base: statistics classified by customer industry location, company size, and type of cloud vendor



Note: The number of survey samples is as follows: Total number of downstream customer surveys: 200; Total number of cloud vendor surveys: 30

Emerging Asia Pacific Market Overview: Demand for Hybrid Cloud

Hybrid clouds are being widely adopted in the emerging Asia-Pacific region due to many benefits such as security, flexibility and scalability, the demand for hybrid cloud management is booming. Enterprises are not able to transform overnight, they have different demand of IT resources at different stages, and as transformation deepens and business complexity increases, hybrid cloud becomes a key form of problem solving



Hybrid cloud combines the advantages of public and private clouds, increasingly becoming the best choice for emerging Asia-Pacific government and enterprise users

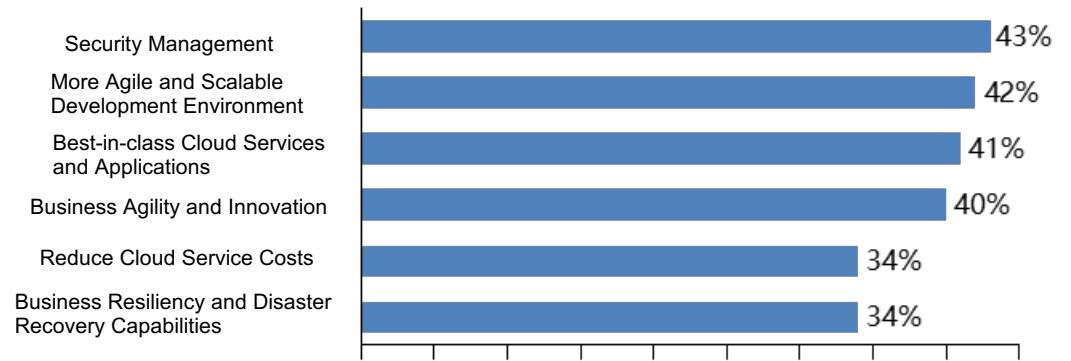
At present, the industrial Internet is booming, the needs of traditional government and enterprise users, the main group of cloud users in the emerging Asia-Pacific region, are very consistent with the characteristics of hybrid cloud. This group of users is accelerating their own digital transformation, has a large business scale. The robust demand of public cloud infrastructure resources to be agile and elastic in responding to business needs and the demand of greater privatization, control and data security exist simultaneously. Now more than 90% of Asia-Pacific enterprises and organizations are running their business on more than one cloud.

- Public Cloud - Public cloud environments ensure: 1) Cost-effectiveness and scalability 2) Instant provisioning of computing and storage resources on demand 3) High availability and disaster recovery
- Private Cloud - A private cloud environment provides: 1) Provides a higher degree of data security 2) Management can better match the government and enterprise structure and better adjust the use of resources according to company needs 3) High level of customization and compliance regulations

Hybrid cloud that can continuously synchronize public cloud capabilities has attracted increasing attention from governments and enterprises

- Emerging businesses of government and enterprises require services such as AI and big data to support application innovation. Cloud computing deployed in local data centers is an asset-heavy operation. Compared with the rapid iterative nature of public cloud, local data center capabilities are updated slowly and are difficult to meet the new business needs of enterprises. In addition, in response to sudden business peaks, single-form cloud resources are limited and cannot achieve real-time business load. Hybrid cloud has become an effective solution to the problem. Hybrid clouds that can synchronize high-end services such as databases, big data, and AI have attracted more attention from customers.
- As the economy in the Asia-Pacific region transitions from rapid development to high-quality development, the digital transformation of governments and enterprises is also gradually deepening, seeking intelligent development. Hybrid cloud solutions launched by cloud vendors that can provide both public and private clouds can ensure continuous updates of local cloud service capabilities and are favored by more and more government agencies and large enterprises.

Important Drivers For Businesses and Organizations To Use Hybrid Cloud



Most Companies Are Leveraging Multi-Cloud To Manage Security, Enhance Application Development Capabilities and Improve Business Agility

According to Sullivan's survey of employees covering industries including finance, manufacturing, transportation, government, etc., "Your organization uses What are the important reasons for multi-cloud (public and private cloud)?"

Source: RightScale, Wind, Sullivan

Overview of the emerging Asia-Pacific environment: a favorable macroenvironment

Emerging Asia-Pacific region offers favorable macro environment for hybrid cloud market in terms of policy, economy, society and technology

- The emerging Asia-Pacific region provides a favorable environment for the hybrid cloud services market in terms of economic, social, and political aspects, coupled with technological improvements in terms of infrastructure and talent to drive the rapid growth of the hybrid cloud market.

Politics



- Policies of countries in emerging APAC support the development of the digital economy, information technology and cloud computing, and promote the development of hybrid cloud services.
- Strategic and commercial partnerships have been established between emerging APAC countries on hybrid cloud.
- Malaysia is one of the early adopters of the Personal Data Protection Act (PDPA), which prohibits data users from transferring any data subject's personal data out of the country, except in exceptional circumstances, and requests for data compliance at the policy level, prompting the development of hybrid cloud services that can meet their requirements.

Economy



- In 2022, the emerging Asia-Pacific region is expected to grow at 3.8%, down from 2021. With the recovery of supply chain and the end of Covid-19, the economic scenario is expected to improve in the future, favoring the growth of the hybrid cloud market.
- Covid-19 has stimulated the demand for cloud services among enterprises, governments, and individuals that are actively undergoing digital transformation to improve efficiency and adapt to new changes in the market, which is also contributing to the growth of the hybrid cloud services industry.
- The emerging Asia-Pacific region has a huge potential for economic growth and many of these countries are experiencing rapid economic growth and industrialization, which provides a broad application outlook and customer base for the hybrid cloud market.

Society



- Among the emerging Asia-Pacific countries and regions, Hong Kong, Singapore, Thailand and Malaysia, the Internet penetration rates reach 85% and above, providing a solid user base for hybrid cloud development.
- The corporate culture in the emerging Asia-Pacific region is generally more open and adaptable, which is conducive to the acceptance of new technologies and ideas, and a greater willingness to experiment with hybrid cloud solutions to optimize business processes.
- Numerous enterprises and government organizations have triggered significant demand for hybrid cloud services, including the need for IT diversity, sensitive data security, compliance risk and interoperability.

Technology



- The emerging Asia-Pacific region is actively improving its data centers, servers and other infrastructure, and currently has 315 data centers in the region providing basic facilities for hybrid cloud services.
- Recruitment and training of communications technology staff is being actively pursued. For example, Singapore has launched the Digital Leadership Program to accelerate the recruitment and training of technical talent.
- The development and promotion of emerging technologies, such as 5G networks and edge computing, offer more possibilities for the development of hybrid cloud applications.
- Governments and enterprises in the emerging Asia-Pacific region are realizing intelligent upgrading through hybrid cloud, establishing user data platforms and financial data lakes, etc., to promote technological innovation on the cloud and unleash digital productivity.

Source: Wind, Data AI, Internet World Stats, Frost & Sullivan

Official governmental support, capital flow and disruptive digital information technologies lay a solid basis for the development of the hybrid cloud market in emerging APAC

Malaysia

- In 2022, the Malaysian government launched a digital initiative, focusing on 9 areas including digital finance, digital tourism, digital trade, and digital agriculture
- About US\$9.3 billion in foreign direct investment attracted in two months after government launched Malaysia Digital Plan 2022
- Supreme Court of Malaysia utilizes complete data backup solution for e-government and general document management
- The "Personal Data Protection Law" was promulgated and the Personal Data Protection Department was established to focus on the relevant requirements for personal data processing activities and security protection in commercial transactions

Bangladesh

- The country implements the Digital Bangladesh 2021 strategy and will actively promote the ICT information industry as an important national strategy. With the completion of the first Tier 4 national data center in China, the reform of digital government and enterprise digitalization will be further implemented

Sri Lanka

- The Ministry of Shipping of Sri Lanka stated that Sri Lanka attaches great importance to the development of the digital economy and hopes to achieve greater progress in policy legislation, talent training and financial support, promulgate policies, and lead the digital economy through cryptocurrency and blockchain. Sri Lanka has introduced the 2020-2025 National Digital Policy. Aiming to build a more complete data protection and information security system

Maldives

- The Maldives government and service providers signed a digital economy cooperation agreement to facilitate digital transformation
- The Maldives government is taking steps to improve its internet infrastructure. It has implemented a national broadband plan to increase access to high-speed internet and is also investing in digital infrastructure such as public Wi-Fi networks to ensure access to cloud services for government and enterprise customers

- Starting from the 2020 National Strategy, digital parks and infrastructure will be exempted from corporate income tax for up to 8 years
- The National 20-Year Development Strategic Plan was promulgated, proposing to strive to become a developed country by 2037. Digital transformation is an important strategic step for Thailand to move towards a high-income country
- Promulgated the "Personal Data Protection Law", established a Personal Data Protection Committee, and made clear provisions on the legality of data processing

Thailand

Hong Kong

- In 2022, the Hong Kong SAR government proposed to establish a "Digital Economic Development Committee" in the "Financial Budget" to promote the process of Hong Kong's digital economy
- The Security Bureau issued the "Security Regulations" to stipulate the security classification of administrative information, requiring government departments to classify their information and take appropriate measures based on the classification to protect information in storage and business operations

Philippines

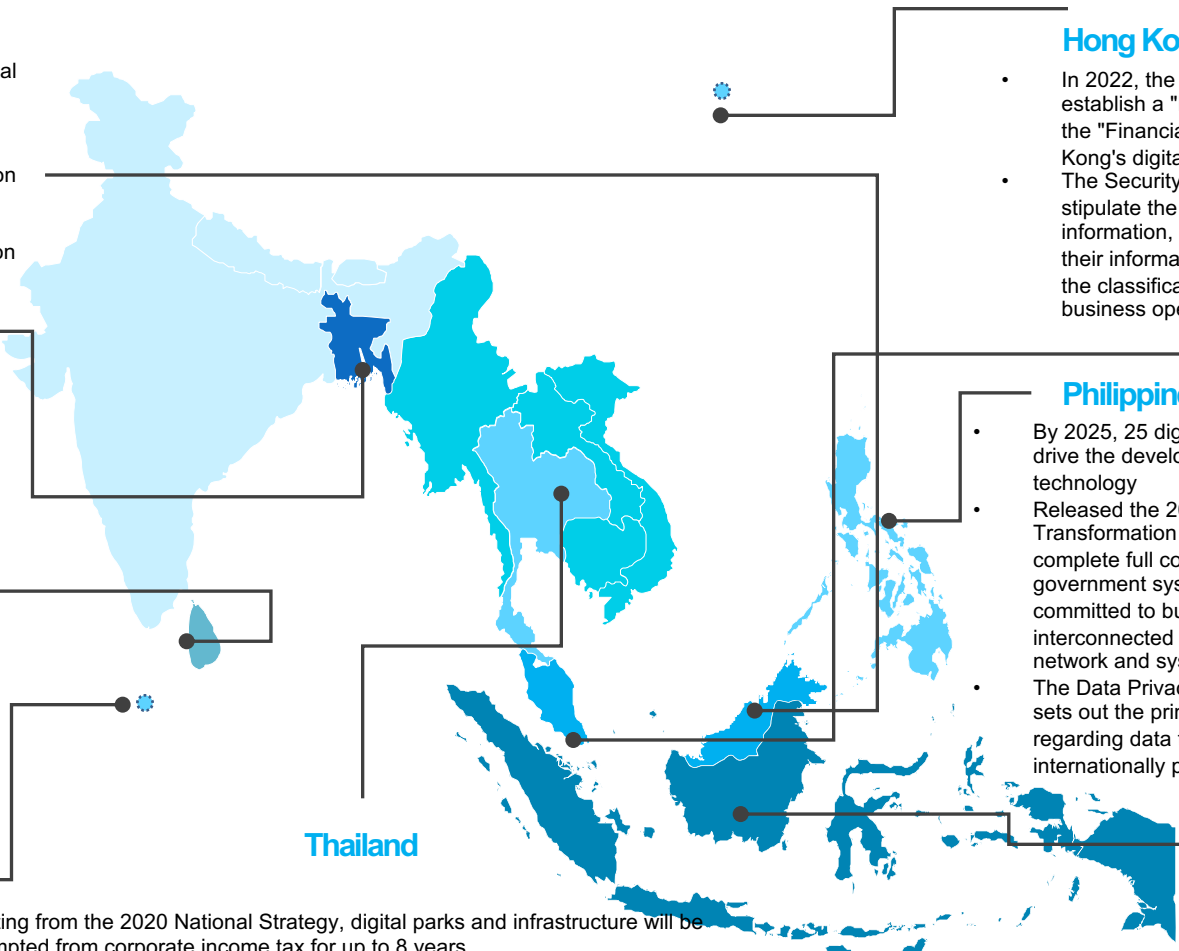
- By 2025, 25 digital cities will be built to drive the development of information technology
- Released the 2022 "Digital Transformation Strategy", planning to complete full coverage of e-government systems in 2022, and committed to building an interconnected government ICT network and system
- The Data Privacy Act, among others, sets out the principles of responsibility regarding data transfers, including internationally processed information

Singapore

- The "Digital Startup Plan" provides newly established small and medium-sized enterprises with two basic digital solutions and waives fees for at least 6 months to help enterprises embark on the road to digitalization as soon as possible
- In 2022, the National Science and Technology Administration announced that it will build a sovereign cloud to ensure that workloads and data in the cloud do not leave the country, accelerating the agency's promotion of digital transformation and innovation
- Singapore's official multi-layer cloud security standards are based on international standards and cover multiple areas such as data preservation, data sovereignty, and data portability

Indonesia

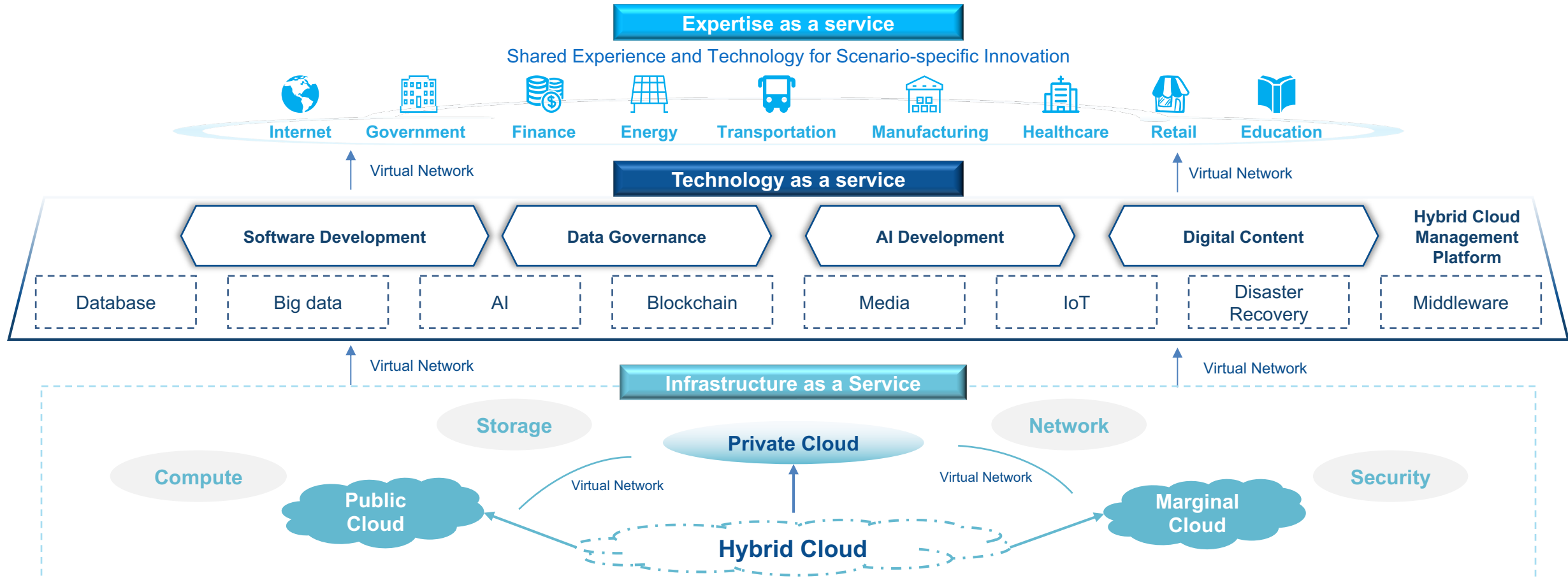
- In 2022, the Ministry of National Development and Planning announced the Indonesian Digital Industry Development Master Plan 2023-2045 to support the country's digital transformation
- The "Personal Data Protection Law" was promulgated in 2022, clearly distinguishing the data processing responsibilities of data controllers and processors; clarifying cross-border flow policies such as specific scenarios for transferring personal data overseas



Source: Department of Information and Communication Technology—the Philippines, Thailand Digital Economy and Society Development Plan Economic Planning Unit in Malaysia, Govtech Singapore, Communication and Informatics Ministry in Indonesia, Frost & Sullivan

Market Definition of Hybrid Cloud

Hybrid cloud connects public cloud, private cloud and marginal cloud via virtual network, combining the advantages of flexibility of public cloud and security of private cloud to provide a portfolio of resources and services



- At the base layer, the hybrid cloud connects private cloud, public cloud and edge cloud via a virtual network, infrastructure includes computing, storage, networking and security, providing rich cloud services including IaaS, PaaS, database, big data, AI, etc.
- The technology layer is the hybrid cloud management platform that contains the software development pipeline, data governance pipeline, AI development pipeline and digital content pipeline.
- At the application level, hybrid cloud provides services for specific scenarios such as Internet, government, finance and manufacturing, etc.

Source: Frost & Sullivan

1. Internet Cloud Vendors

Vendor and hybrid cloud products



Amazon Web Services:
AWS Outposts



Microsoft Cloud:
Azure Stack



Huawei Cloud:
Huawei Cloud Stack



Google Cloud:
Google Anthos



Tencent Cloud:
TStack



Ali Cloud:
Apsara Stack

2. Extend From Private Cloud To Hybrid Cloud

Vendor and hybrid cloud products



VMware:
Hybrid cloud solutions



Huawei Cloud:
Huawei Cloud Stack



Red Hat:
OpenShift

3. Carrier Cloud Vendors

Vendor and hybrid cloud products



Philippines Telecom:
Cloud solution



Telekom Malaysia:
Cloud Alpha



Thailand Yiwang Information:
AIS Enterprise Cloud solution



Maldives Telecom:
Colocation Cloud solution



Sri Lanka Telecom:
Cloud solution



Bangladesh Telecom:
Cloud solution

4. Others

Vendor and hybrid cloud products



Rackspace:
Hybrid cloud solution

Migrate to Hybrid Cloud: Improvements of Infrastructure and Data Security Compliance

Improving infrastructure facilitates migration to hybrid clouds, and growing demand for data security compliance and privacy protection requires more advanced cloud computing technologies

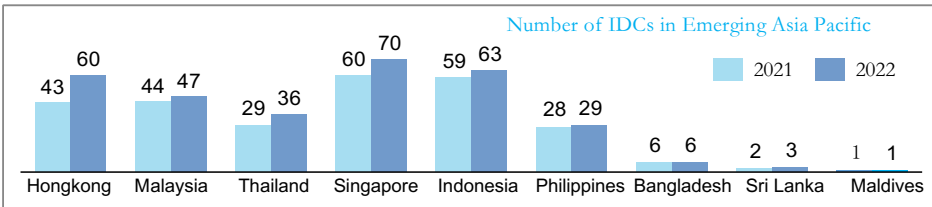
Infrastructure Improvements

Advances in chip technology are driving the development of hybrid cloud at the infrastructure level

Chip makers and cloud service providers develop new chips to provide better underlying computing capabilities for hybrid cloud and to better meet the new demands of cloud computing



The Increase in The Number Of Data Centers Enables The Development Of Hybrid Cloud



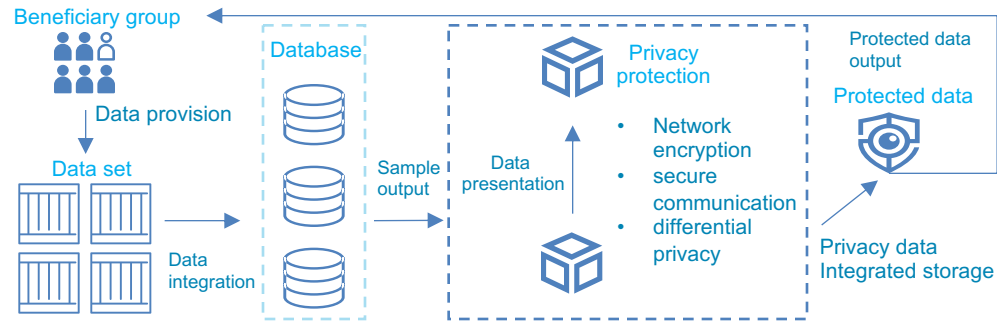
- Increase in data centers in emerging Asia-Pacific region will bring greater economies of scale, the increase of data centers has promoted the hybrid cloud deployment model with better prospects for development

- Promote Multi-Cloud Strategies: Encourage enterprises to adopt a hybrid cloud deployment model, which can more flexibly switch and manage workloads between private clouds and public clouds, and choose the most appropriate cloud strategy according to different needs.
- Reduce Latency and Improve Performance: Private and public clouds will be closer to end users, helping to reduce data transmission delays and improve application performance and response speed.
- Save Operation and Maintenance Costs: You can better take advantage of economies of scale, thereby reducing infrastructure construction and operation costs, helping cloud service providers provide more competitive prices.
- Promote IoT Innovation: Make hosting and analyzing large-scale IoT sensor data more efficient and flexible, and provide enterprises with expanded network connectivity and hybrid cloud advantages for implementing IoT.

Increase of data security compliance requirements

The increasing data compliance regulatory has prompted hybrid cloud to leverage advanced technologies such as privacy computing, federal learning to meet compliance requirements of data security

Privacy computing is a data protection technology keeping the data opaque and inaccessible to the calculated party and other unauthorized parties during the processing of data



- ▣ Asia Pacific has established and are improving data-related laws and regulations.
- ▣ The emerging Asia-Pacific is building a safe and reliable cyberspace and strengthening the protection of personal data as well.

Country (Year)	Legislative Body	Law/Regulation
HK (1996)	Legislative Council of the HK	Hong Kong Personal Data (Privacy) Ordinance (PDPO)
Indonesia (2022)	Indonesian House of Representatives	Personal Data Protection Act (PDPL)
Malaysia(2010)	Congress of Malaysia	Personal Data Protection Act (PDPA)
Philippines(2012)	Congress of Philippines	Data Privacy Act of 2012 (DPA)
Singapore(2012)	Parliament of Singapore	Personal Data Protection Act (PDPA)
Thailand(2022)	Thai Parliament	Thailand's Personal Data Protection Act (PDPA)

Key Findings

- Advances in infrastructure technologies such as chips and data centers are driving the continued development of hybrid clouds. Hybrid cloud can make better use of the computing power of public cloud and improve the performance of cloud applications, while sensitive data can be stored in private cloud for maximum security.
- Hybrid cloud providers in the emerging Asia-Pacific are improving data security technologies. For example, Huawei Cloud released the privacy computing product TICS, using differential privacy and federated learning technology to create conditions for data flow. AliCloud built a privacy-enhanced computing platform through technologies such as secure multi-party computing and differential privacy.

Source: Cloud Scene, ASKCI, IDC, Frost & Sullivan

Migrate to Hybrid Cloud: Grasp the Market Opportunities

Favourable policies, post-Covid economy, more developed technology and infrastructure are boosting the further growth of hybrid cloud in the emerging Asia-Pacific area

Key Market Drivers

1



Policies

Favourable policies contribute to the improvements of digital foundation and end-user market of hybrid cloud

- Governments in emerging APAC countries are promoting digital technology adoption through initiatives and across industries, such as Industry 4.0, the Philippine Digital Transformation Strategy 2022, MyDIGITAL Malaysia, the Cloud First Policy, Hong Kong Smart City Blueprint, etc.
- Accelerating demand in emerging APAC regions for hybrid cloud services such as Thailand, Malaysia, Philippine, Singapore, Hong Kong, Bangladesh, etc as the end-users become more familiar with latest cloud technologies and services

2



Economy
&
Society

COVID-19 drives digital transformation faster and more efficient in Asia Pacific

- The COVID-19 pandemic stimulates businesses to adopt and adapt to new technologies to create resilient supply chains, support remote working, and digitalize operations. This has brought advantages to businesses including faster market reach, reduced expenses, and the development of futuristic and highly resilient infrastructures.
- Cloud technology has become a valuable solution, especially in regions like Asia, which is home to about 60% of the global population. In response to the pandemic, the financial sector and government departments in Hong Kong and Singapore have increased investment and adoption of hybrid cloud to enhance operational stability, improve the quality of citizen services, and accelerate the digitalization and improvement of financial institutions and government enterprises. Increase the awareness of using cloud services and help the whole society digital transformation.

3



Technology



Performance

Business development and IT infrastructure enhancements further drive hybrid cloud growth

- Demands such as large models, intelligent service robots, and business data insights have created a huge demand for new technologies with the development of technology and emerging businesses. However, new technology tools cannot be quickly deployed and obtained in the local computer rooms of industry customers, resulting in more hybrid demand for cloud usage, senior management is interested in the adoption of hybrid cloud. According to Frost & Sullivan, about 75% of surveyed companies are expected to adopt a hybrid strategy by the end of 2023. This adoption sets the stage for the next wave of technological disruption, characterized by cloud-based artificial intelligence services, edge computing and the Internet of Things (IoT).
- Reducing cloud computing costs and lower latency are driving hybrid cloud adoption in the Asia Pacific (APAC) region. For example, Google and Facebook announced a new undersea cable system called the Apricot Cable System in August 2021. The system connects multiple countries in the Asia-Pacific region such as Singapore, Indonesia and the Philippines, providing more reliable and high-quality enhanced communication network connection services.
- At the same time, innovative cloud service products have the ability to quickly access public cloud services, and distributed physical resources can be abstracted into a unified overall resource pool, supporting the use of hybrid cloud and public cloud multi-resource pools. Cloud services with more advanced technology can integrate full-scene assets, realize unified management of data, operation and maintenance, and digital assets, and support a full range of micro-services such as application cloudization, cloud-native applications, big data analysis, AI applications, etc. The advanced technology architecture provides a unified local cloud experience.

Hybrid Cloud Market Analysis: Application Areas (Government)

Hybrid cloud meets the demand of governments to improve efficiency, reduce costs, and improve data security which results in its wide coverage in the emerging Asia-Pacific region

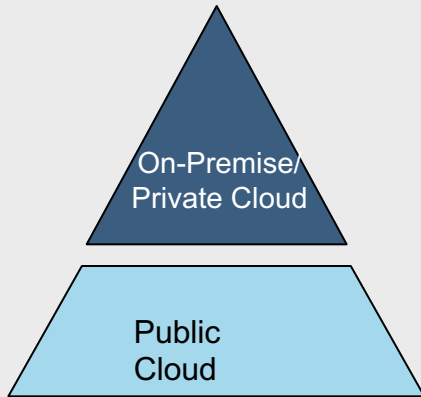
Government Demand

- Government agency needs may change over time. Hybrid cloud offers the flexibility to enable governments to adapt and expand their IT resources as needed, helping government agencies become more efficient in managing IT resources while also reducing costs.
- When government agencies need to apply front-end technologies (such as AI) to improve efficiency and solve manpower shortages, hybrid cloud becomes a suitable solution. This is critical to handle growing data volumes and complex business needs.

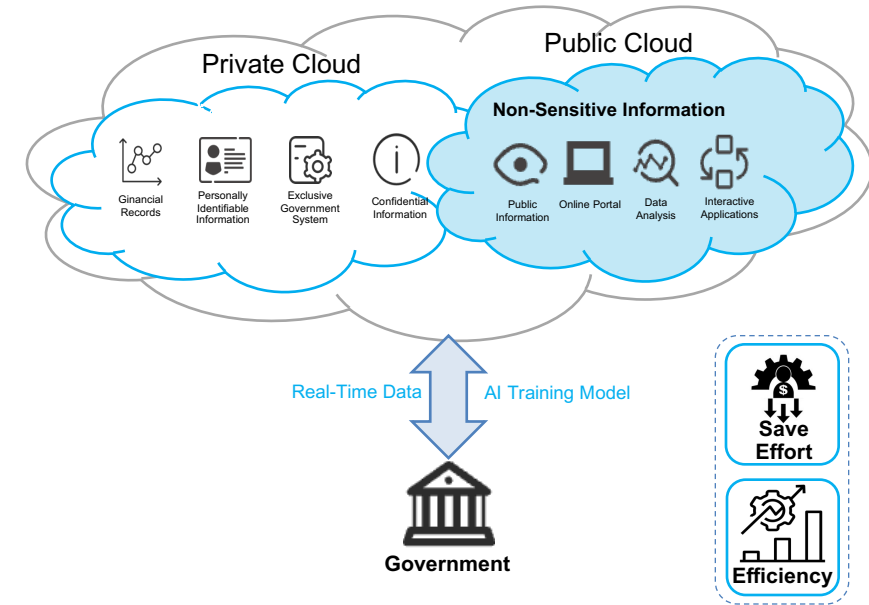
Different Levels Of Security Requirements:

- On-premises private cloud, off-site private cloud operated by a contractor, and public cloud used for general services could store data in different locations according to data type and sensitivity, and allocate cloud resources according to different service requirements.
- Private clouds mainly store and manage sensitive data, while public clouds are responsible for running non-sensitive data and applications.
- Deploy firewalls to increase the flexibility of advanced security technologies such as intrusion detection and prevention systems, data encryption, and access control.

- Sensitive Data
- Non-Sensitive Data



Practical Application



- Cloud migration: Government agencies place data on public clouds and private clouds based on data types.
- Connectivity: Ensure secure connections between private and public clouds to enable communication and integration of data and applications.
- Security measures: Data security is key, and government agencies take measures such as encryption, authorization, and authentication to protect sensitive data from unauthorized access.
- Supervision: Monitoring and management mechanisms are used to track the performance and operations of the hybrid cloud environment and resolve issues in a timely manner.
- Optimization: Optimize the resource configuration and cost of the hybrid cloud environment to ensure that it meets actual needs.

Government supports digital transformation, Thailand and Bangladesh join forces with hybrid cloud vendors to accelerate development

Thailand

- ❑ In 2016, the Thai government proposed Thailand 4.0 to transform Thailand from a traditional agricultural and manufacturing country to a high-tech and innovation-driven digital economy. In the Thai market, Alibaba Cloud, Huawei Cloud and Tencent Cloud compete fiercely. Alibaba Cloud has built a data center in Thailand, provides a full set of cloud solutions to local enterprises, and cooperates with the government to promote digital transformation. Tencent Cloud is building large-scale data centers in Thailand, providing comprehensive hybrid cloud solutions for local enterprises, and strengthening cooperation with local enterprises. Huawei Cloud is the first international cloud vendor to establish three availability zones (AZs) in Thailand.
- ❑ Huawei has cooperated with the Thai Government Cloud GDCC and Thailand's Siriraj Hospital and signed a memorandum of understanding with the Ministry of Digital Economy and Society of Thailand (MDES) to deepen Huawei's cooperation with MDES and strengthen the operational efficiency of Thailand's digital government and national digital competition force. The government cloud solution provided by Huawei for the Thai market is based on Huawei's long-term technology accumulation in the ICT field and rich experience in the government and enterprise market. Huawei Cloud provides customers with the best digital infrastructure for digital transformation, including a unified cloud infrastructure base and three services that enable the digital transformation of industries, and four scenario-oriented connection points that provide hybrid cloud solutions while promoting technological innovations such as AI and the Internet of Things.
- ❑ Siriraj Hospital is the largest and oldest hospital in Thailand, with nearly three million consultations every year. Siriraj Hospital is committed to becoming a smart hospital, elevating medical services to new heights by integrating cloud computing, AI, IoT and big data. Huawei Cloud's hybrid cloud solution provides it with cloud computing, big data, AI and other advanced technologies to seamlessly connect public and private clouds through a unified architecture, helping Siriraj Hospital build an efficient, secure and open hybrid cloud platform. At the same time, Huawei uses 5G, F5G and Wi-Fi 6 technical solutions to enable every corner of the hospital to be interconnected under a unified network. Especially during the COVID-19 period, Huawei Cloud enables emergency departments in hospital to make faster and more efficient decisions. Accurate decision-making uses augmented reality glasses and 5G technology to build a bridge between patients and experts. The communication facilities in the examination room increase diagnostic efficiency by nearly 85%.

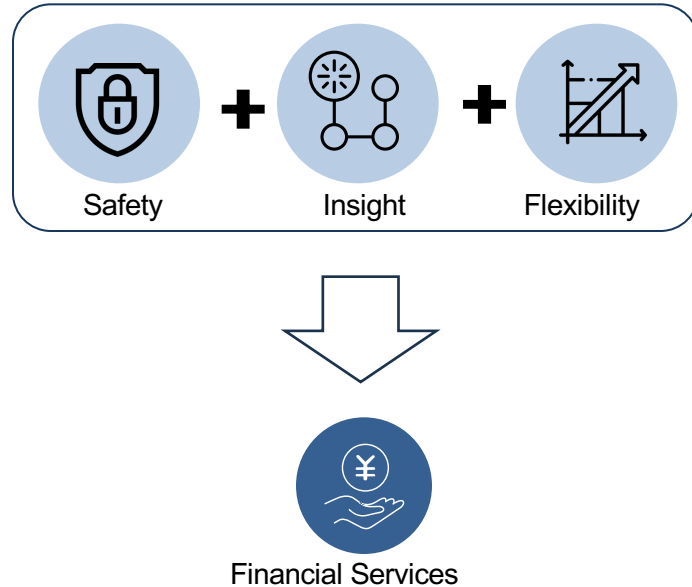
Bengal

- ❑ The Internet penetration rate is 32%, which leaves great growing potential in the future, and 5G mobile Internet interconnection services have been launched, and the government has used its own funds and foreign aid to carry out "digital interconnection" projects and strengthen infrastructure construction.
- ❑ Grameenphone, a leading telecom carrier in Bangladesh, uses AWS hybrid cloud services to accelerate its digital transformation. AWS helps it improve the scalability, reliability and convenience of its architecture, provides cloud resources and architectural support for the rapid deployment of its communication network and information electronic services, and empowers business applications such as content distribution and user data analysis.

Hybrid Cloud Market Analysis: Application Areas (Finance)

The need for processing of different data types and seasonal transactions has promoted the widespread adoption of hybrid cloud in the emerging Asia-Pacific financial industry

Financial Services Needs



- **Data Security and Compliance:** Financial service providers handle large amounts of sensitive customer data, including personally identifiable information and financial data. They need to ensure data security and compliance with strict regulations and industry compliance standards such as GDPR, HIPAA, etc.
- **Flexibility and scalability:** The business needs of financial service providers often change, and they need to flexibly adjust computing resources to meet changing business scale and traffic needs.
- **Innovation and rapid delivery:** Financial service providers need to continuously innovate and launch new products and services quickly to meet market demand and customer expectations.
- **Backup and disaster recovery:** For financial service providers, high data availability and disaster recovery capabilities are crucial. They need to ensure the reliability of data backup and disaster recovery strategies.

Practical Application

- 1 Store and Manage Data**
There are a large number of data management requirements, which are placed on public/private clouds by type.
- 2 Security Compliance**
Increase or decrease computing resources based on demand. Private clouds can provide direct control over resources, while public clouds can provide elastic resources on demand.
- 3 Peak Frequency Modulation**
In view of the seasonal characteristics of the financial industry, resources can be reasonably allocated by flexibly expanding or transferring data to the cloud.
- 4 Rich Services**
Public cloud provides a wealth of cloud services and development tools, which can help financial service providers develop and deploy new financial products and services more quickly.
- 5 Disaster Preparedness**
Implement multi-site backup and disaster recovery strategies to improve business continuity.

Source: Frost Sullivan

Fintech development in the emerging Asia-Pacific region, hybrid cloud vendors assist Singapore, Malaysia and Thailand in digital financial transformation

Singapore

- ❑ Singapore's financial services industry is one of the most important pillars of the local economy as an international financial center. Singapore focuses on data security and technological innovation. For example, the Personal Data Protection Act 2012 has been revised to protect the collection and use of personal data. The Monetary Authority of Singapore (MAS) and SNDGG, an artificial intelligence organization affiliated with the Prime Minister's Office of Singapore, launched Singapore's financial data infrastructure. SGFinDex (Singapore Financial Data Exchange) to accelerate digital transformation. As financial institutions introduce advanced technologies, such as deploying businesses to run in cloud environments, the Multi-layer Cloud Computing Security Specification (MTCS) formulated by the Singapore Information Technology Standards Committee requires cloud service providers to adopt sound risk management and security practices to assist Clients achieve business goals while reducing risk and meeting regulatory requirements.
- ❑ Huawei Cloud has partnered with Singapore's Green Link International Bank (GLDB). Usually, for a traditional bank, it takes three years to build the core system at the beginning of its establishment. However, based on the application development on the cloud, Green Bank International realized the banking system and business applications online in less than one year. In the future, GLDB could achieve rapid business development and iteration on the cloud, and provide more small and medium-sized customers with rich digital financial services.

Malaysia

- ❑ Online banking in Malaysia has quadrupled in the past decade, benefiting from 4G coverage and cheaper data plans, boosting mobile banking. The number of bricks-and-mortar commercial bank branches has decreased and the number of ATMs has declined, indicating that financial institutions have turned to financial technology. Malaysia was also ranked first among emerging and developing Asian countries in the 2019 World Economic Forum's Cyber Readiness Index.
- ❑ Microsoft Azure partners with CIMB Group Malaysia. CIMB is one of the largest financial services institutions in Malaysia. Azure provides it with a hybrid cloud architecture. On the one hand, the core banking system and sensitive user data are retained in the local data center. CIMB utilizes Azure's elastic public cloud resources to realize digitalization. Rapid deployment of banking services and smooth user experience, while leveraging Azure's machine learning capabilities and data analysis tools to enhance the depth of insights from its own massive user data to provide a more personalized user experience and empower business decisions based on data insights.

Thailand

- ❑ According to the Global Digital Report 2019. Thailand ranked first globally in terms of the popularity of online banking services, with a utilization rate of 74%. The New Crown Epidemic has led to a reduction in the need for cash and subsequently a shift towards more financial transactions through digital channels, prompting many fintech companies in Thailand to be developing various financial services, such as digital payment platforms.
- ❑ Huawei has partnered with Thailand's Siam Commercial Bank (SCB), a benchmark bank for digital transformation in the Thai banking industry, with approximately 143 million SCB users accessing services electronically. To achieve its strategic plan and target of 200 million e-banking users, SCB launched a long-term strategic partnership with Huawei to leverage resource scalability to optimize costs, flatten the container network to a single tier, reduce network latency, and improve concurrent performance. Huawei's localized cloud service deployment enables users to obtain cloud services within 0.1 seconds, and Huawei Cloud provides customized solutions for SCB core services.

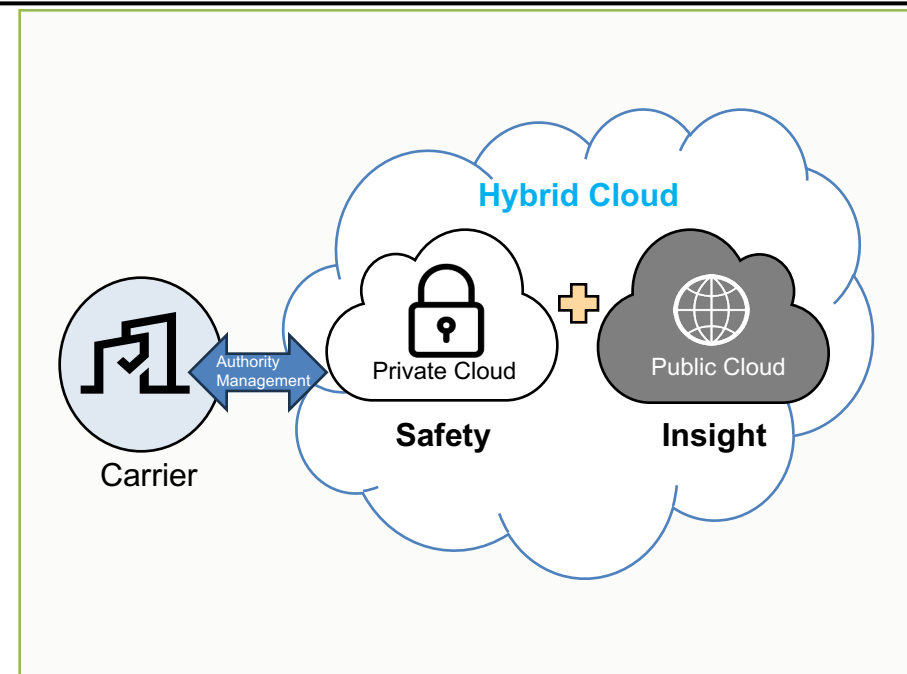
The adoption of hybrid cloud enables carriers to continue to innovate and provide efficient services, reducing costs and increasing efficiency

Communication and carrier industry needs

- Data processing and analysis: Carriers generate a large amount of user data, network data and business data every day. They require powerful data processing and analysis capabilities to extract useful information, optimize network performance and improve services.
- Network management and optimization: Carriers need to monitor network equipment and traffic in real time, predict network congestion and failures, and perform network optimization to ensure network stability and efficient operation.
- Elastic expansion: Carriers need to cope with sudden increases in network traffic and changes in business needs. They need the flexibility to scale computing and storage resources to meet changing requirements.
- Service provision and deployment: Carriers provide various services, such as cloud services, network services and application services. They need to deploy and deliver these services quickly while maintaining reliability and high performance.
- Data security and compliance: Carriers handle large amounts of user data and sensitive information. They need to ensure data security and comply with relevant regulations and industry compliance standards.

Practical Application

- Private cloud hosting: Carriers can provide private cloud hosting services to enterprises, allowing the enterprise's sensitive data and key applications to run in private cloud. This ensures data security and privacy.
- Public cloud access: Carriers can introduce public cloud services into hybrid cloud solutions, allowing enterprises to take advantage of the flexibility and scalability of the public cloud to meet temporary or peak demand.
- Cross-cloud management: Carriers can provide management and integration across multiple public cloud service providers, allowing enterprises to flexibly switch between different cloud services to obtain optimal performance and cost-effectiveness.
- Data backup and disaster recovery: Carriers can provide data backup and disaster recovery services for enterprises through hybrid cloud solutions to ensure that enterprise data can be recovered in a timely manner in the event of a catastrophic event.
- Resource optimization and load balancing: Carriers can optimize resource allocation and load balancing in hybrid clouds based on enterprise needs to ensure efficient system operation and reduce costs.
- Security and compliance: Carriers can provide advanced security measures and compliance support to ensure that enterprise data and applications are fully protected in hybrid cloud environments.
- Professional support and consulting: Carriers can provide professional support and consulting services to help enterprises plan and implement hybrid cloud solutions, as well as solve problems encountered during the use of hybrid cloud.
- Efficient operation and maintenance: Carriers provide operation and maintenance support services through professional operation and maintenance teams, quickly respond to problems in the process of enterprise cloud use, and use automated operation and maintenance, remote operation and maintenance and other capabilities to offload the load of enterprise operation and maintenance work, thereby focusing on core business develop.



The emerging Asia-Pacific region has developed ICT infrastructure, and hybrid cloud providers are helping Macau, China and Sri Lanka meet demand of industries through technological innovation

Macau, China

- ❑ Macau, China is a highly developed region whose ICT infrastructure and digitalization level are leading in Asia and even the world. Local government agencies in Macau, China attach great importance to digital transformation and actively use information technology to improve work efficiency, optimize business processes, improve customer experience, and achieve more intelligent operations.
- ❑ Companhia de Telecomunicações de Macau (CTM) is the leading telecommunications operator in Macau, China. CTM is committed to promoting new communication technologies to all areas and corners of Macau, China, and contributing to the construction of a smart city in Digital Macau. CTM uses Huawei Cloud Stack to provide it with industry-leading public cloud services. The interconnection between network and storage resources, disaster recovery and backup, and cross-cloud application scheduling provide it with a convenient user experience. At the same time, physical isolation makes CTM easier to meet security compliance requirements. Huawei Cloud Stack provides remote operation and maintenance specialist support, allowing CTM to implement subsequent operation and maintenance at a lower cost.

Sri Lanka

- ❑ Sri Lanka's carrier industry has made significant progress in mobile communications and data services and is constantly promoting the development of 5G technologies to meet the growing needs of users. The Sri Lankan market is highly competitive, with several major operators including Dialog Axiata, Mobitel, Hutch, Airtel, etc. competing fiercely and striving to attract more users.
- ❑ Dialog uses Huawei Cloud to meet security compliance requirements, integrates various public cloud services, provides high-quality technical support and around-the-clock customer service, ensures data sovereignty and low-latency connections, supports private clouds and public clouds, and meets future needs.

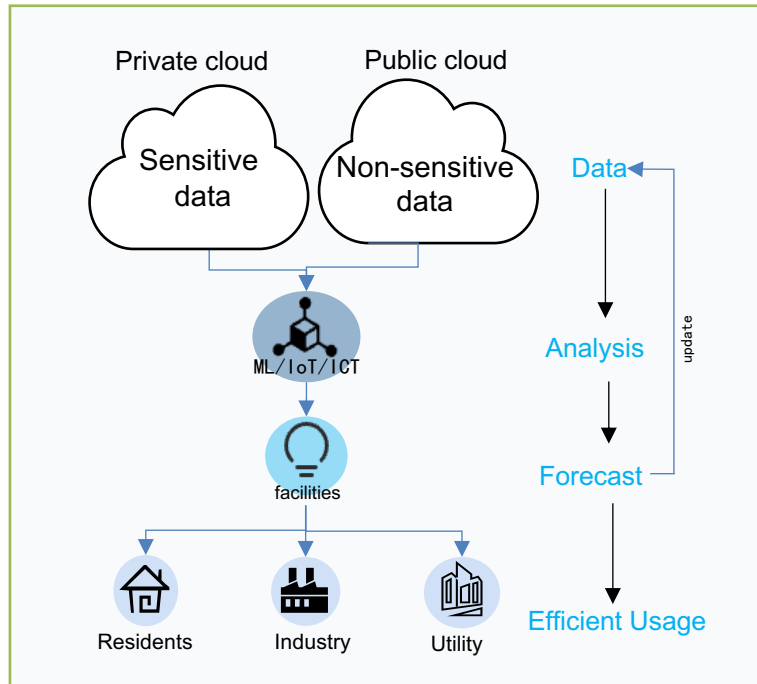
Hybrid Cloud Market Analysis: Application Areas (Others)

The energy and transportation industries have improved efficiency through the analysis capabilities of hybrid clouds for better real-time detection and demand forecasting

Other industry needs

- The energy industry needs to monitor and predict energy demand in real time, optimize production and distribution to improve energy efficiency. At the same time, it needs to monitor the status of the equipment, predict the fault and carry out timely maintenance to improve the reliability and operation efficiency of the equipment. In addition, the energy industry also needs to analyze market trends and price changes, predict supply and demand, and make informed business decisions. High-level data security measures are also necessary to protect the transmission and storage of sensitive data and meet industry compliance requirements.
- The transportation industry needs to monitor and optimize traffic flows, including those of roads, public transportation, and transportation hubs, to improve traffic efficiency and reduce congestion. At the same time, it needs to monitor traffic conditions in real time, find potential traffic safety problems, and prevent accidents. To this end, an intelligent transportation system is established, using data analysis and intelligent algorithms to provide traffic route optimization and real-time navigation services to improve the traffic experience. In addition, public transportation systems also need to optimize management, including vehicle scheduling and passenger information management, to improve the convenience and reliability of public transportation.

Practical application



- **Big data analysis:** The private cloud stores energy data and uses the public cloud for real-time analysis to achieve intelligent management and market forecasting to achieve service optimization.
- **Edge-computing applications:** Edge computing is used to process equipment monitoring data, reduce transmission delay, and realize equipment condition monitoring, maintenance and risk control.
- **Elastic extension:** With the scalability of the public cloud, it can quickly adjust computing resources and flexibly respond to fluctuations in the energy market.
- **Data encryption and Access control:** In a hybrid cloud environment, private clouds are used to provide data encryption and isolation to ensure sensitive data security and compliance standards.
- **AI:** Industry models are deployed in the hybrid cloud to provide enterprises with real-time business analytics and optimization services.
- **Public management platform:** An integrated management platform is established to optimize public transportation scheduling and management by using the data sharing and processing capabilities of hybrid cloud.

Hybrid cloud vendors contribute to digital transformation in the emerging Asia-Pacific areas , improving efficiency and boosting business growth through technological innovation

Singapore

- ❑ Singapore is one of the most densely populated cities in the world. With its highly developed subway network, traffic jams rarely occur. The subway system covers the whole island and is expected to be doubled by 2030, ensuring that 80 % of families can reach the subway station on foot within 10 minutes. The Thomson-East Coast Line is one of the most important lines of the Singapore Metro. The entire line is located underground and serves 500,000 to 1 million passengers per day. In order to cope with the high temperature and high humidity environment, the subway power supply system must be reliable and easy to operate and maintain to ensure the continuity of the subway business. At the same time, in order to reduce the area of the power supply system and leave more space for other infrastructure, Singapore LTA faces challenges.
- ❑ Singapore Land Transport Authority (LTA), together with Google Cloud, published digital travel survey through Google Kubernetes Engine to better connect and interact with urban commuters, and uses Looker Studio to quickly and easily produce visual reports. Cloud IAM and Cloud Armor ensure data security and reduce vulnerability. Cloud Monitoring fraud detection logically identifies bot traffic to improve data quality through platformed Cloud IAM and Cloud Armor.

Cambodia

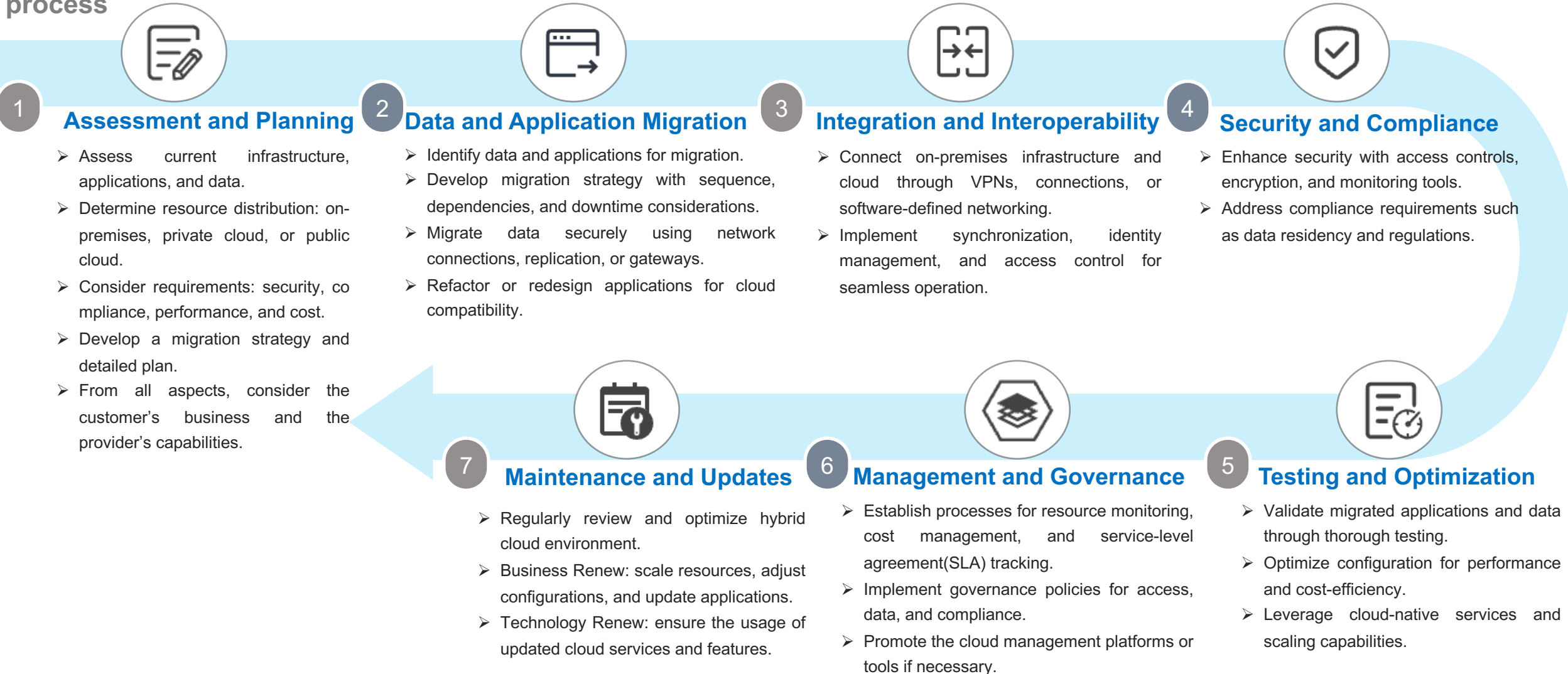
- ❑ With the development of the digital economy, the Cambodian government has issued the " Digital Economy and Digital Society Policy Framework " and formulated 139 specific measures aimed at building digital infrastructure. As a developing country in Southeast Asia, Cambodia has a variety of business models and start-up development.
- ❑ Huawei builds a fast and agile service system and capability for Lanmei Airlines to reduce the overall OPEX cost. As a start-up enterprise, at the beginning of its establishment, Lanmei Airlines is facing the technical and operational adjustment of building a competitive secure online platform. In the case of limited human and hardware resources, it is necessary to build a perfect and reliable IT system. Huawei provides one-stop cloud services to ensure the localization of key systems and the localization of sensitive information. Under the premise of safe preservation, it provides a fast and convenient website system, trading system and OA system that can bear high concurrency and high capacity through the public cloud. Elastic Cloud Server provides scalable computing power for it, Content Delivery Network implements low-latency content distribution for its distributed global users, Relational Database Service assists LMC to develop new functions for website and mobile phone applications and handle high-concurrency scenarios, while cloud data recovery service and Object Storage Service achieve safe and reliable high-capacity data storage and data recovery for LMC.

Indonesia

- ❑ Bank Neo Commerce (BNC) is Indonesia 's leading bank, providing convenient and reliable financial services for small and medium-sized and large enterprises and individual users. It is ranked by Forbes as the 10 best banks in Indonesia by 2023. BNC can provide customers with one-stop financial services through the neobank app, with more than 23 million account opening users.
- ❑ As the world 's leading cloud service provider, Huawei Cloud covers the world with service nodes to provide enterprises with the required service products and solutions. BNC cooperates with Huawei Cloud to build a more open source partner ecosystem and services, and uses Huawei 's full set of fast-available cloud services to improve user experience and fast-online application function modules. Huawei Cloud Stack provides localized deployment of automated applications, and centralized and effective operation and maintenance management allows its teams to focus more on core business. At the same time, Huawei has more than 130 security certifications to assist BNC in preparing for global business expansion under the premise of meeting Indonesia 's strict financial compliance requirements.

Migrate to Hybrid Cloud: Plan Implementation And Process Monitoring

To create a hybrid cloud environment for the enterprise, suppliers need to arrange strategies in advance to ensure that customers can safely migrate data, integrate infrastructure, test, and create a management architecture throughout the process



Looking Forward: Key Technology Trends of Hybrid Cloud

Adoption of more advanced architecture and technologies breed more intelligent hybrid cloud services and form better ecosystem for continuous technological development



Intelligent Services



Empowering enterprise-specific intelligence

- The construction of an exclusive large model of enterprise integration has become the driving force of the general trend, calling for cloud intelligent computing power and full stack production tools in line with the productivity of AI era.
- Deep empowerment operator fusion and hybrid precision optimization can improve the efficiency of enterprise AI training and intelligentize the whole production process of enterprises.

Cloud data intelligence fusion

- AI technology adapts to government and enterprise infrastructure and data architecture.
- Enabling unified metadata management, cloud-native fusion data lake enables full-link data governance, data asset reuse and intelligent decision-making, with stronger availability, higher security, and close follow-up regulatory requirements.
- Data and resources to achieve seamless scheduling on the cloud and under the cloud.



Ecosystem

Integration of open ecology

- Leading manufacturers will strengthen the construction of capacity-centered ecological partner development system (including software, service and system integration and other partners).
- With ecological deep ploughing, it has become a new normal for leading manufacturers to realize the sharing of rights and interests among partners in cloud ecology and high-quality sustainable win-win situation.



Application Modernization

Cloud Native Development

- Cloud native accelerates the realization of application modernization, realizes ' national development ', and accelerates business innovation incubation.
- The development model has evolved from traditional ' waterfall ' development to cloud data-driven DevOps, and application development and deployment have moved towards automation.
- Empowering the evolution of traditional enterprise architecture to service-oriented architecture such as microservice / Serverless

Infrastructure



Cloud-edge collaborative infrastructure

- Connect the headquarters-branch-edge resources of cloud users, cooperate with the external public cloud or industry cloud, and realize the ' perspective of a cloud ' in the cloud, cloud edge and cloud.
- Empowering cloud users will extend intelligence to the edge to achieve a unified cloud service experience of ' center + edge '.
- Enable efficient collaboration of cloud users ' own application, data, resources, management and other dimensions.



Compatible with heterogeneous computing power

- The complexity of the business environment faced by government and enterprises and the speed of update and iteration will be further increased, and intelligent computing power will become the mainstream of application.
- The traditional core business on the cloud and multi computing power node hybrid deployment has become the mainstream, calling for higher compatibility of heterogeneous computing power cloud platform.



Professional operation and maintenance

- As the core business of the enterprise is on the cloud, the complexity of cloud operation and maintenance increases exponentially with the scale. The professional operation and maintenance team has become the key to break through the depth of the large scale and deep stack of the cloud stage.

Safe Operation



Cloud Native Security

- With the adoption of cloud native architecture, cloud native security will become the core of secure IT operation and maintenance.
- Enabling cloud users to realize end-to-end security services from the computer room to the cloud and the landing of security construction in each link has become the mainstream.



A variety of architecture cloud disaster recovery

- Through the combination of multiple architecture models such as local, intra-city, off-site, and hybrid cloud, the cloud disaster recovery architecture project that meets the requirements of cloud user business diversification disaster recovery level has become the top priority.

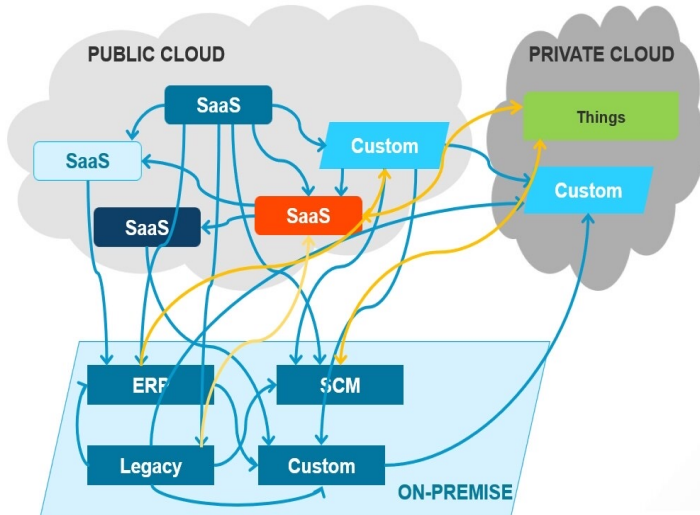
Choose the Right Cloud: Key Success Factors of Outstanding Hybrid Cloud Service

Comprehensive offerings and thorough data security management along with excellent client support are the key success factors for hybrid cloud providers

“Deployment of hybrid cloud increases IT management complexity, however, in order to lower OPEX, improve scalability and agility, ensure data security and enhance business intelligence, ultimately, achieving the global carbon-neutral goal, the road to cloud deployment, especially hybrid cloud deployment is inevitable.

Comprehensive Offerings

- ✓ Develop a **robust** and **comprehensive** hybrid cloud solution that caters to the diverse needs of customers
- ✓ Offer tools and technologies that enable efficient workload placement, data transfer, and performance monitoring
- ✓ Continuously update emerging technologies such as AI, blockchain and big data on the hybrid cloud to ensure a unified architecture of private cloud and public cloud, so that enterprises can obtain innovative cloud service capabilities on the public cloud in a timely manner.



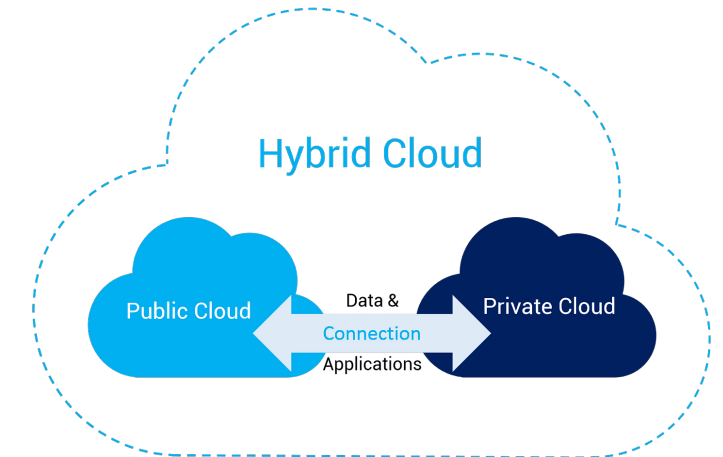
Data Security and Compliance



- ✓ **Thorough risk assessment:** identify the potential vulnerabilities and risks
- ✓ **Security initiatives:** access controls, encryption, multi-factor authentication, data loss prevention, network monitoring, incident response plans, etc.
- ✓ **Defense-in-depth approach:** combine multiple layers of security to mitigate risks effectively.
- ✓ **Meeting compliance needs:** The products provided can meet the standards of security and data protection in different countries.

Customer Support and Continuous Innovation

- ✓ Provide excellent customer support and services to assist customers in managing their hybrid cloud environments
- ✓ Offer comprehensive documentation, training materials, and technical support to ensure smooth deployment and ongoing operations
- ✓ Continuously invest in R&D to address emerging customer requirements



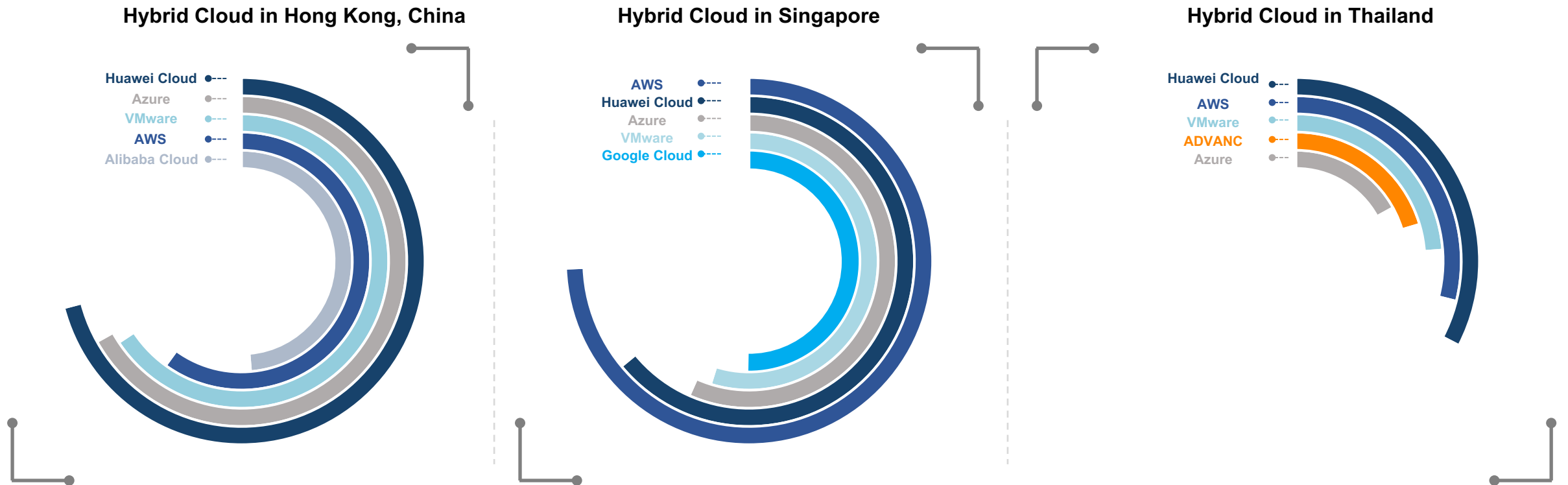
Source: Frost & Sullivan

Choose the Right Cloud: Competitive Landscape of Hybrid Cloud in the Emerging Asia-Pacific

Huawei Cloud took the lead in the hybrid cloud market in Hong Kong, China and Thailand 's in 2022, and AWS ranked first in the Singapore market

● By country / region

Unit: 100 Million RMB



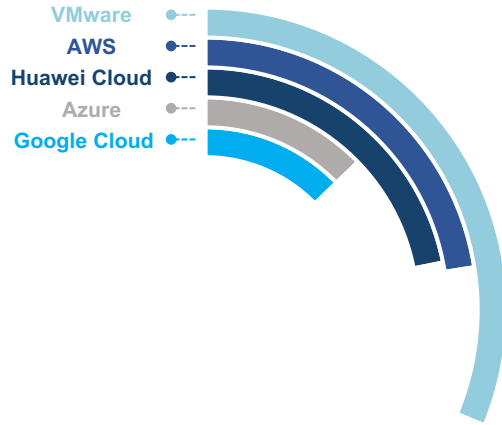
Note : The length of the bar chart represents the sales revenue obtained by the manufacturer in different markets.

Source: Frost & Sullivan

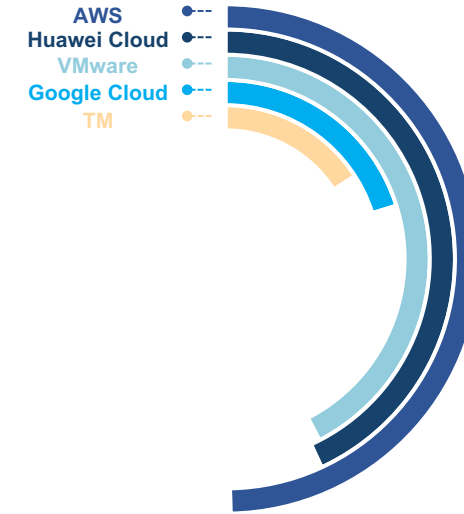
Choose the Right Cloud: Competitive Landscape of Hybrid Cloud in the Emerging Asia-Pacific

Unit: 100 Million RMB

Hybrid Cloud in Indonesia



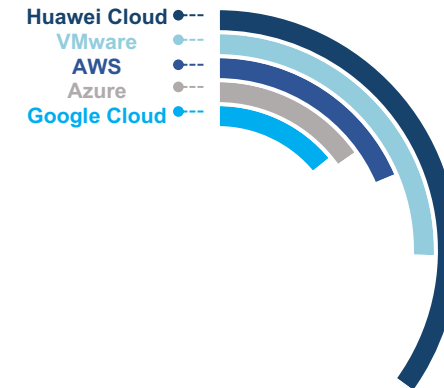
Hybrid Cloud in Malaysia



Hybrid Cloud in the Philippines



Hybrid Cloud in Bangladesh



Note : The length of the bar chart represents the sales revenue obtained by the manufacturer in different markets.

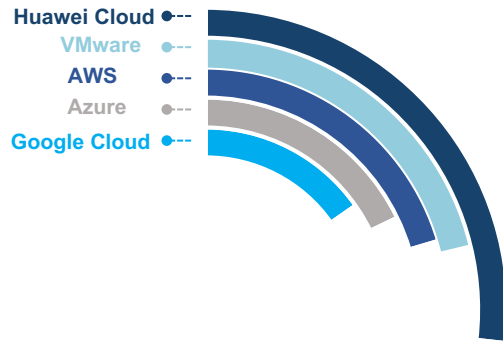
Choose the Right Cloud: Competitive Landscape of Hybrid Cloud in the Emerging Asia-Pacific

In 2022, Huawei Cloud took the lead in launching hybrid cloud in Maldives, and Huawei Cloud ranked first in the field of hybrid cloud in Sri Lanka

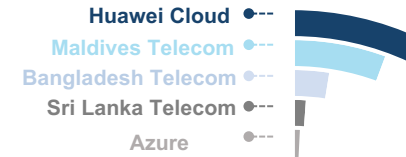
● By country / region

Unit: 100 Million RMB

Hybrid Cloud in Sri Lanka



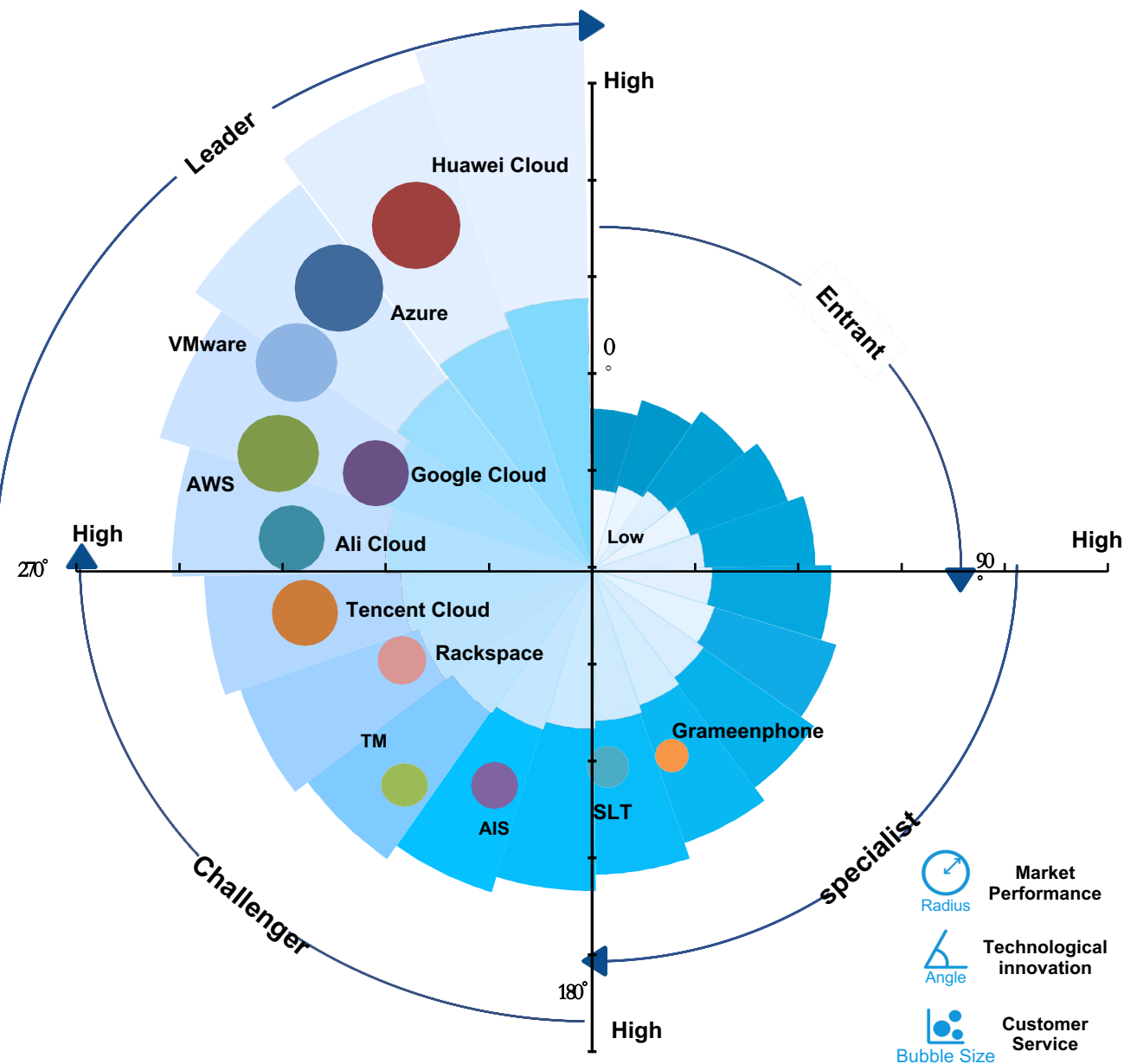
Hybrid Cloud in the Maldives



Note : The length of the bar chart represents the sales revenue obtained by the manufacturer in different markets.

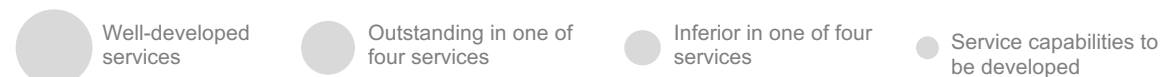
The Competitive Landscape of Hybrid Cloud Providers in the Emerging Asia Pacific

Competitive Leadership Mapping in the Emerging Asia-Pacific region



Evaluation Criteria

- “Market performance” of vendor is expressed as the distance between the center of the circle and the origin of the coordinates (radius) :
- The distance measures the market performance of vendor in the emerging APAC market in terms of various application areas (mainly government, finance, healthcare, transportation, manufacturing, etc.). The larger the radius the stronger its market performance capability of the vendor.
- “Technological innovation” of vendor is expressed as the angle between the center of the circle and the origin of the coordinates to the Y positive axis (angle) :
- The angle measures the technical capability of vendor in terms of cloud foundation performance, cloud security governance, technological advancement, product application capability, application innovation level and cloud ecosystem openness. The larger the angle the stronger its technical capability of the vendor: i.e 360 degree refers to full marks in technical capability.
- “Customer service” of vendor is expressed as the bubble size (bubble size) :
- The bubble size measures the customer service of vendor in terms of pre-sales services, application services, operation & maintenance and expert services. Each vendor’s competitiveness applies one of the four size classes representing different service capabilities.



Key Findings

Huawei Cloud , AWS ,VMware, Azure , Google Cloud and Ali Cloud are recognized as “Leaders” in the APAC hybrid cloud market.

- These vendors are improving application data security, technology compatibility and cloud-native application development & deployment with privacy differentials, cloud-native technologies, etc., to make the hybrid cloud platform experience more secure, advanced, and easy to use. Also, these vendors have strong market performance capability in various application areas and are consistent in providing their clients with well-developed service to fulfill their demands.

Tencent Cloud , Rackspace, TM and AIS are recognized as “Challengers” in the APAC hybrid cloud market.

- These vendors are gaining the power to drive growth through increasing their product application quality-price ratio, differentiating themselves from competitors, and providing more openness to the hybrid cloud ecosystem.

SLT and Grameenphone are recognized as “Specialist” in the APAC hybrid cloud market.

- These vendors are niche players with the potential to develop quality applications and technological innovations.

Supplier Analysis

Huawei hybrid cloud has been widely used in many regions and industries with its leading technology, complete products and mature customer service

Major customer cases in the Asia Pacific region



- Sri Lanka Telecom Operators Achieve New Growth Through ' Cloud Transformation
- Products: Huawei Cloud Stack
- Effect: Huawei Cloud Stack's solution for carriers helps Sri Lanka 's telecom operator transform to the cloud and accelerate new business growth. Huawei Cloud provides a hybrid cloud solution for Dialog to access various cloud services, such as computing, storage and network, while maintaining data sovereignty. Dialog has made good progress in promoting cloud transformation in recent years. It is currently the largest four-in-one service provider in Sri Lanka and has market advantages in all business areas.



- Huawei Cloud Stack Solution for Macau Telecom CTM
- Products: Huawei Cloud Stack
- Effect: Huawei Cloud provides Huawei Cloud Stack Solution for CTM of Macau Telecom, establishes local cloud platform CTM Cloud, allows access to public cloud services, and ensures that data is not transferred outside Macau. Based on CTM 's leading 5G technology, CTM Cloud uses the synergistic effect of cloud network to introduce cutting-edge technologies such as artificial intelligence, big data, and meta-universe for Macao enterprises.



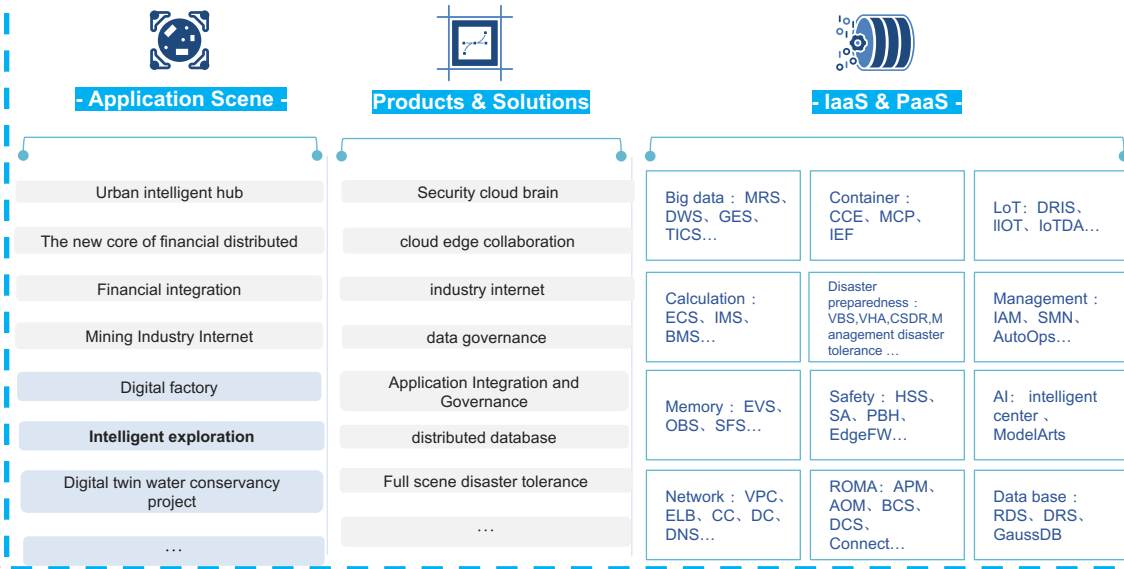
- Customers signed a memorandum of understanding on cybersecurity cooperation with Thailand 's Ministry of Digital Economic and Social Affairs
- Products : Huawei Cloud Stack
- Effect: Huawei Cloud has become a major supplier of cloud technology in Thailand, helping the Thai government and enterprises to accelerate the transformation to digital, online and intelligent. The two sides cooperate to expand the development and construction of Thailand's public cloud infrastructure, strive to cultivate an ecosystem of government agencies and industry partners, start-ups, small and medium-sized enterprises and universities, provide integrated solutions, continue to deepen cooperation between the two sides in the field of government cloud, support Thailand 's construction of a digital government, enhance its competitiveness in the field of digital economy, and thus promote Thailand to become an ASEAN digital center.



- Strengthen the network security of banking services
- Products : Huawei Cloud Stack
- Effect : strengthen infrastructure, banks and Huawei cooperate to protect servers and network equipment ; help the new Austrian bank effectively maintain customer data and privacy, and prevent data leakage in the system with data management system and the distributed database solution.

Service Framework

Product matrix of Huawei cloud Stack service



Value-Of-Service

- Huawei Cloud Stack is deployed in the customer's data center. Customers use private cloud services offline and they could gain absolute control over data and O&M. Huawei Cloud Stack is a unified architecture based on public and private clouds, which enables customer to use cloud service to the fullest.

Rich Service

- **A large number of service:** With the same architecture as the public cloud, Huawei Cloud Stack can continuously synchronize Huawei 's public cloud services and ecology. Cloud services can continue to evolve, including big data, databases, AI and other high-frequency services that are just needed by government and enterprises to support user business innovation.
- **Mature delivery capabilities and professional services:** Thanks to Huawei 's deep cultivation in the government and enterprise industry for several years, it can provide mature government and enterprise customer service processes and localized layouts to quickly respond to customer needs. At the same time, through the professional service precipitation scenario solutions. Huawei Cloud helps customers build the cloud, use the cloud, and manage the cloud.
- **Soft and hard collaboration:** Huawei Cloud Stack collaborates with Huawei ICT products, using the advantages of the full stack to achieve performance tuning and functional innovation, greatly improving performance in scenarios such as disaster recovery, computing, and AI inference training, and providing customers with a solid and reliable cloud platform.

Source: HuaWei Cloud , Frost & Sullivan

Supplier Analysis

Microsoft's hybrid cloud is the first choice for companies seeking comprehensive cloud solutions. It is known for its commitment to empowering the digital transformation of emerging Asia-Pacific regions through advanced artificial intelligence and analytical capabilities

Major customer cases in the Asia Pacific region

Microsoft Azure HELLO TALK

- Provide real-time voice to text, subtitles, text to speech, machine translation and pronunciation evaluation
- Product: Azure Stack
- Impact: HelloTalk has enhanced its platform to enable users from more than 200 countries to learn languages with ease and pleasure.

Hong Kong

Microsoft Azure CUMULUS PRO

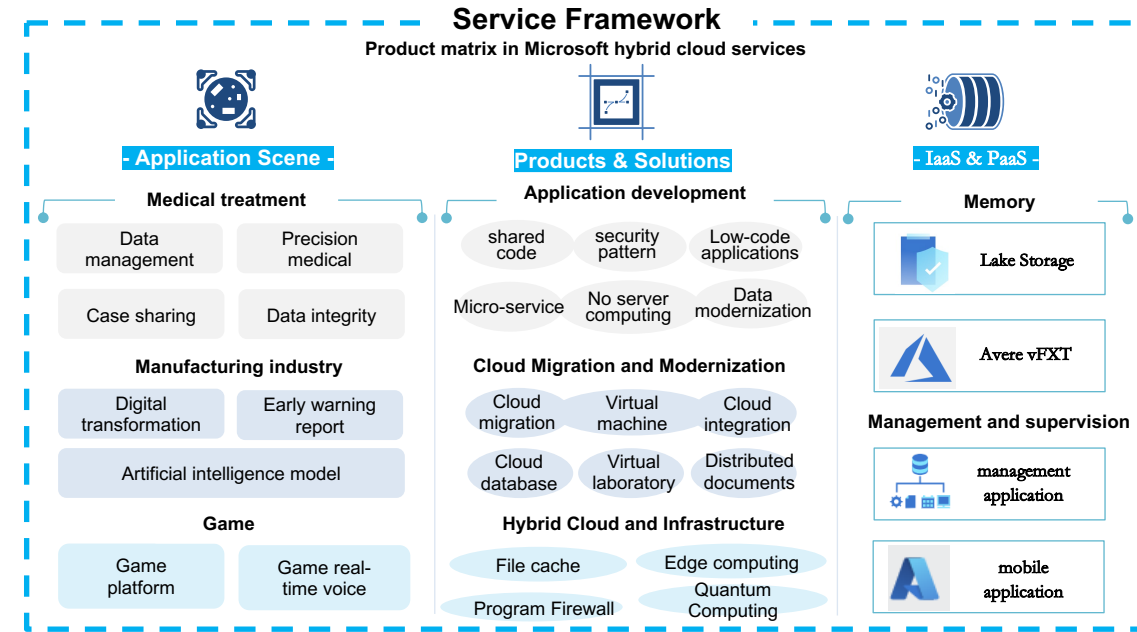
- Promote the rapid delivery of digital solutions, leveraging the scalability and flexibility of the cloud
- Product: Azure Stack
- Impact: This enables Cumulus Pro to respond quickly to customer needs, quickly produce prototypes, and shorten the time to market from months to weeks.

Singapore

Microsoft Azure ATRAM

- Cloud Manage and analyze scattered, isolated data to effectively tailor products and services to customers
- Product: Azure Stack
- Impact : It improves the speed and quality of data processing, realizes the function of prediction and standardization, strengthens the relationship with fund distribution partners, improves customer service, and promotes the digital transformation of the organization.

Philippines



Value-Of-Service

- Promote innovation and transformation:** Microsoft Hybrid Cloud provides a complete service ecosystem with cutting-edge technology, focusing on user-friendly solutions and rich industry experience in the Asia-Pacific region to help companies innovate and transform operations.

Rich Service

- Perfect service system:** Amazon hybrid cloud has a perfect service system to provide customers with a full range of products and solutions.
- User-friendly integration solutions:** Microsoft's hybrid cloud integration solution has a friendly user interface and provides SDK support, which can help customers reduce the technical threshold.
- Industry expertise:** Microsoft's hybrid cloud has rich industry expertise, can achieve transformation in different fields such as media, entertainment, and health care, and is in a leading position in the market.

Supplier Analysis

VMware is a global provider of cloud infrastructure and mobile business solutions that enable the operation, management, connectivity, and protection of any application on any cloud and device

Major customer cases in the Asia Pacific region



- Transform IT services to run in sync with the business with VMware
- Product: Hybrid cloud solution
- Effect: Chow Sang Sang has transformed its IT infrastructure into a modern, dynamic and agile powerful platform to support its fast-growing e-commerce business and future multi-cloud strategy.

Hong Kong

Thailand



- Make healthcare business management easier with VMware Cloud
- Product: Hybrid cloud solution
- Effect: Kubernetes can be used to enable rapid development and deployment of new capabilities, and migrating Alyssa to HM Sovereign Cloud can reduce operational costs. While operating performance improved, the team was able to design a feature-rich platform that healthcare providers trusted.

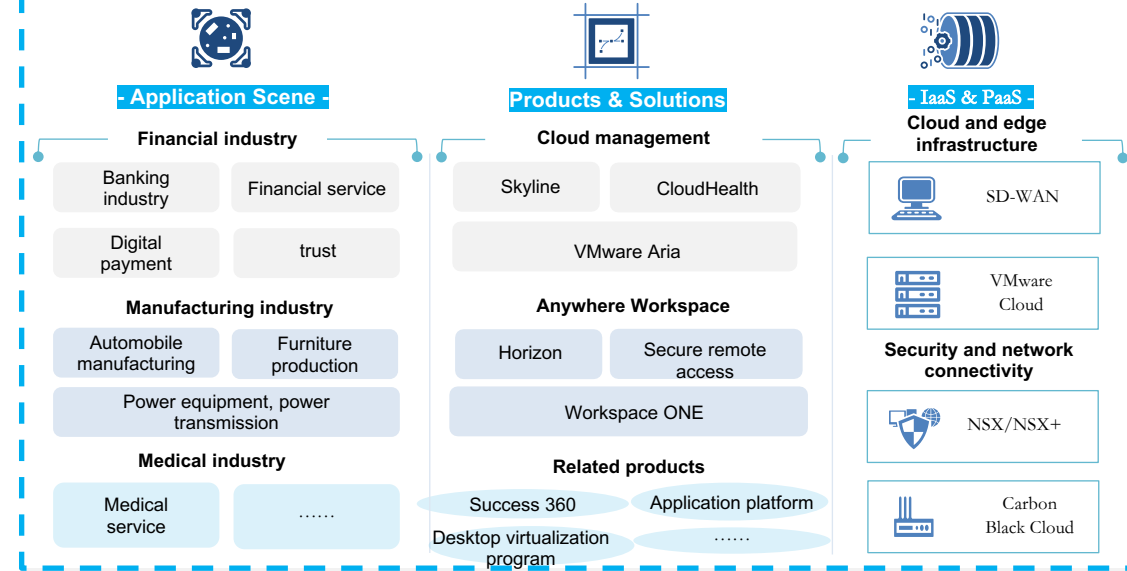
Singapore



- VMware enhances workforce employability for training provider NTUC LearningHub
- Product: Hybrid cloud solution
- Effect: NTUC LearningHub seeks to partner with VMware to help job seekers gain industry-relevant skills that will enhance their long-term employability. This will support the Singapore Government's efforts to upskill its workforce to help meet the changing needs of employers and cope with the impact of the pandemic.

Service Framework

Product Matrix for VMware Services



Value-Of-Service

- **Multi-cloud Service Solution Provider:** Provide multi-service solutions such as application modernization, cloud infrastructure, network, and telecom cloud.

Rich Service

- **Innovate data centers:** VMware software natively integrates computing, network and storage virtualization technologies and automation and management functions, enabling data centers to have the agility and economy of cloud service providers and expand to a flexible hybrid cloud environment.
- **Public cloud integration:** VMware cloud computing technology uses VMware hybrid cloud and native public cloud to provide IT organizations with applications that run, manage, connect, and protect in any cloud.
- **Security transformation:** VMware uses the distributed software layer across application infrastructures and endpoints to adjust security controls and policies according to the protected applications. Support for inserting third-party security services to provide additional intelligent protection.
- **Compliance:** VMware provides a common software layer that covers the endpoints of the application infrastructure to help organizations streamline compliance management.

Source : Tencent Cloud, Frost Sullivan

Supplier Analysis

With cutting-edge innovation, user-friendly products and rich industry expertise, Amazon hybrid cloud is in a leading position in the hybrid cloud market in the emerging Asia-Pacific region with its diversified services and wide range of enterprise application adoption rates

Major customer cases in the Asia Pacific region

Hong Kong

AWS WESURANCE Wesurance

- Provides insurance companies with end-to-end digital solutions and innovative insurance distribution channels
- Product :AWS Outposts
- Effects: Simplify the insurance company's digital transformation, increase AXA Hong Kong's renewal rate by 20%, and offer new products through innovation channels.

Singapore

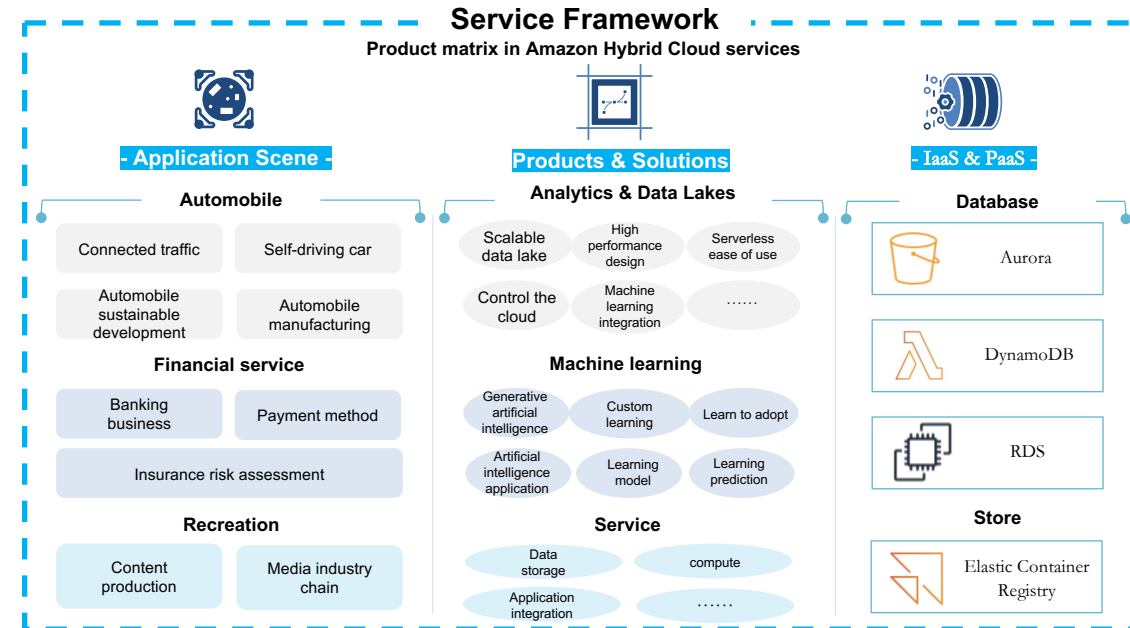
AWS DBS Bank DBS

- Quantitative Pricing Engine (QPE) migration to provide its trading clients with near-real-time pricing and dynamic workload support to replace costly and difficult-to-scale in-house infrastructure
- Product : AWS Outposts
- Effects: The pricing engine is scalable, reducing provisioning time from months to minutes, and has access to the latest technology that seamlessly integrates into its solution stack, significantly reducing the cost of the pricing engine.

Malaysia

AWS Pizza Hut

- Simplify data integration and analysis and create automated dashboards
- Product : AWS Outposts
- Effects: Data processing time has been reduced from hours to minutes, providing actionable insights for marketing and operations, enabling 360-degree analysis of customers and the purchase journey.



Value-Of-Service

- Powering Digital Transformation:** Amazon Hybrid Cloud offers a comprehensive range of products and services to help businesses achieve seamless digital transformation and expand their presence in the emerging Asia Pacific region.

Rich Service

- Comprehensive Product range:** Amazon Hybrid Cloud offers a complete and diverse set of products and services to meet customers' every need.
- Scalability and flexibility:** Whether scaling up during peak periods or scaling down during periods of low traffic, Amazon Hybrid Cloud offers a seamless and cost-effective way to handle diverse workloads. This ensures that the enterprise efficiently handles changes in demand and optimizes resource allocation.
- Industry Leadership:** With extensive industry experience, Amazon Hybrid Cloud has always been at the forefront of the transformation of traditional and emerging industries, maintaining a market leadership position.

Source : Amazon Cloud Technology, Frost Sullivan

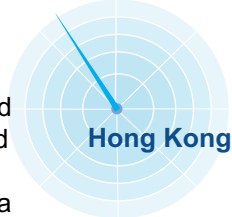
Supplier Analysis

Google 's hybrid cloud provides reliable and efficient cloud solutions that can be seamlessly integrated with emerging Asia-Pacific infrastructure, enabling agile growth through cost-effective data analysis and enhanced user experience

Major customer cases in the Asia Pacific region



- Improve platform gaming experience and reduce infrastructure costs
- Products: Google Anthos
- Impact: Reduced network latency, increased download speeds of game resources, saved 30% in infrastructure costs, and realized zero connection failures over the course of a 6-month deployment.



Hong Kong



- Provide the necessary cloud infrastructure and services to support its cross-border operations and vision of becoming a global economic infrastructure
- Products: Google Anthos
- Impact: Achieved geographic coverage, reliability, low latency, security, data consistency, cost reduction and speed of innovation, enabling seamless cross-border operations and supporting millions of dollars in payments and international transfers.



Singapore



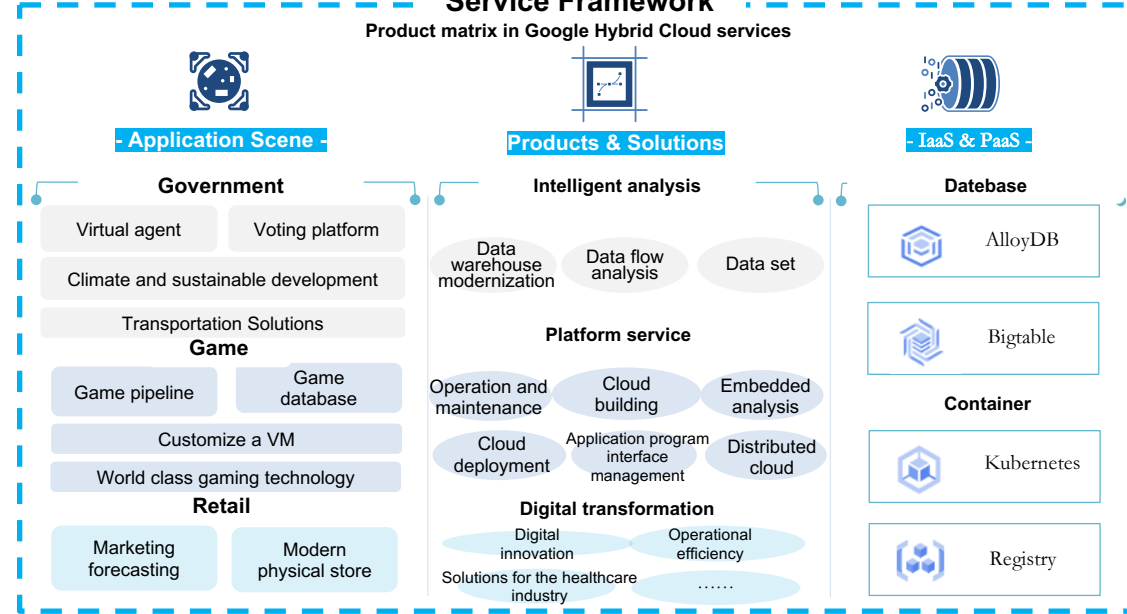
Indonesia



- Creation of a digital fisheries ecosystem that connects more than 36,000 fishers to global markets and promotes sustainable fisheries practices
- Products: Google Anthos
- Impact: Improved sustainable fishing practices through GPS trackers and visualization techniques; reduced food waste by anticipating demand.

Service Framework

Product matrix in Google Hybrid Cloud services



Value-Of-Service

- **Achieve innovation and simplification :** By leveraging cutting-edge technology and lean DevOps, Google 's hybrid cloud provides a collective ecosystem that paves the way for the future of cloud computing and fosters a culture of continuous improvement and technological evolution.

Rich Service

- **Scalable and reliable infrastructure :** Google 's hybrid cloud provides scalable and reliable infrastructure that can automatically expand and shrink to handle unpredictable traffic peaks while reducing hardware costs. This scalability and reliability ensures a seamless user experience and cost-effectiveness of the enterprise.
- **Advanced data analysis capabilities :** With the global network and advanced data analysis capabilities, Google 's hybrid cloud enables companies to efficiently process and analyze data to gain valuable insights and make data-driven decisions.
- **Security and Compliance :** Google 's hybrid cloud prioritizes security and compliance. Data centers replicate user data in the country and comply with financial regulations to ensure data security and compliance of sensitive financial information.

Source : Google Cloud, Frost Sullivan

THANKS!

