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CBC Tech: Empowering Enterprises with Network-as-a- Service solutions

Ricky Chau
Chief Strategy & Customer
Officer, CBC Tech

**The Evolution and
Impact of Mobile
Financial Services**

**China Mobile's 5G
Integration Advances
Global Business Success**

**Transforming Telecoms:
Huawei ICT Services & Software
Enable Digital Intelligence
Acceleration**

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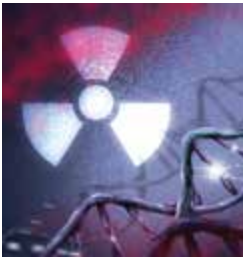


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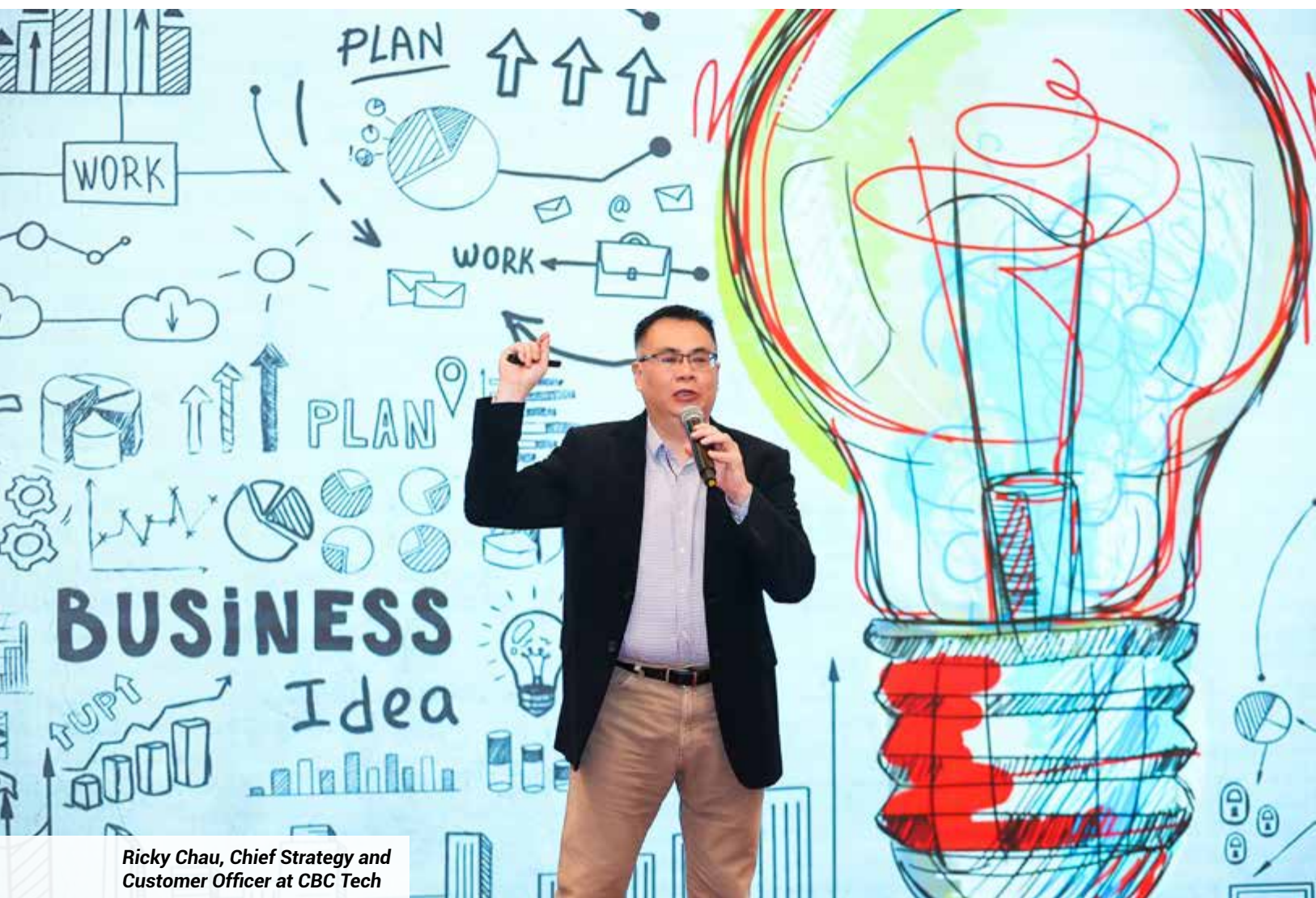
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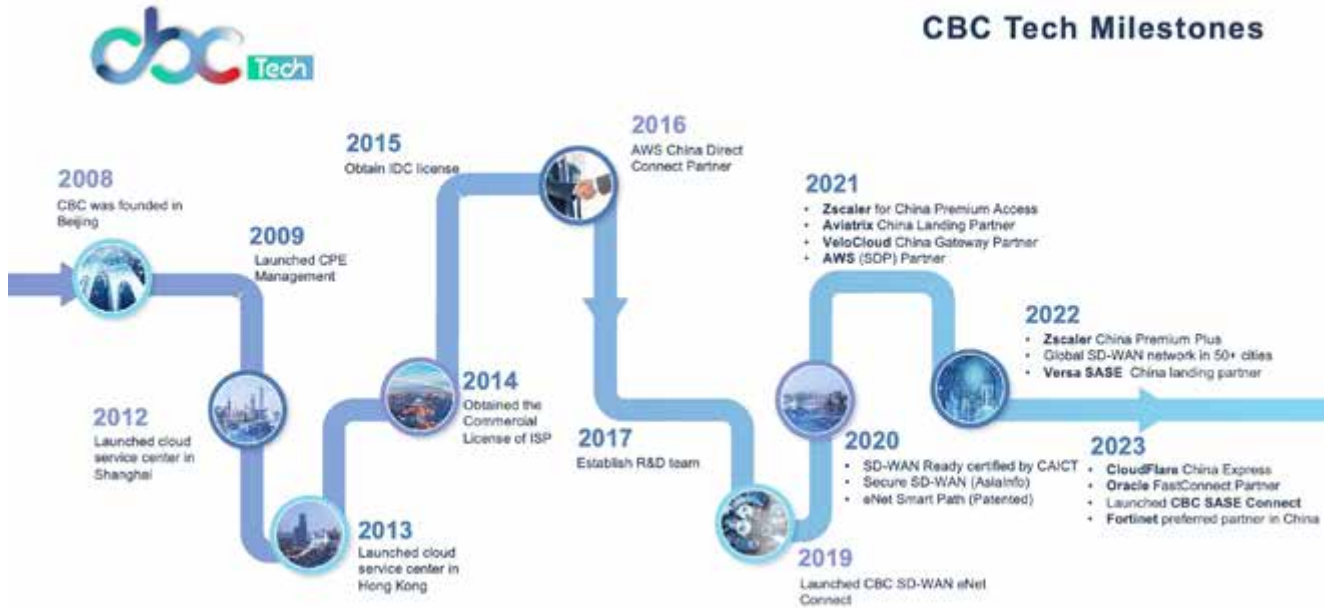
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Ricky Chau, Chief Strategy and Customer Officer at CBC Tech

CBC Tech: Empowering Enterprises with Network-as-a-Service Solutions

The convergence of networking and security in a unified cloud-native service offers enterprises the agility, scalability, and robust security required to overcome growing challenges and thrive within the ever-evolving landscape of enterprise infrastructure.



In an exclusive interview with Telecom Review Asia, Ricky Chau, Chief Strategy and Customer Officer at CBC Tech, provided insights into the company's global strategy, specifically outlining how it is growing its offerings and ecosystem to better address customer demands in a rapidly evolving digital era.

Please outline CBC's footprint across Asia and beyond. Could you outline the availability of its services and its approach to market strategy in various regions worldwide?

CBC Tech was founded 15 years ago with our headquarters in Beijing and international headquarters in Singapore. Our next-generation Network-as-a-Service (NaaS) solution combines SD-WAN, application assurance, cloud-based security, and multi-cloud services on a single fabric to enable application performance for enterprises without having to build and maintain their own infrastructure.

At present, our network infrastructure covers 40+ cities in China and 50+ cities internationally. Our value proposition is to enable Network-as-a-Service (NaaS) for global service providers and multinational enterprises operating in

China, facilitate Chinese multinational enterprises to go global.

Our competitive edge stems from our pioneering research and development (R&D) of our SD-WAN in 2017, followed by the commercial launch of our eNet fabric (our patented SD-WAN) in 2019. There are only a few service providers that possess their own SD-WAN technology and operate their network infrastructure on a global scale, and CBC Tech stands among them.

Our patented SD-WAN enables complete control over our offerings, empowering us with the flexibility and agility to craft bespoke solutions for our customers. Today, with a growing portfolio exceeding 30 patents (alongside ongoing innovations), we consider this a significant competitive advantage that positively impacts our customer experience. For example, CBC Tech's SmartPath technology is transforming network traffic routing and management. Embedded within CBC Tech's eNet fabric, SmartPath dynamically adjusts networking paths based on traffic performance, revolutionizing how networks operate.

The global expansion of our eNet fabric targets emerging markets such as Southeast Asia, Eastern Europe, Latin



Our value proposition is to enable Network-as-a-Service (NaaS) for global service providers and multinational enterprises operating in China, facilitate Chinese multinational enterprises to go global





CBC Tech has embarked on a journey to transform from a network provider to a tech provider to enable cloud-based networking and Security-as-a-Service (SECaaS) for our customers

America, the Middle East, and Africa, with a primary focus on facilitating Network-as-a-Service for Chinese multinational enterprises to go global. Recently, we announced our strategic partnership with Cirion Technologies in Latin America to provide our customers with an expanded range of sophisticated solutions in Latin America.

How does CBC Tech ensure that its business strategies are aligned with customer demands in the rapidly changing technological landscape?

CBC Tech has embarked on a journey to transform from a network provider to a tech provider to enable cloud-based networking and Security-as-a-Service (SECaaS) for our customers. We're not just investing in technology and innovation; we are investing in our people, reshaping our culture, and redesigning our processes to realize our vision.

The shift towards cloud computing, Software-as-a-Service (SaaS), and remote work has been gaining momentum for some time now. Enterprises are recognizing the benefits of Secure Access Service Edge (SASE). SASE offers a converged approach to network and security services, incorporating SD-WAN, Secure Web Gateway (SWG), Cloud Access Security

Broker (CASB), Next-Generation Firewall (NGFW), and Zero Trust Network Access (ZTNA) through Security Service Edge (SSE) platforms.

To fulfill our customers' SASE requirements, we're enhancing our SD-WAN and Security Service Edge (SSE) portfolio through strategic partnerships with leading tech companies. By seamlessly integrating our partners' SD-WAN and SSE solutions into our eNet fabrics, we enable our customers to tailor their SASE solutions to meet their specific needs. With a robust ecosystem, including global tech companies like Zscaler, Fortinet, Versa, VM Ware, Cloudflare, and more, we are offering unparalleled choice of SASE for our customers. Our unique edge lies in our ability to seamlessly integrate and manage multiple SASE vendors on our eNet fabric, delivering a unified experience as a single provider.

At CBC Tech, excellence isn't just a goal; it's our commitment to our customers. Customer centricity is our core value, and our customers are at the center of everything we do. Our professional customer-facing and support teams meticulously guide our customer journey, prioritizing speed and agility as our defining traits. Our dedication to excellence is evident in our recent





customer survey, which demonstrated a Net Promoter Score (NPS) of 64, a Customer Satisfaction Score (CSAT) of 97, and a Customer Effort Score (CES) of 90, showcasing our commitment to delivering service excellence.

Could you share some examples of CBC Tech's ecosystem partners and showcase instances of successful solution deployments? How have these initiatives impacted digital transformation and contributed to the overall success of your customers?

A Fortune Global 500 company in the wine and spirits industry has recently partnered with CBC Tech to enhance their user experience in China through the implementation of a managed Zscaler Private Service Edge. This customer—with a distribution network and key offices across China—encountered persistent issues with unstable connections and sluggish network performance while utilizing Zero Trust Network Access (ZTNA) to access various cloud-based applications outside of China. The network performance via ZTNA is crucial for their remote users, particularly as video conferencing serves as the primary means to connect their global teams and external partners. The implementation of ZTNA, alongside CBC Tech's solutions, significantly mitigated intermittent

performance issues, markedly enhancing their user experience.

This comprehensive solution not only tackled critical challenges in ensuring stable and secure connectivity for accessing various cloud-based applications but also specifically addressed concerns related to Microsoft 365, including Teams video calls. This enablement showcases how CBC Tech leverages our eNet fabrics and our tech partner ecosystem to deliver a robust, managed, SASE solution, effectively addressing critical business needs and reinforcing our commitment to delivering the best application performance with exceptional customer experience.

What is your vision moving forward?

Our vision is crystal clear: to emerge as the next-gen Network-as-a-Service provider, enabling managed Secure Access Service Edge (SASE) solutions to our customers. We're committed to transforming CBC Tech into a leading tech company through relentless investment in R&D, enhancing our expertise in SASE, upskilling our workforce, expanding our tech ecosystems, and delivering unparalleled customer experiences. With innovation as our compass, we're poised to lead the way in shaping the future of the industry. **TR**



By seamlessly integrating our partners' SD-WAN and SSE solutions into our eNet fabrics, we enable our customers to tailor their SASE solutions to meet their specific needs





Xin Chang, Huawei's VP of Standardization and Industry Development

Huawei's Perspective on Accelerating Digital Transformation

In an exclusive interview with Telecom Review, Xin Chang, Huawei's VP of Standardization and Industry Development, shed light on the pivotal role of telecommunication standards in driving innovation and fostering digital transformation. As a prominent player in the industry, Huawei continues to champion advancements in ICT, telecommunications, and computing technologies, recognizing their foundational role in shaping the future across diverse sectors.

Significance of Telecom Standards in Innovation: A Symbiotic Relationship
Chang emphasized the open nature of standards, presenting them as a platform accessible to everyone, "the best part of the standards is that it is an open platform

for everyone, and I think standards are really helpful for our innovation." She highlighted the profound impact of standards on innovation, serving as a conduit for various sources of cutting-edge advancements. Access to the standards platform means the ability to tap into the most advanced technologies within a specific domain and timeframe. Chang underscored

the collaborative aspect, emphasizing that standards create an environment where contributors open their doors, fostering a dynamic exchange of ideas and technologies.

Furthermore, she articulated the symbiotic relationship between standards and innovation. Leveraging the innovations of others not only integrates one into the forefront of technology but also serves as a source of inspiration. This interconnectedness enhances the creative process, enabling innovators to refine and elevate their work. The relationship, therefore, is characterized by mutual support and complementarity.

Huawei's Contribution to Global Telecommunication Standards

In the generation of digital transformation, Huawei stands out as an ICT wonder. Chang reiterated the foundational role of ICT, telecommunication, and computing technologies, categorizing them as essential contributors to progress across industries. As the world undergoes rapid digitalization, Huawei sees telecommunication technology as a method and valuable asset for various sectors.

The emphasis, according to Chang, lies in understanding how industries can derive their business value. Huawei expresses a keen interest in collaboration, seeking to engage with other industries to understand their needs and provide tailored solutions. The company envisions a collaborative journey where mutual support leads to shared success in navigating the challenges and opportunities of the future.

Huawei's perspective on accelerating digital transformation aligns with a commitment to open collaboration, standards, and innovative solutions. Through actively engaging with various industries, Huawei aims to contribute to the development of global telecommunication standards, fostering a dynamic environment where technology and innovation intertwine to shape a sustainable future. **TR**



Artificial Intelligence Catalyzes Indonesia's Digital Transformation

Digital transformation is a pivotal force reshaping the landscape of businesses across multiple sectors. This paradigm shift entails incorporating new technologies into all aspects of operations, necessitating a fundamental rethinking of traditional business models. Companies that embark on the journey of digital transformation embrace innovative tools and strategies to improve efficiency, agility, and customer experience.

Among the transformative technologies, artificial intelligence (AI) stands out as a disruptive force with far-reaching implications in the industry and within society. AI, a relatively new but rapidly evolving technology, has the potential to revolutionize the way businesses operate and people interact with technology. Its potential extends across multiple domains, from automating routine tasks to gaining unprecedented insights through advanced analytics.

The incorporation of AI into business processes can result in increased productivity, better decision-making, and the creation of innovative products and services. However, this transformative power raises ethical concerns, as the responsible use of AI necessitates the careful consideration of issues such as bias, transparency, and privacy.

Indonesia's Digital Ascent

Indonesia has emerged as ASEAN's largest digital economy, making significant progress in digitalization, with further growth of up to USD 2.8 trillion expected by 2040 due to continued technological adoption. The Java region, a key contributor, is expected to see economic growth of up to 6.65 percent between 2030 and 2040 as a result of new technology adoption. This is an opportune time for businesses to embrace digitalization, particularly with the rise of AI tools. These tools are poised to assist businesses in analyzing extensive customer data, gaining deeper insights, and making informed decisions quickly.

AI technologies are being widely adopted in Indonesia thanks to a pervasive "digital mindset" that is driving the country's thriving internet economy to rapid growth. Prominent digital tech unicorns like Bukalapak, Traveloka, and OVO call the nation home, and regional start-ups that are leading the way in big data analytics and natural language processing are making waves abroad.



Digital powerhouses, Gojek, and Tokopedia, are leading Indonesia's adoption of AI and a mobile-first strategy. Well-funded start-up, Gojek, uses AI for biometric security features and scalable machine learning models to provide personalized customer preferences across multiple Asia Pacific markets. A prominent player in e-commerce, Tokopedia, uses AI and ML capabilities to develop new products and works with the University of Indonesia to promote AI research and talent development. Tokopedia has introduced technologies like NVIDIA DGX-1 for deep learning and AI-based solutions like smart warehouses, smart logistics, and demand prediction.

Organizations must continue to redefine their approaches to business strategy, customer engagement, and workforce dynamics as they navigate the challenging terrain of digital transformation and AI integration. They must also adapt to the rapidly changing technological landscape. It becomes strategically necessary to adopt these disruptive technologies since they offer the chance for sustained growth and competitive advantage. This is a journey that extends beyond the simple adoption of new technology and involves a

through rethinking and reevaluation of how companies function in the digital era. **TR**



AI technologies are being widely adopted in Indonesia thanks to a pervasive "digital mindset" that is driving the country's thriving internet economy to rapid growth





e&: Strategic Partnerships Key to Expansion in APAC's Diverse Market

As e& has been expanding in the Asia-Pacific region with a range of transformative initiatives and strategic partnerships, Dino Civitarese, Vice President at e& Carrier & Wholesale for the Asia & Pacific region (APAC), sits down with Telecom Review for an exclusive interview to share e&'s exceptional progress made in the wholesale business especially in the APAC region and their bold plans for the future.

Can you share insights on your journey in 2023 and what can we expect during 2024 and top priorities fueling this impressive growth especially your focus of e& APAC?

In e&'s transition from a telco to a techco, we have maximised value across all our operations, and we have systematically expanded through organic means and acquisitions, driving strong performance and significant milestones and achievements till date. Today, the Group has 16 operating companies and over 167 million subscribers across its footprint.

We have taken massive strides in entering strategic partnerships for business growth. An example is our stake in Vodafone Group, which enables collaboration across a broad range of growth areas and drives benefits for both partners from our respective operational scale and complementary geographic footprint. These strategic moves are extending our reach into additional countries and ushering in a substantial influx of new subscribers, cementing our position as a prominent global player.

Our growth from the Middle East and Africa market into the wider Asia region began when in 2018, the Singaporean Government awarded

us a facility-based operator license (FBO). The license allowed us to invest and build infrastructure for the domestic wholesale market and open opportunities for the international market. Through this infrastructure, we have been able to serve customers in Asia Pacific and the Middle East, extending our reach to fast growing markets such as Indonesia, Malaysia, Thailand, Vietnam, Philippines.

Could you elaborate on the specific market segments you are focusing on in the APAC region and the corresponding services you offer?

As e&'s subsidiary in Asia Pacific, our Singapore office has been targeting market segments and offering the

high-capacity next-gen technologies required to meet the growing demands of seamless connectivity and instant communication. With advanced technology and infrastructure, this region can benefit from deployment of cutting edge mobile networks such as 5G, high-speed broadband services and the latest in telecom infrastructure. We could contribute to the digital transformation of the APAC region by introducing innovative services and solutions. This may involve fostering partnerships with local businesses contributing to the culture of innovation in the region. Our network could leverage on the international presence and experience by enhancing global connectivity for businesses and individuals including improving international networks, offering seamless roaming services and facilitating cross-border communication. We are not only leveraging our local infrastructure that was built in Singapore but also the assets owned in the subsea cable systems, which e& has invested in over the past 15 to 20 years. In addition, e& has capitalised on the market trend towards application-to-person (A2P) communications and included it in our product portfolio under our mobility services. Since its launch, we have experienced an impressive growth of over 400 per cent in SMS traffic. Despite launching voice and cloud services just last year, we have witnessed substantial growth and a surge in demand from OTT providers and enterprise customers.

Lastly, given the increasing demand for advanced digital infrastructure by OTTs, hyper-scalers, carriers and Content Deliver Networks (CDN), we have generated high interest in our data centre solutions. e&'s SmartHub data center, with its four facilities in UAE, is one of the most preferred 'carrier neutral' gateways and connectivity hubs in the region. Customers demanding access to the Middle East, Africa, and Europe region seek to place their edge nodes, caching servers in the SmartHub due to its high reliability and connected ecosystem.

We remain committed to our strong growth strategy and have detailed our

intentions to expand SmartHub beyond the borders of the UAE and are actively exploring opportunities to set up data centres in the region.

e& APAC operates in a diverse and dynamic landscape. How does the company stay ahead in both innovation and competitiveness?

To stay at the forefront of evolving communication trends, we have had a series of initiatives, projects, investments.

An example is the investment in the CPaaS applications and anti-fraud systems to enable us to offer services to customers that were not initially served by e&. In recent years, our strategic vision has revolved around elevating our service offerings to include SD-WAN and services on demand to address the connectivity needs of our end customers and expand our reach not only in the UAE, but also overseas.

Our Asia Pacific enterprise market has been growing in recent years with double digit CAGR, and we want to further solidify our position to be able to serve a wider range of clients and demands of this region.

In the techco industry, building and nurturing robust partnerships is paramount. Can you share instances of strategic collaborations and illustrate the role in e& Carrier & Wholesale success?

In the past 12 months, we have been helping to bring the e& outsourcing business model here in Asia. Operators may choose to focus on their core business as MNO or fixed network provider, and they would outsource services like voice, A2P to other companies. This is currently a growing trend in Asia Pacific.

Last year, we started working exclusively on managing the SMS traffic of one of the largest MNOs in the Philippines. This signifies that our networks are now the exclusive pathway for all SMS traffic from global operators in the country.

In July 2023, we also established a strategic partnership in Indonesia,

the first of its kind in e& to deploy a Managed Voice Service solution. Any inbound and outbound voice traffic generated to and from our partner in Indonesia transits through our gateway and is managed by us. As the second-largest operator in Indonesia, with one of the biggest and most significant rising markets in Asia and the world, this venture is significant to us. It reinforces our commitment to forge key partnerships in high-growth markets.

The Asia-Pacific region is known for its cultural and market diversity. How does e& APAC tailor its services and strategies to address the unique needs of different countries within the region?

The Asia Pacific region has one of the most diverse cultures in the world, even in our industry. We always try to have a good mix of people, which we consider to be the most important assets of a company.

Second, we work closely with our customers, from Pakistan to Japan, to gain a comprehensive understanding about their needs and aiming to deliver based on their expectations. This not only enhances their satisfaction but also improves our long term relationships, which contributes to the overall mutual success. We also try to bring the Middle Eastern culture into Asia by creating a sort of corridor between e& OpCos in Middle East and Africa and our customers and partners in Asia Pacific.

We carefully study the markets and strategically establish our presence by providing innovative solutions that benefit our customers and the community. While we started from Southeast Asian countries like Indonesia and Malaysia, which have more synergies in terms of culture, contents, and business development targets, we are actively looking to expand in countries such as Vietnam and Hong Kong through partnerships or M&A.

The future of the APAC region is full of possibilities and as e&'s presence grows, we are ready to achieve even more extraordinary results for the benefit of all. **TR**



Subsea Cable Maintenance Impacts Cloud Connectivity

In recent weeks, two of the internet's major submarine cable systems were down for repairs, impacting internet traffic between Europe and Asia. As we've pointed out in the past, the major public clouds rely on the same submarine cable infrastructure as us regular internet users, so when a cable incident occurs, cloud connectivity is also affected.

In this article, we delve into the exclusive insights featured in the Cloud Observer, shedding light on our observations during Sea-Me-We-5 (SMW-5) and IMEWE's downtime (due to repairs).

Cloud Synthetic Measurements

The Cloud Observer is a recurring series focused on analyzing inter-regional cloud connectivity. These posts utilize Kentik's continuous measurements between our agents in over 110 cloud regions in the world's largest cloud

providers: AWS, Azure, and Google Cloud. Configured in a full mesh, these agents perform ping and traceroute tests to every other agent providing a continuous picture of interconnectivity within the cloud.

SMW-5 Downtime

Sea-Me-We-5's name is an acronym that traces the geographic path the cable takes— Southeast Asia (SEA), Middle East (ME), Western Europe (WE). It was designated as 'Ready for Service' (RFS) in 2016 and is the fifth edition of a consortium-owned intercontinental

submarine fiber optic cable carrying a large portion of the internet traffic between Europe and Asia.

At 00:00 UTC on 23 October 2023, SMW-5, the major submarine cable connecting Asia to Europe, was taken down to repair a shunt fault. A shunt fault occurs when sea water breaches the cable's insulation, causing a short circuit in the cable's electrical feed.

Submarine cables contain an electrical system that carries thousands of volts of electricity to power the amplifiers



SeaMeWe-5 path (Source: www.submarinecablemap.com)

find insiders willing to confirm details of submarine cable repairs.

In a LinkedIn post for the SMW-5 repairs, he identified the cable ship (CS) Asean Restorer, as the vessel performing the repairs of the shunt fault disrupting the internet traffic from Europe-to-Asia.

The loss of the major route between Asia and Europe was picked up on the latency measurements between our agents in cloud regions. Numerous routes experienced latency increases of around 40 ms. The criticality of SMW-5 was evident as all three major public clouds experienced latency changes due to the loss of the cable. The following shows some of the impacts caught in Kentik's cloud measurements.



Source: Philippe Devaux

The impacts for AWS and GCP revealed a stable shift in latency, which is likely due to a longer geographical path while SMW-5 was undergoing repairs. Alternatively, the measurements involving the Azure regions showed periodic latency increases that align with work days, as pictured below. This may suggest that Azure shifts a portion of its traffic to a longer path only during busy working hours.

Of course, it wouldn't be a submarine cable analysis without providing an example of a case when latencies improved due to the loss of a submarine cable. The graphic below illustrates the impact of the loss of SMW-5 on the latencies from AWS's eu-west-3 in Paris to Azure's UAE N orth in Dubai — a drop from 114ms to 90ms.



Amazon Web Services

(often referred to as repeaters) that are placed every 70 km or so to maintain signal strength. Normally, a cable can continue operating despite suffering a shunt fault but must be repaired as soon as possible.

My friend, describes himself as “a keen observer of the global submarine cable systems industry” and has a knack for piercing through the secretive world of submarine cables (occasionally reaching the ship crews themselves) to

Why would latency drop as a result of the loss of a submarine cable? I addressed this in a separate article I wrote in August 2023 about the submarine cable cut - offs on the west coast of Africa.

While this may seem counterintuitive, this is a phenomenon I have often encountered when analyzing submarine cable cuts. Essentially a higher latency route becomes unavailable, and traffic is forced to go a more direct path. Why would traffic be using the higher latency path in the first place? What you can't

see in these visualizations are factors like cost.

In that example, latencies between Cape Town and Seoul dropped when the WACS cable was cut and AWS had to redirect traffic over a more direct path through the Indian Ocean. In that case, there simply may not be a business case to justify paying a premium to ensure the lowest latency between those two distant locations.

That logic would seem to hold less weight in the case of latencies between Dubai and Paris. Network engineers in the Middle East typically try to optimize latencies to Europe, the main source of global transit for the region. In this case, we're looking at a traffic handoff between two clouds (AWS and Azure); it is not uncommon to find suboptimal latencies between two clouds each operated by a different networking team with its own interconnection strategy.

IMEWE Downtime

Similar to SMW-5, IMEWE's name derives from its route, heading east to west: India (I), Middle East (ME), Western Europe (WE) and was RFS in 2010. In a talk I gave at MENO in Muscat, Oman, in 2011, I presented evidence of IMEWE's activation for the country of Lebanon.

In a LinkedIn post, Philippe Devaux again identified the vessel performing the repair as the cable ship (CS) Maram, presently in the Gulf of Aden. Philippe added: "CS Maram departed Salalah 27OCT23, currently positioned about 60km off Aden, where she has been mostly stationary since 03NOV23, likely busy repairing IMEWE fault. (Expected Time to Repair (ETR): 12NOV23)"

We could see the impacts of this cable maintenance in a couple of places in our tools. Latency between AWS's eu-south-1 in Milan and me-south-1 in Manama, Bahrain, dropped by 31 ms during the IMEWE outage.

Additionally, Kentik Market Intelligence (KMI) reported impacts, including the loss and subsequent return of transit from Telecom Italia Sparkle (AS6762) for Pakistani incumbent PTCL (AS17557).



Google Cloud



Azure



Below is a visualization of transit data from KMI over time, showing the disappearance of AS6762 (in peach) on November 2nd, followed by an

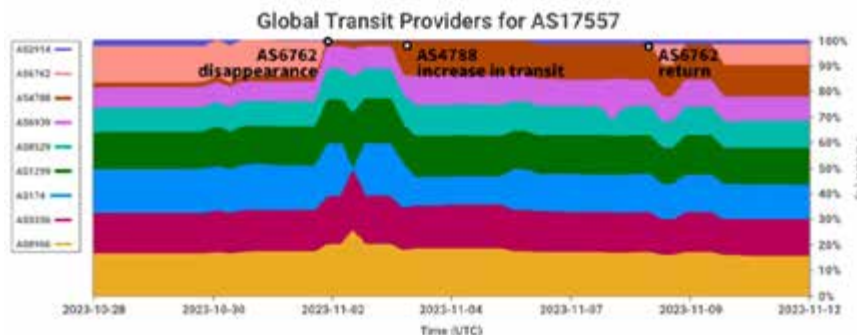
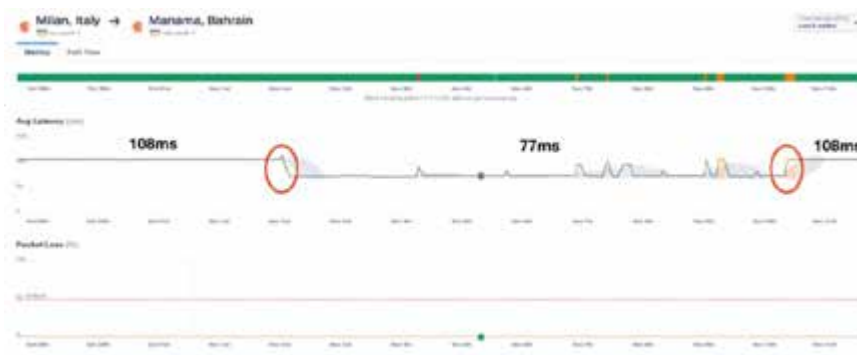
increase in transit from TMnet (AS4788 in maroon) before seeing a return of AS6762 transit for AS17557 on the 10th.



IMEWE path (Source: www.submarinecablemap.com)



Source: Philippe Devaux



Incidentally, I have a connection to the cable ship performing this repair. At a submarine cable conference in 2016, the event provided a tour of the newly christened, CS Maram, docked in Dubai, where I saw the — a massive remotely operated vehicle (ROV) for subsea trenching and cable maintenance.

A Call to Action

Submarine cables require regular maintenance and repair, and as I mentioned in other articles, I have written about submarine cable cuts in Africa; the seafloor can be a dangerous place for cables.

The loss of submarine cable connectivity can have profound impacts on the international flow of internet traffic, but unfortunately, the submarine cable industry isn't communicative to the general public on events like this, and this is a problem. Typically, cable operators only report downtime and outages to their direct customers. If those customers fail to notify a broader audience, the general public is left to speculate on the causes of internet outages.

In 2017, I wrote a blog post about 'Telecom Heroics in Somalia,' which told the story of how the ISPs in Mogadishu faced down a terrorist threat to activate their first submarine cable landing. In that piece, I also covered an incident where the lack of communication from a cable operator could have gotten people hurt.

The secrecy around submarine cable maintenance events does not serve the public interest. It is long overdue for the submarine cable industry to develop a practice of widely disseminating (beyond just direct customers) advanced notice on any scheduled cable maintenance activity that could lead to a widespread internet blackout.

In a time of heightened tensions around the world, not doing so could have grave consequences.

For more information, please visit [Kentik](#).

By Doug Madory, Director of Internet Analysis, Kentik

Redefining Tech for a Better Future

The 4th edition of Asia Tech x Singapore's (ATxSG) flagship B2B event ATxEnterprise, returns this year with an expanded and bigger agenda, bringing together visionaries, experts, governments, and industry leaders from across the globe to discuss trends in AI technologies, its regulations, and their impact on the digital economy and society.

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Li Qiang, General Manager of China Mobile Planning and Construction Department

China Mobile's 5G Integration Advances Global Business Success

The advancement of 5G technology from its beginning to its current stage has been remarkable, and the development is still progressing towards 5.5G, bringing new opportunities and potential improvements.

China Mobile has been acknowledged as a global leader in telecommunications due to its record-breaking progress in 5G technology, with the world's largest commercial 5G network. This has driven market expansion and revolutionized industries, paving the way for a new era of connectivity and innovation.

At the 5G Beyond Growth Summit at MWC 2024, China Mobile presents their 5G practice cases and successful business models to facilitate collaboration and awareness.

Reshaping the Intelligent Era

Having built the world's largest 5G network, China Mobile boasts more than 1.94 million 5G sites, which is equivalent to more than 30% of the 5G sites around the world. The broad reach of China Mobile's network is evident in the country, with more than 94% of the population having access to 5G. The widespread adoption of the 5G network has resulted in a monthly data traffic per user (DoU) of 25Gb; and over 60% of the network traffic are utilizing 5G.

According to Li Qiang, General Manager of China Mobile Planning and Construction Department, the company's dedication to digital transformation goes beyond offering extensive connectivity. The company has effectively incorporated 5G technology into more than 33,000 commercial use cases, including RedCap, Core network, 5G new calling, 5G Internet of Vehicles (IoV), 5G Internet of Things (IoT), cloud phone services, OTT video service, naked-eye 3D, and 5G live ecommerce.

Furthermore, China Mobile has been consistent in innovating and implementing state-of-the-art solutions to uphold its technological leadership. This year, 5.5G will be deployed for commercial use for the first time. The company plans to integrate cloud core AI to introduce new technologies, services, models, and experiences.

In order to facilitate innovation, the company plans to proceed with the large-scale deployment of multi-carrier aggregation. This advanced technology enhances the user experience by effectively handling the aggregation process, leading to improved network performance and scalability in the future.

The nationwide deployment of 2CC and the smaller scale deployment of 3CC in multi-carrier aggregation demonstrates the network's ability to attain download speeds of 2Gbps at 2.6GHz and 30MHz at 700MHz on the 5G network. Meanwhile, the 5.5G technology is expected to achieve download speeds beyond 4Gbps, demonstrating China Mobile's dedication to advancing technological capabilities.

Another example of China Mobile's excellence is the deployment of RedCap in more than 50 cities in the country, symbolizing the company's commitment to innovation. The company has also identified five key cities, namely Hangzhou, Ningbo, Shenzhen, Suzhou, and Ningde to demonstrate the potential of RedCap technology. Apart from this, the industry white paper for the RedCap technology has been released and five scenario-based solutions has been launched.

China Mobile is also operating the world's largest centralized, all-cloud, and fully integrated 5G Standalone (5G SA) core network. The network's advanced features have raised it to new levels, providing unparalleled connections and setting the stage for future progress in the industry.

The company's core network features a fully integrated 4G/NB-IoT/5G system with more than 500 million cloud users and 177,000 servers. It has reached a level-8 disaster recovery (DR) using containers, microservices, and an 8+x cloud-based structure, ensuring the development of a highly stable, agile and smart cloud infrastructure. China Mobile has extended its innovations beyond land-based networks to include connectivity

throughout space. In terms of space-to-ground integration, the company has launched the China Mobile 01 satellite— the world's first test satellite to support this technology.

The company has also launched the world's first 6G architecture verification satellite, which complements the land-based facilities, providing an integrated effect that could potentially transform the future of integrating space and ground operations.

Integrating Commercial 5.5G with AI and Cloud

Following China Mobile's undeniable achievement in the deployment of 5G, the company is dedicated to taking the lead in the development and commercialization of the 5.5G network. This year, the company will transition its operational strategy from resource sales to refined operations to further increase average revenue per user (ARPU) by innovating products for different user categories, such as youth, rural users, elderly, and vertical users.

The advancement of this technological architecture is expected to accelerate the implementation of 5.5G, resulting in compatibility with cloud computing and Artificial Intelligence (AI), as well as breakthroughs in overall experience, connections, models and services. This strategic decision is poised to enhance intelligence capabilities, facilitating the implementation of widespread 5.5G deployment this year.

China Mobile's launch of the first commercial 5.5G within the year will be considered Wave 1. This will enable the extensive commercial adoption of 3CC and RedCap, as well as a commercial trial of ISAC and intelligent and passive IoT. Developing business models and enhancing infrastructure will set the foundation for the upcoming phase.

During Wave 2, which is planned for 2025, ISAC is expected to be more commercialized. There will also be significant improvements in intelligence, passive IoT, and XR multimedia. The promotion of 5.5G applications is expected to facilitate its

widespread adoption and integration across different industries.

By 2026, Wave 3 (or full commercialization of 5.5G) is expected, along with explorations into satellite-ground integration, decarbonization, and the expansion of 5.5G ecosystems.

Li Qiang outlined China Mobile's vision to develop novel experiences and connections that could provide various opportunities. Enhanced bandwidth, increased awareness, and layered operations will revolutionize user experiences, as 5.5G downlink speeds transcend 4Gbps and uplink speeds exceed 500 Mbps.

A multi-metric monetization approach encompassing rate-differentiated services, dedicated livestreaming services, AI+5G new calling, glasses-free 3D, and cloud phone, amongst other offerings, will ensure new experiences, while a network-cloud-intelligence convergence will support new connections. Finally, accelerating 5.5G commercialization and the use of AI-powered applications will drive the valuable growth of the ecosystem.

Tailored end-to-end intelligent and distinctive experiences will be customized based on user and service tiers, utilizing wireless network intelligence capacity and the 5G Core User Plane Function (UPF) and the Network Data Analytics Function (NWDAF). This ensures an exceptional experience with cloud-based phones, glasses-free 3D technology, and virtual reality/augmented reality (VR/AR).

New connections, including those related to the Internet of Things (IoT) in industries, will also be developed in the coming months. The company aims to establish a digital framework capable of accommodating 100 billion IoT connections. This includes initiatives such as implementing RedCap waste sorting in Shenzhen and passive IoT logistics inventory counting at Haier in Qingdao. Embracing RedCap technology not only delivers cost savings but also outperforms 4G, enhancing efficiency in logistics

inventory management. The advancement of Industry Sensing and Automation Control (ISAC) technology transcends mere connectivity. Enhanced communication and sensing capabilities contribute to heightened efficiency in monitoring pathways, facilitate small-scale business applications for building an intelligent society, and foster overall industrial expansion. This vision extends to the development of the low-altitude economy in Shenzhen and initiatives like the Smart Yangtze River activities in Hubei.

Furthermore, the IoV sector is projected to extend its operations from localized areas to widespread adoption across entire cities. This expansion will enable intelligent driving through the utilization of high-bandwidth and low-latency networks, consequently facilitating faster uploads of AI training data.

Driving Business Success

China Mobile aims to integrate its technological expertise using creative commercial strategies and services to ensure success for end-users. Collaborations between carriers and OTT providers are expected to achieve shared success through enhancing user experiences, boosting network traffic, and improving user retention.

The emphasis on market segmentation for network capability assurance is intended to boost ARPU, DoU and customer acquisition by offering popular and rural packages. Popular packages prioritize enhancing network uplink capabilities and promoting Frequency Allocation Standalone solutions, while rural packages will provide 5G coverage for more than 490 million residents, focusing on extensive coverage in rural areas and flexible deployment in critical situations.

China Mobile is constantly developing new ways to monetize the user experience to provide customers with innovative services. The company plans to launch improved 5G new

calling, cloud phone services, and glasses-free 3D. These innovations are poised to boost traffic and offer users a novel internet experience.

China Mobile has pioneered various digital transformations in the recent year. The company's dedication extends beyond basic connectivity, seeking to revolutionize network infrastructure for improved user experience. Its commitment to innovation is not only influencing the future of the telco industry but also making a lasting impact on the global technological landscape. China Mobile will maintain its leadership position as the industry transitions to the deployment of 5.5G networks. **IT**



China Mobile has been acknowledged as a global leader in telecommunications due to its record-breaking progress in 5G technology, with the world's largest commercial 5G network





ZTE at MWC 2024: Panoramic Planning and Innovations for the 5G-A Era

ZTE Corporation hosted its “5G-Advanced Innovation and New Product Release Conference” at MWC Barcelona 2024. Demonstrating ZTE’s panoramic planning and futuristic innovations for the 5G-A era, the company also released 10 stunning new 5G-A products, fully prepared for 5G-A commercial use. China’s three major telecom operators and industry partners also participated in the conference.

Zhang Wanchun, Senior Vice President at ZTE, pointed out in his opening keynote speech that the unveiling of 5G-Advanced technologies is an exciting milestone

for the possibility and potential of future communication technology development. 5G-Advanced represents more than the evolution of 5G to 6G in speed and connectivity; it signals a paradigm shift in the way people live, work and play. He called on the industry to join hands and work

together for a smarter and more connected intelligent world.

New Horizon of 5G-Advanced

Additionally, Li Xiaotong, Vice President at ZTE, General Manager of RAN products, delivered a speech entitled ‘New Horizon of 5G-Advanced,’ and

shared ZTE's understanding, planning and achievements of 5G-A. "5G-A is consistent with the evolutionary direction of 5G-A and 6G in the industry, which is an enhancement of 5G and a connection to 6G. 5G-A will enhance its capabilities in three major 5G scenarios— eMBB, mMTC and uRLLC— and will open up three major scenarios, including integrated sensing and communication, universal intelligence and ubiquitous connectivity," said Li Xiaotong.

"Through the six-dimensional scenarios' enhancement and expansion, 5G-A will continuously realize the infinite value of B2C digital life, B2B digital industry and B2X digital society. ZTE has implemented several 5G-A use cases in different domains, demonstrating the exciting prospect of 5G-A."

ZTE's New Products Family

During the product release event, ZTE unveiled 10 innovative products incorporating three categories— simple, highly-efficient UBR and FDD M-MIMO products, mmWave products, and a NTN ground base station to extend 5G-A scenarios. As well as a series of products with integrated communication and computing for rich B2C, B2B applications.

Unique Insights on 5G-A

At the conference, representatives of China's three major operators also shared their practical experience and unique insights into 5G-A.

Cao Lei, Deputy Director of Wireless and Terminal Technology, China Mobile Research Institute, delivered a comprehensive speech entitled '5G-A Promotes the Prosperity of Low-Altitude Economy,' which systematically outlined the growth trends of the low-altitude economy, the business scenarios it encompassed and the key role of 5G-A in strengthening this sector.

Cao Lei said that the low-altitude economy has become a new track for global economic development, covering express logistics, emergency rescue, environmental monitoring, agriculture, forestry

and plant protection, consumer entertainment and many other fields. As 5G-A encounters new pathways, it stimulates unlimited opportunities.

China Mobile actively cooperates with the industry to conduct research on low-altitude intelligent network technology based on 5G-A. It also takes the lead in formulating technical standards such as UAV terminal capability identification. Furthermore, it proposes a low-altitude networking technology system for all scenarios. Additionally, it innovatively proposes key technologies (such as terminal-based interference control) in response to the prominent problems of high interference and frequent handovers in low-altitude scenarios.

Fan Bin, Director of the Wireless Network of China Unicom, pointed out that China Unicom has built up the world's largest co-constructed and shared 5G network, and made significant achievements in 5G industrial applications. By upgrading network capabilities, 5G applications in vertical industries are moving from non-critical production to critical production. 5G-A with high deterministic capability is one of the best choices to meet the requirements of mobility, easy to wear and tear, massive connectivity, and frequent adjustment. China Unicom, together with ZTE and leading enterprises in the industry, has conducted multiple commercial practices of 5G-A applications within critical production domains, such as 5G-A + cloud-based PLC application in WuHu Midea Kitchen & Bath Appliances Manufacturing Co., Ltd. and 5G-A + industrial control application in Wuhan Iron and Steel Co., Ltd.

Yao Wei, Director of China Telecom Research Institute of Mobile and Terminal Technology, presented the significant advancements achieved by China Telecom in deterministic networking. Furthermore, based on their experience in digital transformation practices within the industry, he discussed the future direction of wireless network development. Yao Wei emphasized that establishing deterministic

networking capacity is crucial for industry applications to penetrate critical production processes effectively. In collaboration with ZTE, China Telecom aims to continue driving technological innovation, while empowering the new development of industries.

5G-A is set to penetrate large-scale construction and accelerate commercial use. ZTE will work with all sectors of the industry to jointly promote the continuous iteration and commercial practice of 5G-A technology and drive the continuous and in-depth development of global digital and intelligent transformation. 



5G-A will enhance its capabilities in three major 5G scenarios— eMBB, mMTC and uRLLC— and will open up three major scenarios, including integrated sensing and communication, universal intelligence and ubiquitous connectivity



ZTE Launches Next-Gen AI Home Media Center



ZTE Corporation, a leading global provider of information and communication technology solutions, has unveiled a new AI home media center at MWC 2024 Barcelona.

The ZTE AI home media center integrates the features of an 8K Set-Top Box (STB) with storage, computational capabilities, and intelligent control. This will allow operators to build sophisticated smart home centers, offering users enhanced home entertainment and interaction experiences in different situations.

The product's 8K video decoding capabilities were designed to meet the increasing demand for advanced

video services, providing an exceptional viewing experience.

Furthermore, the solution combines processing, storage, and intelligent control features to cover six primary household scenarios including:

- **Definition Up-Scale:** Powerful AI computing is used to upscale images so that the image quality can be significantly improved compared to the original. In this way, this product can revitalize the existing contents and solve the problem of scarce ultra-high-definition contents.
- **Home NAS:** It is used to provide safe and private storage space for home users to store family albums, movies, files and videos.
- **Real-Time Translation:** AI computing is used to process language interaction and audio/video contents in real time. It supports multi-language interaction and subtitle translation, significantly improving the interaction and movie-watching experience of users.

- **Game Rendering:** The powerful processing capability provides storage and rendering capabilities for VR and AR applications to bring interactive, ultra-high-definition and immersive experience to users.
- **Motion Sensing Interaction:** AI computing and cameras collaborate to detect users' movements and instructions, expanding applications such as motion-sensing exercises and games.
- **IoT Control:** The product fully supports matter-over-thread; achieves cross-vendor, cross-protocol, barrier-free IoT control and interaction; and is the central brain of the smart home.

ZTE, a world-leading provider of home media terminals, is committed to research and development (R&D), ensuring the constant delivery of high-quality products. The company is ready to enhance partnerships with international operators in the AI computing sector, which will help advance a new age in smart home technology.

DOCOMO Spearheads AI Innovation with Global Semiconductor Collaboration



NTT DOCOMO, INC.— Japan's leading mobile operator— is set to revolutionize AI innovation with SAPEON, a global AI semiconductor company backed by South Korea's SK Group. This strategic collaboration, facilitated through DOCOMO Innovations, INC., marks a significant milestone in the advancement of the artificial intelligence landscape.

Pioneering AI Solutions

Focused on enhancing internal operations, cutting costs, and driving innovation, the partnership aims to accelerate the development of pioneering AI solutions. Through an

extensive exploration of applications such as large language models (LLMs), image and video processing, and computer vision AI, both NTT DOCOMO and SAPEON will undertake Proof of Concept (PoC) initiatives to solidify their advancements.

Yoshikazu Akinaga, President and CEO of DOCOMO Innovations said, "As a leader in technological innovation, DOCOMO Innovations is committed to embracing new platforms and an open approach, enabling us to persistently push the envelope and innovate in order to provide our customers with unparalleled solutions. We are diligently evaluating SAPEON's technology and are excited about the potential collaboration with them to pioneer a new generation in the AI world."

The Importance of AI Semiconductors

As part of this initiative, DOCOMO Innovations has begun testing

SAPEON's recently launched AI semiconductor, the X330, which allows them to test customized models and large language models (LLMs). This comes after testing the SAPEON X220, which has proven to be highly efficient. SAPEON 'X330' is an AI semiconductor for data centers that outperforms SAPEON's current product (the X220) by more than four times and saves more than twice as much power.

AI semiconductors play a pivotal role in advancing cutting-edge services that have far-reaching implications across various industries. These semiconductors are instrumental in enhancing critical functions like voice recognition, converting conversations to text, and automating responses. In healthcare, they enable more accurate diagnostics and personalized treatment plans, while in finance and insurance, they enhance fraud detection and risk assessment capabilities.

HCLTech Launches Innovative GenAI Platform



HCLTech has introduced HCLTech AI Force, a cutting-edge GenAI platform that accelerates time-to-value and improves the efficiency of software development and engineering operations.

The platform guarantees increased production, enhanced quality, and faster release timelines with the help of AI.

HCLTech AI Force, built on Azure OpenAI and integrated with Microsoft GitHub Copilot, is system-agnostic and offers a versatile solution for many applications. It also provides a tailored set of GenAI-powered solutions that enhance software development and engineering workflows by incorporating intelligence, leading to increased efficiency and improved developer experience.

“This platform is a true game-changer and some of our pilots with clients in the technology and financial services industries have delivered extremely encouraging outcomes,” said Vijay Anand Guntur, President

of Engineering and R&D Services, HCLTech.

The innovative GenAI platform is committed to responsible AI implementation, thus it has strong security and governance features to ensure secure innovation and sustainable growth at scale.

HCLTech's extensive experience in AI and full-stack application development makes them well-equipped to help clients maximize the value of GenAI. The platform serves a wide range of purposes, from chip development to cloud and business process improvement.

India Launches Digital Platform to Combat Fraudulent Calls and Messages



India has launched a digital platform that will allow people to flag fraudulent calls and text messages, providing additional protection against faceless criminals who use technology to rob people of their money.

The new Chakshu platform, from the Department of Telecommunications, simplifies reporting on fraudulent calls and messages while also allowing for real-time intelligence sharing among multiple stakeholders.

“Chakshu will allow Indian citizens to report fraudulent communication—whether received on call or SMS or social media like WhatsApp. Once such information is received, the platform will trigger re-verification, and failing re-verification the number will be disconnected,” Union telecom

and IT minister, Ashwini Vaishnaw, said.

Several cases of fraud have surfaced, with criminals impersonating banks or government officials, encouraging individuals to update their information for bank accounts, gas and electricity connections.

The Telecom Regulatory Authority of India (TRAI) recently published its final recommendations to make caller identification a default feature on domestic telecom networks to help individuals protect themselves from fraudsters.

Vaishnaw stated that TRAI is developing an app for Chakshu and that the government is willing to collaborate with private firms such as Truecaller

to improve fraud protection on the platform.

Chakshu, which is currently unavailable to individuals, will serve as an information exchange and coordination hub for telecom companies, law enforcement agencies, banks and financial institutions, social media platforms, and authorities issuing identity documents.

The platform will also include information about cases involving the misuse of telecom resources.

According to Vaishnaw, the government will also establish a grievance redressal platform for reporting connections that were inadvertently disconnected, as well as a mechanism for returning frozen funds.

Chakshu will serve as a backend repository for citizen-initiated requests on the Sanchar Saathi platform, awaiting action by various stakeholders.

Sanchar Saathi— which was launched in May of last year to allow people to track or block lost mobile phones and report instances of identity theft— has already assisted in the recovery of over 700,000 phones and the detection of over 6.7 million suspicious communication attempts.

Bitera Data Center Launches to Grow Indonesian Digital Economy



Bitera, a world-class data center, officially held its Grand Launching on February 27, 2024. The inauguration was attended by several Indonesian government's high-rank officials, including Bahlil Lahadalia, the Minister of Investment/Head of the Investment Coordinating Board, and Erick Thohir, the Minister of State-Owned Enterprises (BUMN). The presence of these key leaders reflects the strong synergy between the Indonesian government and the private sector, creating a solid foundation to drive the growth of Indonesia's digital economy.

"The penetration of data centers in Indonesia is currently still below 1 watt

per capita, far compared to neighboring countries like Singapore at 100 watts per capita. As another comparison, the average consumption in Japan reaches 10 watts per capita, indicating that Indonesia still has a lot of room to grow in terms of data center infrastructure," said Tedy Harjanto, CEO of Bitera.

"In line with Indonesia's great potential in developing the digital economy, MMS Group Indonesia sees a significant upside for data centers. We believe Bitera will meet these needs and play a crucial role in supporting Indonesian digital economy development. Bitera's presence also aligns with the government's goal to drive the growth of nation's digital economy through collaboration with the private sector," said Sedy Greti, CEO of MMS Group Indonesia.

Minister of Investment/Head of the Investment Coordinating Board, Bahlil Lahadalia, emphasized that digital

infrastructure is the key requirement in the digital transformation of the Indonesian and global economy. Therefore, to achieve this goal, appropriate digital infrastructure is needed.

"Bitera's presence as a local pride data center represents a significant historical milestone on our nation's digitalization journey. The presence of Bitera is expected to strengthen the national digital infrastructure in order to help preparing Indonesia to compete on the international stage, empowering MSMEs and startups through access to sophisticated technology," said Bahlil.

Bitera's Grand Launching serves as an ideal platform to showcase the synergy between the government agenda and the private sector to shape a solid and sustainable digital future for Indonesia, especially that Bitera is a 100% Indonesian-owned company.

Rakuten Mobile Unveils Satellite Connectivity Initiative



Rakuten Mobile Unveils Satellite Connectivity Initiative

Rakuten Mobile has announced that it plans to offer satellite-to-cellular services in Japan, aiming to launch the service in 2026 in partnership with AST SpaceMobile. This company is creating the first space-based cellular broadband network that can be accessed directly via regular smartphones. The exact timing and scope of the service are uncertain and depend on various factors beyond Rakuten and AST SpaceMobile's control.

Enhancing Connectivity Across Japan
The goal is to provide direct satellite-

to-cellular services that go beyond text messaging to include broadband communication like voice and video calls on everyday smartphones. In Japan, where natural disasters are common and there are many remote islands and mountainous areas, there is a growing need for space-based communication services using low Earth orbit (LEO) satellites. These services are crucial during disasters when ground infrastructure is damaged. LEO satellites will ensure mobile connectivity regardless of ground conditions, helping in emergency situations.

5G Connection Between Smartphone and Satellite

AST SpaceMobile's testing program has achieved significant milestones, including the world's first 5G connection for voice and data between a regular smartphone and a satellite in space, reaching download speeds of 14 Mbps, and successfully

completing 4G video calls and 5G cellular broadband connections. These speeds support various activities like internet browsing, file downloading, messaging, video streaming, and more on regular smartphones.

Rakuten Mobile and AST SpaceMobile will continue working together to provide coverage across Japan, ensuring connectivity even during natural disasters. Mickey Mikitani, Chairman and CEO of Rakuten Group and Chairman of Rakuten Mobile, emphasized the importance of expanding mobile connectivity in Japan, especially in challenging areas like remote islands and mountainous regions.

The partnership with AST SpaceMobile aims to bring innovative satellite-to-cellular services to Japan, enhancing mobile connectivity for customers across the country.

AIS and True Corp to Launch Emergency Cell Broadcast Service



Thai operators, AIS and True Corp, announced that they are preparing to launch an emergency cell broadcast service commissioned by the National Broadcasting and Telecommunications Commission (NBTC). The cell broadcast service is intended to quickly identify specific areas impacted by urgent and critical incidents such as violence, shootings, and natural disasters.

The service is divided into two parts: a Cell Broadcast Entities (CBE) system, which is managed and overseen by the government's central command center; and a Cell Broadcast Center (CBC) system, which is managed and monitored by mobile operators.

The CBE system defines message content and delivery areas, which include functions such as system management, message creation, and approval. The CBC system is in charge of delivering message content to base stations based on predefined areas, which include system management and configuration, message deployment, and network management.

The cell broadcast service will send direct warning messages from area base stations to all mobile phones in the region. The message appears on the mobile phone's screen as a near-real-time triggering pop-up notification.

The system differs from regular SMS in that it does not require phone numbers, allowing for faster and more efficient communication of emergency information throughout the affected area. This also means that the public is not required to download any specific applications. Additionally, users will receive messages even when the device is turned off.

The Ministry of Digital Economy and Society (DES) first proposed establishing a cell broadcast system for emergency alerts in October 2023, following a shooting at Siam Paragon Mall that killed two people and injured five more. Since then, the NBTC has worked with DES, DDPM, the Royal Thai Police, and mobile operators to develop the system.

"Currently, negotiations are underway with the government to put this system into practice... Marking a first step of success for True Corp in developing and cooperating towards the Ministry of Digital Economy and Society, the NBTC, and the DDPM for immediate deployment," said Chakkrit Urairat, True Corp's chief corporate affairs officer.

NBTC's Sarana said in a joint statement with AIS that funding for the system would be supported by the Universal Service Obligation (USO) and Telecommunications Infrastructure Fund.

Globe Telecom Enhances Philippine Connectivity



Globe Telecom Inc has activated a significant portion of its Philippine Domestic Submarine Cable Network (PDSCN), which will improve connections for customers in key areas from Luzon to Mindanao. The activated segment of the PDSCN Express Route includes various cities such as Lucena City, Quezon; Boac, Marinduque; Calatrava, Tablas Island, Romblon; Roxas City, Capiz; Placer, Masbate; Palompon, Leyte; Mactan, Cebu; Talisay City, Cebu; Tagbilaran City, Bohol; and Cagayan de Oro City, Misamis Oriental.

Joel Agustin, the Senior Vice President (SVP) and Head of Network Planning and Engineering at Globe, stated that the PDSCN Express Route supports the company's efforts to strengthen

network connections, improve efficiency and security, and reduce service errors, particularly in geographically-isolated areas.

He also mentioned that it will enhance the reliability and resilience of their network, considering the country's vulnerability to disasters and calamities. The PDSCN is the longest submarine cable network in the Philippines, spanning 2,500 kilometers, and it is Globe's fourth domestic submarine network. It was launched in July 2022 in Subic Bay, Zambales, and consists of 24 segments with 33 landing sites connecting the entire archipelago.

Improving Digital Infrastructure

The project is a collaboration between Globe, Eastern Communications, and InfiniVAN, Inc. Agustin emphasized that the PDSCN is a crucial part of their network expansion program and demonstrates their commitment to bridging the digital divide in the Philippines. They believe in improving the country's digital infrastructure to create a more inclusive and equitable digital future

for all Filipinos.

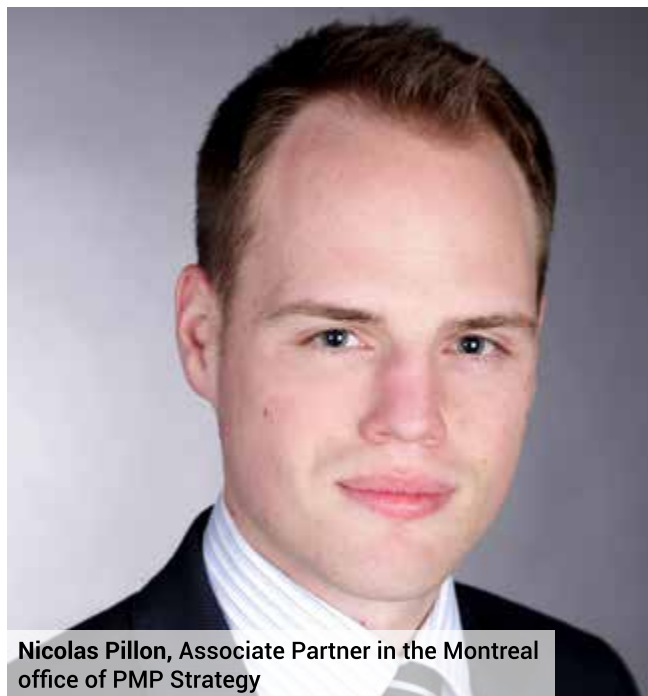
By leveraging advanced submarine cable technology, it will enable faster data transmission speeds and lower latency, resulting in improved overall internet performance for businesses and consumers alike.

Subsea cables are less susceptible to disruptions caused by natural disasters or physical damage compared to terrestrial infrastructure. The PDSCN's deployment of a robust and redundant network architecture enhances the resilience of the country's telecommunications infrastructure, ensuring continuity of service even during adverse conditions.

The increased connectivity offered by the PDSCN creates new opportunities for businesses to thrive in the digital age. Improved internet access enables small and medium enterprises (SMEs) to participate in e-commerce, access cloud services, and engage in global trade more effectively, driving economic growth and innovation.



Ken Campbell, Managing Partner in the London office of PMP Strategy



Nicolas Pillon, Associate Partner in the Montreal office of PMP Strategy

Open Access Fibre: The When, Where and How

Historically, most telecom operators have a hard time 'sharing their toys.' While tower sharing has existed for decades and RAN sharing has seen some success, the idea of open access networks on fibre has only really taken shape in the last few years.

France adopted it early, with a regulatory policy that provided pseudo-monopolies in rural areas. The UK, with BT's Openreach in place, has provided a platform for open access since the UK government's Digital Communications Review in 2017, forcing the creation of a separate entity. In the UK others have followed, including the Mubadala-backed, alt-net CityFibre and nexfibre (Liberty Global, Telefonica, Infravia JV). In the landscape of UK alternative network providers (altnets), the presence of an open access element is a common thread among many of the

98 players. The intention is to challenge Openreach's dominance in the market.

The US had been reluctant to pick up the idea as North American broadband markets are characterized by a multitude of vertically-integrated operators. However, various local open access networks (Intrepid, Ubiquity, SiFi, Utopia, Meridiam, Tillman, and Underline) have developed in recent years, and in May of 2023, AT&T and BlackRock came together to announce a joint venture. AT&T's idea was to build a 1.5 million wholesale open access fibre network in the United States which could leverage the financial strength of BlackRock and the

operational/brand strength of AT&T. The JV, called Gigapower, is now taking shape with AT&T as the anchor tenant.

Bob Lagrone, SVP of AT&T Corporate Strategy, summed it up. "We will be the first selling into this, but it's being built as an open access network. We believe that's a better way to drive the utilization of that network up and to reach segments that AT&T might not be able to reach."

While this announcement was big news in the US, PMP expects to see significant progress in open access development in the coming years given its key advantages.

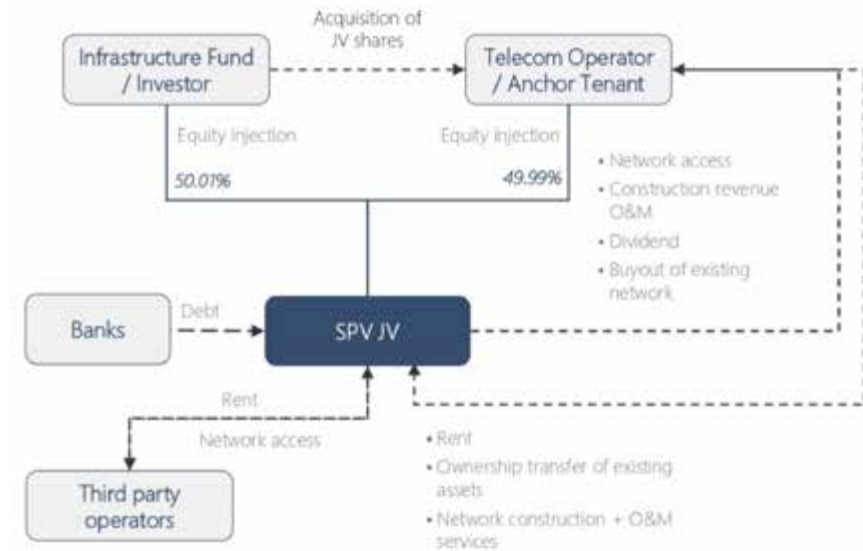
Why Move to Open Access Networks?

- **To Drive Penetration:** With multiple ISP brands offering services over one network, penetration is boosted. Competitive intensity among ISPs creates an important dynamic.
- **To Address Financing Needs:** The need to access new sources of financing (project financing/infra-fund equity investment) beyond traditional corporate financing to support the high cost of building these fibre networks.
- **To Discourage Infrastructure Based Competition:** There is a clear need amongst any company deploying fibre to prevent overbuild risk and defend market share.
- **To Support a Converged Offer:** There is increasing demand for open access models from MNOs that are eager to capitalize on the convergence thesis. The fixed/mobile convergence strategy enriches MNO's value proposition by boosting customer retention through churn reduction. This is the case for both T-Mobile in the US and Vodafone in the UK, where they lack their own fibre infrastructure but need a fibre proposition to defend their mobile business through a bundled proposition.
- **To Improve the Overall Economics:** Open access reinforces overall operator positioning, especially with regards to potential market consolidation. For a fibre infrastructure player, the open access model can be more profitable (and trade at a higher multiple) than the vertically integrated model in the long run.

Although current open access development is still very localized in the U.S., it will become increasingly important to secure first-mover advantage as the main open access player in regional markets.

Three Main Open-Access Models Exist: Independent Wholesale Platforms, Hybrid Retail/Wholesale Providers and the JV/FibreCo Model

The JV/FibreCo model has widely developed in Europe where tough competition among operators and investment funds' willingness to finance infrastructure has led operators to open



their network (either pushed by the regulator or for economic reasons) and to carve out their networks. Operators needed to finance new infrastructure builds and were facing constraints in funding capacity. European investors were also looking to invest in a new digital asset class and benefited from the low-interest market (at the time). In France in 2018, the Altice FTTH carve-out was one of the first major fiber carve-outs that paved the way for many such developments.

Given the increase in interest rates, debt financing is becoming more challenging, and it is likely that many US and international players will seek to develop JV structures to access equity financing from Infrastructure Funds (IF) to finance the roll-out of their fiber networks.

The Standard Characteristics of the Fiber JVs Are the Following:

- Creation of an SPV by an incumbent or a large player (the Telecom Operator/anchor tenant) and the sale of a roughly equal stake of the SPV to an investor to allow deconsolidation
- Call option allows reconsolidation after building period, securing long-term network control
- The operator is an anchor tenant of the JV, buying access to the JV's network through rental fees or IRUs, usually pledging not to use any other NextGen Network in the area covered by the JV

- The JV-SPV is responsible for network construction, network management and commercialization of the network
- Operations are usually sub-contracted to the operator through ex-ante exclusive sub-contracts, covering network construction, network maintenance, and managed services (IT, payroll, compliance, management, real-estate, etc.)
- Lenders provide additional debt financing to the SPV (Project Financing Model with high gearing ratio and lower interest debt than corporate financing)

In summary, assuming the right conditions, an open access model can de-risk the business and create more business opportunities than an integrated operator.

Standard JV Structure

The 'age of sharing' is upon us. As with an airport or a shopping mall, a shared tower or any shared infrastructure, the right mode of investment can provide superior returns and unlock access to lower costs of capital. Assuming the right ISP agreements (or anchor tenancies) are in place, commercial risk is mitigated, and a sustainable business model is created. **TR**

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The Evolution and Impact of Mobile Financial Services

In the past decade, mobile financial services (MFS) have transformed the landscape of financial transactions, making it easier, faster, and more accessible for people around the globe to manage their money. This transformation is particularly significant in developing countries, where traditional banking infrastructure is sparse, but mobile phone penetration is high. From mobile banking to mobile wallets to peer-to-peer transfers to microloans, MFS have become a cornerstone of economic activity for individuals and businesses alike.

Mobile financial services refer to any financial service performed via a mobile device, including banking services, payment transfers, and mobile money solutions. The inception of MFS can be traced back to the early 2000s, with the launch of M-Pesa in Kenya in 2007 often cited as a pivotal moment. M-Pesa allowed users to deposit, withdraw, and transfer money, and pay for goods

and services easily through a mobile device, without the need for a bank account. This innovation showcased the potential for mobile technology to revolutionize financial access, especially in regions with limited banking infrastructure.

However, the proliferation of mobile financial services (MFS) not only transforms the financial sector but also offers a myriad of benefits for mobile operators. By building a comprehensive MFS solution, mobile operators can tap into new revenue

streams, enhance customer loyalty, and significantly expand their market influence.

Benefits for Mobile Operators in Developing Mobile Financial Services

The integration of mobile financial services offers mobile operators a transformative opportunity to evolve beyond traditional telecom services. By building an ecosystem that includes MFS, operators can enhance customer loyalty, encourage new revenue streams, and position themselves as indispensable partners

in their customers' financial lives. The strategic development of MFS solutions enables operators to not only face the challenges of a rapidly changing telecom landscape but also thrive within it, leveraging their unique position to become central figures in the digital economy. Below, are the multifaceted benefits that MFS bring to mobile operators in more detail:

• **Building an Ecosystem**

One of the most significant advantages for mobile operators delving into MFS is the creation of a holistic digital ecosystem. This ecosystem encompasses various services beyond traditional telecom offerings, such as payments, loans, savings, and insurance. By integrating these services, operators can become central to their customers' daily lives, facilitating everything from routine transactions to financial planning. This integration encourages constant engagement, deepening the customer-operator relationship.

• **Enhancing Loyalty Programs**

MFS enable mobile operators to offer enriched loyalty programs. By integrating rewards directly with financial services, operators can incentivize customer behaviors in more nuanced and compelling ways, such as offering cashback on mobile wallet transactions, discounts on bill payments made through the app, or better interest rates for savings. These programs increase customer loyalty and enhance the perceived value of the operator's offerings.

• **Financing Devices Directly**

Following the advent of MFS, operators have the opportunity to finance the purchase of mobile devices directly. This approach can significantly boost device sales, as customers can spread the cost over time, making smartphones more accessible to a broader audience. Financing also ties customers to the operator for the duration of the repayment period, reducing churn.

• **Creating Additional Revenue Streams**

MFS introduces new revenue streams for mobile operators. Transaction fees,

interest on loans, and premiums on insurance products contribute directly to the bottom line. Additionally, by offering a suite of financial services, operators can tap into markets previously dominated by traditional banks and fintech companies.

• **Accessing a Larger Share of Wallet**

By offering comprehensive financial services, mobile operators can capture a larger share of their customers' wallets. This means that a greater portion of customers' spending and financial activity flows through services controlled by the operator, from daily purchases to savings and investments. This not only increases revenue but also provides valuable data on customer behavior, enabling further customization and cross-selling opportunities.

• **Reducing Customer Churn**

MFS are a powerful tool for reducing customer churn— a perennial challenge in the telecom sector. By embedding themselves more deeply into customers' financial lives, operators make it more cumbersome for customers to switch providers. The convenience and benefits of using a single platform for both communication and financial transactions create a strong incentive for customer loyalty.

• **Leveraging Billing and Distributor Finance**

MFS also offer operators the chance to streamline their own billing processes. By encouraging customers to use mobile money for bill payments, operators can reduce the cost and complexity of bill collection. Furthermore, MFS can be used to finance distributors or retail partners, ensuring smoother operations and potentially increasing sales channels' efficiency and reach.

• **Implementing Mobile Financial Services for Mobile Operators**

As demonstrated previously, implementing mobile financial services (MFS) presents telecom operators with a significant opportunity to diversify their offerings and deepen their customer engagement. However, the journey from conceptualization

to the execution of MFS follows various paths, each with its own set of advantages, challenges, and strategic implications. The following are practical approaches telecom operators can take, ranging from building their own greenfield MFS platforms to leveraging white-label solutions.

• **Own Greenfield Build**

A greenfield build refers to the process of creating a new MFS platform from scratch. This approach allows telecom operators to design and develop a customized solution that aligns perfectly with their strategic objectives, brand identity, and customer needs.

• **Implementation Steps**

1. **Strategic Planning:** Define clear objectives, target market, and the range of financial services to be offered (e.g., payments, savings, loans).
2. **Regulatory Compliance:** Engage with regulatory bodies to ensure the service complies with all legal and financial regulations.
3. **Technology Infrastructure:** Develop the necessary technology infrastructure, including secure payment gateways, user-friendly mobile apps, and robust backend systems.
4. **Partnerships:** Form partnerships with banks, financial institutions, and other service providers to offer a wide range of services.
5. **Customer Experience Design:** Focus on creating an intuitive and seamless user experience.
6. **Marketing and Launch:** Develop a comprehensive marketing strategy to promote the new service and onboard customers.

• **Leveraging White-Label Solutions**

White-label solutions involve partnering with a third-party provider to use their pre-existing MFS platform, branded under the telecom operator's name. This approach can significantly reduce development time and cost.

• **Implementation Steps**

1. **Market Research:** Identify the most suitable white-label platform that aligns with the operator's goals and customer needs.

2. Vendor Selection: Choose a white-label provider with a proven track record, robust security measures, and comprehensive support services.
3. Customization and Branding: Work with the provider to customize the platform's look and feel to match the operator's branding and incorporate any specific features required.
4. Integration: Integrate the white-label solution with the operator's existing systems, such as customer management and billing systems.
5. Regulatory Approval: Ensure the solution meets all regulatory requirements, with the provider's assistance if necessary.
6. Launch and Marketing: Roll out the service to customers, supported by targeted marketing campaigns to drive adoption.

Hybrid Approach

A hybrid approach combines elements of both greenfield development and white-label solutions. For instance, an operator might develop certain components in-house while leveraging third-party solutions for others.

Implementation Steps

1. Strategic Assessment: Determine which MFS components are strategic to build in-house and which can be outsourced.
2. Component Development and Selection: Develop in-house solutions for core components while selecting white-label solutions for non-core elements.
3. Integration: Seamlessly integrate in-house and third-party solutions to offer a cohesive service.
4. Customization and Compliance: Ensure the entire service, though hybrid, meets branding standards and regulatory requirements.
5. Launch and Iteration: Launch the service with an emphasis on continuous improvement based on customer feedback and market trends.

Strategic Partnerships

Engaging in strategic partnerships with existing banks or fintech companies can also be an effective way to enter the MFS market without building a solution from the ground up.

Implementation Steps

1. Partner Identification: Identify potential



- partners who already offer MFS and share a mutual interest in collaboration.
2. Co-Creation and Integration: Work together to co-create a service offering that leverages the strengths of both parties, ensuring tight integration with the telecom operator's infrastructure.
3. Joint Marketing: Utilize both parties' customer bases and marketing resources for a powerful, joint go-to-market strategy.

For telecom operators, the decision on how to implement mobile financial services hinges on a variety of factors including time to market, cost, the strategic importance of customization, and regulatory considerations. Whether opting for a greenfield build, leveraging white-label solutions, adopting a hybrid approach, or entering into strategic partnerships, the goal remains the same: to deliver value-added services that enhance customer engagement and offer new revenue streams. Careful planning, execution, and ongoing management are crucial to the success of any MFS initiative.

Challenges and Future Directions

Despite their benefits, mobile financial services face challenges, including regulatory hurdles, security concerns, and the digital divide. As these services continue to evolve, addressing these challenges will be crucial for maximizing their potential.

The future of MFS lies in leveraging technologies like blockchain for greater security and transparency and artificial intelligence (AI) for personalized financial services; all while continuing to innovate

to reach underserved populations. As these technologies mature, mobile financial services are set to become even more integral to global economic systems, further transforming how we think about and manage money in the digital age. **TR**

By Marco Lichtfous, Managing Director, PMP Strategy Benelux & DACH and Vivek Yadav, Managing Director, PMP Strategy MEA



By building an ecosystem that includes MFS, operators can enhance customer loyalty, encourage new revenue streams, and position themselves as indispensable partners in their customers' financial lives





Emerging Trends in ICT for Improved Business Productivity

Over the years, the information and communication technology (ICT) industry has played a vital role in driving innovation and enhancing productivity. In order to maintain a competitive edge, it is essential for businesses to closely monitor and adapt to emerging trends in ICT. From artificial intelligence (AI) to the Internet of Things (IoT), these technologies are revolutionizing the way organizations function and engage with their customers.

The ICT industry is continuously undergoing growth and expansion, which shapes the industry, lifestyles, and operations of major businesses in Asia and around the world.

This year, studies predict that the ICT industry will be at the forefront of innovation and transformation. Industry leaders believe that cybersecurity, data analytics, AI, cloud computing, quantum computing, and blockchain technology will further evolve and revolutionize productivity of businesses.

Enhanced Connectivity to Boost Productivity

IoT has become a crucial component in creating an intrinsically linked corporate and business ecosystem. This technology refers to the networked connectivity of objects and tangible assets, allowing them to gather and exchange data simultaneously. The interconnectivity between different components improves the efficiency and responsiveness of operations. For instance, in manufacturing, sensors integrated with the IoT may constantly observe the state of equipment in real-time. This enables the anticipation and mitigation of equipment malfunctions, leading to a reduction in production downtime.

IoT can also facilitate precision farming in agriculture by providing farmers with real-time data on soil moisture, climatic conditions, and crop health. Implementing a data-driven approach not only improves effectiveness but also conserves vital resources. According to the IDC's Worldwide Semiannual Internet of Things Spending Guide, IoT investments in the Asia-Pacific are projected to reach USD 435 billion by 2027, with a compound annual growth rate (CAGR) of 11.7%. The driving factors behind this growth include the rising demand for remote operations, improved supply chain efficiency, the implementation of

commercial 5G technology, and the expansion of a digital presence.

Moreover, AI's relevance in the upcoming months remains paramount as data emerges as the contemporary currency, offering companies a competitive edge through the skillful extraction of valuable insights. This year, studies suggest that the use of AI for data analytics will increase. These advanced tools will have the capability to thoroughly analyze datasets, offering valuable insights and automating intricate processes. Companies can use these technologies to implement targeted marketing, anticipate maintenance needs, and make real-time decisions. AI-driven diagnostics and treatment optimization will continue to gain recognition in the healthcare industry, but persistent debates regarding the ethical consequences of AI algorithms may persist.

While cloud services have seen rapid adoption, 2024 will see a more refined and sophisticated strategy. Hybrid cloud solutions, which combine private and public cloud resources, will continue to grow in the coming months. Firms are motivated to transition to the cloud to enhance control and flexibility in managing their data. Another development that might improve cloud deployments— particularly for low-latency applications— is edge computing, which involves processing data near its source.

Cybersecurity Concerns

The digital age has ushered in a myriad of possibilities, yet it has also brought about heightened dangers and security concerns. In 2024, the concern over advanced cyberattacks, particularly ransomware, is more significant than ever before. In order to address this issue, it is crucial for businesses and individuals to place a high importance on implementing strong cybersecurity measures. Implementing security models based on zero-trust architectures, deploying advanced threat detection systems, and ensuring comprehensive cybersecurity training for personnel

are all crucial measures. Given the rapid expansion of the IoT, prioritizing the development of secure devices and implementing rigorous standards for data management is imperative to counter the increasing threat of attacks.

Businesses can establish themselves as market leaders by actively incorporating technological trends into their operations and staying updated on recent industry innovations. As these technologies converge, the future of the digital world may become more automated, connected, and secure. These trends serve as symbols of innovation which are defining a future where technology does more than just revolutionize industries; it empowers individuals and improves the quality of life. **TR**



IoT has become a crucial component in creating an intrinsically linked corporate and business ecosystem



5G ADVANCED



Thailand's Quantum Leap: Achieving 5G-Advanced Mastery in 2023

Thailand has emerged as a trailblazer, paving the way for 5G innovation. Renowned as the world's premier 5G market, Thailand's commitment to propelling the latest mobile communication technologies forward is not merely a vision but a tangible reality.

Thailand has made significant progress in the development of 5G-Advanced technology, surpassing the expectations set by the 3rd Generation Partnership Projects (3GPP) Rel-18. While the freeze is expected in 2024, Thailand has already completed the majority of its 5G-Advanced technology verifications in 2023. This achievement is not just a technological feat; it is a significant stride forward in establishing a new

digital infrastructure that will underpin Thailand's Industry 4.0 development.

Thailand's ICT Industry Leadership

The fervor with which Thailand has embraced 5G-Advanced technology is a testament to its dedication to spearheading the global ICT industry. Thailand's pivotal role in fostering mobile communication technology's evolution is evident in its strategic approach to testing and implementing the latest advancements. The completion of the majority of the 5G-Advanced technology verifications in 2023 has positioned Thailand at

the forefront of the 5G revolution, promising a transformative impact on the nation's technological landscape.

Pioneering Achievements in 5G-Advanced Technologies

In the realm of 5G-Advanced technologies, Thailand has not only embraced but excelled in various key aspects. According to official releases from major operators like AIS and True, Thailand has successfully tested Carrier Aggregation (CA) between frequencies of 2600MHz and 26GHz on a real network, achieving an impressive 10.38 Gbps. In December 2022, for instance,

a successful demonstration of the capabilities of the 26 GHz frequency band (or mmWave wave technology) was conducted. The collaboration involved True 5G and partners in Southeast Asia and Australia.

The demonstration utilized transmitters and a receiver device with a chipset. They were able to achieve long-distance transmission of mmWave signals on the actual network, enabling data to be transmitted at Gigabit speeds up to 11.1 km. This achievement is significant as it is the first successful demonstration of its kind in the Asia-Pacific region. It will contribute to the expansion of high-speed internet access in remote areas and reduce the reliance on wired connections.

On the other hand, the demonstration showcased the capabilities of short latency, RedCap, and Autonomous Driving Network functionalities concerning 5G-Advanced key technologies.

Wasit Wattanasap, Head of Nationwide Operations and Support Business Unit at AIS, stated that their goal is to become an intelligent telecommunications technology organization by creating an Autonomous Network. This network will be highly intelligent, will be able to adapt in real-time and will be able to provide personalized services to customers. AIS is working with engineers and IT personnel and is collaborating with partners to develop new technologies and enhance their network's capabilities.

Moreover, Thailand has successfully commercialized essential network capabilities, including 5G Standalone (SA), network slicing, FR2+FR1 3CC aggregation, and SEPP-based international roaming.

These commercial implementations mark a significant leap in Thailand's technological capabilities, setting the stage for a more connected and efficient digital ecosystem.

Shaping the Future

The deployment of advanced

capabilities, particularly in areas like Enhanced Mobile Broadband (eMBB), Massive Machine Type Communications (mMTC), and Ultra-Reliable Low Latency Communications (URLLC), is set to unleash a wave of innovation across various sectors.

Applications ranging from glass-free 3D video streaming services to Fixed Wireless Access (FWA) connections in homes, vehicles, and enterprises will benefit from the upgraded network capabilities. The integration of perception positioning systems further solidifies Thailand's position as a technological powerhouse that is ready to support diverse and sophisticated applications.

Fueling the Technological Revolution

Thailand's foresight is reflected in its strategic distribution of abundant spectrums, including 26 GHz, 2600 MHz, and 700 MHz. All three spectrums have been commercially leveraged, ensuring that the nation is well-equipped to meet the growing demands of a digital future. Chulalongkorn University's successful completion of 5G on 6 GHz adds another layer of accomplishment to Thailand's technological narrative, showcasing a collaborative effort between academia and the industry, ultimately pushing the boundaries of innovation.

Breathing Life into Thailand's Digital Economy

The completion of two high-quality 5G networks in Thailand has injected newfound vigor into the country's digital economy. This infusion of advanced technology has transcended theoretical advancements to exhibit practical, real-world applications. The positive ripple effect can be felt across diverse sectors, including ports, logistics, hospitals, retail, agriculture, and smart factories. Thailand's digital economy is witnessing a paradigm shift, with 5G applications seamlessly integrating into everyday operations, promising increased efficiency, connectivity, and economic growth.

Thailand's journey towards 5G-Advanced technology is not merely a national achievement but a testament to its aspirations at a global level. By surging ahead in technological prowess,

Thailand is poised not only to lead the ASEAN digital revolution but also to establish itself as a formidable global player in the digital landscape. As other nations look to Thailand for inspiration and collaboration, the country's commitment to continuous innovation and collaboration between academia and the industry will undoubtedly shape the trajectory of future technological advancements.

Thailand's achievement in completing the majority of 5G-Advanced technology verifications in 2023 is not just a milestone; it is a declaration of the nation's intent to be at the forefront of the digital revolution. As Thailand forges ahead, it is not just embracing the future but actively shaping it, solidifying its position as a technological powerhouse with the potential to influence the global digital landscape. **TR**



Thailand's journey towards
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Asia-Pacific Companies and the Digital Landscape: Hurdles and Prospects

Companies in the Asia-Pacific region face obstacles in their journey towards digital transformation. Integrating new technologies into operations, supply chains, and customer experiences requires rethinking strategies, but with the right digital roadmap, they can pave the way for long-term success. However, leaders must first assess weaknesses in legacy systems and tech expertise among staff. Despite the rocky terrain ahead, those who adapt now stand to reap substantial rewards in the future.

Digital transformation in the Asia-Pacific region presents challenges that require significant investments and workforce retraining. However, the potential benefits are significant. Digitization increases operational efficiency through automation and data-driven insights. Cloud computing and AI allow rapid scaling while reducing costs,

and e-commerce platforms provide opportunities for new sales channels.

To succeed, companies in the Asia-Pacific must develop a digital strategy aligned with business goals, invest in digital infrastructure and tools, retrain and upskill employees, prioritize the customer experience, and foster a culture of innovation. Despite the challenges, companies that make the right technology investments, retrain their workforces, and prioritize

the customer can gain a competitive advantage, tap into new markets, and ensure sustainable long-term growth.

Challenges Faced by Companies Adopting Digitalization

Companies in the Asia-Pacific region face several challenges when adopting digitalization. One major hurdle is the lack of digital skills and talent, as employees need training in areas such as data analysis, artificial intelligence, and cloud computing.

Another obstacle is the integration of new systems and processes with existing technology and business models, which requires significant effort. Cybersecurity threats also increase in a connected digital world, so leaders must prioritize data protection and privacy through strategies like multi-factor authentication and employee security awareness training. Additionally, uncertainty and resistance to change can hinder digital transformation efforts, thus, senior leaders must communicate a clear vision and address concerns to gain organization-wide buy-in.

Despite these challenges, companies can succeed in digital transformation by investing in training, updating infrastructure, implementing security protocols, and adopting change management practices.

Opportunities for Businesses Embracing Digital Technologies

In the Asia-Pacific region, businesses that embrace digital technologies can tap into new opportunities and gain a competitive advantage. Advancing technologies like artificial intelligence, virtual reality, and augmented reality are transforming customer experiences, allowing for personalized interactions, while building brand loyalty.

Cloud computing, data analytics, and automation help improve operational efficiency by streamlining processes and reducing costs. Digital connectivity and new technologies also enable the creation of new products and revenue streams, such as subscription services and digital subscriptions. Though the path to digital transformation comes with challenges, the rewards are worth it.

Strong leadership, innovation, and strategic technology investments can help companies thrive in the region by enhancing customer experiences, improving efficiency, and exploring new products and revenue streams.

Successful Digital Transformations in Asia-Pacific

As companies in the Asia-Pacific navigate the digital landscape, some have managed successful

transformations. China's Ping An Insurance Group began digitizing in the 1990s and now generates over 60% of its revenue via online sources. Ping An developed an app integrating financial services and launched online insurance and banking platforms. They cultivated a 'customer-centric' culture and used data to personalize offerings. Nonetheless, privacy concerns persist regarding Ping An's data collection practices. Therefore, it's imperative for companies to strike a balance between personalization and privacy.

Meanwhile, Tata Consultancy Services (TCS), India's largest IT company, underwent a digital transformation, emphasizing automation, cloud computing, and AI. TCS prioritized retraining its employees and recruiting candidates with digital skills. Additionally, the company acquired other firms to enhance its capabilities. Despite some job losses, TCS managed to retain many employees through reskilling programs. Thus, companies undergoing digital transformation should invest in employee education and consider strategic acquisitions to fill skill gaps.

Additionally, Grab, a ride-sharing company in Southeast Asia, started as a taxi-booking app but now offers food delivery, payments, and other services. Grab utilized partnerships to expand its platform and optimized operations via data analysis.


Grab's success demonstrates the importance of partnerships and leveraging data. However, Grab faces criticism over its monopoly and treatment of drivers. Companies should therefore balance expansion and corporate responsibility.

Key Benefits and Opportunities of Digitalization

The key benefits and opportunities of digitalization for companies in the Asia-Pacific include improved efficiency and productivity, enhanced customer experience, new growth opportunities, increased agility and competitiveness, and additional revenue streams. By automating processes and leveraging data insights, companies can reduce costs and waste. Personalizing

interactions and providing seamless omnichannel service leads to higher customer satisfaction, loyalty, and revenue.

Digital business models open up new ways to generate value and reach customers, while data-driven innovations uncover new product and service opportunities. Digital capabilities enable companies to respond faster to market changes, gaining a competitive edge. Monetizing data, digital services, or online platforms provides new sources of revenue.

Although there may be hurdles, with strong leadership focused on customers and engaged employees, companies can embrace digital transformation and become more resilient and better equipped to serve stakeholders. 



Digital business models open up new ways to generate value and reach customers, while data-driven innovations uncover new product and service opportunities.





Connecting the Region: A Look at the Top Telecom Vendors and Providers in the Asia Pacific

Telecommunications profoundly influences our daily routines, often imperceptibly. Consider the iPhone's impact or the convenience of GPS navigation. Telecom companies are largely responsible for these conveniences. In the Asia Pacific, the telecom sector yields over USD 500 billion annually, highlighting its significant success.

Key Telecom Equipment Vendors in the Asia Pacific
The telecommunications equipment market in the Asia Pacific is thriving, with major vendors competing to provide infrastructure and technology to telecom service providers across the region. Huawei is a leading global telecom equipment maker based in China. Huawei offers a wide range of

products, including wireless networks, fixed networks, global services, and smartphones. It has partnered with over 170 telecom carriers to build 5G networks. Despite facing restrictions in some western countries, Huawei continues to grow its influence in Asia, the Middle East, and Africa.

Meanwhile, ZTE is another major Chinese telecom equipment vendor that provides wireless networks, terminals, and telecommunication software systems and services. Similar

to Huawei, ZTE is focused on building a robust 5G infrastructure and already has over 30 commercial 5G contracts worldwide. However, it was sanctioned by the US government in 2018 due to security concerns, limiting its business development in North America. Nevertheless, ZTE remains a key player in emerging markets like Southeast Asia, South Asia, and Africa.

Nokia is a Finnish company that offers telecom network equipment, software, services, and licensing. Nokia is a

leader in 5G network deployments and has over 210 commercial 5G deals with operators worldwide. It competes closely with Huawei and ZTE in the Asia Pacific, with a focus on markets like India, Thailand, Philippines, and Australia (where there are fewer geopolitical challenges). Nokia aims to increase its market share as more countries deploy 5G networks over the next decade.

Despite being renowned for its smartphones, Samsung, the South Korean conglomerate, also offers telecom networking equipment and services. Samsung Networks targets 5G infrastructure and collaborates with operators in Japan, Australia, and South Korea. However, Samsung plays a smaller role in the telecom equipment market compared to Huawei, Nokia, and ZTE, focusing on select markets in the Asia Pacific and the Middle East. Nonetheless, with its technical capabilities and regional influence, Samsung remains an important vendor to watch.

Top Telecom Service Providers Across the Asia Pacific

The Asia Pacific is home to some of the world's largest telecommunications companies. These major service providers dominate the region and offer mobile and internet services to billions of customers. China Mobile is the largest mobile network operator in the world, serving over 1 billion subscribers in China alone. They provide 2G, 3G, and 4G/LTE mobile services, as well as landline and broadband internet.

While their primary operations are in mainland China, China Mobile has expanded into other Asia-Pacific markets like Pakistan and Thailand. Bharti Airtel, headquartered in New Delhi, India, is one of the leading telecom groups in South Asia and Africa. They offer 2G, 3G, and 4G wireless services, mobile commerce, enterprise services, and more to over 350 million subscribers across 18 countries in South Asia and Africa. Airtel is the third-largest mobile operator in the world based on subscriber base.

Singtel, based in Singapore, is a leading communications technology company that provides a diverse range of services including mobile, data and internet, info-communications technology, and satellite services. They currently have over 700 million mobile subscribers in 21 countries throughout the Asia Pacific, Africa, and the Middle East. Singtel offers 3G, 4G, and 5G network services, as well as IPTV and mobile payments.

Telstra is Australia's largest telecommunications company, offering 17.5 million mobile services, 7.5 million retail fixed voice services, and 3.5 million retail fixed broadband services. They own and operate Australia's largest mobile network, with 4G coverage reaching over 99% of the population. Telstra also has investments in Foxtel's paid TV service and Chinese tech company, Netlinkz. They have a growing presence in Asia with offices in Hong Kong, China, Taiwan, the Philippines, and Indonesia.

These telecom companies in the Asia Pacific are making significant investments in new technologies like 5G, fiber optics, and satellite technology. They are building a strong communications infrastructure to support future growth and innovation. Additionally, by offering affordable mobile and internet access, these service providers are helping to bridge the digital divide in the region.

How Telecom Operators and Vendors Are Connecting the Region

Telecommunication vendors and operators, such as Huawei and Nokia, are working towards building infrastructure and providing services to connect people in the region. Huawei offers telecom equipment to operators like China Mobile and Telstra. Nokia collaborates with operators in India, Indonesia, and the Philippines to deploy 5G networks.

Telecom operators like Telstra and Singtel are heavily investing in new technology to enhance their respective coverage and performance, while Chinese operators aim to expand their 5G networks and aim to amass 600 million subscribers by 2025.

In India, Jio Platforms is transforming connectivity with low-cost 4G services. Overall, the telecom industry in the Asia Pacific is expected to experience significant growth with investments in 5G, IoT, and cloud technologies.

The telecommunications industry in the Asia Pacific is experiencing rapid growth and transformation. Key trends in the telecom industry include the deployment of 5G networks, expansion of fiber optic infrastructure, rising demand for data centers, digital transformation among telecom companies, and industry consolidation. These developments are driven by the need to meet growing connectivity demands and provide new digital services. The future of telecom in the Asia Pacific is expected to be ultra-fast, data-driven, and increasingly converged. **TR**



Telecom companies in the Asia Pacific are making significant investments in new technologies like 5G, fiber optics, and satellite technology



ZTE, CelcomDigi Revolutionize Malaysia's Manufacturing Industry



ZTE Corporation, a global leader in information and communication technology solutions, has partnered with CelcomDigi Berhad (CelcomDigi) at MWC Barcelona 2024 to develop smart technology and cutting-edge 5G solutions, transforming Malaysia's manufacturing and warehouse industry.

CelcomDigi's Innovation Centre will utilize ZTE's advanced technologies such as the Digital Twin, Natural Navigated 5G Automated Guided Vehicle (AGV), and the Smart Helmet to reinvent smart manufacturing and warehousing, which could accelerate the use of 5G technologies throughout the country.

Datuk Idham Nawawi, CEO of CelcomDigi, enthusiastically outlined the potential of this collaboration in driving the adoption of 5G solutions across Malaysian industries and its impact on the digital economy.

"Our collaboration with ZTE enables us to accelerate real-world digital applications [specifically] for the nation's manufacturing and warehousing industries with cutting-edge 5G powered solutions, unlocking the true potential of the industries with efficient and sustainable operations," said Datuk Idham Nawawi.

ZTE's Digital Twin technology will play a crucial role in enabling factory automation, real-time machine task control, and data dashboards, accelerating enterprise informatization and IR4.0 transformation, thereby realizing the 'lights-out' factory concept.

ZTE is also debuting its Natural Navigated 5G AGV, the world's first-of-its-kind, with an integrated 5G module to boost productivity and logistics. Finally, ZTE's

Smart Helmet, equipped with multiple safety detection features such as, vital signs monitoring, GPS tracking for emergency response, and alarm notifications, is expected to enhance workplace safety and operational efficiency.

"This strategic alliance with CelcomDigi marks a significant milestone in ZTE's mission to drive digital innovation and excellence. By introducing these transformative solutions, we are set to revolutionize industries, enhance productivity, and foster a new era of digital economy growth," said Steven Ge, Managing Director of ZTE Malaysia.

The two companies signed the Memorandum of Agreement (MoA) for the partnership at MWC Barcelona 2024, witnessed by Tan Sri Mohamad Salim bin Fateh Din, Malaysian Communication and Multimedia Commission (MCMC) chairman, and YM Tengku Dato' Sri Azmil Zahrudin, CelcomDigi's Chair of the Board.

Vietnam Initiates Phase-Out of 2G Service



Vietnam will start blocking signals for 2G-only mobile phones, as part of a larger plan to phase out 2G service later this year.

The Vietnam Telecommunications Authority (VTA) has reportedly directed all mobile operators to stop accepting subscribers with phones that only support 2G technology unless they are on the Ministry of Information and Communications' (MIC) list of conformity certification.

The VTA recommended that users contact their mobile service providers for further information and instructions. They

can also contact the Telecommunication Quality Metrology Centre to obtain a list of 2G phone models that have been cleared by the MIC. The list is available on the TQC website.

The MIC announced in December that it plans to phase out 2G by September 2024, when the current 2G spectrum license for telcos expires. It had originally planned to phase out 2G by the end of 2023. The MIC also intends to auction the 5G spectrum sometime this year.

The MIC has prohibited the import of 2G devices since 2020, but they are still being imported through the grey market. According to a report, Vietnam still has approximately 15 million 2G subscribers.

Why Phase-Out 2G?

With the rapid advancement of telecommunications technology, particularly in the realm of mobile networks, 2G technology is becoming

outdated. Phasing out 2G allows Vietnam to allocate resources towards more advanced and efficient technologies like 3G, 4G, and 5G, which offer faster data speeds, better connectivity, and support for more advanced services and applications.

Spectrum is a limited resource, and reallocating spectrum currently used by 2G networks to newer technologies allows for more efficient use of this valuable resource. By shutting down 2G networks, Vietnam can repurpose spectrum for newer technologies that can better meet the growing demands for data and connectivity.

Maintaining legacy 2G networks can be costly for mobile operators. By phasing out 2G, operators can reduce operating expenses associated with maintaining outdated infrastructure and invest in newer technologies that offer better returns on investment.

Singtel and VMware Leverage Expertise, Offering MEC Solution



VMware (now owned by Broadcom Inc.) and Singtel, have teamed up to help businesses manage their connectivity and cloud infrastructure more easily by leveraging their expertise in 5G, cloud infrastructure, and software-defined edge to provide a comprehensive MEC solution. This partnership promises to empower businesses worldwide, helping them navigate modern IT environments with ease, while driving digital transformation.

A Symbiotic Partnership

Singtel's 5G network offers ultra-low latency, high reliability, and network slicing capabilities, while VMware

provides advanced virtualization, cloud computing, and software-defined edge solutions.

This combination allows companies to quickly deploy and manage critical applications, which is especially beneficial for businesses in smart cities, telemedicine, and automated factories where real-time operations are essential. Through this partnership, businesses using VMware Edge Cloud Orchestrator can seamlessly access Singtel's 5G network without needing to redesign their applications.

To support this collaboration, Singtel and Broadcom will establish a joint innovation lab. This lab will bring together experts in 5G and edge-native application design to help enterprises onboard their VMware-based applications to Paragon more easily. The lab aims to speed up the development and testing of new

applications, ultimately reducing time to market.

Accelerating MEC Accessibility

Bill Chang, CEO of Singtel's Digital InfraCo, stated that Singtel's goal is to make the benefits of 5G and MEC accessible to all enterprises through innovations like the Paragon platform. The positive response to Paragon in various markets shows its effectiveness, and the partnership with VMware and Broadcom will allow them to extend these benefits to more telco partners and enterprise customers.

Together, they are offering Infrastructure as a Service (IaaS) and Container as a Service (CaaS) to help businesses power their edge-native applications. Both companies believe in the importance of network programmability at the software-defined edge to enable dynamic and on-demand connectivity with the lowest latency.

IMDA to Invest in Singapore's NBN



The Infocomm Media Development Authority (IMDA) has announced plans to invest in the improvement of the Nationwide Broadband Network (NBN) in Singapore.

IMDA will invest SGD 100 million to ensure a future-ready network that is expected to bring higher broadband speeds of up to 10 gigabits per second (Gbps) to more than half a million households by 2028.

Enhanced Speed and Efficiency

Singapore decided to invest ahead due to the rapid development of digital technologies. The higher-capacity broadband network, which is ten times faster than the current speed, is expected to serve as the

foundation for future innovations and opportunities.

This increase in speed will enable faster internet connections, allowing users to download and upload data more quickly, stream high-definition content seamlessly, and engage in bandwidth-intensive activities such as online gaming and video conferencing with minimal latency. With speeds of up to 10 Gbps, businesses can transfer large files, access cloud-based applications, and collaborate with remote teams more effectively. This enhances productivity and competitiveness in the global market.

By ensuring that over half a million households have access to higher broadband speeds, IMDA's initiative promotes digital inclusion. It ensures that all segments of society, regardless of their socio-economic background, have the opportunity to benefit from the digital revolution. This helps bridge the digital divide and creates more equitable access to opportunities in the digital age.

Designing a Future-Ready Network

Singapore's successful deployment of the first generation NBN in 2006 laid the groundwork for a dependable and high-bandwidth connectivity infrastructure, which supported the country's rapid digital transformation. After 18 years, the new investment to improve the infrastructure will ensure the country's readiness for the future, upgrading both the back-end network and the front-end user equipment, which will not only enhance the services, but also offer more competitive prices to consumers.

Currently, the NBN runs in every household, with more than 85% of residential homes experiencing services of at least 1 Gbps.

The NBN upgrade is planned for mid-2024 through 2026. The rollout of 5G mobile services and faster Wi-Fi networks will simultaneously complement the 10G NBN which will provide symmetric end-to-end connectivity at 10 Gbps.

Indosat, Nokia to Boost Indonesia's Digital Talent and AI Adoption Capabilities



Indosat Ooredoo Hutchison (Indosat) has partnered with Nokia to introduce Bell Labs' learning and certification programs to university students in Indonesia, aiming to improve the country's digital talent competencies.

Through the partnership, Indonesia's digital talent pool is expected to improve its capabilities in adopting artificial intelligence (AI) technologies.

Indosat and Nokia also plan to conduct a competence development program and cultivate promising talents. The

candidates will have the opportunity to visit one of the research and development innovation laboratories worldwide.

"Learning from Nokia Bell Labs will not only introduce young and brilliant Indonesian youth to the latest technological developments but also empower them to play a more active role in the fast-becoming pervasive global digital economy. With the endeavor we administer, we believe we can contribute to achieving the nation's vision of Golden Indonesia 2045," said Vikram Sinha, President Director and Chief Executive Officer of Indosat Ooredoo Hutchison.

Participants in the program are expected to gain significant insights and experience through interactions with professionals in Nokia's top-tier

R&D laboratories, which focus on recent technological advancements, such as AI, machine learning (ML), security, and other innovative developments.

Ozgur Erzincan, Head of Market Unit at Nokia Indonesia, expressed his enthusiasm regarding the partnership and looks forward to sharing Nokia's extensive R&D with the students.

"Nokia Bell Labs is at the forefront of global technology developments and the program will provide an unmatched opportunity for the participants to advance their learnings by interacting with our industry-recognized experts," said Erzincan.

The partnership was finalized at MWC Barcelona 2024 and was signed by Vikram Sinha and Pekka Lundmark, President and CEO of Nokia.

SK Telecom to Transform Energy Efficiency in AI Data Centers



SK Telecom will collaborate with Iceotope Technologies and SK Enmove to develop advanced liquid cooling solutions for artificial intelligence (AI) data centers.

These solutions promise to revolutionize data center operations by offering enhanced cooling efficiency, improved energy efficiency, increased density and scalability, noise reduction, and environmental sustainability.

By efficiently dissipating heat from critical server components, liquid cooling solutions prevent thermal throttling and ensure consistent performance, while also reducing overall energy consumption compared to traditional air-cooled systems.

This enables data center operators to maximize space utilization, support future

expansion requirements, and minimize their environmental impact, making them ideal for the high-performance computing demands of AI workloads.

Enhancing Energy Efficiency

The partnership will focus on enhancing energy efficiency by reducing the power consumption of cooling systems, which is a major contributor to energy consumption in such facilities.

"By combining core technologies and capabilities of SKT, Iceotope and SK Enmove, we expect to develop innovative energy efficiency solutions that can not only help us strengthen our competitiveness in AI data centers, but also put us on the right path towards sustainability," said Lee Jong-min, Vice President and Head of Future R&D at SKT.

SKT will use Iceotope's Precision Liquid Cooling (PLC) alongside SK Enmove's thermal fluid at its AI data center testbed to demonstrate the efficiency and power-saving potential of PLC. Additionally, SKT intends to create an

integrated Coolant Distribution Unit (CDU) with technical assistance from Iceotope to support several liquid cooling systems.

"We are thrilled to be collaborating with SKT and SK Enmove on AI data center innovation and look forward to helping them and their customers realize energy-efficiency in their facilities with our Precision Liquid Cooling solutions," said David Craig, CEO of Iceotope.

Iceotope's PLC technology ensures the accurate distribution of dielectric fluid to remove heat from the hottest components of servers, while SK Enmove's thermal fluid improves the cooling function of the system.

SK Telecom plans to develop an AI-driven, self-regulating cooling system in the future. The AI Autonomous Cooling System will analyze temperature and power load in the AI data center, automatically adjusting the supply temperature and flow rate of thermal fluids in the CDU, improving operational efficiency in data centers.

SmarTone Uses 3.5GHz Spectrum for Enhanced 5G Coverage



SmarTone has recently added the 3.5GHz 'golden frequency band' in Hong Kong International Airport. This upgrade significantly improves the 5G network capacity in both indoor and outdoor areas of the airport.

"Our 5G network completely covers Hong Kong's major ports and provides an uninterrupted high-speed and smooth 5G network experience for

busy inbound and outbound traffic," SmarTone said in a press release.

The first phase of the 5G network upgrade project at Hong Kong International Airport has been completed, including the departures and arrivals halls, baggage reclaim halls, and restricted areas. With the upgraded 5G network in place, both arriving and departing customers can easily connect to various intelligent facilities throughout the airport and enjoy smooth 5G network experiences.

SmarTone has pioneered full 5G network coverage across the entire territory. Hong Kong's transportation

hubs have been covered, including all 23 road tunnels, major routes, and MTR stations. By deploying the exclusive 850MHz frequency band within MTR stations, SmarTone significantly increased 5G network capacity. Thus, customers will have a high-quality, fast, and stable network experience on the go, even during peak hours.

SmarTone will continue to expand its network coverage and improve network performance, with the goal of providing the most advanced network infrastructure to customers and Hong Kong, while also leading the development of Hong Kong's smart city initiatives.

Telstra to Launch New 5G Slicing Solution



Telstra plans to introduce an innovative 5G slicing solution this year, driven by a newly created proof-of-value mobility analytics engine, which is capable of creating multiple virtual networks with unique performance features on one physical network to meet specific customer needs.

The proof-of-value engine analyzes 5G slicing traffic in real-time, ensuring consumers receive the promised performance. Customers will be sent invoices according to the performance they obtain, which enhances transparency and accountability in providing particular speeds and uptime within the network slice.

Deploying 5G Slicing to Enterprise

Shailin Sehgal, Telstra Executive, Network Applications and Cloud,

highlighted the significance of this development, which can be considered an essential piece in the puzzle to deploying 5G slicing to enterprise.

"What's groundbreaking about this development is that it allows us to commit to a minimum performance level for a customer, then measure and report on the slice performance to know if the slice is performing as designed," said Sehgal.

Telstra's 5G slicing product ensures consistent performance and customizes slices for individual customers based on their specific needs and performance criteria using slice templates, including minimum and maximum speed, security measures, and latency.

Improved Stability and Speed

Hindmarsh, an Australian construction, real estate development, retirement services and capital management company, is the first to trial Telstra's innovative 5G slicing technology.

Mark Crameri, IT Manager at Hindmarsh, expressed contentment with the deployment, noting the exceptional stability and improved

speed in accessing crucial business processes.

"Telstra's new 5G fixed wireless network slicing link was deployed at one of our heaviest use sites with over 30 staff. To date, the reliability of the new link has been tremendous and access to our business-critical systems is incredibly fast, not to mention video conferencing and internet access, making it faster and easier to work productively on site," said Crameri.

Telstra has also partnered with Casa Systems to enhance network performance and configuration by utilizing their advanced Realtime Fastlane Accelerator (RFA) technology and User Equipment Route Selection Policy (URSP) 5G standard, enabling Telstra to direct various types of traffic to certain network slices using dynamic network slicing based on a network template.

Furthermore, Telstra also collaborated with Ericsson to implement this network slicing technology, showcasing the company's 5G slicing technology's potential in providing exceptional customization and performance for different industry applications.



Dealing with Data Deluge Through Real-Time Data Streaming in the Asia-Pacific

Organizations around the Asia-Pacific region are compelled to reconsider their data management strategies due to the unprecedented volume of data that is being generated across industries during the current technological advancements.

There has been an evident change in how businesses capture and use information brought about by the emergence of real-time data streaming.

How Real-time Data Streaming Works

Real-time data streaming involves the uninterrupted and prompt transfer of data from one source to a destination, enabling the rapid processing and analysis of information as it is generated. This approach differs from the traditional method of batch

processing, in which data is gathered, stored, and processed in chunks at predetermined intervals.

In real-time data streaming, the sources are among the most important components. These sources include the numerous devices

and applications that produce high volumes of continuous data. The variety of sources, which includes everything from mobile devices and web applications to sensors for IoT and gaming platforms, contributes to an uninterrupted flow of information, which provides the foundation for real-time analytics.

Advantages of Real-time Data Streaming

The implementation of real-time data streaming has become increasingly significant for businesses that are seeking to improve their operational processes across industries. One notable example would be the deployment of this technology in financial institutions in Asia. High-frequency trading depends on immediate decision-making informed by up-to-the-minute market data. Stock exchanges in countries such as Japan and Singapore utilize real-time data to guarantee equitable and efficient trading, with transactions being completed within milliseconds.

In addition to significantly reducing latency and increasing overall efficiency, real-time data streaming allows business leaders to make decisions through the seamless access and instantaneous analysis of data.

Moreover, real-time data is used by industries such as e-commerce and telecommunications to gain a comprehensive understanding of customer behavior. This enables prompt personalization of services, tailored product recommendations, and quick problem resolution.

This technology can also be deployed in supply chain management, allowing closer monitoring of the movement of goods, optimization of routes, and more effective inventory management, which streamlines operations and reduces costs.

Real-time data streaming can also be used in healthcare, which enables the early detection of anomalies through continuous patient monitoring and timely interventions, which ultimately leads to improved patient care.

In Asia, where the market is considered to be highly competitive, companies that adopt real-time data streaming can employ a strategic edge by staying ahead of shifting market conditions and promptly adjusting to evolving consumer preferences. By utilizing real-time data insights, businesses can make well-informed decisions ahead of their competitors.

Challenges in Deploying Real-time Data Stream

The advancement of real-time data streaming has revolutionized businesses' operations, empowering them to make expedited, data-centric decisions. However, these come with some challenges that companies also need to address to fully take advantage of the benefits this technology has to offer.

The widespread adoption of real-time data streaming involves an increased risk to data breaches and violations of privacy. Organizations that deal with sensitive information prioritize implementing strong security measures to protect against unauthorized access. Adhering to data protection regulations should be a fundamental element in establishing and preserving consumer trust.

Implementing encryption methods, access restrictions, and periodic audits to guarantee the confidentiality and integrity of the data are just some of the ways companies can ensure the protection of data. By investing in secure, end-to-end solutions, businesses can establish a highly protected environment for processing real-time data.

Scalability can also be a concern when utilizing real-time data streaming, which is why adopting cloud-based solutions, which provide flexible architectures that can manage the growing data volume without sacrificing performance, should also be considered.

Companies can optimize their infrastructure by using cloud platforms, allowing them to dynamically scale their resources and meet the changing demands of real-

time data processing. This not only improves efficiency but also enables cost-efficient scalability, as resources can be assigned according to real-time usage.

Real-time data streaming offers benefits and opportunities for organizations to gain a competitive advantage. Nevertheless, it is crucial to tackle the challenges that come with it to achieve a successful implementation and make the most of what it offers. **TR**



The implementation of real-time data streaming has become increasingly significant for businesses that are seeking to improve their operational processes across industries.





Asia-Pacific's Fiber Frontier: A High-Speed Adventure to 2030 and Beyond

The Asia Pacific fiber optics market anticipates a robust compound annual growth rate (CAGR) of 9.0% from 2023 to 2030. The region is undergoing a technological transformation, emphasizing smart cities, Internet of Things (IoT) integration, and advancements in healthcare systems.



Growing Fiber Optics Market

Fiber optics play a crucial role in supporting these initiatives, providing high-speed and

low-latency communication for real-time data transmission. The increasing adoption of fiber optic connectors further propels market growth, serving as a cornerstone for reliable and high-speed communication in the Asia Pacific region.

The Asia-Pacific fiber optics market is experiencing a surge in growth, driven by the adoption of cutting-edge technologies like Wavelength Division Multiplexing (WDM) and Dense Wavelength Division Multiplexing (DWDM). These technologies enhance data capacity by transmitting multiple light wavelengths over a single fiber.

A notable example is Bharti Airtel's collaboration with Ribbon Communications Inc. in February 2023 to expand its DWDM network, supporting applications such as 5G, cloud computing, and video streaming.

Further contributing to market expansion is the increasing use of fiber optic cables beneath the sea in Asia. This trend has significantly improved connectivity between countries, boosting network capacity and spectral efficiency. The deployment of undersea fiber optic cables—exemplified by the Asia-Africa-Europe 1 submarine (AAE-1) cable system spanning over 25,000 kilometers—connects multiple countries across Asia, the Middle East, Africa, and Europe. As the demand for fast data transmission and reliable connectivity grows, the utilization of undersea fiber optic cables is expected to rise, driving continued market growth in the region.

The telecom segment asserted its dominance in the Asia-Pacific fiber optics market, securing a substantial revenue share of 39.6%. The telecom sector in the region plays a pivotal role by offering an array of advantages, most notably a significantly higher bandwidth capacity. This enhanced capacity allows telecommunication



providers to meet the demands of connected devices and data-intensive applications, ensuring a seamless user experience even during peak usage periods.

Key Players and Milestones of Fiber Optic Deployment

Mainland China had the highest total length of fiber optic cable deployment among developing markets, with 59.6 million kilometers installed. According to Kagan, fiber broadband subscribers will make up at least 90% of all broadband subscribers in mainland China by the end of 2027. China Mobile Ltd. spearheaded the fiber initiative, with an estimated 19.4 million kilometers of fiber cables installed.

In India, Reliance Jio Infocomm Ltd. (RJIL) outperformed all other FTTH providers within two years of its launch. By the end of 2022, the company had more than 7.6 million FTTH-connected residences, cementing its position as market leader. Bharti Airtel Ltd. is the second-largest fixed broadband operator in India. According to Airtel, the company will expand its FTTH footprint to over 500 new towns in India by 2022.

Japan and South Korea were pioneers in fiber network adoption, enabling nationwide fiber broadband services in the aughts. Both markets have focused on improving the speed and power efficiency of long-distance

signal transmission through upgraded network infrastructure.

Looking ahead, the Asia-Pacific fiber optics market is positioned for continued expansion, fueled by technological innovation, strategic collaborations, and the imperative role of fiber optics in shaping the region's digital future. **TR**



Mainland China had the highest total length of fiber optic cable deployment among developing markets, with 59.6 million kilometers installed





Expanding Cloud Infrastructure and Rapid Adoption Reshape India's Landscape

India is a significant growth market for cloud service providers, and many have increased their presence in the country in recent years. This is attributed to India's swiftly expanding digital economy, where a growing number of businesses and individuals utilize cloud-based services to enhance productivity and efficiency.

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Meeting Demand Through Data Centers

To meet this growing demand, cloud computing service providers are establishing new data centers and cloud regions in India. These facilities enable them to provide faster, more reliable, and secure cloud services to customers in the region. Having a local presence allows these providers to comply with local data privacy and security regulations, which is critical for building customer trust.

Amazon Web Services (AWS), Microsoft Azure, Google Cloud, and Alibaba Cloud are some of the cloud service providers that have recently expanded into India. These companies have set up new data centers or cloud regions in major Indian cities such as Mumbai, Chennai, and Hyderabad, among others. This expansion is expected to continue in the coming years, as India's cloud adoption shows no signs of slowing.

Over the last year, Indian enterprises have invested an average of INR 3.7 billion in public cloud solutions. These significant investments demonstrate a growing confidence in cloud-based technologies and their ability to drive business transformation and innovation.

According to Forrester's 2022 Infrastructure Cloud Survey, a significant majority of Indian enterprise cloud decision-makers— 73% to be exact— use hybrid cloud setups that combine the strengths of both public and private cloud environments. Furthermore, an overwhelming 85% of organizations leveraging the power of public cloud solutions use services from two or more vendors, indicating a multifaceted approach to cloud adoption.

Other Key Trends Reshaping India's Cloud Market

The changing landscape of the Indian cloud market reveals several key trends that are reshaping how businesses view technology adoption. For starters, public cloud platforms are expected to remain popular among large and



medium-sized businesses due to their scalability, flexibility, and cost-effectiveness.

Concurrently, startups in India are increasingly adopting a cloud-only policy, abandoning traditional in-house infrastructure in favor of cloud-based solutions, motivated by the need for agility and rapid scalability. Furthermore, as businesses embark on technology modernization journeys, they are increasingly adopting a cloud-first or cloud-only strategy to reap the benefits of agility and cost-efficiency. Crucially, large-scale cloud migrations within Indian enterprises frequently rely on strategic partnerships, emphasizing the importance of working with reputable service providers and technology partners.

Furthermore, cloud-native technologies are quickly becoming the norm for Indian businesses, allowing them to develop and deploy applications more efficiently while adhering to principles of scalability, resilience, and portability. Finally, the financial sector (particularly banks and financial institutions) has emerged as a pioneer in the transition to hyperscale cloud platforms, leveraging the capabilities of leading cloud providers to improve security, scalability, and operational efficiency. As the Indian cloud market evolves, these trends highlight cloud technologies' transformative potential across multiple industry verticals.

In 2024, India's cloud computing and technology growth prospects appear to be bright. India's technology industry is rapidly expanding, and cloud computing and other emerging technologies are expected to play an even larger role in shaping the country's economic future. **TR**



The changing landscape of the Indian cloud market reveals several key trends that are reshaping how businesses view technology adoption





Fixed Wireless Access Transforming Digital Connectivity in Asia

Fixed Wireless Access (FWA) has had a significant impact on the telecommunications industry, resulting in transformative changes not just in Asia, but globally. This technology has rapidly evolved from a niche solution to a widely-used alternative, offering a network infrastructure that is both reliable and secure.

The deployment of FWA has become an advantageous innovation in the digital world, addressing challenges and reshaping the way individuals connect with high-speed internet and more reliable services.

Growth in FWA Usage

FWA involves the distribution of internet and communication services using wireless networks rather than the conventional wired infrastructure. This technology utilizes radio spectrum to create a direct link between the user's location and the network hub of the service provider.

The evolution of FWA can be attributed to increasing demand for more secure and dependable connectivity. FWA is designed for stationary or fixed locations, such as homes, businesses, or other fixed infrastructure, unlike mobile wireless services that are meant for on-the-go connectivity.

Studies predict that the FWA market will have significant growth in Southeast Asia alone, reaching 7.87 million subscriptions by 2028, with a compound annual growth rate (CAGR) of 13% through 2028.

This significant growth can be due to various factors, such as the added priority of bridging the digital divide, the expansion of 5G technologies, and the development of additional revenue sources for communication service providers (CSPs). The service revenue for the FWA market is expected to reach a substantial amount of USD 2.23 billion by the end of 2028.

Additionally, the increasing demand for digital connectivity in Southeast Asia, coupled with the poor penetration rates of fixed broadband (FBB) in countries such as Indonesia, the Philippines, and Malaysia, has pushed FWA as the preferred alternative. Consistent fiber deployment can be challenging due to the obstacles that are presented by the archipelagic structure of some of the countries in the region.

Revolutionizing Connectivity

One of the evident advantages of FWA is its enhanced security features. Traditional wired connections, which can be vulnerable to physical tampering and surveillance, frequently encounter security threats. FWA, on the other hand, operates on a closed radio frequency, which adds an extra layer of security against unauthorized access. The encryption protocols incorporated into FWA systems enhance security by protecting data transmissions from potential cyber threats.

For example, in countries such as Singapore and Japan, where cybersecurity is of utmost importance, FWA has become increasingly popular among corporations and government organizations because it efficiently mitigates the growing threats regarding cyber vulnerabilities that wired networks may present, as it securely transmits essential data through wireless communication.

It is also worth noting that the incorporation of FWA with 5G technology has further accelerated the deployment of this technology throughout Asia. The potential of FWA is complemented by the high bandwidth and low-latency capabilities of 5G networks, which provide customers with unparalleled speed and reliability, which is evident in countries like South Korea, China, and Japan.

The economic impacts of deploying FWA technology cannot be neglected. This has allowed for healthy competition among service providers, which in turn fosters innovation and reduces costs. As FWA becomes a viable alternative to wired internet, it also encourages more competition in the market.

There has been a rise in the level of competition among providers in some Asian countries which has not only resulted in an improved quality of the service, but also led to the development of internet plans that are more reasonably priced, which has made high-speed connectivity more accessible to a large number of subscribers.

Challenges with FWA Deployment

Despite its numerous benefits, there are still challenges to overcome when it comes to implementing FWA technology. The expansion of FWA is heavily influenced by regulatory frameworks, spectrum allocation, and economic investment in infrastructure. In order to ensure that service providers are operating on an equal playing field and to encourage healthy competition, governments throughout Asia need to develop regulations that are beneficial to the development of FWA networks.

The introduction of FWA in Asia has revolutionized the telco industry. It has contributed to the digital transformation of the region with its improved security features, reliability in remotes areas, and its integration with 5G technology. **TR**



The evolution of FWA can be attributed to increasing demand for more secure and dependable connectivity



— 2024 —

Unleashing Network Capabilities with 5G-Advanced

Organised by Telecom Review Asia, this webinar delves into the potential of 5.5G in the Asia Pacific region, spotlighting on the substantial enhancement in network capacity brought about by 5G-A, and the array of opportunities it will unlock for the region.

Place: Online



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APRIL

Asia Tech x Singapore (ATxSG)

Asia Tech x Singapore 2024, Asia's flagship tech event, is the hub of the world's fast-growing digital economy, featuring the most innovative digital solutions and connects industry leaders worldwide.

Place: Singapore Expo, Singapore



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MAY

Submarine Networks

Submarine Networks features the world's leading annual submarine communications gathering to exchange knowledge, explore the latest projects, develop strategies and form lucrative new partnerships to drive the industry forward.

Place: Suntec Convention Centre, Singapore



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SEPTEMBER

ACC

On its 20th year, the Asia Carriers Conference (ACC) has become a widely recognized event that promotes innovation and collaboration in the telecommunications and ICT industry.

Place: Shangri-La Mactan, Cebu, Philippines



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SEPTEMBER

Latest updates on:
www.telecomreviewasia.com

— 2024 —

FutureNet Asia

FutureNet Asia brings together the telecommunications industry leaders and facilitate the advancement of innovation through the promotion of partnerships and technology collaborations.

Place: Marina Bay Sands, Singapore



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SEPTEMBER

Innovate Asia

Innovate Asia 2024 spearheads Asia's autonomous network revolution, fostering intelligence, connectivity, and impactful growth for a thriving future.

Place: Centara Grand at CentralWorld, Bangkok, Thailand



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NOVEMBER

Telecom Review Leaders' Summit

The Telecom Review Leaders' Summit is among the largest C-level industry gatherings, bringing together the leaders of the ICT industry and governments from around the world.

Place: Dubai, UAE



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DECEMBER

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