

Net5.5G Sets New Benchmark for Bearer Networks, Facilitating Business Success in Intelligent Era

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To meet the stringent requirements of AI applications for network bandwidth, latency, reliability, and security in the emerging intelligent era, fixed networks — especially data communication networks — must be extensively upgraded and optimized. The rollout of Net5.5G, the next-generation target network defined by the data communication industry, is currently underway. In tandem, Huawei has introduced AI WAN, a router solution tailored for the AI era, to redefine the IP bearer network. With it fueling the growth of new services on carriers' networks, Net5.5G is a crucial factor enabling carriers to unlock business value in the intelligent era. Building on Huawei's research and joint exploration with carrier partners, we believe that AI WAN can help carriers meet diverse experience requirements in this era by developing multiple key capabilities, covering speed, latency, and guaranteed experience. AI WAN helps carriers reduce costs, increase revenue, and improve efficiency. It also facilitates significant growth in ToC, ToH, and ToB services, enabling carriers to achieve new heights in the new era along with continuous business success.

Multiple key capabilities drive the growth of new services on carrier networks

Carriers' bearer networks face ever-evolving requirements. The widespread adoption of artificial intelligence generated content (AIGC) has led to a major surge in video upload and download traffic, driving growth in network traffic. Predictions expect a tenfold increase in network traffic within five years, with AI-related traffic accounting for 70% of the total. In light of this substantial traffic growth, carriers must consider building networks with optimal TCO to minimize costs. Additionally, critical services provided by more and more carriers require accelerated experience monetization. For instance, emerging services like cloud gaming demand a network latency of 5 ms to deliver a high-quality experience. Furthermore, as network complexity continues to increase, leading to frequent network failures, the introduction of AI technologies is needed to ensure efficient and stable network operations. Consequently, carriers must enhance the core capabilities of their bearer networks.

AI WAN comprises AI routers, AI new connections, and AI agents, providing customers with novel experiences in AI-native 800GE all-service bearer, AI-driven differentiated services, and AI-centric intelligent O&M. AI WAN fuels the growth of new services on carrier networks by leveraging key capabilities such as 400GE/800GE all services, application identification-based differentiated services, and three AI agents.

First, at the network element layer, the NetEngine 8000/NetEngine 8800 series routers provide AI capabilities and support 400GE/800GE all-service bearer. These routers offer intelligent sensing capabilities and implement AI-powered dynamic energy saving and AI-boosted intrinsic security, enabling carriers to construct networks with optimal TCO.

Second, at the network layer, AI-powered experience guarantee and application identification enable carriers to activate scenario-specific value-added service packages and provision various value-added packages on demand. This helps carriers implement differentiated experience mon-

etization, accelerate business monetization, and boost their revenue.

Third, at the operations layer, AI-centric intelligent O&M introduces three AI agents that deliver full-lifecycle services covering planning, construction, maintenance, and optimization, helping carriers reduce OPEX. ChangeSpirit facilitates error-free network changes; FaultSpirit enables precise troubleshooting, eliminating O&M efficiency barriers; and OptimizationSpirit delivers deterministic experiences and maximizes network ROI. The three AI agents help significantly improve network O&M efficiency and ensure efficient and stable network operations.

AI WAN enables carriers to achieve multiple business benefits

At its core, Net5.5G boasts higher data rates and lower latency, enabling a seamless and uninterrupted real-time online interactive experience. The vision of Net5.5G goes beyond just faster network connections — it aims to be the cornerstone of a new intelligent era. For carriers, AI WAN promises more business monetization opportunities and greater value to carriers in terms of ToC, ToH, and ToB services.

Regarding ToC services, traffic is increasing rapidly, with an annual growth rate of 20% to 30%. In response, carriers are accelerating their deployment of 5G infrastructure, aiming to add 1.5 billion new 5G connections. Despite this, carrier ARPU continues to decline, and the industry faces intense price competition. To address this, carriers are introducing new services like extended reality (XR), ultra-HD video, and cloud phones, aiming to boost their revenue through enhanced user experience and operations. AI WAN enables carriers to develop 5G and 5G-A services, offers optimal service experience, releases suppressed traffic, and improves DOU.

Regarding ToH services, commoditized competition is intense in developed markets, prompting carriers to shift towards experience-centric operations. In addition, carriers are launching new services such as acceleration packages and video packages, in an effort to improve the ARPU



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through precision marketing. AI WAN empowers carriers to perform precision marketing, identify high-value users, and boost home broadband revenue. It also offers high-value bundles like application acceleration and GreenNet to increase the ARPU. Furthermore, it provides experience assurance for applications, enhances brand competitiveness, and reduces customer churn rates.

And regarding ToB services, enterprises are expediting their digital transformation. More and more enterprise services are being migrated to multiple clouds, and both cloud and computing power are being increasingly utilized

in sectors such as healthcare, education, manufacturing, and scientific research. In addition to requiring traditional private line services, enterprises now place higher requirements on bandwidth, reliability, and security. But in terms of competitiveness, carriers' traditional IP private lines fall short. The competitive edge of differentiated B2B products can be enhanced if one-stop services can be provided, helping to drive B2B growth. To address the diverse needs of industry cloudification, AI WAN can provide new IPv6 B2B private network services, enhancing the competitiveness of industry products and increasing B2B revenue.

Differentiated service assurance facilitates the development of computing power services

The rise of ChatGPT and Sora has had a profound impact on the development of various industries, as an ever-growing number of individuals, families, and businesses leverage AI to boost production efficiency. In the intelligent era, AI WAN will facilitate the development of computing power services.

As industry digitalization and intelligence take hold, there is a pressing need for computing power services across industries. Carriers are now expected to provide not only conventional private line services, but also cloud-based private line services and intelligent computing services. Despite the Internet historically not being truly data-centric, IPv6 Enhanced applications can now facilitate data circulation and management.

First, in scenarios where massive amounts of data samples are transmitted to computing centers, enterprises engage in AI foundation model training, giving rise to transmission demands of petabyte-scale big data. However, relying on private lines raises concerns over time-consuming transmission and unaffordable high bandwidth. Carriers can meet enterprise demands by offering elastic 10 Gbps private line package services. But unlike traditional services, approximately 90% of intelligent computing service traffic consists of elephant flows. For instance, in a cluster scenario comprising 10,000 GPUs, the network throughput efficiency is merely 35%, a reduction of more than 50%. By leveraging its industry-unique built-in intelligent flow awareness engine, Huawei facilitates precise identification of elephant flows and significantly enhances network transmission capacity to more than 90% through load balancing of the flows. In lab environments, the utilization of GPUs can be boosted by 50%.

Second, in AI training scenarios that combine local storage and remote computing power, many industries mandate that sensitive data not be stored at intelligent computing centers due to stringent data security requirements. Consequently, remote computing power must be accessed on

demand through networks, requiring them to transmit sample data to remote computing centers for training. In addition to providing basic private line packages, carriers can also offer new remote training services involving sensitive data. Compared with traditional services, training data is one hundred times more sensitive to packet loss — even a 0.1% packet loss rate can result in a substantial 50% decrease in training efficiency. Huawei has successfully achieved zero packet loss over distances of up to 1,000 km by leveraging its RDMA-based in-depth load balancing and network-level flow control technologies, thereby boosting computing efficiency to over 95%. Innovative technologies such as network slicing have been deployed at scale, effectively meeting differentiated service quality assurance requirements. And leveraging new capabilities such as ultra-high WAN bandwidth, high throughput, and lossless transmission, carriers in China have begun building 400GE intelligent computing networks. These carriers plan to offer basic private lines to sectors like finance, scientific research, automotive, and education, while also introducing new services such as computing power leasing, elastic private line services, and sensitive data training to increase their revenue.

With the advent of the intelligent era, how can carriers capitalize on the emerging opportunities presented by AI to drive new business growth? First, carriers must leverage "AI for Network" to enhance user experience and boost service revenue. Second, they need to harness "Network for AI" to unlock new business opportunities and stimulate fresh revenue streams. AI WAN is a pioneering solution that fully addresses these two requirements, setting a precedent in its implementation. Net5.5G represents the most significant evolutionary step forward for data communication networks and is leveraging AI to propel high-quality development in the communications sector. In this intelligent era, we believe that the communications industry remains poised for sustained business success.

