

Topic 2

Vigorously Serving the Smart Winter Olympics

The year 2021 is a decisive year for the preparation of the Winter Olympics. As the sole official telecommunication services partner of the Beijing 2022 Olympics and Paralympic Winter Games, China Unicom adhered to the ideology of “Green Olympic Games, Sharing Olympic Games, Open Olympic Games and Honest Olympic Games” and earnestly implemented the requirements of “simplicity, safety and excellence” into its Winter Olympics communication services, so as to achieve zero fault in networks support, zero complaint in event services, zero infection in personnel, and zero negative public opinion related to the Olympics, contributing China Unicom’s wisdom and strength to the high-profile Olympic Games.



Supporting the Olympic Games with smart networks and hyper speeds

China Unicom strived to build safe, reliable and future-oriented premium networks with right architecture, comprehensive functions and advanced technology, covering various scenarios such as competition venues, non-competition venues, service facilities, and traffic trunk lines. China Unicom's premium networks served as an advanced digital base for a high-tech Winter Olympics, leveraging new technologies such as 5G, "IPv6+" and WiFi 6.

- The Company successfully completed the support for a series of testing activities under the theme of "Meet in Beijing" and conducted communication system testing as extensively as possible, which was highly recognised by various organising committees.
- The Company built the world's leading intelligent comprehensive digital information infrastructure in 87 Winter Olympics venues across three regions in Beijing and Zhangjiakou, Hebei, creating a Winter Olympics "information channel".

 <p>First-time full 5G coverage at Olympics venues and built gigabit venues with "the highest speed and maximum capacity in the history of the Olympic Games".</p>	 <p>Applied for the first time "IPv6+" next-generation Internet technology and the WiFi 6 next-generation wireless access technologies at the Olympic Games.</p>	 <p>The Broadcast Contribution Network (BCN) with the highest speed, the maximum bandwidth, the longest distance and the largest scale in the history of the Olympic Games, which greatly improved the efficiency and quality of broadcasting.</p>	 <p>For the first time 5G+AI+AR technology was applied in the Olympic Games, to provide fully digital operational support that combined virtuality and reality.</p>	 <p>For the first time, an Optical Cross Connect platform (OXC) was deployed at the Olympic Games to offer 5G wireless fixed voice service, and replace integrated cabling with 5G networks, effectively implementing the concept of Green Winter Olympics.</p>	 <p>For the first time permanent timing and scoring cables were laid in the Olympic Games to avoid duplicate investment.</p>
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Serving the Olympic Games with smart applications and an extensive range of products and services

China Unicom fully leveraged new-generation communications technologies such as 5G, "IPv6+", cloud computing, Big Data and AI to perfectly integrate technology and sports, and helped the Beijing Winter Olympics to achieve a number of "global firsts" and "historical breakthroughs" in multiple fields such as "smart competition, smart spectating, and smart participation".

China Unicom 5G-Empowering Smart Winter Olympics

				
Smart spectating	Smart competition	Smart participation		
Bringing wonderful viewing experience to the public Providing new experiences such as high-definition live broadcast, bullet time and multi-angles live broadcast	New concept of digital intelligence and efficient coordination Built new applications such as smart command and dispatch, smart venues, Wo Zhihu and smart material management	Breaking through physical distance with innovative applications Creating new experience such as smart cloud broadcast, unmanned interview, intelligent Internet of Vehicles, remote first aid, etc.		

- On the Beijing-Zhangjiakou high-speed railway, the world's first high-speed railway with continuous 5G 200MHz bandwidth coverage, we jointly built the ultra-high-definition live broadcast studio of "5G + 4K + high-speed rail" for the first time, letting passengers enjoy the 5G + 4K Winter Olympics grand visual entertainment on high-speed trains.
- 5G cloud broadcast was used for the first time in the Olympic Games. New technologies such as "free perspective" and "bullet time" were applied to let audience freely choose the viewing perspectives and enjoy freeze-frame fantastic moments.
- Adopted 5G backhaul video broadcast signals in the Olympic Games for the first time, helping Olympic Broadcast Services (OBS) achieve the first 5G-based event broadcast in the history of the Olympic Games.
- For the first time in the history of the Olympics, the INFO-AV system realised full cloud production, editing and processing, so that registered reporters around the world could watch the live broadcast, on-demand broadcast or playback of the press conferences through the system.
- The first large-scale deployment of the digital automatic processing platform of "Big Data + AI + computing".

- Adopted the unmanned hybrid interview technology in the Olympic Games for the first time, which not only enabled real-time transmission and ensured the quality of interviews, but also met the requirements for pandemic prevention and control.
- The 5G public network intercom was used among all the Olympic stadiums in the three regions of Beijing and Zhangjiakou for the first time, improving the efficiency of event command and dispatch.
- Timely assistance was provided to skiers through 5G intelligent medical care in the Olympics for the first time, seeking to treat patients within the golden window.
- Level-4 unmanned shuttle bus, 5G unmanned torch transmission and other smart Internet of Vehicles services were provided at the Olympic Games for the first time, offering high-quality smart travel experience for the Beijing Winter Olympics.
- 5G-based smart pandemic prevention was provided for the first time at the Olympics. The Company independently developed a handheld smart pandemic prevention device called “WO Zhihu”, which improved the efficiency of event operation and management during the pandemic.



China Unicom built a 5G intelligent Internet of Vehicles system covering an area of over 1 million square meters in Shougang Park. Taking advantages of cutting-edge technologies such as 5G, MEC and BeiDou, it demonstrated intelligent operation of scenarios such as unmanned retail, driverless transport and precise delivery. The vehicles were running smoothly and could avoid obstructions in a timely manner in case of unexpected road conditions. In the Beijing Winter Olympics Village, the three core “green technologies” of “5G + perception + positioning” empowered innovative unmanned cleaning, helping to build a 5G + smart Winter Olympics Village.

Supporting the Olympic Games with smart technology and professional teams

Facing harsh natural environment such as extreme coldness, high mountain and strong wind, China Unicom insisted on network-wide coordination and overcame difficulties. Our headquarters, Beijing branch, Hebei branch, the five provinces around the Beijing Moat and the provincial branches where the international bureaus and satellite stations were located jointly contributed high-quality network service capabilities. We established a digital operation support system for the Winter Olympics network and a “1 + 5 + N” control system for the competitions, providing a full-system integrated support for the opening and closing ceremonies and various events of the Winter Olympics.

- During the Winter Olympics, a total of 257,000 personnel participated in communication support and 113,000 vehicles were dispatched across the country, successfully supporting 427 Winter Olympics events. Among which, more than 1,500 people worked in the support red line at Winter Olympics venues, more than 5,000 people directly participated in the major support initiatives of the Winter Olympics, and more than 30,000 people worked in network communication, network security, digitalisation and other support services.

- A “Digital Great Wall” for network and information security was built to provide a reliable digital protection for “Secure Winter Olympics”. Relying on cutting-edge technologies such as network security situational awareness, Big Data risk control and monitoring, artificial intelligence analysis, and automatic blocking, as well as an efficient and robust command and dispatch system, the Company ensured the secure operation of various Olympic network systems.

- According to the principle of “one venue, one policy”, 87 specialised plans were formulated, 49 large-scale drills were carried out in total, and all the Winter Olympics areas were protected by “double routing, double nodes and double power supplies”.

- We provided powerful and highly reliable network services which allowed on-site users to experience the ultimate network speed during the games, with the upload speed reaching 500Mbps, and the download speed reaching 1.5Gbps.



China Unicom Winter Olympics Telecommunication Technology Operation Command Centre (TTOC), the Intelligence Brain for Winter Olympics communication

On 4 February 2022, the Beijing 2022 Winter Olympics was grandly opened at the National Stadium. China Unicom provided 5G + 4K/8K ultra-high-definition live broadcasting to bring a wonderful opening ceremony visual experience to the public, and met the connectivity requirements of nearly 40,000 visitors and performers. In addition to the full-scenario mobile video live broadcasting, IPv6+ technology was applied to the Winter Olympics for the first time, providing a good connectivity environment with one-click activation and plug-and-play for the media. Xinhua News Agency and other media achieved real-time transmission of on-site photos and videos of the opening ceremony through 5G network slicing.



Provided reliable communication support for the opening ceremony of the Winter Olympics



The splendid moments of athletes from all over the world entering the stadium were transmitted through 5G high-definition video

With the highest standards, the strictest organization management, the most practical measures, the best services and the outstanding effects, China Unicom has been affirmed by the central leadership as for the all-out preparation and service support of the Winter Olympics. Thomas Bach, President of the International Olympic Committee, paid a visit to China Unicom's major support team and praised that "China Unicom's communication support team is a vibrant team. In addition, there were many breakthroughs in this Winter Olympics, especially the broadcasting and communication technology". Yiannis Exarchos, the Chief Executive Officer of Olympic Broadcasting Service, mentioned that "This may be the best broadcasting infrastructure that I have experienced in the history of the Winter Olympics". Athletes, reporters and staff from various countries also expressed high praise to China Unicom.

Igniting national passion for winter sports with a smart image

Adhering to the development strategy of "North Ice, South Exhibition, West Expansion and East Progress" of national winter sports, China Unicom took practical actions to help achieve the goal of "300 million people participating in winter sports". Through a series of activities such as the selection of "Winter Dream Ambassadors", the "Smart Winter Olympics China Tour", and the Winter Olympics franchise product business plan, the Company told the stories of the Winter Olympics and promoted the spirits of the Olympic Games, gathering the majestic power for the Winter Olympics. Focusing on the promotion themes of "China Unicom 5G Great Power", "China Unicom 5G Empowers Smart Winter Olympics" and "China Unicom Trusted by the Winter Olympics", the Company fully demonstrated its social responsibilities as a central state-owned enterprises and a pillar of the country, and promoted the core strength of central state-owned enterprises in technological innovation.

- During the period of the Winter Olympics, China Unicom was reported three times on News Broadcasts and 27 times on CCTV. It was also reported by several professional media, provincial and municipal local media and social media.
- The selection of China Unicom's "Winter Dream Ambassadors", which lasted for 4 years, has come to a perfect conclusion. A total of 2022 "Winter Dream Ambassadors" were recruited from more than 2,000 colleges and universities in 30 provinces across the country, and more than 2 million creative works were received, creating 17.4 billion views and nearly 300 million interactions, forming a wide social impact.
- We carried out a series of activities under the theme of "Smart Winter Olympics China Tour" to bring Olympic culture and winter sports experience to citizens in 16 cities including Beijing, Zhangjiakou, Shenyang, Taiyuan, Guangzhou and Haikou, so that the public can experience the passion and charm of winter sports.
- Taking advantages of China Unicom's nationwide online and offline channels, the Company sold franchised products for the Winter Olympics in hundreds of its business outlets in more than 300 cities in 31 provinces across the country, so that people from the Greater Khingan in Heilongjiang province, Sanya in Hainan province, Ngari in the Tibet Autonomous Region could buy the lovely "Bing Dwen Dwen" and "Shuey Rhon Rhon", letting them understand, experience and feel the Winter Olympics through China Unicom.



China Unicom "Winter Dream Ambassadors" campus activities



China Unicom "Smart Winter Olympics China Tour"