

Hardware breaks barriers and builds its own ecology

HarmonyOS, closer to the Internet of Everything

Reporter Tan Hanwen

On July 8, the number of users of the HarmonyOS 2 operating system that opened the upgrade channel for one month exceeded 30 million. According to Huawei's previously announced plan, it is expected that by the first half of 2022, there will be hundreds of models that can get new systems, even including old equipment that has been released for more than two years. This self-developed system that carries Huawei's vision for the Internet of Everything is gaining recognition from more consumers, and it is gradually turning good hopes into reality.

Create a new generation of operating system for the era of Internet of Everything

HarmonyOS is well known and started with a ban on Google. The inability to use Google Mobile Services (GMS) has greatly affected the overseas markets that Huawei has cultivated for many years.

"I heard that Huawei was banned from using Google services. I was struggling." Xiao Ren, a Chinese student studying for a master's degree in Singapore, expressed regret. "I have been using Huawei mobile phones for many years, and my loyal 'pollen' is undoubtedly, but as soon as the news came out, I was hesitant to buy a new Huawei phone."

For international students living overseas, many essential software must rely on Google services. Using a mobile phone that does not support Google services will greatly affect both their studies and life.

"Although Huawei itself has launched a similar service (HMS) to make up for it, after all, Google services are still the mainstream in foreign countries."

ries. Huawei's services still need time to develop. Just like in China, every one uses WeChat to contact. If you don't use WeChat, It is very possible to leave the society." Xiao Ren said.

Being controlled by others is not a long-term solution, the self-developed operating system HarmonyOS came into being. In 2018, Wang Chenglu, president of Huawei's consumer business software department and head of HarmonyOS operating system, expressed in a business report to Huawei founder and CEO Ren Zhengfei that the operating system is not in his own hands. Ren Zhengfei recognized the development of self-developed operating systems, Has accelerated the pace of HarmonyOS commercial. The story of "spare tires turning normal overnight" is boiling, and this is another breakthrough that is no longer "stuck".

How important is the self-developed operating system? Professor Guo Yao, deputy director of the Department of Computer Science and Technology of Peking University, said in an interview with our reporter that operating systems are the most important basic software in computer systems, and my country has relied on foreign products in this field for many years. "The self-developed operating system is not just a matter of independent control, but also the ability to develop operating systems at critical moments. By building the HarmonyOS operating system and ecosystem, it is important to have a strong team capable of independently developing operating systems. It goes without saying for the development of our country's computer and information industries."

Self-developed operating system has a long way to go, but at the time node where new technologies such as 5G, AI, and IoT are intertwined, Harmony Systems sees opportunities amidst the emergence of a large number of new smart hardware, unfinished technologies, and ununified paths.

HarmonyOS is not only for "replacement", but more importantly for the future. Xie Keqiang, a senior engineer at the data center of the Fifth Instit

ute of Electronics of the Ministry of Industry and Information Technology, told this reporter: "Without the support of the underlying operating system, it is difficult for Huawei Mobile Services (HMS) to break the monopoly of Google Mobile Services (GMS). Moreover, Huawei is developing new technologies. The system is not only for mobile phones, but for building the next generation of operating systems."

What is the shape of the next-generation operating system? The focus of the development of operating systems is shifting to wearable devices, smart homes, and automobile control systems in the Internet of Things, and will become the command center of various products and systems. At the same time, separate operating systems such as PCs, servers, and smart terminals are moving towards a cross-domain and cross-platform integrated operating system.

As Wang Chenglu said, HarmonyOS is on a completely different track from the current iOS and Android. It is a new generation operating system for the era of Internet of Everything.

Better serve the ubiquitous applications of the Internet of Everything

Where is HarmonyOS "Bull"? The most eye-catching feature is the "super terminal" function that seamlessly connects different hardware. It is the core new feature of HarmonyOS operating system, which provides a more convenient and intuitive entrance for the interconnection of different devices and saves many connection links.

"Before connecting to different devices, I needed to turn on the Bluetooth and Wi-Fi of each device, and then select, pair, and enter the pairing code. It was very troublesome. However, the 'Super Terminal' allowed me to just check the mobile phone control center. Pull the balls of the two devices together to establish a connection." Mr. Zhang, who lives in Beijing, is a "technologist". Everything in it is mirrored to the computer, and the comput

er can freely control the contents of the two devices. You can directly "drag and drop" files and photos from the mobile phone to the computer for processing without passing them back and forth. The work efficiency is much higher! "

In addition to existing mobile phones, tablets, computers, etc., in the future, it can also be interconnected with more devices that join the HarmonyOS ecosystem, such as TVs and household appliances. It is worth mentioning that this function is not just to use the portable device as a "remote control", but to realize the transfer of content and applications between different devices, make the best use of the material, and maximize the advantages of each hardware.

"Before, many interconnections were just that I could control other devices with my mobile phone. The system of HarmonyOS was more interoperable." Mr. Zhang said, "I can use the large screen in the living room to make video calls in the mobile phone, and use the computer keyboard to type in the mobile phone. Using the tablet as the second screen space of the computer, and after they communicate with each other, they can still maintain the original operation logic. The mouse, keyboard, and touch will not fight, and even free access to files across devices is absolutely incredible!"

"HarmonyOS is trying to use Huawei's '1+8+N' strategy to cover the entire industry chain. The smartphone business is limited, and IoT devices are particularly important. In addition, Huawei is working on products such as smart cars, routers, smart screens, and smart watches. Go out of a strategy that supports the coordination of different hardware." Guo Yao said.

HarmonyOS's interconnection allows the flexibility of mobile phones, tablet writing, computer productivity, and smart screen large screens to be fully utilized. It can be freely combined and used in the hands of users and shared resources without the need for cumbersome content transmission. The barrier is being broken.

In addition to the new features within reach of mass consumers, HarmonyOS also has its own uniqueness in the underlying architecture. Huawei defines it as "a full-scene distributed OS based on a microkernel."

"The micro-kernel architecture, on the one hand, can ensure the security of the kernel, and at the same time, it can open up hardware of different scales to use the same kernel." Guo Yao commented on the characteristics of the micro-kernel, "This is the current Android and iOS ecosystems have not been able to. Completely. According to reports, after adopting micro-kernel, HarmonyOS can improve the application performance in specific fields by several times, and to a certain extent it has overcome the weakness of traditional micro-kernel performance. Especially when the processor speed is fast enough. Today, operating systems should consider how to better serve the ubiquitous application scenarios of the Internet of Everything. Microkernels have unique advantages in this regard."

Build independent operating system technology and industrial strength

In the competition of operating systems, function and technology are only one aspect, and more importantly, the ecosystem built around the system platform.

Wang Chenglu said that the current difficulty in the development of the HarmonyOS system is the software ecosystem.

HarmonyOS has created an advanced "software city", and the prosperity of this city depends on the cooperation of developers "citizens" and an ecosystem built in collaboration with the entire city's infrastructure builders.

In this regard, Guo Yao said that the current feasible way for Harmony OS System is to build a virtuous cycle of operating system and application ecology based on Huawei's panoramic product family, including software and hardware suppliers, App developers, and end users.

Xie Keqiang also believes that the current operating system development has evolved from the competition of a single company, the competition of a single product, and the competition of pure technical architecture to the competition of the industrial ecosystem. "From the perspective of the development history of Android, iOS and other systems, the key to its success lies in building a complete ecosystem that can connect software developers, chip companies, terminal companies, and operators in the industrial chain as a platform."

"Whether it can develop a large number of applications and establish an application ecosystem is the key to success or failure. In a sense, it can be said that developers determine the number and quality of applications, and developers determine who is the winner of the operating system. Therefore, HarmonyOS system must pay special attention to cultivating developers. "Xie Keqiang further said.

And this is exactly what Huawei is doing. On July 16, Huawei released the HCIA-HarmonyOS certification, a professional certification exam for HarmonyOS system engineers, which aims to train HarmonyOS engineers with professional knowledge and skills. Developers are free to choose the direction of application development or device development. Passing the examination and certification proves that they have the abilities required by the relevant positions.

This provides standardized guidance for developers who are interested in building HarmonyOS system applications and equipment, and is of great significance to HarmonyOS's expansion of the developer team.

Xie Keqiang believes that Huawei can also launch a developer reward program to establish a developer community, through community sharing, creation, mutual assistance, and profitability, so that developers can generate stickiness and a sense of identity, and then introduce more developers.

Rome was not built in a day. To create an ecological ideal is lofty, and the road is long and difficult. If you want to go out of your own path surrounded by Android and iOS, with a market share of 16%, it is a "line of life and death" for HarmonyOS.

It is not easy to achieve this goal, but "everyone gathers firewood with high flames", and Huawei is not the only one standing behind HarmonyOS Ecosystem. This open ecosystem not only has the support of home appliance giants such as Midea and Haier, but also attracted upstream module suppliers such as Sichuan Ailian and Shanghai Qingke to enter the game, as well as the blessing of cutting-edge technology peers such as Jihu and Meizu.

Wang Chenglu said that the equipment equipped with the HarmonyOS system is expected to reach 300 million units this year.

The way hardware advancements gain user stickiness is gradually being replaced by the user experience brought by software applications. The success or failure of HarmonyOS is related to the success or failure of Huawei's transformation into a "software advanced company". Ren Zhengfei once said that, objectively speaking, Apple is a software company, while Huawei is essentially a hardware company. He has also mentioned many times that the urgency of building a software ecosystem will increase talent investment in software architecture, methods and tools.

In the era of digital ecology, software is unprecedentedly important. The operating system is the basic platform for carrying various information equipment and software applications, and its decisive role in the industrial development pattern is more prominent.

"The technological progress of domestic operating systems represented by HarmonyOS is of great significance to my country's construction of independent operating system technology and industrial strength, ensuring the security and stability of the information technology industry chain supply chain."

n, enhancing cyberspace competitiveness, and realizing the strategy of cyber power." Xie Keqiang said.

This is still an inexperienced task, but fortunately, we have turned things around at the end of the mountain more than once. Today, we are closer than ever to the goal of the Internet of Everything.