

What Does a 5G-Powered Era Look Like?

5G 主導的新時代將會如何？

Cisco Systems (HK) Limited

思科系統(香港)有限公司

5G technology and its mass adoption have started to thrive in 2020. The significant advantages of 5G, including high speed, low latency and super connectivity are set to refine networking, redefine user experience and rewrite people's interaction with data and content.

5G Global Adoption Facilitated by Cisco

5G is hitting the road with a significant presence. According to the latest Cisco Annual Internet Report, 5G is expected to cover over 10% of global mobile devices and connections with even higher concentrations in key markets by 2023. Global mobile devices will also reach 13.1 billion by 2023 with 1.4 billion being 5G capable. The average 5G speed will reach 575 Mbps, 13 times higher than current mobile connections. It is expected that by 2023, the top three 5G countries will be China (20.7%), Japan (20.6%) and the United Kingdom (19.6%).

With the advent of 5G technology, substantial impacts are expected across all business segments. Although the implications of the new connectivity may vary from industry to industry, a comprehensive 5G plan that includes employee coverage, policy, security and analytics is essential for every business to move forward in the world of 5G. Cisco has been driving developments and deployment of a growing number of 5G solutions.

Cisco's Vision and Plans in Embracing the 5G Era

The United Nations has projected that 68% of the world's population will be living in urban areas by 2050. In order to ensure that services and economic activities, provided for and initiated by governments and businesses, can scale to match the population growth, cities must get smart about where and how they process their data workloads.

As a technology leader, Cisco is committed to working with service provider partners and customers to utilize 5G capabilities to their fullest, bringing extraordinary value and unparalleled convenience to them and ultimately the entire community.

Cisco has three main visions in driving smart city development. These are smart utilities and services, smart crowd management systems, and smart roads supporting autonomous vehicles. Cisco believes a world-class smart city should be equipped with technologies and connectivity to monitor and respond to water, trash and energy usage in real time to reduce water waste and energy consumption, intelligent solutions to prevent public health outbreaks like COVID-19, and an Internet of Vehicles connecting autonomous vehicles, traffic lights, smart roads and signage to improve traffic flow and minimize road damage.

自 2020 年以來，5G 技術及其廣泛應用一直蓬勃發展。憑藉 5G 多項強大優勢，包括高速度，低延遲性以及強大連結，網絡效能有望進一步完善，並透過數據及內容加強互動，重新定義用戶體驗。

思科致力推動全球 5G 網絡技術應用

5G 技術正迅速發展，所擔當的角色亦愈趨重要。根據最新發布的思科年度互聯網報告，預料 5G 將於 2023 年前在多個主要市場支援逾 10% 的全球流動網絡裝置和連接，與此同時，全球流動裝置亦增至 131 億，而當中有 14 億更可支援 5G 技術。5G 的平均速度亦將提升至每秒 575 Mbps，較現時平均流動網絡連接速度快 13 倍。另外，報告又預測於 2023 年全球首三排名的 5G 國家分別為中國 (20.7%)、日本 (20.6%) 及英國 (19.6%)。

5G 技術的面世預料將對所有業務領域的企業帶來重大影響。儘管 5G 嶄新連接性對企業所造成的影響因行業而異，但一個全面的 5G 方案，當中包括員工覆蓋、政策、網絡保安以及分析功能，無疑是每間企業在 5G 世界蓬勃發展的關鍵。因此，思科一直致力推動開發及部署更多 5G 解決方案，協助企業應付未來挑戰。

思科推動 5G 新時代的願景及計劃

聯合國預計至 2050 年時，全球 68% 的人口將生活在城市區域內。為確保政府和企業提供及發起的服務及經濟活動能夠配合人口增長，城市必須充份了解在何地及如何處理數據工作負載。

思科作為科技業界領導者，一直致力與服務供應商及客戶合作，冀能充分發揮 5G 功能，為整個社會帶來非凡價值及無可比擬的便利。

在推動智慧城市發展上，思科三大主要願景分別為智能公用事業及服務，智能人群管理系統以至支援自動駕駛汽車的智能道路。思科相信，一個世界級的智慧城市應具備先進科技及強大連接性，從而實時監控及回應水資源，垃圾以至能源使用的情況，減少食水浪費及能源消耗；甚至提供智能解決方案，預防如 2019 冠狀病毒病一類的公眾健康問題爆發；而將自動駕駛汽車、交通信號燈、智能道路及路牌連接至車聯網，亦可改善交通流量，減低道路損壞。

And Cisco is already working hard to make these smart city visions come true. For example, the company's end-to-end portfolio of cloud-native core network functions, together with an IoT portfolio that includes industrial networking, cybersecurity, management, data and edge computing, offers comprehensive solutions to service providers for further applications and integration with other wireless and cellular access technologies in addressing current and future business needs.

思科正努力將以上智慧城市的願景一一實現，例如透過具備雲端原生核心網絡功能的端對端產品組合，連同涵蓋工業網絡、網絡保安、管理、數據及邊緣運算的物聯網產品組合，務求為服務供應商帶來更全面的解決方案，進一步應用並整合其他無線及蜂窩連接技術，應付當前及未來的業務需要。



A Growing Portfolio of Real-life 5G Use Cases

Cisco will place specific focus on codifying 5G use cases to demonstrate how 5G adoption helps make the community safer and more sustainable.

Cisco has provided solid support to business for deploying innovative 5G system architecture. In Japan, mobile network operator Rakuten Mobile Network (RMN) has partnered with Cisco to deliver their commercial services with an innovative 5G system architecture from scratch. RMN has also developed a completely new business model that is created in an innovative way, by applying cloud and automation techniques. This state-of-the-art architecture is set to disrupt the global telecom industry landscape. It is the world's first cloud-native network that is fully

5G 實際案例不斷增長

思科將重點整理 5G 的實際案例，展示 5G 應用如何令社區變得更安全及更具可持續性。

作為企業的强大支援，思科一直積極協助它們部署創新 5G 系統架構。在日本，思科與流動網絡營辦商樂天流動網絡 (RMN, Rakuten Mobile Network) 合作，建立創新 5G 系統架構的商業服務。樂天流動網絡透過運用雲端及自動化技術，以創新方法開發全新商業模式，其先進網絡架構勢將打破全球電訊業現行營商格局。此一全球首個從無線接入網絡 (RAN) 至核心均完全虛擬化的雲端原生網絡，具備網絡及服務端到端自動化功能，令樂天流動網絡可提供更廣泛的服務配套，包括消費者流動服務、窄頻物聯網 (NB-IoT)、無線固網 (Fixed Wireless)、萬物互聯、豐富式媒體

virtualized from RAN to core with end-to-end automation for both network and services, allowing RMN to offer a broad suite of services that includes consumer mobile, NB-IoT, fixed wireless, connected everything, rich media, and low latency services such as AR and VR. Customers of these services will benefit from the unique mobile edge computing infrastructure which provides users with a differentiated experience.

The new 5G architecture presents service providers with a portfolio for the new and innovative use cases that can generate new revenue and investment opportunities. To better manage the increasing 5G traffic, KT Corp, Korea's largest telecommunication service provider, has transitioned its network architecture with advanced routing and automation software, intelligent analytics and machine learning, with Cisco's technologies. The new 5G mobile network platform includes automated and virtualized technologies on Mobile Edge Cloud, featuring Mobile Packet Core, network slicing, segment routing and control, and user plane separation (Remote-CUPS) which enable KT to remotely manage its traffic at scale. The distributed data centers use a Cisco Network Convergence System Router 6000 and ACI on the Nexus 9000 switching platform as the 5G routing backbone, addressing the need for new and innovative B2B and B2C 5G services.

Apart from the change in IT related industries, 5G technology is also transforming the way people farm and fish. Cisco is actively carrying out 5G tests on farming, for instance, launching a connected cow test in southwest England. A herd of 180 cows is fitted with 5G collars and ear tags to help farmers monitor the cows' health and automate the milking process. The 5G collars can communicate with a robotic milking system through an ID check on a gate and hook the cows up to a robot for milking. With 5G technology, this helps these digital farms gain tighter control of operations and increase productivity with more predictable results.

5G technology will continue to create enormous business potential and revenue growth opportunities for organizations which are embracing it. Cisco is committed to providing service providers and customers of all sizes and from all industries with tailored solutions that can capitalize on 5G opportunities. Together, we will further utilize 5G technology, creating smarter cities and enriching our daily lives in new and exciting ways. ●

(rich media), 以至包括擴增實景 (AR) 及虛擬實景 (VR) 的低延遲服務。採用以上服務的客戶可從流動邊緣運算基建中獲取優勢，從而為其用戶帶來與別不同的使用體驗。

嶄新 5G 架構亦針對服務供應商的創新用戶案例帶來應用方案組合，創造更多收益及投資機會。為妥善管理日漸增長的 5G 流量，韓國最大的流動電話網絡供應商 KT Corp (KT) 利用思科最新科技，包括升級路由器、自動化軟件、智能分析及機器學習，優化網絡架構。全新 5G 流動網絡平台包括流動邊緣雲端上的自動化及虛擬技術，具有流動分組核心 (Mobile Packet Core)、網絡分段、網段路由和控制，以至遙距控制用戶介面分離 (Remote-CUPS)，令 KT 可進行大規模遙距流量管理。而分佈式數據中心則使用了思科 Network Convergence System 6000 系列路由器，以及利用思科 ACI 整合到思科 Nexus 9000 系列交換器平台作為 5G 路由的骨幹，滿足其對創新企業對企業 (B2B) 和企業對客戶 (B2C) 5G 服務的需求。

除了資訊科技業界的轉變外，5G 技術亦為農耕及捕魚方式進行轉型。思科正積極為農業應用 5G 技術進行測試，例如在英格蘭西南部將 5G 技術連接不同乳牛進行測試，合共有 180 頭乳牛獲安排配戴上 5G 智能頸圈及耳標，幫助農夫監控乳牛的健康狀況，並自動進行擠奶過程。5G 智能頸圈可將訊息傳送至機器化擠奶系統，認證測試乳牛，並將乳牛固定在適當位置，以進行擠奶工序。憑藉 5G 技術的幫助，這些智能化數碼農場可更嚴格地控制營運狀況，並利用結果預測提高生產效率。

5G 技術將持續為企業創造無可限量的業務潛力及收入增長機會。思科致力為各行各業不同規模大小的服務供應商及客戶，提供度身定造的解決方案，充分把握 5G 機遇。我們將進一步利用 5G 技術，創建更具智慧的城市，並進一步以嶄新的方式豐富我們的日常生活。 ●