

ERICSSON AND 5G 愛立信與 5G

Ericsson
愛立信

What will happen in the next five years?

Industries will be transformed by new capabilities brought on by 5G. Examples of these capabilities include:

1. The ability to download a full-length HD movie in seconds.
2. The quick reaction time (low latency) to enable remote surgery.
3. The ability to spin up virtual networks on-demand with network slicing.
4. Battery lifetimes beyond 10 years for remote cellular devices.

Ericsson 5G technology moves from test bed to field trial prototypes

5G has become the hottest topic in mobile, even though standards-based 5G networks will only be commercially available starting in 2020. Mobile operators around the world have already indicated that pre-standard, pre-commercial networks can be expected earlier in a number of markets.

As with past mobile generations, leading operators are keen to gain a first-mover advantage in 5G. Working with these operators, we're leading the development of new 5G technologies to ensure early success and enable rapid adoption of 5G-enabled applications. 5G will deliver better, faster mobile broadband for consumers, and enable video everywhere. But 5G will also connect new types of devices to drive new IoT, or Internet of Things, applications for everything from connected vehicles to immersive gaming experiences to remote surgery.

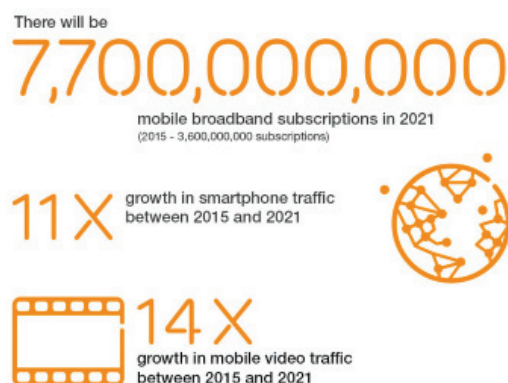
So, operator differentiation in 5G will not be based on lab trials but on what they are able to achieve in live network environments. Our 5G Radio Prototypes are the first products designed to enable operators to conduct live field trials in their own networks. With Ericsson 5G Radio Prototypes, operators move beyond the 5G hype of lab-based speed tests and gain a greater understanding of the potential for 5G in their own network environments and markets.

In fact, 5G Radio Prototypes have been developed as an evolution of Ericsson's award-winning 5G Radio Test Bed, which achieved a number of world's first technology milestones for both peak throughput and advanced integration in indoor and outdoor environments. Now, we've taken a key step along the path to commercialization with 5G Radio Prototypes developed to support operator field trials. On August 31, 2016 Ericsson

未來5年會發生什麼變化？

5G帶來的新功能將顛覆各個行業。這些能力包括：

1. 在數秒之間下載完整的高清電影
2. 快速回應（低延遲），實現遠端手術
3. 能夠透過網絡切片技術按需運轉虛擬網絡
4. 將遠程蜂窩裝置的電池使用壽命延長至10年以上



愛立信5G技術從測試床轉移到現網試驗原型

儘管基於標準的5G網絡要到2020年才會投入商用，但目前5G已成為流動通訊技術領域最熱門的話題。全球的流動網絡商紛紛表示，協調標準、協調商用5G網絡有望提前在一些市場上出現。

與過去幾代流動網絡問世的情況一樣，領先的網絡商熱衷於獲得5G的先發優勢。我們攜手這些網絡商客戶，引領新5G技術的發展，旨在保證5G應用儘早獲得成功，並快速普及。5G能夠為消費者提供更好、更快的流動寬頻，支援在任何地點觀賞視頻內容。此外，5G也能夠連接新型終端，推動新物聯網（IoT）應用不斷推陳出新，從互連汽車、沉浸式遊戲體驗，到遠程手術，層出不窮。

因此，網絡商在5G技術領域的競爭優勢不在於實驗室試驗，而是他們能夠在現網環境下實現什麼目標。我們的5G無線原型是第一批產品，旨在讓網絡商能夠在自己的網絡下執行實地現網試驗。通過愛立信5G無線原型，

announced the commercializing of the world's first 5G NR radio for massive MIMO, with the first deployments coming in 2017. Together with the Ericsson 5G Plug-Ins announced in June and Ericsson's already commercially available Radio System Baseband 5216, which currently powers Ericsson's award-winning Radio Test Bed, Ericsson is first to deliver all components of a 5G access network.

Of course, we have also been actively applying our 5G innovations to today's LTE networks, with new features such as Licensed Assisted Access (LAA), supporting the 5G technology concept of licensed-unlicensed spectrum band aggregation, and Lean Carrier, which employs 5G ultra-lean design concepts on today's LTE networks and smartphones.

5G technology will encompass an evolution of today's LTE technology and the addition of new radio access technologies, often in higher frequencies. Ericsson's new 5G radio access technology is referred to as NX. While 5G will impact the entire mobile network and associated eco-system, from devices to radio access, IP core and into the cloud, the Ericsson 5G Radio Test Bed and new 5G Radio Prototype innovations focus on the interactions between mobile devices (used by both people and things) and the radio access network, both indoors and outside.

Evolving to 5G

5G subscription uptake will commence in 2020 and is expected to be faster than for 4G. The development of 5G is being driven by new use cases that will impact both consumers and industries. New applications and use cases anticipated for 5G include safe, self-driving cars, remote controlled robots, haptic feedback-enabled drones and fixed wireless access - rivalling fiber capacity - for residential homes. As a result, mobile operators are today planning for their 5G future.

Number theories: what 100 operators really think about 5G?

The ICT industry has never seen anything like the journey to 5G. But what will 5G be used for, who will drive it and when will operators be ready? To learn more about operators' expectations, use cases and plans for 5G, Ericsson commissioned a detailed survey of 100 technology leaders from operators in North America, Europe, Asia Pacific, and Central and Latin America. Respondents included COOs, CTOs and CIOs, as well as heads of network operations, network innovation and network development.

Almost all (95 percent) of the respondents in the survey agreed that 5G supports the ongoing influx of connected devices and the Internet of Things (IoT). This is because 5G will increase network capacity, which will be required to handle the traffic generated

客戶不再局限於宣傳5G實驗室傳輸速度測試，而是對5G在自己網絡環境下和市場中的巨大潛力有了更深入的瞭解。

實際上，5G無線原型作為愛立信屢獲殊榮的5G無線測試床的進化成果已獲得了長足發展，在室內外環境的數據傳輸率和高級集成方面實現了多項具有里程碑意義的全球首次突破。現在，我們在商用道路上邁出了關鍵的一步，開發的5G無線原型可支援運營商進行實地測試。於2016年8月31日，愛立信公布率先交付5G NR無線系統，全球首創的大規模MIMO 5G NR基站預計將於2017年實現部署。



AIR 6468 is the first commercial NR radio. Ericsson is first to deliver all components of a 5G access network.

AIR 6468是首款商用NR基站。愛立信是全球率先提供5G接入網所有元件的設備供應商。

當然，我們也一直積極將5G創新應用到現有LTE網絡中，推出新功能例如Licensed Assisted Access (LAA)，它支援授權/非授權頻段聚合的5G技術概念，還有 Lean Carrier技術，這項技術在現有LTE網絡和智能電話上運用5G超簡設計概念。

5G技術包括現有LTE技術的進化，此外新增了無線接取技術，通常採用更高頻率。愛立信新的5G無線接取技術被稱為NX。雖然5G將影響整個流動網和相關的生態合作體系（從終端到無線接駁，從IP核心到雲端），但愛立信5G無線測試床和新的5G無線原型創新主要專注於流動裝置（人和物所使用的流動裝置）和室內外無線接駁網之間的交互。

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向5G進化

5G業務將在2020年啟動，普及速度有望超過4G。新實案例子對消費者和各行業將產生巨大影響，不斷推動5G的發展。預期的5G新應用和用例包括安全的無人駕駛汽車、遙控機械人、觸覺感知無人機，和適用於住宅使用的固定無線接駁（能夠與光纖網絡的容量相媲美）。因此，網絡商現正積極為自己的5G未來勾劃發展大計。

數位理論：100位網絡商對5G的真實看法

5G的未來發展對資訊及通訊科技產業是新的一頁。然而，5G將用於那些場景、由誰推動、網絡商何時準備就緒？為了瞭解更多業界對5G的期望、用例和部署，愛立信委託了調查公司，訪問了100位來自北美、歐洲、亞太地區、中美洲和拉丁美洲的電訊業翹楚，當中包括首席營運主管、科技總裁和首席資訊主管，以及網絡營運、網絡創新和網絡開發負責人。

by the expected 28 billion connected devices in 2021. In addition, 5G will decrease the energy requirements for devices, enabling battery life of up to 10 years in some cases. This will significantly reduce maintenance costs, making large IoT installations more practical and cost-effective.

Ninety-two percent of respondents agreed that 5G paves the way for the emergence of new technologies. One such example is haptic feedback, which brings the sense of touch to a user interface. This could enable someone controlling a remote robot, for example, to “feel” objects in the robot’s environment in real time in order to avoid collisions. The near-zero latency of 5G enables the quick reaction times that make this possible. Haptic feedback will enable new use cases such as remote surgery, and it will greatly improve the safety and effectiveness of remote robot or drone operation.

A very large majority of respondents (86 percent) believed that 5G enables a wider range of services than any network has done before, and 86 percent also believed that 5G will enable new disruptive business models and technology in industries.

To capture the full value of 5G, operators around the world are aggressively pursuing 5G rollout plans – even before standards are finalized – to keep up with demand for low latency, higher performance, capacity, density and security.

Together we make 5G a reality.

幾乎所有（95%）受訪者認為，5G能夠支援互連裝置和物聯網（IoT）的持續高速增長。這是因為，5G能夠增加網絡容量，要處理2021年280億互連裝置所產生的巨大流量，就需要對網絡進行擴容。此外，5G能夠減少裝置的電能需求，在某些情況下能夠使電池使用壽命延長至10年。這將顯著降低維護成本，使大型物聯網設備更加實用、性價比更高。

92%的受訪者認為，5G為新技術的湧現鋪路。一個例子就是觸感回饋技術（haptic feedback），觸感的目標是為了提升使用者介面，能夠讓控制遠端機械人的一方即時感覺到機器人觸及的物件，避免發生碰撞。5G接近零延遲的優點支援高速反應，實現上述例子。觸感回饋技術將實現更多用例，如遠端手術，並將大大提高遠程機械人或無人機操作的安全性和有效性。

大多數（86%）受訪者認為，5G支援的服務範圍遠遠超過了過往的任何網絡，此外，86%的受訪者還認為5G將為各行業實現全新的顛覆性商業模式和技術。

為了充分實現5G的價值，世界各地的營運商在最終標準落實之前，都在積極探索和制定5G部署方案，以滿足使用者對低延遲、高性能、大容量、高密度和高安全性的需求。

讓我們攜手實現5G願景。