

EXECUTIVE BRIEF

# OPPORTUNITIES AND THREATS OF 5G ON IT

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THIS EXECUTIVE BRIEF IS A SUMMARY OF THE REPORT BY 451 RESEARCH:

## The Coming Revolution: 5G and Its Impact on IT

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### INTRODUCTION

- The 5G mobile network project is an ambitious global and industry wide initiative to define the next generation of mobile networks, supported by telecom operators, equipment providers and governments. Considerable uncertainty about the rollout of 5G and its overall impact persists, driven by the boldness of its vision, level of investment required and potential rival technologies.
- 451 Research's Foresight report on 5G is intended to be useful to technology business manager and investors working both within and outside the mobile sector.

### IMPORTANT DATA

- The goals of the 5G initiative are; 1000 times more data volume, low latency with a five-fold reduction in data transfer time with speed increased by a factor of 10 to 100. With 5G there will be a 10 to 100 times increase in devices in a given area, an increase of device battery life by a factor of 10 and decrease in core network consumption by 90%.

### KEY POINTS

- For 5G goals to be achieved, network architecture and design will require fundamental change and this, in turn, will require rethinking of IT investment and strategy.
- 5G is unlike previous generations of mobile technology (2G, 3G or 4G) as it is intended to support converged communications and computing across public networks, which will allow information and computing power to be instantaneously available.
- 5G is an enabling technology for the IoT, massively increasing and optimizing M2M traffic. This should result in economic benefits that propels IoT growth.
- IoT using 5G connectivity will pass beyond measuring and sensing to automation. The projected doubling of M2M connections over cellular to 700 million between 2015 and 2018 will be further boosted with 5G which will enable new IoT use cases.
- IoT & 5G will stimulate innovation creating new opportunities for suppliers. An example is ultra long battery life - needed for more reliable, cheaper IoT devices, or new protocols for event-driven, low-latency transmission that 5G requires.
- The momentum behind 5G depends who you are talking to. For many governments the sense of urgency is palpable, whereas many mobile operators are less keen on obsoleting recent 4G networks before 2025.
- Currently, governments, mobile equipment developers and mobile operators are pushing the 5G agenda with projected rollout dates ranging from 2018 to 2022.
- Competitive threats to mobile operators include non-licensed network operators and cloud service providers delivering services over public IP networks (OTT providers). Big OTT providers have already started to serve dense or lucrative markets by providing their own fiber backbone or Wi-Fi type mobile connectivity using unlicensed spectrum.



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## CHALLENGES

- Whilst worldwide network traffic is projected to increase 100 fold by 2020 and 5G is expected to play its part, major innovation is required in order to meet a 90% reduction in energy consumption of networks & devices, a goal of the 5G network project.
- The 5G goal of sub-1ms latency will be difficult to achieve and there is debate on the necessity for it considering human physical and mental limitations. However low latency is a requirement for such devices as fully autonomous vehicles.
- 5G, particularly as it involves huge amounts of video traffic, will require more radio spectrum. This will be acquired by licensing new high end frequencies or integrating 5G into the lower unlicensed frequencies. Furthermore 5G will require more antenna services and this will impact the cost of its rollout.
- The move to 5G may not be as clear and untangled as the hype suggests, nor is it without competition. For example, LTE-Advanced is an existing technology that may meet the criteria for a critical mass of 5G requirements. Mobile operators are keen to protect existing network investments.
- 5G specifications demand a generational change in mobile communication devices. Miniaturization, better power management, changes in protocols, frequencies and air interfaces will be required.

## INDUSTRY IMPACT

- In the media and entertainment vertical, 5G will be able to provide immersive realities mixed with live experience to tens of thousands of people on a temporary basis in 'smart stadiums'.
- In the healthcare vertical, 5G will enable advanced data transfer from wearables and sensors, facilitating remote clinical decisions and robotic surgery.
- 5G connectivity will transform transportation. Increasingly vehicles will have autonomous features, requiring ultra reliable M2M infrastructure, with very low end-to-end latency, seamless data roaming handoffs & full road network coverage with 100% reliability.
- 5G connectivity will be a catalyst to driverless vehicles within a 7-year time horizon.
- 5G will bring virtual reality into the classroom, allowing students to face real-life situations without real-life consequences.
- 5G's high capacity communications network is at the heart of a 'smart city', populated by digital citizens in continual interaction with their surroundings, their peers and public services. Communications & computing power come together enabling a hyperconnected 'Internet of everything' world.
- New applications and services will be made possible by 5G, enabling the 'digitization of everything'.
- 5G, as part of IoT, will accelerate the development of always-on, always-sharing, cloud applications and services. For application developers the benefits of 5G may indeed be revolutionary - speed of response, availability of data, access to analytics - all immeasurably enhanced.

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**INDUSTRY IMPACT** (cont.)

- 5G will be disruptive in core networks forcing a shift toward virtualized and software-defined communications networks, development of lower-latency applications requiring greater use of distributed functions and control of energy consumption.
- 451 Research predicts that 5G's impact on non-IT, physical devices produced by manufacturers will be very significant & disruptive. The collective ability of IoT, 4G and 5G to enable ubiquitous, low-cost remote monitoring represents a major step into the physical world.
- 451 Research sees a strong likelihood that 5G's need for low latency will stimulate strong demand for urban datacenters.
- The disruptive impact of 5G on data analytics and management may be very significant, driving innovation as new opportunities for big data analytics evolve with IoT expansion.
- 451 Research predicts that 5G will disrupt wireless networks very significantly, driving innovation, opening opportunities and re-aligning businesses.

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**NEW INSIGHT**

- 451 Research expects that 5G will not support Wi-Fi-like service operation, but rather be tied to a traditional subscription based mobile services model.

**TAKEAWAYS**

- 5G is seen by some as simply just an improvement in speed, efficiency and bandwidth over 4G and LTE. By others it is predicted to be more importantly a revolutionary change in convergence of computing and IT, the final stage in integrating packet-based networks and the start of a process leading to seamless and ubiquitous information control.
- Innovation is key to 5G success - both from the paid-for licence spectrum operators and those investing in unlicensed bands (eg IoT applications). In fact 5G could help bring these otherwise divided parties closer together as the combination of IoT and 5G reach into each other's areas.
- Although enterprise organizations are currently more focused on IoT than 5G, the role 5G plays will hinge on the ingenuity of enterprises, services providers & operators.
- 5G will act as a catalyst for innovation and help drive demand in IT. However uncertainty still surrounds key technologies required for 5G and although momentum and support for 5G is and will be strong, implementation will be patchy.
- Unless energy efficiency is addressed, 5G will falter. It is an economic and technical necessity otherwise the cost of running 5G networks will be prohibitive and limited battery life will adversely impact innovation.
- If the value proposition of 5G is locked to a tightly coordinated, licenced spectrum, equipment providers and operators will realize a sizeable market opportunity. The converse of this may also be true.
- 5G is at the core of next-generation IT but it will not happen overnight. Think in terms of a decade or more for it to fully unfold.
- 451 Research recommend that most IT and IoT players need to engage with 5G in the 2016 to 2017 time frame.

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