



The 5G Hype vs Reality

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The 5G hype

Mobile World Congress '18 drew to a close a few weeks back with many participants drunk on the 5G hype. The question is, how bad will the hangover be and is there a hangover cure?

It was hard to find a stand that did not have "5G" printed on it, and for the big three (Ericsson, Nokia, Huawei) it was the dominant theme. Looking back, we seem to get new iterations of "Gs" coming faster than ever. For all of the '90s we were happy with 2G; it was not until after 2003 that we saw 3G being widely deployed. 3G was probably not what it was all professed to be but when 4G came along to significantly boost bandwidth, it made it possible for us to stream videos in high definition on our smartphones and tablets. Even so, most people do not have 4G consistently, or at all, and both 3G as well as still 2G are the predominant carriers of most mobile phone traffic today. This means that operators are still investing heavily in rolling out 4G, while 3G and 2G are slowly tapering off in usage (several 2G networks already turned off and most will be gone by 2025).

Our scepticism to 5G, what it will be and when it will come, is born out of a few realisations:

- Not all 5G standards are finalised yet and there is still a huge debate about it being a revolution or an evolution. Some of the final key standards should be set this year.
- There seems to be a lack of clear use cases that will significantly change the way we currently use mobile services and are willing to pay for them. Increased bandwidth is not the answer because operators give it away almost for free, so why invest in CapEx to only give more bandwidth away? This concern has recently been voiced by several large operators.
- CapEx fatigue is occurring among mobile operators because they are still busy investing in the roll out of 4G infrastructure and maintaining 2G and 3G networks.
- 5G is operationally complex. It will be a much denser network in comparison with 2G, 3G and 4G. Governments will need to allocate much more spectrum and sort out access to street assets to facilitate the efficient addition of masts and antennas more quickly at much lower costs than prior standards. Furthermore, operators will need to hire and train tens of thousands of new staff to get the networks installed.

Although we see the standardisation moving forwards to bring 5G in place over the coming years, getting it implemented, tuned and working will take years longer as the technology "pushes the laws of physics".

The predominant use case being touted is more bandwidth to enable new use cases. This is already something of an Achilles heel for the mobile operators as they are trying to cope with a "data deluge" stemming from an exponential increase in use of video streaming over 3G and 4G by their customers. Many other 5G use cases like autonomous cars, will only become feasible when a full roll out has taken place as you can't afford to have holes in your network coverage.

Mobile operators are currently challenging the large equipment vendors over which use cases 5G can be profitable and, so far, they are not impressed or convinced by the answers.

One idea that is being pushed is a fixed wireless solution involving one or several antennas covering a nearby building (residential or business), giving users much more bandwidth. But hold on a second! Isn't this what WiMax promised and failed to deliver? Regardless, a fixed wireless solution could make sense because mobile operators will be able to be very selective of where they roll out new networks, and test whether they can get returns on their investments.

Since analogue mobile technology back in the '80s, radio spectrum has been a scarcity and often a goldmine for governments when sold off. Current spectrum allocations are highly utilised, and with 5G, new spectrums are needed. This will bring us into less palatable spectrums like the millimetre bands that can carry huge amounts of data but struggle to reliably pass through a leafy tree, let alone a concrete wall, with sufficient signal to noise levels. This will lead to a highly dense network and estimates have been made that London alone will need 500,000 antennas! This leads us onto another set of challenges: operators are currently spending a lot of time and resources (both people and money) to gain access to land, buildings and street furniture in order to put up a limited number of more antennas. Unless there are dramatic changes in planning laws, rolling out these dense 5G networks will be very costly and time consuming and, in the best case, take decades.

When Rajeev Suri, CEO at Nokia, described China/USA to be in a race with other geographies to launch 5G in his speech at MWC, we questioned what type of race he meant - a sprint or a marathon? For Nokia it is a race to get to the next mobile operator investment cycle as they have recently seen stagnations in their growth. With all the challenges ahead for 5G, being a "first mover" might be of less importance than being a "fast follower"; it may pay off to capitalize on others' mistakes in order to achieve a more efficient, smoother roll out addressing established and profitable use cases.

As large equipment vendors are putting most, if not all, of their eggs into the 5G basket, they may overlook new and innovative ideas. The new standards are designed to enable commoditisation of end-to-end solutions to facilitate disintegrated white box strategies, and established vendors will be very vulnerable to more creative vendors gaining traction and eating the 5G cake. Who might those companies be? Well, companies like Mavenir and Affirmed Network with a SW first strategy could be seen as up and coming, but many more are getting ready in the background. The challengers are already making substantial inroads and growing rapidly. Others will continue to emerge to make the big three look like dinosaurs; extinction might not be far away if they cannot adapt.

5G will happen but many uncertainties exist. The winners will be those who can come up with innovations to utilize the underlying technology advancements that 5G brings to delight consumers and make money for the mobile operators. The first ones could be companies in the fixed wireless area. Other winners will be those who can take the opportunity to fundamentally lower the cost structure of the mobile operators by utilizing technologies to move away from expensive proprietary hardware and implement SDN solutions running on off the shelf x86 hardware.

Watch this space for many success stories and potentially incumbent failures. Fasten your seatbelts – it will be a long and bumpy ride.

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Selected Up and Coming 5G Companies

Companies	Founded	Country	Stage	Description
Affirmed Networks	2010	US	Growth	Provider of virtualized network services designed to reduce complexity and accelerate time-to-market of new services
AirHop Communications	2007	US	Growth	Developer of self-organizing-network solutions for dynamic resource optimization and QoS/QoE management of heterogeneous wireless networks
Athonet	2005	Italy	Mature	Developer of a transportable networking platform. The company helps in the creation of a data traffic network for smart grids
Blu Wireless	2009	UK	Startup	Pioneers of intelligent, agile, mmWave products, Blu Wireless Technology enables accessible, multi-Gbit communications
Blue Danube	2006	US	Mature	Provider of mobile wireless access services designed to increase network capacity and enhance quality of service
CCS	2010	UK	Growth	Self-organising 5G microwavw backhaul. Delivers high capacity, ultra-low latency and ultra-fast deployment
CellWize	2013	Israel	Growth	Developer of cellular network optimization technologies designed to provide innovative SON services for wireless operators
Core Network Dynamics	2013	Germany	Startup	The company operates within the industries of network management software, other communications and networking, and connectivity products
Mavenir (Acq. By Xura 2017)	2005	US	Mature	The company provides services such as Voice-over-Long-Term Evolution ("VoLTE"), Voice-over-WiFi ("VoWiFi"), video, Rich Communication Services ("RCS"), messaging, radio access and packet core solutions
Mimosa	2012	US	Growth	Provider of broadband wireless communication services designed to deliver 5G Fixed wireless connection
Movandi	2016	US	Growth	The company's wireless network technology are providing 5G and other multi-gigabit networks, by providing cost effective, scalable, integrated RF, antenna technology and systems to meet the demand for high frequency, millimeter wave performance, enabling clients to unlock the the potential of high frequency wireless communications, opening numerous new market opportunities and applications
PeerApp	2004	US	Growth	Provider of intelligent media caching services designed to enhance the network of the users
Phluido	2014	US	Startup	The company employs Radio-as-a-Service technologies to design and develop cloud based cellular networks and network infrastructure
Saguna Networks	2008	Israel	Growth	The company's mobile software delivers web content directly from the mobile network edge straight to subscribers, accelerates application and content delivery time and reduces peak hour traffic loads over the mobile core, enabling mobile operators to deploy new revenue generating services for content delivery, Internet-of-things, retail and enterprise applications
Taoglas	2013	Ireland	Growth	Provider of internet of things (IoT) and machine to machine (M2M) antenna products. The company's internet of things (IoT) and machine to machine (M2M) antenna products include a comprehensive range of embedded and base station antenna for M2M applications such as telematics, automotive, smart-grid, metering, telemetry, home automation, remote monitoring and medical applications, enabling industries achieve the enhanced possible performance from the wireless devices.
Vasona Networks	2010	US	Growth	Provider of network transformation services designed to collaborate with mobile network operators to overcome network challenges and deliver a better subscriber experience
Zeetta Networks	2015	UK	Startup	Transforms one's network into an interactive programmable platform for better control, improved efficiency and enhanced performance

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