



SMALL CELL FORUM

Solving the HetNet puzzle



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SCF: Lighting the path to 5G

The 5G Panel at MWC 2017

At Mobile World Congress 2017, SCF hosted a panel featuring Huawei, Ericsson, AT&T and Sprint to discuss the industry change required for the smooth rollout of hyperdense networks. This report includes a round-up of the debate and coverage of all the 5G-focussed announcements from the event.

smallcellforum.org



Small Cell Forum's 5G Panel strips away the hype



"The road to 5G will follow a different course for each operator; but it will always run through small cells."



This year's Mobile World Congress in Barcelona was full of 5G. Discussion, debate, demonstrations, all mixed in with a dose of hype and scepticism. Fascinating, but also bewildering, and often it was hard to relate the 5G excitement to real business plans.

That was where Small Cell Forum's 5G Panel, held on the second afternoon of the show, came in. The aim was to bring the 5G conversations firmly down to earth, stripping out both the hype and the scepticism in order to focus on achievable realities.

Everyone in the mobile market needs to understand how 5G will impact their business, whether they aim to deploy the next generation radios before 2020, or wait for many years. In either case, planning needs to start now to ensure that 4G enhancements such as densification can lead smoothly to future 5G.

5G cannot be a rip-and-replace upgrade this time – it must be a continuation of current 4G HetNet and densification programs, and must be triggered by a strong business case, not a technology roadmap. The Forum's work helps to enable this commercially driven migration by laying foundation stones now, and keeping interfaces and upgrade paths fully open for future technologies.

Small cells underpin three major areas of mobile operator activity – densification to enhance LTE performance and capacity; more effective enterprise business models; and defining the roadmap to 5G. These three were top of the agenda for this year's 108,000-strong MWC audience. A week of non-stop conversations and debates about the road to 5G has informed Small Cell Forum's priorities for 2017 and ensured that, at MWC 2018, there will be significant progress to report.

The panel in detail: getting to the heart of 5G migration issues

The centrepiece of Small Cell Forum's activities at Mobile World Congress 2017 was the 5G Panel, which provided the audience with a wide range of insights and viewpoints about the road to next generation networks. In particular, the panellists debated the role of small cells in 5G itself, but also in a migration path which operators can start to implement right now, to deliver immediate commercial results.

The packed audience was treated to inputs from two of the largest US operators, AT&T and Sprint, whose representatives discussed their very different approaches to small cells, densification and 5G migration. And they also heard about the technical and commercial issues of 5G from the two biggest mobile network vendors, Ericsson and Huawei.

Senior executives from all four companies shared their experiences and views, providing a detailed and real world picture of how current deployments of small cells and dense HetNets will lay the foundations for 5G futures whilst easing the pain of moving to a new generation of networks.

There was broad agreement on some issues, such as the need for the small cell sector to work with a wide range of standards and industry bodies. 5G will not just be about the 3GPP radio specs, but will involve open source initiatives like Facebook Telecom Infra Project, and standards work on application programming interfaces, security and the cloud.

In other areas, panellists had different perspectives. An important one was the timing of 5G small cells. AT&T is one of the operators driving an accelerated schedule for initial standards and trials, but Sprint is more focused on densifying its current LTE network rather than moving quickly to new high frequency bands. These decisions depend on the spectrum available to the operator. Mark Lipford of Sprint spoke of their advantage in having a large swathe in the 2.5GHz band, while all the panellists were cautiously interested in the potential of shared or unlicensed airwaves such as the 3.5GHz CBRS spectrum in the US.



The panel in detail: getting to the heart of 5G migration issues **continued**

A 4G evolution

There was also broad consensus that 5G will not be a clean break, but will be introduced alongside continuing 4G evolution to support specific new use cases, some of them not yet fully understood. Hyperdensity to support virtual reality; analytics powered by AI; and mobile edge applications which bring the network close to the user were all name-checked, and all rely on small cells.

Ericsson and Huawei are both involved in tests and trials which examine these type of use cases, as well as others in the Internet of Things and connected vehicles spaces. Both companies acknowledge the challenge of striking a balance between enhancing LTE and introducing 5G, and believe that a unified small cell platform, encompassing multiple bands and air interfaces, will be key to a smooth coexistence.

Real world concerns

Despite all the buzz around applications like driverless cars, the audience questions tended to be more pragmatic, reflecting the real world concerns of most operators. In particular, the panellists were asked to comment on how site and rollout processes for urban small cells can be simplified. Standardized approvals for small cells and better communications with stakeholders such as cities and landlords were highlighted, along with the potential for multi-operator networks in some scenarios.

Panel conclusion

The overall conclusion from the panel? Small cells provide a way to get more out of the 4G network and to build a bridge to new levels of density and edge-based services in 5G. The timing of that move, and the balance between 4G and 5G, will be an individual choice for each operator, depending on its business priorities.

“A united small cell platform, encompassing multiple bands and air interfaces, will be key to a smooth coexistence.”



The four critical success factors for 5G

Unified global standards

It is essential that a globally harmonized 5G standard should be developed under the framework of 3GPP. Standardization is critical for a healthy eco-system in which a wide variety of vendors and solutions can compete. This leads to economies of scale and enables the convenience of global roaming for users. In the 5G era, we will need unified standards not only across different countries and regions, but also across different industries. Standards fragmentation will damage confidence in 5G technologies, especially among vertical industries.

Globally harmonized spectrum

Harmonized spectrum is the key to accelerating the pace of the 5G industry towards maturity and economies of scale. But there are more challenges than in previous generations. Unlike 2G/3G and 4G, 5G will not focus only on sub-6GHz bands, but also extend to centimeter and millimeter wave spectrum. Following decisions at WRC-15 (World Radio Conference 2015), the C-band (3400-4200MHz) has already been identified as mobile broadband spectrum by nearly all regions and countries. In mmWave, we still need to work together to identify one or two globally harmonized bands.

Technical innovation

5G will expand the boundaries of mobile communications by embracing vertical industries and boosting their efficiency. However, compared with the mobile internet services sector, vertical industries have far more varied requirements. But the long-tailed nature of the enterprise and industrial market means that it will not be economical to develop different networks to suit each sector. Instead, an important aspect of the 5G business case will be the use of network slicing to adapt a single, virtualized network to the requirements of different verticals on a flexible basis. Network slicing will enable the transformation from a connectivity economy to a platform economy.

Cross industry collaborations

5G has the capability to serve a larger number of industries than previous generations, connecting not only people but also things. This expansion of the service scope for mobile networks will enrich the telecom network ecosystem. A number of traditional industries, such as automotive, healthcare, energy and municipal systems are participating in the construction of that new, broad ecosystem. This close cooperation is essential for cross industry adoption and success for 5G.

Find out more: huawei.com



5G for the networked society

5G is the foundation for realizing the full potential of the networked society, enabling organizations to move into new markets and build new revenue streams with completely new business models and use cases, including Internet of Things (IoT) applications.

The new capabilities of 5G span several dimensions, including tremendous flexibility, lower energy requirements, greater capacity, bandwidth, security, reliability and data rates, as well as lower latency and device costs.

The first generation mobile network (1G) was all about voice. 2G was about voice + texting. 3G was about voice + texting + data. 4G was everything in 3G but faster, and built to support and address video demand. 5G will be something totally different. Like the transitions to 2G and 3G, the move to 5G will add a new element: the industrial internet. And like the transition to 4G, it will be much higher performance than the previous generation. It will be fast enough to download a full-length HD movie in seconds. In terms of latency, a self-driving car with 4G would take about 4.6 feet (1.4 meters) to apply its brakes, but it would be just an inch (2.5 cm) for a car with 5G to do so, helping avoid collisions and accidents. (Source: CTIA).

“In a recent survey of C-level executives from a variety of industries, 87% of respondents agreed that “Next generation mobile networks [5G] will be a real game-changer for us.”

Greater capacity will allow more devices on the network, and lower energy requirements will enable battery life 10x what we see today – both are critical for the growth of IoT. And with speeds that are faster than fiber, 5G will be used for fixed wireless broadband for the “last mile” connection to the home. (Source: AT&T.) But 5G is much more than high performance. With 5G, we’ll see more secure transactions and virtual networks on-demand – based on network slicing. All this will create opportunities for new use cases that we haven’t yet dreamed of, new markets, and radically new business models.

5G architectures will reflect diverse needs for latency and coverage and will support multiple business needs using network slicing and virtual network functions. Small cell network architectures will be of utmost importance as 5G is expected to start in high frequencies, leading to smaller cells and potential challenges for indoor coverage. Like the networks of today, 5G small cells will also create a huge demand in site acquisition, infrastructure and transport. For that reason, it’s crucial to consider how to integrate 5G small cells in the network, including strong plans on network evolution, virtualization and architecture going forward. From a timeline perspective, it is certain that 5G will co-exist with LTE in the early phases of 5G rollouts, and some operators will opt to deploy 5G only for hot spots, while using LTE as the blanket coverage. Others will go for full 5G coverage right away. Whatever the strategy, Ericsson is committed to enabling our operator customers to deliver the highest performing networks, today and into tomorrow.

MWC 2017 news round up: small cells take centre stage

5G played a central role at Mobile World Congress 2017. Here are some of the show's most interesting announcements related to 5G and small cells.

- On the eve of MWC, a collection of operators and vendors announced the 5G NR Acceleration initiative. This could bring certified 5G radios to the commercial market in early 2019 by fast-tracking a subset of the specs, known as 5G NR non-standalone (because it still requires an LTE anchor network). The launch group includes 16 tier one operators and six large vendors, including Intel, Qualcomm, Huawei, Ericsson, LG and ZTE.
- Verizon has been pursuing its own route to early 5G deployment, developing its own radio technology in partnership with a group of large vendors. These specs will be adapted to comply with the standards when they are finalized. Verizon updated MWC about its planned trials in 28GHz and 39GHz. These high frequency bands were the subject of intense interest at MWC and while they are initially being tested for fixed wireless applications, their medium term potential is to support hyperdense zones of small cells, because of their short range and high capacity.
- But for 4G now, and early 5G migration, there was greater focus on other new sources of spectrum capacity, such as 5GHz for LTE-LAA and the 3.5GHz airwaves. Both these relatively high frequency bands are well suited to small cells, and there were announcements from many vendors, including ip.access, Spidercloud, Ruckus and others.
- New site options to ease deployment of large numbers of small cells were a strong theme. Ericsson installed cells around the venue using its new Lightpole Site Slim solution, which combines its small cell with Philips Lighting's LED lights. JC Decaux and Spanish TowerCo Cellnex showed off deployments on bus stops, while Kathrein was demonstrating its small cell embedded under a manhole in the pavement.
- Huawei also showcased a variety of small cell approaches, including its AtomCell BTS3912E, an outdoor small cell for mounting on street poles; and its latest LampSite 3.0 offering, which is designed to integrate easily with urban buildings and supports 1Gbps data rates and multi-operator network sharing.
- Multi-operator and neutral host models were hotly discussed and many see them as essential to accelerate the pace of small cell deployment. ip.access was majoring on its SUMO multi-operator technology, with three new access points for enterprise and rural users.

“Operators are keen to explore the economics of migration, the use cases and the practical steps to deployment”



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MWC 2017 news round up: small cells take centre stage **continued**

- CommScope's OneCell, ip.access's Viper and Baicell's new OpenRAN were all examples of distributed or virtualized small cell architectures, which were prominent in Barcelona. These provided a real example of how operators can adopt new architectures now, often to address enterprise or hyperdense scenarios, and then use them as a springboard for 5G when the time is right.
- One of the solutions which epitomized how operators are already combining different key trends to enhance their small cell economics – well ahead of 5G – was seen at Corning. The DAS vendor teamed up with Cloud-RAN specialist Altiostar to produce a system which can support multiple LTE operators now and be compatible with 5G radios. Altiostar provided the virtualized baseband unit and ethernet fronthaul, which connected to Corning's DAS head end.

These highlights provide a flavor of the many announcements, centered on 5G and small cells, which caught our eye in Barcelona this year. They are just some examples of the far bigger story which dominated the event – that of a dense, self-optimizing HetNet, which is emerging now using current technologies, and is evolving, by way of virtualization and other changes, towards 5G.





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SCF Cannes Plenary

27-29 March 2017

Deploying hyperdense HetNets and enabling the digitized enterprise

Make your voice heard as we tackle the business and technology enablers on the path to 5G.

Technology and 5G

- nFAPI and virtualization
- MEC & FOG
- Hyperdense HetNet Architecture
- Security Task Force

Marketing

- Accessing healthcare, hospitality and property markets
- Connectivity and public policy advocacy
- Guiding operators to 5G

Interoperability

- Private EPC Plugfest
- HetNet and SON Plugfest

Operational

- Enterprise deployment
- MEC-NFV impact on operations
- 5G x-haul requirements
- GSMA-SCF regulatory alignment
- Hyperdense operations

Business Principles

- Ownership models for hospitality and property
- IoT use cases for small cells
- Value-added services
- Light/unlicensed spectrum

Plus

- Enterprise Task Force Workshop
- Agreeing Release themes and deliverables for 2017
- GSMA and OMA partner alignment
- Networking with your customers and suppliers

Find out more: smallcellforum.org

