



SMALL CELL FORUM CHAMPIONS

Commercializing the mobile edge

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Small Cell Forum held our first major open event, **Small Cells Champions' Day**, in Rome, September 2015. One aspect of this well attended and lively event was celebration – highlighting the success stories in our maturing industry and congratulating the innovators and operators that are driving growth.



Champions' Day also looked forward to our new work program that will take small cell HetNets to the next level of commercial scale.

This means tracking and addressing the evolving requirements of those operators which are starting to make the leap to large scale deployment. Six of those areas have been identified, based on feedback from the Forum's operator members, and now form the topics of six work items, on which the SCF Working Groups will focus their energies going forward:

- Enterprise small cells
- License-Exempt spectrum
- HetNet and SON (self-organizing/optimizing networks)
- Virtualization of small cells
- Multi-Operator / neutral host support
- The role of small cells in 5G, IOT and M2M



Each work item is being championed by an operator and a vendor member, who are responsible for driving a coherent set of activities across the Working Groups. Their goal is to ensure joined up approach to the different facets of the challenge: market needs, commercial imperative, enabling technologies as well as operational and regulatory aspects.

This document outlines the scope of each of the work items. If you have something to contribute, we'll be progressing each work item at our next Plenary in Dallas, November 2015.

If you're not in the room, you're leaving the big decisions to your competitors.

Alan Law
Chair, Small Cell Forum



HetNet and SON

CHAMPIONS: David Orloff, AT&T;

Martin Ljungberg, Ericsson; Joe Thorne, Airhop

“Small Cell Forum has an important role in driving a solution, setting recommendations which could be adopted by the whole industry and creating harmonized multi-vendor systems.”

Small Cell Forum's overall objective with regard to HetNet is to build on the lessons of successful pioneer deployments to enable operators to be able to deploy small cells alongside macro networks, DAS, Wi-Fi and so on – with sufficiently low effort and cost that the business case is made automatically. In that endeavor, SON is a critical enabler.

But HetNet and SON solutions are fragmented between vendors and are evolving rapidly. The Forum has an important role to drive solutions, set recommendations which could be adopted by the whole industry and create harmonized multi-vendor systems while addressing HetNet challenges like interference management, scale, traffic management and untrusted backhaul. This will be essential to the business case.

Small Cell Forum already has a body of work on the very varied use cases for HetNet and SON. These will be an important foundation for further tasks which have been recommended to the Working Groups and which cover a wide range of areas from architecture to deployment to radio and SON functionality in HetNet. HetNet drivers, barriers and business case will be the focus of the next release in May 2016, but in advance of that, there will be work to update papers and add new ones (for instance, on cost comparison between small cells/SON and DAS). SON Plugfests have already started and in the services group, there is work on Wi-Fi/HetNet integration for the Services API.

OPERATOR CHAMPION



VENDOR CHAMPIONS



Enterprise

CHAMPIONS: Benoit Graves, Orange;
Art King, SpiderCloud; Ray Williamson, Huawei

“Some of the most significant business benefits for the operator derive from improved indoor cellular coverage and capacity.”

Many sources* indicate that the enterprise will be the sector in which small cells will see the highest growth in 2015-16. Important enablers like multimode (3G + LTE) support are maturing and the need for improved capacity and coverage is becoming important in many types of enterprise, from office buildings to stadiums to retail malls.

Some of the most significant business benefits for the operator derive from improved indoor cellular coverage and capacity. These drive a more strategic and profitable relationship with the enterprise customer, by supporting better QoS and new added-value services and revenues in areas like PBX connectivity, location-aware services, connected ‘things’, and full private mobile radio services. At the same time, the indoor small cells offload the ‘hard to serve’ users from the operator’s outdoor network, which then behaves more efficiently. The key challenges which still remain were identified as total cost of ownership, including availability of low cost backhaul; awareness among sales channels and enterprises themselves; Multi-Operator or neutral host models (which have their own work item); scalability; integration with cellular and Wi-Fi; and interoperability.

A comprehensive work plan now aims to address all these issues. Where possible this will draw on work already completed within the Forum, particularly on the Enterprise Release, but there will also be new work to refresh or complement those resources. For example, useful additional documents are planned to include vertical market deployment focus briefings; renewed examinations of xDSL and FTTx backhaul options; addition of emerging spectrum combinations and 5 GHz LTE to the Wi-Fi/cellular document.

There will also be lessons to learn from the wider industry, such as comparing the small cell model with that of enterprise WLAN. Best practice examples will be increasingly important as real world roll-outs mount up, particularly around examples of large-scale implementations. The end result should be a broader set of enterprise resources reflecting the experiences of early adopters and extending the current documents to emphasize the latest TCO issues, vertical markets, Multi-Operator issues and Wi-Fi integration.

OPERATOR CHAMPION



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* ABI Research 'Enterprise and Consumer Small Cells Research', April 2015

Rethink Technology Research 'Critical Trends in the new RAN 2014-2020', September 2015

Mobile Experts, 'Small Cells Market Status', June 2015

Virtualization of small cells

CHAMPIONS: SHI Xiaohui, China Mobile;
Mark Grayson, Cisco; Neil Piercy, ip.access.

“Small Cell Forum is already examining Virtualization models which deliver key benefits over a baseline distributed RAN approach.”

Virtualization and NFV are affecting all service provider segments and network types, and there are specific areas of relevance to small cells where the Small Cell Forum will take a driving role. The Forum began work on Virtualization in 2014, examining the role of Virtualization in the core network which was issued as part of its Release Five: Rural & Remote and publishing the results of its study into small cell Virtualization in Release 5.1.

It is already examining Virtualization models which deliver key benefits over a baseline distributed RAN approach, and the work item will look to enhance this architecture further, taking account of important capabilities like elastic operations (allowing the functions to be scaled up or down as required). In turn, that will support new flexible deployment models, like network-as-a-service or per-cell licensing, which can lower the barriers to large-scale small cell roll-out.

A cornerstone of the Forum’s effort will be the work item to evolve the definition of the nFAPI interoperable interface for virtual small cells. This will define the central/remote MAC/PHY split which earlier analysis had concluded supports the most efficient balance between centralized and distributed architectures.

Other important roles will include evangelizing small cell Virtualization; launching Plugfests; working on proof of concept demos of various splits, including co-operation with ETSI; identifying MANO (management and orchestration) aspects; understanding Multi-Operator and, eventually, 5G implications.

OPERATOR CHAMPION



VENDOR CHAMPIONS



License-Exempt

CHAMPIONS: Alan Law, Vodafone;
Caleb Banke, Qualcomm

“The benefits to cellular operators are clear: the chance to tap into a plentiful quantity of free spectrum to supplement their LTE capacity, while managing the user experience and QoS from the licensed-band anchor network.”

This has become a very important issue for the small cells community with the advent of LTE implementations for License-Exempt bands, mainly 5 GHz (LTE-Unlicensed, LTE-LAA and LTE-LWA). Because of its power limitations, 5 GHz is viewed as a small cell band and so the Forum has an important input to make to the emerging standards.

The benefits to cellular operators are clear – the chance to tap into a plentiful quantity of free spectrum to supplement their LTE capacity, while managing the user experience and QoS from the licensed-band anchor network. Many operators believe 5 GHz LTE will be a better option than Wi-Fi to support network efficiency and strong QoS in dense small cell environments. Others are looking to LTE-LWA to leverage already deployed Wi-Fi infrastructure by tightly integrating it with the LTE access network.

Some key issues to address include co-existence aspects; and interworking with the licensed-band macro or small cell network. There were presentations in Rome outlining how all the LTE options have been designed to co-exist harmoniously with Wi-Fi, but it was also acknowledged that there was more to be achieved in terms of real world testing, and also to change some perceptions in the market. The overall goal of this work item is to “develop SCF consensus positioning around the different ways to leverage License-Exempt spectrum”.

The work item has a long list of initial tasks. These range from marketing activities – positioning small cell and voice solutions alongside Wi-Fi, for instance – to technical ones, such as ensuring that FAPI/nFAPI supports LAA/LWA. The deployment Working Group will be examining the practical aspects of including 5 GHz LTE in small cell plans, while there will also be work on interoperability, within the Plugfest roadmap. The Forum’s partnership with the Wireless Broadband Alliance will be valuable in this work item.

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Multi-Operator support

CHAMPIONS: James Body, Truphone;
Nick Johnson, ip.access

“The Champions will be encouraging work group activities focused on the business model, as well as developments in technology, regulation & spectrum, standards bodies and deployment case studies.”

This work item has a stated mission – to “make licensed radio small cells the preferred solution for vertical market, Multi-Operator solutions”.

The challenge is that Wi-Fi has become the default technology for Multi-Operator support even though there are LTE capabilities to enable sharing of small cell infrastructure. Operators need to be convinced of the business case, and especially that they will not just be “enabling their competitors”.

Therefore the Champions will be encouraging Working Group activities focused on the business model, as well as developments in technology (DAS, MOCN, MORAN etc.), regulation and spectrum (e.g. shared access), standards bodies (e.g. 3GPP RAN sharing enhancements), and deployment case studies.

Specific ideas include documents on market drivers and business case, to add to work already included in the Release programs, and specifically addressing the question of ‘opening doors to competitors’. Alcatel-Lucent and NEC are leading a project on challenges and blockers to Multi-Operator. It will also be important to liaise with other relevant bodies including the 3GPP and, within Europe’s 5G PPP agenda, Project Sesame.

OPERATOR CHAMPION

truphone

VENDOR CHAMPION

ip||access

The role of small cells in 5G, IoT and M2M

CHAMPIONS: Tareq Amin, Reliance Jio;

Ray Williamson, Huawei

“Small Cell Forum has a strong interest in helping to shape 5G discussions as they will rely heavily on small cells. This work item has the challenge of defining where the Forum can contribute specifically to topics which at this early stage are very broad.”

There is currently no real clarity on what 5G standards will look like, but there is consensus on a few aspects – that ever-smaller cells will be central, and that it will only be accepted by operators if it supports brand new business cases and revenues. Many envisage a dense, flexible platform, capable of supporting a wide variety of services from high bandwidth video to ultra-low power M2M services. A network like that could support a ‘long tail’ of large numbers of specialized applications, which would make it highly suitable to the diversity of the Internet of Things.

Small Cell Forum has a strong interest in helping to shape 5G discussions around these topics, since this long tail approach will rely heavily on small cells. This work item has the challenge of defining where the Small Cell Forum can contribute specifically to topics which, at this early stage, are very broad and sometimes vague.

There are two key aspects of the 5G process, where the Forum has existing experience of defining operator requirements and platforms. One is ultra-density, where the groups will continue and evolve work in areas like Virtualization, automation, backhaul/fronthaul and HetNet. The other is the emergence of fully service-oriented networks, which are so flexible that thousands of different services may be launched simply and dynamically using open APIs.

Small Cell Forum has already put its stake in the ground with a paper outlining the value it can bring to the 5G process, and it has important co-operations with ETSI, NGMN, 5G PPP, GSMA and other bodies. It also recently submitted its ideas to the 3GPP’s meeting to kick off its own 5G standardization process. This work item will take those valuable starting points forward and ensure that, by driving the operators’ views through the Forum Working Groups, there will be a flow of ideas and contributions as 5G and the IoT evolve in parallel – and that these remain grounded in real world carrier requirements.

OPERATOR CHAMPION



VENDOR CHAMPION

