Small Cell SIG

'Is small-cell thinking changing the face of remote and rural coverage?'

29th June 2017
Hosted by Microsoft Research

This SIG is championed by David Chambers of **Think SmallCell**, Simon Fletcher of **Real Wireless**, Neil Piercy of **ip.access** and Simon Saunders of **Google**

Venue: Microsoft Research Ltd, 21 Station Rd, Cambridge CB1 2FB

AGENDA	
12:30	Registration and networking with lunch
13:30	Introduction to Small Cell SIG from **Bob Driver, CW**
13:40	Welcome from event host, **Bozidar Radunovic, Researcher, Microsoft Research**
13:50	**'Leveraging the public cloud to provide affordable wireless connectivity'** **Bozidar Radunovic, Researcher, Microsoft Research** Affordable internet connectivity is still a big challenge. Less than half of the world population has access to the internet. Even in developed countries such as the US and the UK, more than 15% of the population does not have broadband connection at home. A large part of the problem is that in some cases the network infrastructure is too expensive for big telcos to address all the needs at an affordable price. Recent popularity of dynamic spectrum access has opened up an opportunity for small telcos and community groups to serve some of these needs through wireless access. In some cases, such as CBRS, this means leveraging LTE cellular technology. However, even when spectrum is available, building a cellular network requires considerable expertise and expensive appliances. Today, we will discuss what it takes to create an affordable cellular core network as a service in a public cloud and the technical challenges of the current core architecture. We will also present a novel architecture that addresses these challenges and requires only minimal modifications to the existing small cells.
14:00	Q&A
14:05	**Session chaired by SIG Champion, Neil Piercy, ip.access** **'Self-installed small cells for rural communities - Nokia Kuha solution'** **Enrico Nigra Gattinotta, GS Solution Architect – UK, NOKIA** This session will look at rural and remote communities' connectivity challenges and solutions. Enrico will present the Nokia proposal to a sustainable community-based network to close the gap between the availability of new mobile technologies and services in urban areas and their availability in the rural-remote ones.
14:25	Q&A
14:30	**Session chaired by SIG Champion, Neil Piercy, ip.access** **'Rural Small Cells – Really Making a Difference'** **Neil Winrow, Director, Product Management, Programmes & Projects, ip.access** • An insight from the TUCAN3G project, which studied both the technical and socio-economic elements of introducing telephony and data services in isolated rural areas of developing countries (Peru) – based on small cells for access network, and a combination of WiLD, WiMAX and VSAT for backhaul • The impact those services made on the communities they served, how new business models and regulation stimulate change, and what could be replicated in other regions in the world • Beyond TUCAN3G - What we learned, and how we would do things differently today
14:50	Q&A
14:55	**Refreshments and networking**

Session chaired by SIG Champion, Simon Fletcher, Real Wireless

15:15 **'Connecting the unconnected – a qualitative analysis of using small cells to extend coverage in rural and remote locations'**

Julie Bradford, Wireless Expert, Real Wireless

In many rural and remote locations worldwide, the high cost of traditional macrocells outweighs the small subscriber numbers they extend service too. The lower cost and more rapid deployment of small cells compared with macrocells promise to provide a better cost per subscriber and positive business case in rural areas. However, does this map to how populations are distributed in reality? This talk will review the business drivers for rural small cells and include an analysis of providing coverage to real population distributions worldwide and the potential extension to coverage that small cells could bring.

15:35 Q&A

Session chaired by SIG Champion, Simon Fletcher, Real Wireless

15:40 **'Small-Cell on an Aerial Platform'**

Ayan Ghosh, "Droneman", EE

Ayan's presentation will focus on EE-BT's innovation on enhancing coverage using small cell on aerial platforms - drones and Helikite. The various use cases of small-cell aerial platforms will be shared along with the latest developments on this front.

16:00 Q&A

16:05 Panel session with all speakers chaired by **David Chambers, ThinkSmallCell**

16:40 **Event closes**

With the permission of the speakers, presentations will be loaded to the CW website on the day following the event

Profile of organisers

Cambridge Wireless (CW)

CW is the leading international community for companies involved in the research, development and application of wireless and mobile, internet, semiconductor and software technologies. With over 400 members from major network operators and device manufacturers to innovative start-ups and universities, CW stimulates debate and collaboration, harnesses and shares knowledge, and helps to build connections between academia and industry. CW's 19 Special Interest Groups (SIGs) provide its members with a dynamic forum where they can network with their peers, track the latest technology trends and business developments and position their organisations in key market sectors. CW also organises major conferences and start-up competitions along with other high-quality industry networking events and dinners. With headquarters at the heart of Cambridge, UK, CW partners with other international industry clusters and organisations to extend its reach and remain at the forefront of global developments and business opportunities. **www.cambridgewireless.co.uk**

Profile of host

Microsoft Research, Cambridge

Since its founding in 1991, Microsoft Research has grown into one of the largest and most respected software research organisations in the world. Today, more than 1000 of the brightest scientists and engineers in computer science work across multiple research areas, in labs spanning four continents, with a mission to advance the state of the art in computing through a combination of basic and applied research.

As part of the Microsoft AI and Research Group, Microsoft Research is working to deliver more personal and intelligent computing experiences to people and organisations worldwide.

From a beginning of just three researchers in 1997, to over 130 researchers today, Microsoft Research Cambridge has established itself as a highly credible academic partner and flowing pipeline of technology transfers to the Microsoft business www.microsoft.com/**research**

David Chambers, ThinkSmallCell

David Chambers is Founder and Senior Analyst at ThinkSmallCell.com, an independent website which has tracked the evolution of small cells from their early femtocell origins. With both an engineering and marketing background, and a career spanning product management and marketing for several large telecom vendors, he has gained insight and experience by meeting with mobile operators worldwide. Well known throughout the small cell industry, David writes articles, white papers and presents at conferences on all aspects of the subject. Based in a firm belief that the only technical solution to meet strong data demand is rapid deployment of large numbers of small cells, David continues to be a strong advocate of their adoption whilst pointing out their technical and commercial constraints.
www.thinksmallcell.com

Simon Fletcher, Real Wireless

Simon joined Real Wireless in January 2016 as Chief Technology Officer, taking overall technical responsibility across the company. Recognised as a regular speaker at industry events and currently acting as chairman of the CW Future of Wireless Conference Organising Committee and Small Cell SIG Champion, Simon brings an enviable network of contacts to Real Wireless alongside a proven ability to lead teams in delivering technical projects while identifying and meeting new strategic goals for the wider business. His long-standing association with the UK innovation eco-system as a director of mVCE and the Innovate-UK ICT-KTN brings a wealth of knowledge on the application of strategic research through open innovation to accelerate product and services delivery. In recent times his focus has been on future cities, the application 5G and IoT in industry verticals with an event horizon towards 2030.Simon spent the past 20 years working in the design and development of technical telecoms infrastructure. Beginning his career in technology demonstrators at Racal Radar Defence Systems, he moved to Telecoms Modus in 1999 to play a key role in the development of 3G products and in 2006 he established a core architecture team that helped develop the first-generation of technology for 4G systems culminating in a Steering Board position in the LTE SAE Trials Initiative (LSTI), a global forum with a mission to assure the early adoption of LTE. His long participation in Common Public Radio Interface (CPRI) defining early C-RAN concepts brings great foresight on an important architectural element of emerging 5G architectures. **www.realwireless.biz**

Neil Piercy, ip.access

Neil has been developing base stations for various communications systems for over 25 years, during which time he has performed roles throughout the whole development lifecycle as well as management roles. He joined ip.access as a small cell System Architect when the company was in its infancy in 2000, and has since designed GSM, UMTS and LTE small cell RAN equipment and systems. His specialist areas include security and networking, as well as a focus on all aspects of protocol design and implementation, and on system performance and simulation. Now as Head of Research he is responsible for ip.access future products and technologies. He is an active member of the Small Cell Forum, a Champion for their work on the Virtualisation of small cells. He is currently a representative for the EU project SESAME on the 5GPPP Architecture group. **www.ipaccess.com**

Simon Saunders, Google

Simon is a specialist in the technology of wireless communications, with a technical and commercial background derived from senior appointments in both industry (including Philips and Motorola) and academia (University of Surrey). He is an adjunct professor at Trinity College Dublin and Access Technology Principal at Google. As co-founder and Director of Technology for independent wireless strategy advisory firm Real Wireless, he was responsible for overall technical capability and direction, providing independent wireless expertise and advice to operators, regulators, technology and law firms and wireless users. Customers included Ofcom, Cisco, European Commission, Virgin Media, TalkTalk, Inmarsat and many others. He is an author of over 150 articles, books and book chapters. He has acted as a consultant to companies including BAA, BBC, O2, Ofcom, BT, ntl, Mitsubishi and British Land and was CTO of Red-M and CEO of Cellular Design Services Ltd and has acted as an expert witness in legal proceedings in England and the US. Simon speaks and chairs a wide range of international conferences and training courses and has invented over 15 patented wireless technologies. Particular expertise includes in-building wireless systems, radiowave propagation prediction, smart antenna design and mobile system analysis. He has served on technical advisory boards of several companies, was Visiting Professor to the University of Surrey, member of the industrial advisory board at University College London, founding chairman of Small Cell Forum (formerly Femto Forum), which he chaired from 2007-12 and a member of the Ofcom Spectrum Advisory Board from 2007-14.
www.google.co.uk

Julie Bradford, Real Wireless @real_wireless
At Real Wireless Julie has been involved in multiple studies looking at trade-offs between cost, capacity and performance in cellular networks. These have included studies for Small Cell Forum and iDirect examining the business drivers for rural and remote small cells. She has also led work with Cisco understanding co-existence between LAA and Wi-Fi and supporting 3GPP contributions in this area. Currently she is working to understand the new business models that 5G may bring and quantifying the economic benefits of 5G as part of the EC 5G NORMA programme. **www.realwireless.biz**

Enrico Nigra Gattinotta, NOKIA @EnricoNigra
Enrico Nigra designs and develops innovative solutions to extend the mobile connectivity, including new end-to-end networks deployment models. Enrico joined Nokia in 1999 and over the years has held several technical and commercial roles, from mobile network service and solutions management to mobile devices product marketing. Currently represents Nokia in the Scottish Innovation Partnership, an open collaborative framework to which companies or individuals can contribute, by creating or participating in innovative projects to enhance the lives of local communities through innovation in communications technology. **www.nokia.co.uk**

Ayan Ghosh, EE @Droneman_Ghoshy
Ayan has worked in the telecoms industry since 2001 for companies like Motorola, Nokia, EE and BT. After completing his BEng degree in IT and Masters in Computer Science from UMIST, Ayan rolled out the first WiMax network in the country. Working under Prof Dr Simon Saunders, Ayan was involved in designing wireless communication systems in some of the most iconic stadiums, shopping centers and public buildings in the country including Wembley, Ascot & Heathrow. Ayan was also involved in leading international cross-functional teams within Motorola and Nokia to provide support on 3G and 4G products. Thereafter Ayan was involved in designing and testing EE's 4G Multiband LTE and 3G Femtocell rollouts. Recently Ayan designed and developed EE's patent awaiting Airmast solution using small-cell for which he received the Small Cell World Forum Award. When he is not busy designing networks, Ayan plays cricket for Painswick Cricket Club in the Gloucestershire League and rides his motorbikes in the Cotswolds. **www.ee.co.uk**

Bozidar Radunovic, Microsoft Research
Bozidar Radunovic is a Researcher in NExT groups at Microsoft Research, Cambridge. His research interests are in design and evaluation of computer systems and algorithms with particular interest in wireless access. Bozidar received his PhD in technical sciences in 2005 from EPFL, Switzerland. In 2006 he spent one year as a post-doc researcher at TREC, at ENS Paris and then joined Microsoft Research. He published over 40 research papers in peer reviewed conferences and journals, filed 20 patent applications, and is an active member of ACM and IEEE wireless networking research communities. In 2008 he was awarded IEEE William R. Bennett Prize Paper Award in the Field of Communications Systems. **www.microsoft.com/en-us/research/lab/microsoft-research-cambridge**

Neil Winrow, ip.access
Neil joined ip.access in January 2009, having previously worked at Ericsson, TTPCom and Motorola. Within ip.access, Neil has performed various management roles covering internal product development and external partner programmes including the residential small cell deployment with Cisco & AT&T. As Director of Product Management, Programmes & Projects he has responsibility for full product lifecycle delivery across the ip.access product portfolio. Neil has a BSc in Computing Mathematics from Sheffield Hallam University. **www.ipaccess.com**