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CW CAMBRIDGE WIRELESS

## Joint Radio Technology & Small Cell SIG
## '5G – A Practical Approach'
### 3rd February 2015
**Hosted by Deloitte and jointly sponsored by**
**Microlease and Keysight Technologies and Rohde & Schwarz**
This Joint SIG is championed by Radio SIG Champions, Brian Collins of **BSC Associates** and Diego Giancola of **PA Consulting Group** and Small Cell SIG Champions, Simon Fletcher of **NEC Telecom MODUS** and Zahid Ghadialy of **eXplanoTech**

### Venue: Deloitte, Stonecutter Court, 1 Stonecutter St, London, EC4A 4TR

## AGENDA

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| **12:00** | Registration and networking over lunch |
| **13:00** | Introduction to the Joint Radio & Small Cells SIG by **Brian Collins of BSC Associates** |
| **13:10** | **Session chaired by Brian Collins of BSC Associates**<br>**'5G: A 2020 Vision'**<br>**Zahid Ghadialy,** Technical Program Manager, **techUK**<br>This presentation will look at the motivation, timelines, architecture and most popular technologies that are being proposed for 5G. |
| **13:30** | Q&A |
| **13:35** | **'Bridging the gap between 5G vision and reality'**<br>**Moray Rumney,** Lead Technologist, **Keysight Technologies**<br>The 5G debate is very much underway and the expectations are diverse and challenging. This presentation will look at the factors limiting the performance of existing wireless networks with a view to identifying the most lucrative opportunities to transform end user experience. |
| **13:55** | Q&A |
| **14:00** | **'Millimeter wave – An excursion into a new RAT for 5G'**<br>**Alain Mourad,** Wireless Expert, **InterDigital Europe**<br>As the 5G requirements and timeline move closer towards a global consensus, a new Radio Access Technology (RAT) is emerging not as an alternative but rather as an addition to the 4G-based RAT and its evolution expected in 5G. This new RAT targets a "relatively" new spectrum (above 6 GHz) – also referred to as millimeter wave – where large contiguous bandwidth provides a leverage to deliver on the ultra-high throughput and ultra-low latency requirements. This talk will give an overview of the millimeter wave technology and the challenges ahead towards a successful development of 5G. |
| **14:20** | Q&A |
| **14:25** | Refreshments and networking |
| **15:05** | **Session chaired by Diego Giancola of PA Consulting**<br>**'5G Outlook, Test and Measurement Aspects'**<br>**Mark Bailey,** Application Development, **Rohde & Schwarz**<br>5G is coming, but will it be an evolutionary or a revolutionary step for wireless communications? The requirements for 5G may still be embryonic, yet consensus is emerging. This presentation will explore the Rohde & Schwarz view of what is driving the key requirements for 5G and present test solutions to support the associated technology concepts. |
| **15:25** | Q&A |
| **15:30** | **'5G: Building upon ongoing network disruption'**<br>**Jörgen Tränk,** Product Manager, **Tieto**<br>5G will significantly build upon the ongoing disruption on the way telecom networks are built. From Radio Access to NFV, SDN and Signalling, 5G pushes the whole ecosystem to rethink their product strategy in order to meet the myriad of possible use cases, requirements and business opportunities in a "flexible network" 5G world. This talk with cover Tieto's view on technology and product challenges lying ahead for delivering upon the 5G vision via enhanced Radio, NFV, SDN and Signalling solutions. |
| **15:50** | Q&A |

| **15:55** | **'Forward 2020 → 5G'** |
|---|---|
| | **Egon Schulz,** Director Wireless Innovation Centre, **Huawei** |
| | Visionary application scenarios such as Massive Machine Communication, Internet of Things, Device to Device Communication, Gigabit Wireless Connectivity and many more expected to play a dominant role for 5G mobile communication system. The presentation gives an overview about the driving force for 5G and challenges. |
| **16:15** | Q&A |
| **16:20** | **Panel session chaired by Simon Fletcher of NEC Telecom MODUS** |
| **17:00** | **Fill in Evaluation Forms & 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 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 the annual Future of Wireless International Conference and Discovering Start-ups competition 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. For more information, please visit www.**cambridgewireless**.co.uk

## Profile of host

### Deloitte, London

Deloitte provides audit, tax, consulting, and corporate finance services to public and private clients spanning multiple industries. The Global Technology, Media & Telecommunications Industry (TMT) group consists of the practices organised in the various member firms of Deloitte Touche Tohmatsu Limited (DTTL) and is dedicated to helping clients evaluate complex issues, develop fresh approaches to problems and implement practical solutions. For more information visit www.**deloitte.**com/uk

## Profile of sponsors

### Agilent Technologies

Agilent Technologies, the world's premier measurement company offers a full range of the latest wireless test equipment that spans the entire lifecycle from early design and development through to volume manufacturing, network deployment and service assurance. For more information, please visit www.**agilent**.co.uk

### Microlease

Microlease is the expert in Test Equipment Management. We have over 30 years of experience offering the best test equipment with a range of financing options. With over 4,000 instruments to choose from covering a range of manufacturers and industries, Microlease can help deliver your projects on time and on budget. Whether you need equipment for short or long periods, we can help you easily acquire what you need, when you need it, with options that are ideal for your situation. Our portfolio of services includes rental, leasing and finance, buying new or used equipment, calibration, asset management and auditing and even a programme to buy back your unused equipment. Microlease is also Agilent's Authorised Technology Partner in the UK, Ireland and Italy. Our strong partnership with Agilent gives you access to the best Agilent equipment supported by an unbeatable range of Microlease financial solutions. For more information please visit www.**microlease**.com

### Rohde & Schwarz UK

Rohde & Schwarz UK Ltd has been the UK subsidiary of Rohde & Schwarz GmBH for 40 years. Based in Fleet, RSUK employs 105 people to provide dedicated sales, services and support to customers across the UK and Ireland. Rohde & Schwarz has designed and manufactured the highest-quality specialist products in Germany for 77 years across a wide range of technologies and industries, including wireless, broadcast, aerospace, defence and security markets. For more information please visit www.**rohde-schwarz**.co.uk

### Zahid Ghadialy, techUK.

Zahid has been working in the mobile industry since the dawn of 3G. He worked with the team responsible for the first 3G network rollout in Japan and Europe. Since then he has worked with several established and small companies in different areas of technology as an engineer, programmer, researcher, architect, trainer, project manager, product manager and even in PR and marketing functions. During his career spanning over 15 years, he has worked with chipset and handset manufacturers, network equipment vendors, research companies, small cells and wi-fi companies, analyst firms and even consulting companies. As a Co-Founder, Managing Director and CTO of eXplanoTech, Zahid is using his immense experience to help this young company become well established and successful. Along with an expertise in programming and 3G / 4G technologies, he is nowadays working on futuristic ideas and technologies, including 5G. He is a regular speaker at many small and international conferences and events. His 3G4G blog (http://blog.3g4g.co.uk/) is one of the most well-known independent mobile technology blog worldwide. You can also follow him on twitter **@zahidtg.** For more information please visit http://www.**techuk**.org/

### Simon Fletcher, NEC Telecom MODUS

Simon leads development of emerging global market product strategies and portfolio alignment, including innovation programmes within the NEC Corporation group of companies. His primary system focus is infrastructure and network edge technologies. In CW he is a Small Cell SIG Champion. He has represented NEC in two global product oriented joint venture enterprises developing 3G and 4G radio access products; working in various systems consulting and development project management roles. He represented NEC Corporation in the LSTI (LTE SAE Trials Initiative) steering board and manages co-ordination of 3GPP RAN1 and associated interdependence across 3GPP, CPRI, other standards bodies and industry forum. As acting CEO and a Director of mVCE (a UK research forum leveraging the assets of leading UK communications research groups) he is a Director of the ICT-KTN and works with the University of Surrey business school. At present Simon's focus is leading developments in the migration of 4G towards 5G, SDN (including virtualisation), entrepreneurial society, and ICT for city and wider society benefit. For more information please visit www.**t-modus.nec**.co.uk

### Brian Collins, BSC Associates

Brian has designed antennas for applications including radio and TV broadcasting, base stations, handsets and consumer products, and has operated his own consultancy firm for the last 12 years. He has published more than 70 papers on antenna topics and contributed chapters to several recent textbooks. He operates a small consultancy company, chairs the Antenna Interface Standards Group and is an Honorary Visiting Professor in the School of Electronic Engineering and Computer Science at Queen Mary, University of London. For more information please visit www.**bscassociates**.co.uk

### Diego Giancola, PA Consulting

Diego has spent his career in radio systems R&D and modem design in the wireless communication sector, from 2G to the latest 4G evolutions. His research interests lie in multi-antenna systems and novel signal processing and architectures for radio signals. He currently co-runs PA's signal processing team and leads the research activities in LTE evolution and 5G landscaping. Diego has a first degree in telecommunication engineering and a doctorate in electronics and communication engineering from Politecnico di Milano. For more information please visit www.**paconsulting**.com

## Profile of speakers

### Mark Bailey, Rohde & Schwarz

Mark Bailey has almost two decades of experience in the satellite and mobile platform industries. During this time he worked in R&D, designing and developing microwave and RF circuits and systems. After working for Matra Marconi Space, the majority of his career has been spent in the mobile industry, from the early days of 2G, through to more recent work as a Principal RF Engineer at ST-Ericsson, leading RF teams in the development and complexities of integrating multiple radio standards, including 4G, on to mobile reference design platforms. Mark now brings his wealth of experience to Rohde & Schwarz, providing technical and project support to customers. He has a Master degree in Communication Engineering and Digital Electronics from UMIST, and is a Chartered Engineer and Member of the IET. For more information please visit www.**rohde-schwarz**.co.uk

### Zahid Ghadialy, techUK.

Please see above.

### Alain Mourad, InterDigital Europe

Dr. Alain AM Mourad is currently leading the research and development of next generation (5G and beyond) wireless systems at InterDigital Europe Ltd. Prior to joining InterDigital, Alain was a Principal Engineer at Samsung Electronics R&D UK (Nov'07 – Feb'14) and a Senior Engineer at Mitsubishi Electric R&D Centre Europe (Mar'02 – Oct'07). Throughout his career, he has been active in pre-standardization research (including EU H2020/FP7/FP6 projects) and standardization of recent wireless communication and broadcasting systems, namely 3GPP LTE, WIMAX

IEEE802.16m, DVB-T2, DVB-NGH, and ATSC 3.0. He has also held various leadership positions, such as the Head of broadcasting standards at Samsung Electronics R&D UK (2010-2014), Chairman of DVB SUL (System and Upper Layers) task force (2010 – 2012), and Coordinator of EU FP7 DAVINCI project (2008-2010). Alain has invented over 20 granted patents with several other patent applications, and authored over 30 peer-reviewed scientific publications. He received the Inventor of the Year Award from Samsung Electronics R&D UK in two consecutive years, 2012 and 2013. He holds a PhD degree (hons) in electrical engineering from ENST Bretagne (FR) and an Engineering degree (hons) in computer science and telecommunications from the University of Rennes 1 (FR). For further information please visit www.**InterDigital**.com

## Moray Rumney, Keysight Technologies

Moray Rumney joined Hewlett-Packard in 1984 and has remained with the company through the spin-off to Agilent Technologies in 1999 and again with this year's spin-off to Keysight Technologies. During his 30 years in the electronic test equipment business Moray has had a varied career spanning manufacturing, R&D and technical marketing. Moray joined ETSI in 1991 to develop the GSM test standards. In 1999 he joined 3GPP to continue his work in standards for UMTS, HSPA and most recently LTE. During that time he was a major contributor to the development and specification of base station emulation equipment used for the development and conformance test of cellular phones. Moray is a frequent author and speaker at industry events. In 2009 he was technical editor of Agilent's book on LTE which had a second edition in 2013. Moray has been closely involved since 2009 with the development of radiated test methods for MIMO cellular phones and his most recent focus is on the test requirements for the emerging fifth generation of wireless communications. For more information please visit www.**Keysight**.com

## Egon Schulz, Huawei

Dr. Egon Schulz joined the European Research Center in Munich in July 2009 as Director of the Wireless Innovation Center at Huawei Technologies. His Research interest is 5G. Prior to joining Huawei Technologies he has been serving as director for future radio concepts. In 2002 he received the Best Paper Award of the ICCCAS 2002, Chengdu. Dr. Schulz was involved in numerous national BMBF and EU research projects for the designing of future mobile communication networks. He was the project leader of the Sino-German Project Joint Research B3G (JRB3G) between German and Chinese Research Institutes funded by Siemens AG. Dr. Schulz participated in the 863 (MOST) funded research projects FuTURE and FuTURE+. In 2005, Dr. Schulz was elected as vice chairman of the FuTURE Forum in China. He had a strong engagement in research and prototyping for Long-Term Evolution (LTE) and LTE-advanced (LTE-A). For more information please visit http://www.**huawei**.com

## Jörgen Tränk, Tieto

Jörgen Tränk has been involved in the telecom industry for over 30 years. Working for Ericsson he was the initiator and responsible of developing a portable SS7 signaling stack, which today is used in most Ericsson nodes. He has also been a driving force within signaling for Intelligent Networking, such as CAMEL. In his role as Strategic Product Manager for signaling at Tieto, he is responsible for the next generation signaling initiative which includes products like SIP, Diameter, Diameter Signaling controller and Diameter Mediation Gateway. For more information please visit http://www.**tieto**.com/