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Spectrum Management and Radio Resource Virtualization – a COHERENT approach

Abstract: A new and flexible approach to spectrum usage and management is required in order to fulfil the requirements identified by the 5G PPP in their KPIs for 5G networks, e.g., 1000 times higher mobile data volume per geographical area or 10 to 100 times more connected devices. Many spectrum sharing schemes have been proposed so far (such as LSA, CBRS with SAS, LAA/LWA), and some of them have been tested in the field trials providing useful insights into the spectrum sharing issues. From a real implementation perspective, the above solutions can be applied in various contexts (e.g., for TVWS, or with the use of dedicated databases supported by sensing function), however it is envisaged that more flexible approaches to spectrum sharing (such as innovative Pluralistic Licensing or various cognitive radio oriented schemes) should be pursued and investigated further. However, in conjunction with new approaches to spectrum management and sharing, the network architectures are evolving and incorporating concepts of virtualization and software control. A significant push towards Software Defined Networking (SDN) and Network Function Virtualization (NFV) is being made by all major players involved in realizing the 5G vision including researchers, network operators and regulators. In this talk, various spectrum management systems will be presented together with the analysis of prospective spectrum virtualization approaches that utilize network graphs. This talk will also cover selected findings from the COHERENT project.

Biography: Adrian Kliks received his M.Sc. and PhD degree in Telecommunication from Poznań University of Technology in 2005 and 2011, respectively, and since 2011 he is employed at the Chair of Wireless Communication in the position of assistant professor. His research interests cover the wide spectrum of wireless communications, in particular he is interested in new waveforms for future wireless systems (including orthogonal and non-orthogonal, as well as non-contiguous multicarrier schemes), in application of cognitive radio technology, in advanced spectrum management, but also in deployment and resource management in small-cells, and network virtualization. He was involved in preparation of national and international conferences, such as European Wireless 2012 conference (April 2012, Poznan, Poland), as well as workshops like CRAFT workshop at ISWCS 2013, 2014, and 2015, CRAFT workshop at PIMRC'2016, MACNET workshop at PIMRC2013, and a workshop on small-cells at IEEE WCNC'2014. In 2016 he was the main co-chair of the 13th Thirteenth International Symposium on Wireless Communication Systems (September 2016, Poznań, Poland). He was also the leading guest editor of the Special Issue on future heterogeneous networks that was published at EURASIP Journal on Wireless Communications and Networking. In 2012 he reached the status of IEEE Senior Member. He was/is involved in industrial and international projects (like ICT-URANUS, NoE NEWCOM++, NEWCOM#, COGEU, COHERENT, ACROPOLIS, COST Action IC-0902, COST-Terra), where he also acts/acted as the task and work-package leader. Currently, he participates in working groups established for definition of IEEE 1900.x standards on cognitive radio. From 2014 till 2016 he acted as the Membership Development/Web Visibility Chair at the IEEE ComSoc Europe Middle East Africa (EMEA) region.