Computer Science Seminar

The 6TiSCH Architecture for Industrial Wireless IP-based Networks: Overview and Open Research Issues

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The adoption of wireless communication protocols within industrial deployments is not a taboo anymore. Wireless Sensor and Actuator Networks are quickly replacing traditional wired industrial communication systems, where easy and fast-installation and low-cost maintenance are mandatory in addition to requirements such as reliability and timeliness. In this context, IEEE 802.15.4e is widely considered a major improvement, as it introduces many enhancements to the original IEEE 802.15.4 standard to support critical applications. Among them, the Time-Slotted Channel Hopping (TSCH) MAC protocol has been conceived to guarantee deterministic delay and high reliability. The increased need for interoperability and integration into existing infrastructures has driven recent standardization efforts within IETF towards the definition of solutions to adopt IPv6 as communication protocol also in industrial deployments. In this presentation I will survey 6TiSCH, the emerging family of standards for IPv6-based industrial communication over the TSCH mode of the IEEE 802.15.4e for low-power and lossy networks. Specifically, after a general overview of the 6TiSCH architecture, I will analyze major issues and open research directions.

Bio: Carlo Vallati is Assistant Professor at the Department of Information Engineering of the University of Pisa. He received a Master's Degree (magna cum laude) and a PhD in Computer Systems Engineering in 2008 and 2012, respectively, from the University of Pisa. In 2010, he visited the Computer Science department of the University of California at Davis. His main research interests include next generation broadband networks, wireless mesh networks, sensor networks, M2M communications. He is co-author of +30 peer-reviewed papers in international journals and conference proceedings. He has been involved in the project BETaaS, Building the Environment for the Things as a Service, funded by the European Union under the 7th Framework Program and in several research projects supported by private industries (Nokia Siemens Networks and Fluidmesh). He has served as a member of the organization committee for the international conference VALUETOOLS 2009 and WOWMOM 2011 and as member of the technical program committee for several international conferences. He is co-chair of IoT-SoS 2017 workshop co-organized with WoWMoM 2017.

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