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Keynote Speech

Networks of 'Things'

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Abstract

System primitives allow formalisms, reasoning, simulations, and reliability and security risk-tradeoffs to be formulated and argued. In this work, five core primitives belonging to most distributed systems are presented. These primitives apply well to systems with large amounts of data, scalability concerns, heterogeneity concerns, temporal concerns, and elements of unknown pedigree with possible nefarious intent. These primitives are the basic building blocks for a Network of 'Things' (NoT), including the Internet of Things (IoT). This talk offers an underlying and foundational science to IoT based on the realization that IoT involves sensing, computing, communication, and actuation. The material presented here is generic to all distributed systems that employ IoT technologies (i.e., 'things' and networks). The expected audience is computer scientists, IT managers, networking specialists, and networking and cloud computing software engineers. To our knowledge, the ideas and the manner in which IoT is presented here is unique.

About the speaker

Jeffrey Voas is a computer scientist. His current research interests include vetting mobile app software, how apps depend on clouds, software certification ethics, and Internet of Things (IoT). Voas has worked for small private companies, defense contractors, and government agencies. Dr. Voas has served as the IEEE Reliability Society President (2003-2005, 2009-2010), Vice-President of the IEEE Technology Management Council for Operations (2013-2014), and as IEEE Director (2011-2012). He co-authored two John Wiley books, Software Assessment: Reliability, Safety, and Testability (1995) and Software Fault Injection: Inoculating Software against Errors (1998). He is currently an Associate Editor-In-Chief of IEEE's IT Professional Magazine, and is on the editorial board of IEEE Computer Magazine as well as the Editorial Advisory Board of IEEE Spectrum Magazine. Voas also serves on IEEE's Industry Advisory Board for the Future Directions Committee, and on IEEE's Fellow Committee. Dr. Voas received his undergraduate degree in Computer Engineering from Tulane University (1985), and his M.S. and Ph.D. in Computer Science from the College of William and Mary (1986 and 1990, respectively). He is a Fellow of the IEEE and Fellow of the American Association for the Advancement of Science (AAAS).