



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering
Seminar

**From Content-Centric Internet to Internet of Things:
Some Thoughts on Future IoT Architecture Design**

By

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The Chinese University of Hong Kong

Abstract

Recent years have witnessed the proliferation of various mobile and sensor devices, from mobile phones to smart home devices. These mobile and sensor technologies -- together with a whole gamut of emerging applications they enable -- usher a new era of Internet of Things (IoT) services that will revolutionize the way how we live and interact with each other and the physical world. For example, various kinds of (physical or virtual) sensors in the physical and/or cyber worlds have not only allowed us to collect a whole gamut of (spatial-temporal) data, but also afforded us the opportunity to apply advanced data analytics, machine learning algorithms to extract actionable knowledge (or AI), make intelligent decisions in response to events, take actions and effect changes in the physical world, e.g., via remotely controlling and issuing commands to smart (mobile or embedded) devices (i.e., actuators) -- namely, the so-called "Tactile" Internet.

Emerging IoT applications and services are putting a strain on today's network architecture, which has primarily served as a giant information repository and distribution platform. The challenges posed by emerging IoT applications and services call for re-thinking and re-architecting of existing networking, compute and storage infrastructures. In this talk, we will put forth some initial thoughts on the challenges and architectural design issues for future IoT networks. Leveraging and building upon the CONIA -- content (provider)-oriented, namespace-independent network architecture -- that we have advocated and have been developing for multimedia content delivery, we advance a new IoT architecture -- referred to as

IoTa -- that represents a paradigm shift from content delivery to remotely accessing, controlling or steering real or virtual objects (such as sensors or actuators) in perceived real-time by human operators or machines. The proposed IoTa architecture is application-driven and software-defined}. While it borrows ideas from software-defined networking (SDN) and network function virtualization (NFV), it constitutes a refactoring of the conventional "control-data plane separation" by incorporating and integrating information (including content, control and command) delivery, compute and storage functions in a unifying (network architecture) framework.

Biography

Zhi-Li Zhang received the B.S. degree in computer science from Nanjing University, China and his M.S. and Ph.D. degrees in computer science from the University of Massachusetts. He joined the faculty of the Department of Computer Science and Engineering at the University of Minnesota in 1997, where he is the Qwest Chair Professor in Telecommunications and Distinguished McKnight University Professor. He currently also serves as the Associate Director for Research at the Digital Technology Center, University of Minnesota.

**** ALL ARE WELCOME ****

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