

Managing the explosion of M2M communications in the Internet of Things (IoT) by leveraging the Software Defined Networking (SDN) architecture

Description: the Internet currently evolves into a complete integrated cyber physical system by creating mappings between physical devices and their equivalent in the information world. This evolution is leading to the Internet of Things, which is expected to be orders of magnitude bigger than the current Internet. In addition, most of the communications occurring inside this network will be between machines, thus leading to massive M2M communications. The current Internet architecture is not designed to withstand such an evolution both in terms of scalability and flexibility. In particular, Information-Centric Networking (ICN), network virtualization and big data for instance are features that are hardly supported by the current Internet. Recently, new paradigms have emerged for designing innovative networking architectures, namely Software Defined Networking (SDN) and Network Function Virtualization (NFV). The aim of this thesis is to draw a state of the art of all these technologies and to define some possible solutions building on these new paradigms for coping with this explosion of M2M communications and related challenges. In particular, addressing and routing scalability will be extensively studied as well as service discovery. M2M-adapted communications such as anycast will also be investigated. The following step will consist in implementing the proposals on constrained hardware platforms such as the Raspberry Pi and assess their feasibility.

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