EDGE4ALL: Edge Platform For Smart City⋆

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Abstract. Following the story line of Information and Communication Technologies (ICT), since the first room sized computer to the nowadays finger sized processors, there is an uncontrollable increase of the number of devices per person, each time more powerful, as well as a massive access to the Internet. Altogether, this technological movement brought a new paradigm referred to as IoT (Internet of Things), that is quickly affecting almost all dimensions of life, supported on complex (ICT) infrastructures whose safety and security properties need to be addressed carefully. Although in a first look the Cloud architecture showed itself able to handle the requirements, currently this assumption is no longer true. The exponential growth of devices with limited resources exploited some limitations of the Cloud, namely the lack of bandwidth. This happened because, by design, it was architected to deal with high-level data produced by computer-like terminals. Since the introduction of the IoT paradigm, where billions of devises are continuously uploading minimal logs, there was a need to introduce a new middle-ware (at the edge), capable of gathering all elementary information, producing high-level information adequate to the Cloud.

This project aimed to design such an edge, with specific requirements to support Smart Cities or similar environments. Following the generic Edge Computing paradigm, the architecture Edge4All currently aims to: accept and deal with different devices security levels; dynamically process the information and provide it through an API; keep historical data to provide a proper big data/machine learning information source; offer a platform to securely manage the deployed devices; and design a dynamic and intuitive dashboard displaying the information, warnings and alert messages, aiming to keep both the regular user well informed and offer an efficient decision-making tool, to related decision makers.

Keywords: Edge Computing · Smart City · Internet of Things · Security · Horizontal.