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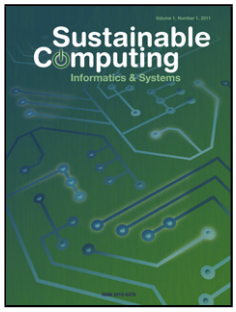

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ACCEPTED MANUSCRIPT

Security, Privacy & Efficiency of Sustainable Cloud Computing for Big Data & IoT

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Highlights

- Cloud Computing System integrated with IoT as a base scenario for Big Data.
- Establish an architecture relaying on the security of the network.
- Install security "wall" between the Server of Cloud Computing & the Internet.
- Cloud provides efficiency regarding privacy issue of bits transferred through time.

Abstract

With the significant advances in communication technologies and in many other sectors, also are growing up security and privacy issues. In our research, is introduced a base technology called Cloud Computing (CC) to operate with the Big Data (BD). CC is a technology which refers to the processing power of data in the fog, providing more "green" computational and sustainable computing. Since it is a recently investigated technology, it has many gaps in security and privacy. So, in this paper, we proposed a new system for Cloud Computing integrated with Internet of Things as a base scenario for Big Data. Moreover, we tried to establish an architecture relaying on the security of the network in order to improve the security issues. A solution proposed is installing a security "wall" between the Cloud Server and the Internet, with the aim to eliminate the privacy and security issues. As a result, we consider that CC deals more efficient with the privacy issue of bits transferred through time. Through our proposed system, the interaction and cooperation between things and objects communicate through the wireless networks in order to fulfil the objective set to them as a combined entity. Regarding the major goal of our research, which is the security, a sort survey of IoT and CC presented, with a focus on the security issues of both technologies. In addition to this, we try present the security challenges of the integration of IoT and Cloud Computing with the aim to provide an architecture relaying on the security of the network in order to improve their security issues. Finally, we realize that through our study Cloud Computing could offer a more "green" and efficient fog environment for sustainable computing scenarios.

Keywords **– Efficiency, Cloud Computing, Big Data, Internet of Things, Topology, Security, Privacy.**

I. INTRODUCTION

The problem with security and privacy in everyday life could be solved or could be minimized by the use of Big Data (BD) analysis tools and services. Big Data is a new popular term, used to describe the surprisingly rapid increase in volume of data in structured and unstructured form [1]. Accuracy in big data may lead to more confident decisions making, and better decisions can result in greater operational efficiency, cost reduction, and reduced risk [2] [3]. BD usually uses Cloud Computing (CC) as a base technology in order to operate.

In addition to this, CC could be used as a base technology for another relative to communications technology, Internet of Things (IoT). The basic idea of the IoT is the diffuse presence of a variety of things or objects used by people such as radio-frequency identification tags, sensors, actuators, and mobile phones. Through unique addressing schemes, these things interact with each other and cooperate with other things near them in order to reach the common goals [4] [5]. The IoT can defined as "*the network of physical objects, devices, vehicles, buildings and other items which are embedded with electronics, software, sensors, and network connectivity, permitting these objects to gather and interchange data*" regarding the bibliography [6] [7] [8]. Some examples include the restrictions of storage, communication capabilities, energy and processing offered to IoT devices. Those inefficiencies motivate us to combine the functionality of CC and IoT technologies [6] [9] [10].

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