Chapter 11

Lower Memory Consumption for Data Transmission in Smart Cloud Environments With CBEDE Methodology

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ABSTRACT

Smart telecoms will deliver lasting improvements to business productivity and enduring consumer benefits that raise the quality of life by enabling telecommuting, telemedicine, entertainment, access to e-government, and a wealth of other online services. And we’ll need next-generation digital platforms on which telecom providers can create and deliver all kinds of services. Therefore, this chapter develops a method of data transmission based on discrete event concepts. This methodology was named CBEDE. Using the MATLAB software, the memory consumption of the proposed methodology was evaluated, presenting the great potential to intermediate users and computer systems, ensuring speed, low memory consumption, and reliability. With the differential of this research, the use of discrete events applied in the physical layer of a transmission medium, the bit itself, being this to low-level of abstraction, the results show better computational performance related to memory utilization, showing an improvement of up to 79.89%.

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INTRODUCTION

The internet has played a pivotal role in our lives since the 90s, when it emerged, both personally and professionally. This digital transformation has, since that decade, stimulated this relationship and synergy, improving the way we relate to information, which is increasingly flooding the world. Nowadays, the Internet is becoming part of the daily lives of many people, so that many activities can only be carried out by the screen of a computer, notebook, tablet or similar. This technological evolution is so great, that even the concept of a cybernetic intelligence, the well-known and famous Artificial Intelligence (AI) was built (Curran, 2016). The AI is nothing more than an intelligence developed by software and technologies, capable of finding solutions to many of the problems, be they of electronic systems, or those faced by humanity. With AI, machines can “think” through data that is collected over time, and stored in their memory, closely resembling human intelligence (Russell & Norvig, 2016).

Drawing a parallel between the human and the artificial brains, it can be realized that just as human intelligence needs a brain structure formed of gray matter, where our neurons perform their processing, so artificial intelligence also needs a structure artificial brain so that things can happen, and she can “think”. Nowadays, artificial intelligence is seen applied in several technologies of humanity’s everyday life, such as computer games, robots (which are increasingly resembling and becoming closer to human behavior), voice command programs on the cell phone, and other software that helps in factories, medical diagnostics, as well as the evolution of computing itself. In this way, artificial intelligence in the cloud is the technology that allows robots to operate intelligently and seamlessly, without physical limitations, and can respond to commands and perform previously limiting human activities that are subject to failure (Russell & Norvig, 2016, Garfinkel & Grunspan, 2018).

These operations include operating systems by voice, the virtual reality of games, where we also see in more advanced studies, intelligent houses and integrated the network almost completely, as well as robots assisting in medicine. Taking into consideration the evolutionary journey of computational technologies since its most basic origin, each stage has aimed, in a way, at improving the performance of the artificial brain by increasing its capacities of connection (data flow) and processing (capacity and speed in processing such data). Going by the way, starting from the first step the migration of a hermetic mainframe, isolated, arriving the client/server architectures, more open and connected, which favors the distribution of data. In the modern days, moving from client/server to mobile, gaining not only connection, but also improvements in processing capacity, working on the same internet that structured the mobile, leveraging the cloud, which adds dimensions of flexibility, scalability and process availability. The concept of cloud computing comes with the idea of storing data outside of the computer and in the internet environment where files and programs can be safely accessed from various devices, desktops and mobile devices, from anywhere, which facilitates and raises the level as the communication between company and employees and clients is carried out, reaching levels of excellence (Russell & Norvig, 2016, Morabit, Mrabti, & Abarkan, 2019, Alfian, 2017).

Today, artificial intelligence operates in the cloud so that the activities are integrated with an entire system of data collection and storage, with advanced security, with hardware and software for developers and intelligent interfaces for users. The cloud has been configured as the natural environment of connected artificial intelligence, forming its artificial “gray matter” where processors, connections and intelligent components interact to “think” and “solve” problems, and can be easily escalated. In contrast to the human brain, the better the connections and the quality of its structure, the better the thought processes tend to be. In the case of artificial intelligence, the process is similar, the quality of the connections and

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