

Chapter 9

Examining Big Data Management Techniques for Cloud-Based IoT Systems

Jai Prakash Bhati

Noida International University, India

Dimpal Tomar

Noida International University, India

Satvik Vats

Birla Institute of Technology, India

ABSTRACT

This chapter provides an insight into big data, its technical background, and how need for it has arisen globally. The evolution of Cloud technology provides a favorable environment for IoTs to nurture and flourish, creating an exponential increase in the amount of data. The Cloud environment provides easy access to this vast data from anywhere on the globe, but this availability has given rise to some challenges for organizations in managing big data efficiently. The chapter discusses the key concepts and technical and architectural principles of big data technologies that help to curb the challenges in managing big data generated by IoTs in the Cloud environment and identifies the important research directions in this area.

1. INTRODUCTION

The world is inundated with data. In an expansive scope of various application areas, data is being gathered at an extraordinary scale. For instance, every customer transactions are being handled by Walmart and then import those transactions into databases and which are estimated to hold more than 2.5 petabytes of data. Another

DOI: 10.4018/978-1-5225-3445-7.ch009

popular social site Facebook, each day handles 250 million photos uploads and the interaction of more than 800 million users with more than 900 million objects. Around more than 5 billion people calling, tweeting, browsing and texting over mobile phones. That much explosion of data is the after effect of dramatic rise in devices situated at the outskirts of networking systems including sensors, cell phones and tablet pcs. The greatest part of this data creates new prospects to find more esteem in human genomics, social insurance, oil and gas, finance, search, surveillance and numerous different zones. As the world is entering the era of “big data”. As the digital data being generated from enormous disparate sources (tweets, images and messages uploaded on social media, banking transactions, stock exchange transactions etc.) is flooding the planet. There is a buzz everywhere on the globe about none other than the “Big Data”. It is emerging as new realm of Technology that is making everyone to think about it and to adopt it. What makes it so lucrative from the business point of view is its distinct approach and new techniques in dealing with the vast data frequently produced from various distinct sources. The traditional approaches that are being in use since biblical time for data analysis were based on Statistics. In these traditional statistical approaches, approximate measurement of a population is done via process of sampling. On the other hand big data solutions add up new approaches and techniques in dealing with huge data.

1.1 Big Data, “Big Thing”

The results of information technology are anything but difficulty to see a mobile phone in each pocket, a pc in bag pack and huge IT framework work places all around. In any case the less recognizable is the data itself. The evolution of data is not new. It proceeds with a pattern that began in 1970s. What has changed is the velocity and diversity of data. The results in large volume of structured and unstructured data, and the term were coined as “big data”. However, there is no rigid definition of Big Data. Big Data is an analogous term portraying a circumstance dedicated to store a large volume of data that is originated very frequently from disparate sources, to process it and perform analysis of large data sets. For a data set to be viewed as big data, it must have at least one attribute that must be able to adapt a proper solution design and architecture for analysis. The traits of Big Data will help to determine the relevant data which is actually featured to be “Big” from the massive amount of data. These characteristics of Big Data are generally introduced by the five “Vs of Big Data” – volume, velocity, variety, veracity and value (Thomas Erl, et al, 2015).

- **Volume:** Big data analytics and solution process a large volume of data which is ever growing and generous. Massive data volume forces to adopt specific data storage and various processing requests. The ability to process

26 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/examining-big-data-management-techniques-for-cloud-based-iot-systems/191838

Related Content

Feedback-Based Fuzzy Resource Management in IoT-Based-Cloud

Basetty Mallikarjuna (2020). *International Journal of Fog Computing* (pp. 1-21). www.irma-international.org/article/feedback-based-fuzzy-resource-management-in-iot-based-cloud/245707

Digital Preservation: Its Framework and Strategies in Cloud Computing Environment

Vijay Parashar, Mohan Lal Vishwakarma and Nisha Patle (2014). *Cloud Computing and Virtualization Technologies in Libraries* (pp. 36-62). www.irma-international.org/chapter/digital-preservation/88032

An IoT-Based Framework for Health Monitoring Systems: A Case Study Approach

N. Sudhakar Yadav, K. G. Srinivasa and B. Eswara Reddy (2019). *International Journal of Fog Computing* (pp. 43-60). www.irma-international.org/article/an-iot-based-framework-for-health-monitoring-systems/219360

Fog Computing Qos Review and Open Challenges

R. Babu, K. Jayashree and R. Abirami (2018). *International Journal of Fog Computing* (pp. 109-118). www.irma-international.org/article/fog-computing-qos-review-and-open-challenges/210568

A Review of Quality of Service in Fog Computing for the Internet of Things

William Tichaona Vambe, Chii Chang and Khulumani Sibanda (2020). *International Journal of Fog Computing* (pp. 22-40). www.irma-international.org/article/a-review-of-quality-of-service-in-fog-computing-for-the-internet-of-things/245708