IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 7, Issue 1, January 2020

Big Data Security: A Review on Issues and Challenges

Virendra Kumar Swarnkar[1], Dr. Asha Ambhaikar[2]

Assistant Professor, Computer Science & Engineering, BCET, Durg, India[1]

Professor, Computer Science & Engineering, Kalinga University, Raipur, India[2]

Abstract: Big data, a recently accepted term that refers to a very big collection of very large and compound data sets, is facing serious security and privacy challenges. Big Data has developed into a essential for business, researchers, healthcare, and government agencies. Big Data deals with collection of enormous digital information for analysing, visualizing and to draw the insights for the prediction & prevention of cyber-attacks. The world is becoming more and more interconnected with the advent of the Internet of Things and new technologies. The users are producing more and more Internet of Things (IOT) data from different devices and systems in the unstructured form which is highly unmanageable and this management of data is the challenging job. In this paper we elaborate various security issues related to big data and their possible solutions to overcome the problems. After all what are the security and challenges facing Big Data?

Keywords: Big Data, Data Encryption, Security, Cloud Computing, Data Transmission

I. INTRODUCTION

Every day, we produce 2.5 quintillion bytes of data so much that 90% of the data in the world today has been twisted in the last two years alone[2]. Day by day there is rapid increase in the amount of data generation as the number of users using social media such as whatsapp, facebook, twitter etc. are increasing rapidly. According to the analysis of IBM, 95% of the data of the world id generated in the last few years and still generation of data is continued at a rate of 2.5 quintillions of bytes data every data. In present world there are many data generalization factors or data resources those are sensors, CCTV cameras, social networks like Facebook, what's app, Gmail and many more. Recently, big data has become a hot topic with significant impact, transforming industries worldwide. Businesses and government organisations consider big data analytics as a contemporary and valuable technique to analyse complex and historical data to discover patterns that could support in their effective decision-making. Big data plays an important role in future data management and operations in various industry sectors such as healthcare, manufacturing, retail, traffic management, banking, weather bureau, education and transportation.

1.1 BIG DATA

Big data is ahead more attention since the number of devices connected to the so-called Internet of Things (IoT) is still growing to unexpected levels, producing huge amounts of data which requests to be changed into precious information. The Big Data is a high volume of data with a variety of datasets which explodes in exponential pace. The conventional database system cannot handle humongous dataset, and thus, the Big Data paradigm has emerged. Big data is a combined term referring to data that is so big and compound that it exceeds the processing ability of straight data management systems and software techniques. However with big data come bigvalues. Big data refers to describe large data sets of structured and unstructured digital data collected from different sources like mobile devices, social media, sensors, geospatial devices, medical, Internet and other machine generated data. all through the preceding few years, big data has evolved to an rising field where advance on technology allows for new ways to agreement with huge amounts of data created in close to real time by a vast assortment of sources. As privacy is the basis of big data security and privacy, we need to protect data from escape. Once data is leaked, its value will be lost. The value of the large data could be departed if hackers attack the data by changing the data or obtaining covert information. Efficiency is especially vital in big data security and privacy as it need high network bandwidth. Authenticity is necessary to ensure reliable data sources, data processors and authorized data requesters.

1.2 IOT Applications

Internet of Things is a new focusing technology of the Internet accessing. In the coming future years, storage, network and communication services will be highly pervasive and distributed: people, machines, smart objects, surrounding space and platforms connected with wireless/wired sensors.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 7, Issue 1, January 2020

1.3 Big Data Security And Privacy Issues & Challenges

Everyday Big Data faces high level of challenges while trade with the privacy and security of huge and heterogeneous data. Data are joint on a large scale by dissimilar people such as researchers, scientists, doctors, business officials, government agencies etc. while the tools and technologies that have been developed till date to switch these enormous volumes of data are not capable enough to offer sufficient security and privacy to data. Also, the here technologies have weak security and privacy preservation ability so they are constantly being breached both inadvertently and intentionally. Newly, CSA (Cloud Security Alliance) at large the top ten big data security & privacy challenges. Prioritizing big data security low and putting it off till later stages of big data adoption projects isn't always a smart move. People don't say "Security's first" for no reason. At the same time, we admit that ensuring big data security comes with its concerns and challenges, which is why it is more than helpful to get acquainted with them.

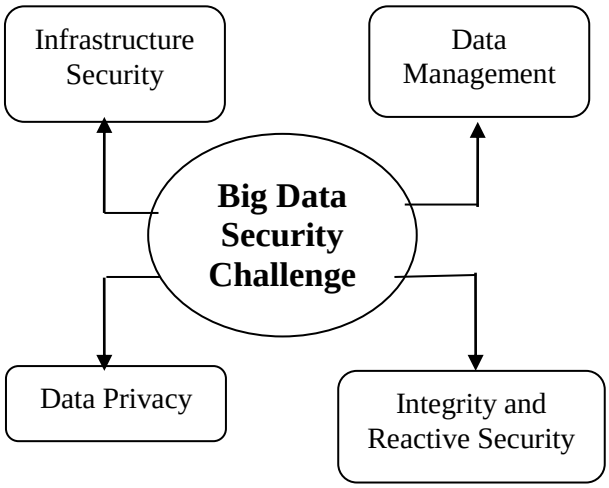

Fig 1: Main Challenges in Big Data Security

1.4 Big data security

Big data security is the cooperative word for all the procedures and tools used to security together the data and analytics process from attack, theft, or other spiteful actions that could injury or negatively involve them. Much like other form of cyber-security, the big data alternative is disturbed with attacks that make either from the online or offline sphere.

1.5 Implement Big Data Security?

There are some ways organizations can apply security method to protect their big data analytics equipment. One of the most common security equipment is encryption, a comparatively simple tool that can go a extended way. Encrypted data is ineffective to external factor such as hackers if they don't have the key to undo it. likewise, encrypting data means that both at input and output, in sequence is completely confined. Building a tough firewall is one more useful big data security tool. Firewalls are efficient at filtering travel that both enters and foliage servers. Organizations can stop attacks before they occur by creating strong filters that keep away from any third parties or unidentified data source.

II. THREATS AND ATTACKS

As the name imply threat can be defined as a opportunity of a network or a system to be uncovered or experience any sort of unhelpful impact or unhelpful event whereas attack is an act of identifying an weakness in a system and exploit the resources that are used in the system. An element or administrator of a system is always conscious of the threat that can be compulsory or it is there in a scheme but assault is known to the nodes of a system after a negative collision has occurred or compromised.

III. CHALLENGING ISSUES IN BIG DATA

As the names propose big data deal with huge number of static and dynamic data. As a storage space intermediate massive techniques connected to data analytics and separation will be functional. In this situation a best and most well-organized technique of solitude has to be practical in big data. There are a few of the challenging issues in big data like transaction .The most preferable means of securing the logs is throughout using Master-slave model.

IARJSET
ISSN (Online) 2393-8021
ISSN (Print) 2394-1588
International Advanced Research Journal in Science, Engineering and Technology
Vol. 7, Issue 1, January 2020

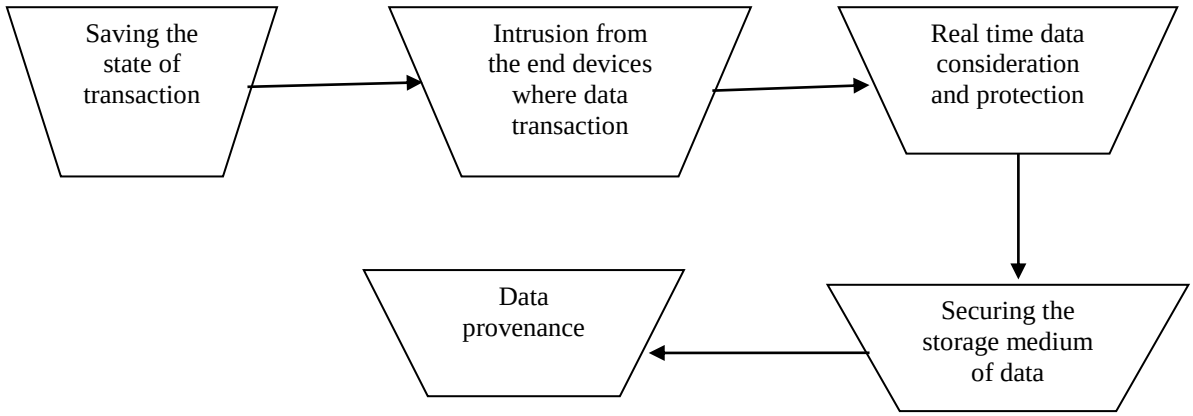

Fig 2 : Research Challenges in Big Data

IV. RELATED WORK

- S.Padmapriya, N.Partheeban, N.Kamal, A.Suresh, S.Arun, (2019) has proposed on the technique of code inline parsing to make the data more secure from the attacks & cyber hacks along with the SQL injections such that the data on the social media is secured. The proposed method secures the platform of Big Data which protects the user's sensitive information.. Different attacking techniques are used by the hackers for inserting the malicious software in the operating systems and the application software where a large amount of data is stored. This paper enhances the security of the big data by securing the user data using the code parsing technique. The proposed method finds way for the enterprises to gain profit by properly securing the company information.
- Sitalakshmi Venkatraman, Ramanathan Venkatraman, (2019) it has provides four practical strategies adapted from contemporary technologies such as data provenance, encryption and access control, data mining and block chain, identifying their associated real implementation examples. This work would pave way for future research investigations in this important big data security arena. Finally, we provided four practical strategies spanning every phase of big data life cycle by using the application of certain contemporary technologies to address the privacy and security challenges of big data. Four existing technologies using popular techniques of data provenance, data encryption and access control, data mining and block chain were discussed with suitable adaptation in order to address the security challenges encountered throughout the big data life cycle.
- Roji K and Sharma G, (2019) in this paper we have gone through some of the major cyber security threats, some of the conventional Cyber security application and try to find how big data analytics can be incorporated in those application to obtain the reliable outcome. We are in the stage where cyber security cannot be compromised. There exist conventional tools to fight these issues, but they are not sufficient. We need to blend traditional tools with big data analytics tools to acquire better and more secure system.
- K. Subrahmanya Sarma, M.Raghupathi, (2018) in this paper we eloraborate various security issues related to big data in handling IOT applications and their possible solutions to overcome the problems. A frequent horizontal platform of big data analytics beside with IOT platform is suggested to support and converse problematic aspects the variety of real time applications that consist of security business, healthcare, transportation, smart cities development, telecommunications and many others in future. The objective of Big Data analytics for security is to get actionable intelligence in actual time.
- Abdullah Al-Shomrani, Fathy Eassa, Kamal Jambi (2018) in this paper research we will define the sources of the Big Data and the characteristics and finally what are the security and challenges facing Big Data.
- Ripon Patgiri, and Umakanta Majhi, (2018) in this paper, we present a study report on Big Data Security Analytics. The Big Data touches the vast area of research field; however, there are frequent fields which are yet to connect the Big Data to boost up the presentation of a system. The data collected from different areas become insecure for research. Consequently, the Big Data Security takes a lion's share in proceeds of an IT Industry. The analytics are engaged with Big Data security to process and analyze resourcefully.
- Jung Lin Guan, Junbo Zhang, Linshu Zhong, Xiaohua Li, Yan Xu, (2017) has proposed on an advanced security and stability defence framework that utilizes multisource power system data to enhance the power system security and resilience is proposed. The framework consists of early warning, preventive control, on-line state awareness and emergency control, requires in-depth collaboration between power engineering and data science. The future technique roadmap for emerging problems is proposed.
- Anupama Jha,Meenu Dave,Supriya Madan, (2017) has proposed to gives insights on overview of big data privacy preserving K-Anonymity technique which aims to protect against leakage of individual's identity and sensitive information before releasing the dataset during analysis. Finally, this paper overviews big data security solution application and their features provided by the top companies.

- Julio Moreno, Manuel A. Serrano and Eduardo Fernández, (2016) has perform the results obtained after applying a systematic mapping study to security in the Big Data ecosystem. It is almost impossible to carry out detailed research into the entire topic of security, and the outcome of this research is, therefore, a big picture of the main problems related to security in a Big Data system, along with the principal solutions to them proposed by the research community. This paper provide an explanation of the research approved out in order to discover the main problems and challenges related to security in Big Data, and how researchers are dealing with these problems. This objective was achieved by following the logical mapping study methodology, which authorized us to find the papers related to our main goal.
- Getaneh Berie Tarekegn, Yirga Yayeh Munaye, (2016) discuss various aspects of big data. We define Big Data and discuss the parameters along which Big Data is defined. This includes the three V's of big data which are velocity, volume and variety. The authors also look at processes involved in data processing and review the security aspects of Big Data and propose a new system for Security of Big Data and finally present the future scope of Big Data. To handle big data and to work with it and obtaining benefits from it a branch of science has come up and is evolving, called Data Science. Data Science is the branch of science that deals with discover knowledge from huge sets of data, mainly unstructured and semi structured, by virtue of data conclusion and exploration.
- Vivekanand, Dr.B.M Vidyavathi, (2015) it has describes the apache hadoop, its present security mechanism, security challenges and survey of existing methods to handle security challenges. Big data security is the significant issue for the big data developers. To hold big data, hadoop tool is introduced but this tool only focus on storage and dispensation of big data. As big data is spreading earlier like that security issues also increasing faster. To hold these security issues, there are many other mechanisms and methods are implemented with hadoop to make hadoop tool as a more secure. In apache guard method authorization is achieved only for few workings of the hadoop, so other component of the hadoop required authorization that should be taken care.
- Raghav Toshniwal, Kanishka Ghosh Dastidar, Asoke Nath, (2015) the processes involved in data processing and review the security aspects of Big Data and propose a new system for Security of Big Data and finally present the future scope of Big Data.
- José Moura, Carlos Serrão, (2014) has review the traditional mechanisms to support security such as firewalls and demilitarized zones are not suitable to be applied in computing systems to support Big Data. SDN is an emergent management solution that could become a convenient mechanism to implement security in Big Data systems, as we show through a second case study at the end of the chapter. This also discusses current relevant work and identifies open issues.

V. CONCLUSION

An Organization must ensure that all big data bases are immune to security threats and vulnerabilities. During data assortment, all the necessary security protection such as instant management should be satisfied. Keeping in mind the enormous size of big data, organizations should memorize the fact that supervision such data could be hard and requires unusual efforts. However, taking all these steps would help preserve consumer privacy.

REFERENCES

[1]. S.Padmapriya, N.Partheeban, N.Kamal, A.Suresh, S.Arun, 2019 “Enhanced Cyber Security for Big Data Challenges” (IJITEE), Volume-8 Issue-10, August 2019, PP. 3478-3481.
[2]. Sitalakshmi Venkatraman, Ramanathan Venkatraman, 2019 “Review Big data security challenges & strategies”, AIMS Maths, PP.860-879
[3]. Roji K and Sharma G, 2019 “Cyber Security Challenges and Big Data Analytics”, Volume 2 - Issue 2 PP. 1-6.
[4]. K. Subrahmanya Sarma, M.Raghupathi 2018 “International Journal of Pure and Applied Mathematics”, Volume 118 No. 14 2018, PP. 221-227.
[5]. Abdullah Al-Shomrani , Fathy Eassa, Kamal Jambi 2018 “Big Data Security and Privacy Challenges”, IJEDR,Volume 6, Issue 1 PP. 894-900.
[6]. Ripon Patgiri, and Umakanta Majhi 2018 “Big Data Security Analytics: Key Challenges” Int'l Conf. Data Science ICDATA.
[7]. Jung Lin Guan, Junbo Zhang, Linshu Zhong, Xiaohua Li, Yan Xu 2017 “Enhancing Security and Resilience of Bulk Power Systems via Multisource Big Data Learning”, IEEE 978-1-5386-2212-4/17
[8]. Anupama Jha,Meenu Dave,Supriya Madan, 2017 “Big Data Security and Privacy: A Review on Issues, Challenges and Privacy Preserving Methods “International Journal of Computer Applications,Volume 177 – No.4, PP. 23-28.
[9]. Julio Moreno , Manuel A. Serrano and Eduardo Fernández 2016 “Medina Main Issues in Big Data Security”, Future Internet , 8, 44 PP.1-16.
[10]. Getaneh Berie Tarekegn, Yirga Yayeh Munaye 2016 “BIG DATA: SECURITY ISSUES, CHALLENGES AND FUTURE SCOPE” IJCET, Volume 7, Issue 4, July–Aug 2016, pp. 12–24.
[11]. Vivekanand, Dr.B.M Vidyavathi 2015 “Security Challenges in Big Data: Review “International Journal of Advanced Research in Computer Science , Volume 6, No. 6,PP. 199-201.
[12]. Raghav Toshniwal,Kanishka Ghosh Dastidar Asoke Nath 2015 “ Big Data Security Issues and Challenges” IJIRAE, ISSN: 2349-2163 PP.15-20
[13]. José Moura, Carlos Serrão 2014 “Security and Privacy Issues of Big Data” 2014.

IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Vol. 7, Issue 1, January 2020

BIOGRAPHIES

Virendra Kumar Swarnkar, did his B.E & M.Tech from R.C.E.T., Bhilai, Dist: Durg Chhattisgarh, India. Currently he is pursuing Ph.D in Computer Science & Engineering from Kalinga University, Raipur, and Chhattisgarh, India. His Research area is Big Data security, image Processing, Data Science. He is having 12 year of teaching experience in technical education.

Prof. Dr. Asha Ambhaikar is a Professor in Computer Science & Engineering at Kalinga University, Raipur, Chhattisgarh. She has obtained her Ph.D degree in Chhattisgarh Swami Vivekanand Technical University, Bhilai. She has published more than 35 Papers in various reputed Journals, National & International Conferences. She is a Dean of Kalinga University, Raipur. She was a member of the Executive Council and the Academic Council of the University.