

Communications on IOT with BigData for Security Challenges

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ABSTRACT

Internet of Things or "IoT" refers to the very interconnected network of dissimilar devices where all kinds of communications seem to be possible, even unconstitutional ones. In such a case, the security requirement for such network becomes dangerous. Present plentiful data is available and it is increasing day by day. Big data is a collection of data sets which is very vast in size as well as problematic. Now a days Big data is most famous topics in IT industry. It is going to play vital role in future. Big data provides the new way for data management and use. The paper presents highlights on Internet of things and big data available on it. It also describes the impacts and importance of these expressions in the current scenario. Further we discuss the security challenges while we activity the big data through IoT. Then we discuss various security enhancing techniques though communicating on Internet of things

Keyword : - IOT, Big Data, security, communication, Data analytics

1. INTRODUCTION

When taking into account the financial value created from technology, as well as the potential for new market opportunities, it is estimated that the Internet of Things will generate \$14.4 trillion in net profit for enterprises over the next two decades. Organizations across all industries have started to develop and implement their own IoT strategies with the motive toward seizing the opportunity this new era presents. Internet of things (IOT) enables any device to be able to connect any other device using the internet. To highlight any device aspect the term internet of everything is also used. The Internet of Things is all about collecting data from various sources and making it useful in ways that enhance how we go about our business. The tremendous volume of data that will be coming in from devices presents a huge challenge for IoT solution providers. Big Data solutions will be overcoming this challenge by giving us the capacity to analyze data, and discover relevant trends and patterns.

Big data refers to collections of data sets with sizes elsewhere the ability of commonly used software tools such as database management tools or traditional data processing applications to capture and analyze within a stipulated time. Big data is described by '4 Vs': volume, variety, velocity and veracity. That is, big data comes in large amounts (volume), is a mixture of structured and unstructured information (variety) arrives at (often real-time) speed (velocity) and can be of uncertain provenance (veracity). Big data sizes are always mutual, getting from a few dozen terabytes in 2012 to today many petabytes of data in a single data set. To meet the demands of handling such large quantities of data, new platforms of "big data" tools are being established. Big data brings with it noticeable benefits for any company willing to use it. The benefits of leveraging big data are real and oftentimes far-reaching, which is why so many establishments have adopted big data for their own operations.

For a long time, communication over the Internet has largely depended on the use of IP addresses to identify communicating parties. Some IoT use cases will require a new technique of communication technologies that are able to provide greater security and more efficient communication. Pitfalls are still plentiful, and few represent as much of a problem as big data security. Businesses may be willing to use big data, but they must also be aware that security remains a top concern. This is in part because the technology is advancing so rapidly that the solutions to security problems often fall behind. If a business wants in on the enabling world of big data analytics, they'll need to be aware of some of the biggest security concerns first. IOT enabled devices would generate and transmit so much data that security issues [1] as well as managing the life cycle of those data are other dimensions that need to be addressed.

2. EFFECT OF IOT ON BIG DATA:

IoT and big data basically are two sides of the same coin. Managing and extracting value from IoT data is the biggest challenge that companies face. Big data is a terminology in both the tech and business worlds. Referring to the huge amounts of data generated by connected technology, big data is a tool that many businesses can use to make their advertising and other advertising efforts more effective. Data and using data for analytic purposes is not new, but what is new is the huge amounts of data now available to us, and that data has come available largely due to the Internet of Things (IoT). So, if the Internet of Things is not the only source of big data, are the two really connected? What is the effect of IoT on big data? The key is in how it is mutable big data and the way companies use that data. The IoT and big data are increasing quickly and are set to transform many areas of industry and daily life. But which particular sectors are possible to feel the IoT/big data trouble first? In its 2015 Internet of Things predictions, according to IDC, At present over 50% of IoT activity is focused in industrial, transport, smart city, and consumer applications, but within five years all businesses will have rolled out IoT initiatives.

New generation of IoT applications is necessary to address specific business needs such as analytical maintenance, loss prevention, asset utilization, inventory tracking, disaster planning and recovery, downtime minimization, energy usage optimization, device performance effectiveness, network performance management, capacity utilization, capacity planning, demand forecasting, pricing optimization, yield management, and load balancing optimization. Fig.1 shows the process of obtaining large data through various application interfaces available on internet. The big data then processed by using big data analytics which further can be utilized by enterprises for their strategic decisions and to increase their sales performance

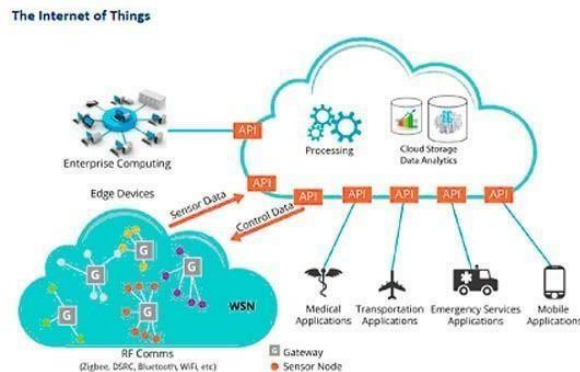


Fig.1 Internet of Things

3. IOT & BIG DATA : A NEW COMPETITIVE ADVANTAGE

The use of Big Data is becoming an important way for leading companies to outperform their peers. In most industries, established competitors and new applicants alike

will control data-driven strategies to innovate, participate, and capture value. Organizations are setting up a proper analytics platform/infrastructure to analyze the IoT data. Big Data Analytics is directed to enable organizations to make better decisions. Data Scientists, predictive modelers and other analytics professionals deal with huge amounts of transactional data and use Big Data Analytics to tap this data that may be unused through conventional Business Intelligence programs. Big data analysis can be done with the software tools commonly used as part of innovative analytics disciplines such as analytical analytics, data mining, text analytics and statistical analysis. Due to the Volume and Velocity of Big Data, data warehouses are unable to switch the processing loads posed by data sets that are being efficient in real time and frequently, such as the schedule on social media websites. The newer technologies complicated in Big Data Analytics include Hadoop and related tools such as YARN, MapReduce, Spark, Hive and Sas as well as NoSQL databases.

Big Data provides new growth opportunities and entirely new categories of companies, by analyzing and aggregating industry data. Many of these will be companies that stand in the middle of large information

availability where data about products and services, buyers and suppliers, consumer preferences and intent can be caught and analyzed. The leaders have started aggressively cultivating the Big Data capabilities. An IoT device generates continuous streams of data in a scalable way, and companies must handle the high volume of stream data and perform actions on that data. In response to the actions can be event correlation, metric calculation, statistics preparation, and analytics. In a usual big data condition, the data is not constantly stream data, and the activities are changed. Building an analytics solution to manage the scale of IoT data should be done with these differences in mind.

4. SECURITY CHALLENGES WITHIN IOT & BIG DATA:

The Internet of Things (IoT) has a data problematic. Everyone is requesting to be the world's smartest something. But that sprawl of devices, lacking context, with fragmented user groups, is a huge challenge for the rapid growing industry. This paper describes the security challenges when organizations start moving sensitive data to a Big Data repository. It provides the different threats and the security control framework to address and mitigate the risk due to the identified security threats.

The assemblage, packing, management and maintenance of massive amounts of data have occasioned in serious security and privacy considerations. Various regulations are being suggested to handle Big Data so that the confidentiality of the individuals is not violated. For example, even if personally detectable information is removed from the data, when data is combined with other data, an individual can be identified. This is fundamentally the suggestion and combination problem that data security investigators have been exploring for the past four decades. This problem is aggravated with the management of Big Data as different sources of data now exist that are related to various individuals.

In certain cases, regulations may cause privacy to be violated. For example, data that is collected (e.g., email data) has to be retained for a certain period of time (usually 5 years). As long as one keeps such data, there is a potential for privacy violations. Too many regulations can also stifle innovation. For example, if there is a regulation that raw data has to be kept by way of is and not manipulated or models cannot be built out of the data, then corporations cannot analyze the data in innovative ways to enhance their business. This way innovation may be stifled. Therefore, one of the main challenges for ensuring security and privacy when dealing with big data is to come up with a balanced approach towards regulations and analytics. That is, how can an organization carry out useful analytics and still ensure the privacy of individuals? Numerous techniques for privacy preserving data mining, privacy-preserving data integration and privacy-preserving information retrieval have been developed. The challenge is to extend these techniques for handling massive amounts of data resides on network. Next the Big Data management strategies such as access methods and indexing and query processing have to be secure. So the question is how can policies for different types of data such as structured, semi structured, unstructured and graph data be integrated? Since Big Data may result from combining data from numerous sources, how can you ensure the quality of the data?

Complexity is inherent in the adoption, implementation, and maintenance of big data technologies. Most of the organizations cite complexity as the main barrier to deploying big data analytics to enhance their enterprise's cyber defense. Organizations deploying the Big Data Setup do not know how a big data solution would affect their legacy technology environment, and who has the right expertise to manage the new technologies. Successfully implementing a big data solution does require sophisticated technologies that will store, organize, and further analyze vast and varied data sets. Interoperability among existing data environments and new technologies is contingent upon choosing the right technologies and having the right expertise to implement them. Moreover, enterprises both large and small lack specially trained analysts to design these big data systems and use the results of the analysis.

The increasing stealth and sophistication of cyber attacks can put a strain on even the most generous security budgets, which are already spread thin addressing risk; insecure mobile devices and apps, including personally owned devices and apps entering the workplace, non-compliance with regulations, data breaches, social engineering tactics, insider negligence, and use of insecure cloud services. Both large and small enterprises cite insufficient budgets as a reason they have not yet adopted big data analytics. The various costs of deploying a big data solution can be many, and often include storage, computers, data tools, and data visualization frameworks. However, the

emergence of big data solutions offered as cloud services, combined with a growing number of firms offering these services, may be seen as an indication that costs will fall and adoption rates will increase. Beyond the capital costs of adopting big data tools are the opportunity costs. When purchasing new technologies,

it affects an enterprise's ability to invest in and maintain other technologies crucial to their security, such as firewalls and detection software.

Another security challenge for Big Data management and analytics is to secure the infrastructures. Many of the technologies that have been developed including Hadoop, Map Reduce, Hive, Cassandra, PigLatin, Mahout and Storm do not have adequate security protections. The question is, how can these technologies be secured and at the same time ensure high performance computing? Finally, the entire area of security, privacy, integrity, and data quality and trust policies have to be examined within the context of Big Data security. What are the appropriate policies for Big Data? How can these policies be handled without affecting performance? How can these policies be made consistent and complete?

We have listed just some of the challenges with respect to security and privacy for big data. That is, we cannot incorporate security into each and every big data technology that is being developed. We need to have a comprehensive strategy so that security can be incorporated while the technology is being developed. We also need to determine the appropriate types of policies and regulations to enforce before Big Data technologies are employed by an organization.

CONCLUSION:

Big Data is changing the way we perceive present world. The impact which big data and internet of things has created is great and will continue to create can ripple through all facets of our life. Global Data is on the rise, by 2020, we would have quadrupled the data we generate every day. This data would be generated through a wide array of sensors we are continuously incorporating in our lives. Data collection would be aided by what is today dubbed as the "Internet of Things". Through the use of smart bulbs to smart cars, everyday devices are generating more data than ever before. These smart devices are incorporated not only with sensors to collect data all around them but they are also connected to the grid which contains other devices. Big Data is also changing things in the business world. Companies are using big data analysis to target marketing at very specific demographics. At the same time, if a business wants in on the enabling world of big data analytics, they'll need to be aware of the security concerns first. IOT enabled devices would generate and transmit so much data that security issues as well as managing the life cycle of those data are other dimensions that need to be addressed. For ensuring secure communications through IoT new security techniques should be adapted rapidly and it should be a continuous process.

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