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Why big data analytics is crucial to how the IoT works and grows

Big data is the fuel of IoT and artificial intelligence that drives the connected things is its brain.

Advances in technology are making it possible to embed enhancing computing power in small devices and extract live streaming data from them at near-live speeds. In the areas of sensing technology, these advances in coexistence with computing and communication technologies are resulting in a universe of interconnected devices usually referred to as the IoT (Internet of Things).

While this capability allows generation of data at scale, the advancements in machine learning have allowed developing models on this data that is increasing continuously. Big data analytics is playing a significant role and becoming increasingly important with an increase in the penetration of connection-ready devices, and the IoT related technologies.

Analyzing IoT Data

Big data analytics is crucial to the effective functioning of IoT. Big data is the fuel of IoT and artificial intelligence that drives the connected things is its brain.

From IoT, the real value can be derived from driving intelligent insights and making smarter connected things that can pave way for new businesses. An enormous amount of data is generated with millions of things and devices connected to IoT.

To analyze this data at scale, it needs artificial intelligence which is possible with big data analytics to know the contextual relations and patterns that impact the business. For making real-time decisions, IoT is driving big data analytics. Hence, it can be said that big data and IoT are closely interrelated.

All the IoT data that is generated may not be needed by the organizations. So, to analyze this data, they must set up a proper analytics infrastructure/platform.

An ideal analytics platform must be based on three parameters. They are future growth, right-size infrastructure, and performance. A single-tenant physical server, which is dedicated to a particular customer and a bare-metal server is the ideal fit for performance. Hybrid is the ideal approach for the growth of infrastructure and future.

Hybrid deployments consisting of dedicated hosting, colocation, managed hosting, and the cloud combines the ideal features from various environments into a single optimal environment.

To handle IoT data, MSPs(Managed Service Providers) are also working on their platforms. In order to cover the complete IoT domain, MSP vendors are working on the tools, performance, and infrastructure side.

IoT devices produce a large amount of data and it is the task of organizations to handle such enormous data and perform actions on it. The actions can include analytics, statics preparation, metric calculation, and event correlation.

The data is not stream data every time and the actions vary in a normal big data scenario. So, in order to manage the scale of IoT data, building an analytics solution must be done keeping these differences in mind.

Bringing Big Data and IoT Together

IoT is changing our lives in every possible way including education, smart homes, health, transportation, retail business, manufacturing, and so on. IoT connects sensors, software apps, wearables, smartphones, thermostats, voice-activated appliances, medical devices, lights and traffic signals, train trucks, trucks, cars and many more.

All these IoT devices are transmitting an enormous amount of data that requires a new infrastructure of hardware and software to handle such massive data and examine in real-time. In order to handle the data that is being produced continuously, the technologies are evolving and improving day-by-day. This is where IoT links with big data. To enable increase their performance, big data helps enterprises utilize data that is available around them.

The businesses can track their assets using IoT to monitor and take corrective actions when required with the help of big data analytics.

Take, for example, IoT helps in monitoring assets like pumps, trucks, engines, and so on. Big data helps in analyzing the data that is available about these devices and machinery regarding failures and the causes of their occurrence.

Big data analytics helps in predicting the problems and fixing them even before they happen. Big data and IoT collaborate with each other and help asset monitoring to be proactive from reactive. Today, only eight percent of business can capture and examine IoT data timely and completely.

Major Challenges

As IoT is continuing its expansion, it is projected that by the year 2020, 20.8 billion things would be used all over the world. Along with the advantages, major risks like cybersecurity issues and safety concerns are also coming up as hackers can hack the power grid, security system, and any other linked systems containing sensitive data.

Organizations must employ internet security platforms that offer protection with cloud-based solutions against unauthorized data access. In the below section, I will let you know how you can deal with data security and storage issues.

Dealing with Data Storage and Security Issues

One of the first things that flash in our mind when we talk about IoT is the enormous data stream that hits an organization's data storage. So, the data storage must be prepared to store this additional amount of data. Instead of maintaining their own storage infrastructure many companies are moving towards the PaaS(Platform as a Service) model as a result of the impact of IoT data on storage infrastructure.

One reason for moving towards the PaaS model is because a company's own storage infrastructure needs continuous expansion to handle this additional load of data. PaaS is a managed solution based on the cloud that offers advanced architecture, compliance, flexibility, and scalability to store the valuable IoT data.

The options for cloud storage include hybrid, public, and private models. If organizations consist of data that is dependent on regulatory compliance requirements that demand high security or sensitive data, a private cloud model can be an ideal fit. In other cases, the organizations can opt for a hybrid or public model for IoT data storage.

The kinds of devices that comprise IoT and the data they produce vary in nature. This includes communication protocols, various kinds of data, and raw devices and these carry inherent data security risks.

This different universe of IoT is quite new to security professionals and thus the security risks may increase due to lack of experience. Any attack here could not only damage the data but also the devices themselves. So, the organizations must make a few changes to their security landscape.

The number of devices connecting to the network is increasing rapidly due to the exponential growth that is happening in the world of IoT. So, these devices will be of varied sizes and shapes and are located outside the network. Hence, for authentication purposes, every device must have a non-repudiable identification. The organizations must acquire all the information about these connected devices and store it for audit purposes.

Proper network segmentation and a multi-layered security system will prevent attacks from occurring and spreading to other network components. An IoT system that is properly configured must follow FGAC(fine-grained access control) network policies to determine which IoT devices can connect.

The combination of network access and identity policies and SDN(software-defined networking) technologies must be utilized to generate dynamic network segmentation. The network segmentation based on SDN must be utilized for point-to-multipoint and point-to-point encryption depending on some PKI/SDN amalgamation.

Big Data and IoT are Working Together

As organizations move to IoT, they must understand the relationship between big data and IoT. For IoT deployments to make a considerable impact, they must offer useful services or tools while also gathering relevant data.

Only gathering data is not enough. It must be analyzed and processed to derive insights and they must drive actionable steps that can enhance the business operations. IoT and big data are working well together to offer insight and analysis and there are many instances to prove this.

The examples include shipping organizations, agriculture, HR activities in an organization, and many more. They are using analytics tools and data from sensors to provide analysis and insights.

Conclusion

The IoT growth is an indicator for a new age of technology and companies that wish to remain in this new era will have to transform the way they carry out their activities to accommodate new data sources and data types.

It is also true that as businesses grow with IoT, there will be many more challenges to solve. A proactive approach which involves detecting the issues much before and devising methods to solve them is needed. Building the analytics solutions keeping the major risks in mind can avoid most issues related to safety and security and any other major issues.

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