

A New Gen IoT Cloud Platform Benefits and Challenges

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Abstract

IoT cloud platform generates abilities to IoT gadgets and CC Provides a assistance over an end-to-end customer requirements and implied by other publicizing factors such as a IoT Cloud Platform. In this era, where billions of e-gadgets are connected via Internet, we see growing potential of striking big data obtained from these e-gadgets and operating them thoroughly through various implementations. IoT Gadgets are e-gadgets with countless sensors connected to the cloud, classically via gateways. There are many IoT Cloud Podiums in the business today provided by various service providers that host broad ranging services. This paper tells about Different Architecture of IoT Cloud Platforms and its Benefits and challenges.

Keywords: Internet of Things(IoT), Cloud Computing(CC), IoT Platform, Cloud Platform

1. Introduction

The IoT business is developed in great rate in spite of having security problems and performance issues. The amount of Internet Connected gadgets already reached 16.2 billion and the maximum will reach 25 billion by 2021. The IoT cloud is a platform for accumulating and operating data from the “Things” on the internet. The platform is designed to catch and operate the massive amounts of data generated by internet associated gadgets, sensors, web sites, customers and other connected software’s. An IoT cloud platform mainly incorporates features like connectivity, network management, device management, data accession, processing analysis and visualization, making application work, and storage[1]. The cloud for IoT can be used in three ways that are infrastructure as a service (IaaS), platform as a service (PaaS) or software as a service (SaaS). It can be difficult to figure out which IoT platform would be suitable for your software. There are many various IoT cloud platform is available in the business market today, making the choice for business even more confusing. Picking up the best IoT platform mainly rely on hardware, expenditure, expansion competency of the project, business model requirements, and other various variables[2].

2. IoT Cloud Architecture:

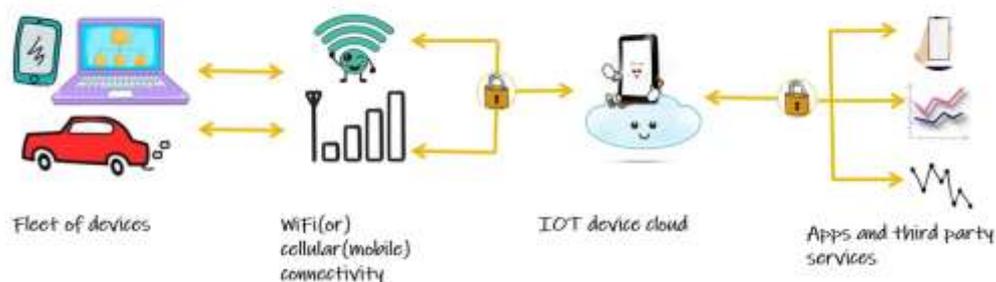


Fig 1. IoT Cloud Architecture

3. IoT Cloud Platforms:

3.1 Microsoft Azure IoT Suite: Microsoft Azure IoT solution was developed for various industry requirements. Azure IoT is built on decades of experience with Microsoft companies. It offers

solutions for remote monitoring, predictive maintenance, smart areas, and connected products. It offers secure and scalable third party services., Azure IoT has all the tools, devices, data analytics, and security you need to meet the IoT goals. It offers Condition Monitoring that Monitor key device parameters to detect anomalies. Facility Management that Optimizes energy use, space utilization and employee productivity in organization. Asset Tracking identifies your assets, tools, and devices used in multiple locations with the Azure IoT Remote Monitoring Solution Accelerator[3].

3.2 Google's IoT Cloud Platform: The Google Cloud IoT platform is a complete set of tools for connecting, processing, storing and analysing data on the cloud. The platform includes scalability and fully managed cloud services. The platform supports a variety of embedded operating systems that work with Linux, providing immediate turnkey support for leading device manufacturers such as Intel and Microchip[4]. Cloud features also trigger automated changes based on real-time events through workflows. Predictive maintenance to make the prediction automatically when the equipment needs servicing. Real-time tracking of assets tracks valuable assets in real-time and performs complex analysis and machine learning of captured data. Logistics and Supply Chain Management Fleet management, inventory tracking, cargo integrity monitoring. Provides integration with other Google services [5].

3.3 Amazon Web services IoT Platform: Amazon dominates the consumer cloud market. They were the first to really turn cloud computing into a commodity way back in 2004. Since then they've put a lot effort into innovation and building features, and probably have the most comprehensive set of tools available. It's an extremely scalable platform, claiming to be able to support billions of devices, and trillions of interaction between them. Pricing is based on messages sent and received by AWS IoT. Each IoT interaction can be thought of as a message between a device and a server. Amazon charges per million messages sent or received.[6]

3.4 IBM Watson IoT Platform: IBM Watson platform is one of the best IoT platforms in terms of security and compatibility. IBM Watson offers a comprehensive set of integrated and additional tools to make your business line rich, augmented and ultimately to gain insights from data simply and intuitively. It enables the IoT and assets to validate and approve events in a reliable, unchanging directory. IBM Watson is a high-performance platform supported by the IBM development platforms Bluemix and Hybrid Cloud PaaS [7]. It provides data sensors and weather data services. Real-time data streaming for supported external data stores. Secure real-time messaging for connected devices, gateways, and applications via MQTT. It offers an extendable data model that supports third-party service extensions. Embedded rules engine that allows you to respond to status changes in your device with multiple notification strategies [8].

3.5 Cisco IoT Cloud Connect: Cisco IoT Cloud Connect provides network, security and data management and updates at all network levels. It provides a complete solution to provide exceptional IoT experience for mobile operators. Cisco provides detailed real-time visibility and updates across all levels of the network. For IoT security, it has systems for protecting against malware, intruders, and other kinds of attacks. Network connectivity including specially designed routing, switching, and wireless products. Fog computing, which allows customers to analyse and manage data locally. It provides Security that integrates cyber and physical security to achieve operational benefits. Data Analysis provides a custom infrastructure for implementing analytics and using actionable data[9].

3.6 Oracle IoT Cloud Platform: Oracle's IoT platform helps in creating real-time IoT enterprise solutions. It leverages powerful, innovative edge analytics and robust security features to easily build integrated solutions with existing enterprise applications. Oracle's IoT platform leverages the Oracle cloud infrastructure for optimized performance while reducing costs and time-to-market. Oracle provides real-time IoT data analysis, endpoint management, and high-speed messaging that allows users to receive real-time notifications directly on their devices. Oracle IoT

Cloud also enables REST API-based integration. Oracle's open and integrated end-to-end IoT platform allows collecting and integrating IoT data from a variety of sources, securely and reliably. Business ready SaaS applications[10].

3.7 SAP Cloud Platform: SAP Cloud Platform connects the IoT to enable scalable capture of sensor data. This service is offered in the cloud and provided as Software as a Service (SaaS) so you can access your software from any web browser. With the SAP Cloud Platform IoT service, you can use a variety of IoT services and protocols to manage the device lifecycle from on boarding to retirement. SAP IoT platform Protect your data with sophisticated encryption. It also provides policy-based access and control for multiple users. Secure and scalable data ingestion- Enable end-to-end enterprise-grade security and Provide policy-based access and control for multiple users. Flexible and reliable message processing- Handle incoming messages based on your specific use case. Build Protocol Adapters and Interceptors use the SAP Cloud SDK to create communication protocol adapters and interceptors [11].

4. Benefits of Cloud Platform in IoT:

4.1 Scalability: One of the greatest advantages of placing your IoT system in a cloud is that it is very easily scalable. In case of complex on-premise network infrastructures, scaling up requires purchasing more hardware, investing more time and undertaking increased configuration efforts to make it run properly. In a IoT Cloud Platform, adding new resources usually boils down to leasing another virtual server or more cloud space which both usually have the extra advantage of being quickly implemented [12].

4.2 Data mobility: The data stored and processed in a cloud server, it can be accessed from almost anywhere in the world, which also means that it won't be bound by any infrastructural or networking constraints. Mobility is especially important when it comes to IoT projects involving real-time monitoring and management of connected devices. an advanced IoT cloud platform will give you the tools to provision, manage, and update your devices and sensors and process the acquired data remotely and in real-time [13]

4.3 Time to market: With IoT cloud solutions, it usually takes less time and effort to implement them and significantly lowers the overall cost, but this is achieved at the expense of platform customization. While it is true that Internet of Things systems installed on premises can be more easily fitted for the project's purpose, they also involve time-consuming deployment of data management and analysis capabilities and upgrades to the company's existing network structure due to increased data traffic[14].

4.4 Cost-effectiveness: Beginning investments might cause an issue of on going costs of hardware maintenance and IT personnel. From the cloud perspective, things look better. Significantly reduced up-front costs and a flexible pricing scheme based on actual usage encourage IoT-based enterprises to switch to the cloud [15].

5. Challenges:

5.1 Security and privacy: Security and privacy are the important thing delaying the acquisition of IoT Cloud Platforms. Cloud providers in most cases will not own the data and they have permission only to do the analytics and control of systems as permitted by the owner of the data. Also, since the value of IoT data is extremely large, genuine legitimate agreements and procedures must be in place to ensure the outcome of data analysis is only used for the specific purpose by the personnel[16].

5.2 Interoperability: Existing IoT cloud platforms are not up to the standards as it is a growing technology, thereby causing few interoperability issues. They may also not support diversified modules. Many organization continue to use IPv4 and this could be a problem as E-Gadgets run out of distinctive IP addresses[17].

Conclusion:

Security and Privacy are the major Problems in IoT cloud Platforms as it is a budding Technology and have some able to exchange and make use of information available. But Very soon the Major IT giants are Coming up with a solutions as soon as possible

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