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New Instances in IOT Technology

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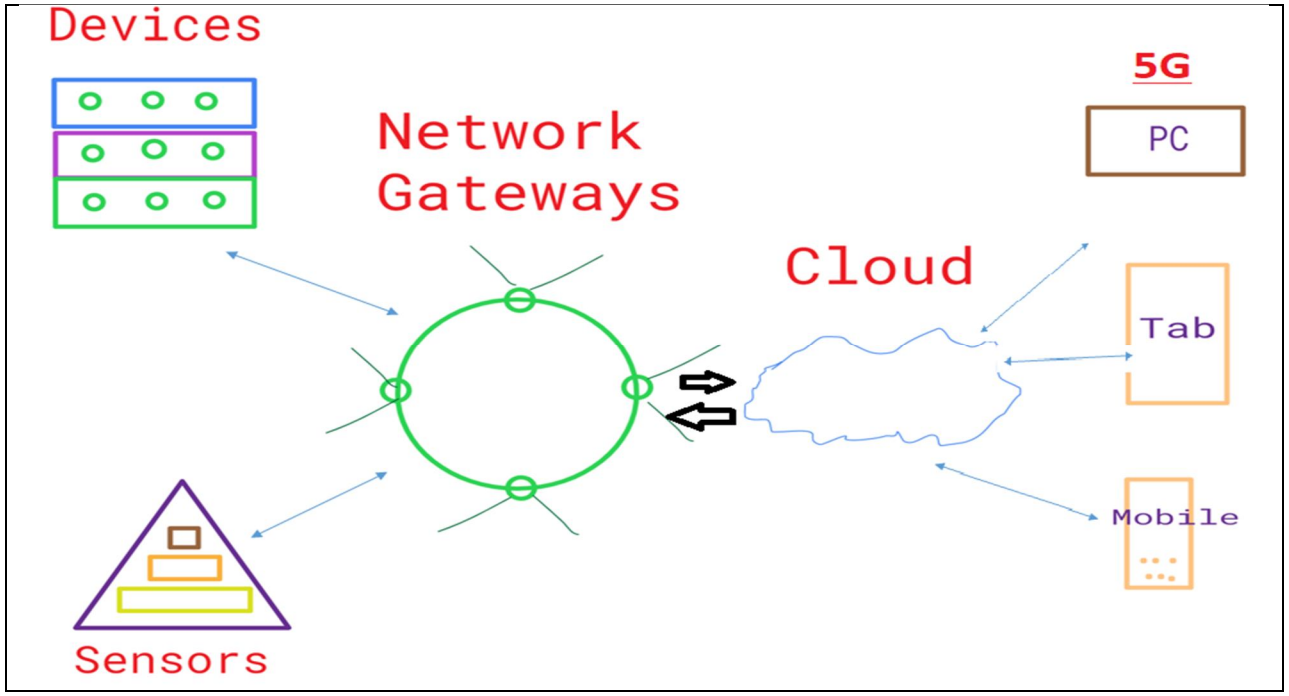
Abstract: ***Future of the Internet of Things with enabled Artificial Intelligence, block chain technology, Big data technology, cloud AWS - Azure endpoints with little coding or no coding to manager enamors powerful device management. Few of the application of Internet of Things like B2C sector of summers like smart homes, smart appliances and elderly care. In infrastructure area in internet of things like smart city, smart energy & utilities and environmental monitoring. In the Commerce area in the Internet of Things like Medical & healthcare, transportation and building accommodations. Coming to Industry and farming area in the Internet of Things like smart manufacturing and smart agricultures and more. Coming to IT Datacenters need to use Internet of Things and IoT enabled ship, airplanes and trains exceptional application going use in multiple manners. IoT application development services enables on all IoT devices / machines connect virtually with global wireless standard using fifth generation 5G mobile network (ultra low latency internet via embedded IoT devices). In Asia-Pacific zone, 5G adoption is going to hit 4 billion in 2025 as per Ericson mobility report.***

Keywords: IOT- Internet of Things, B2C- Business to Customers, 5G- Fifth Generation, REST API - Representational State Transfer Application Programming Interface.

I. INTRODUCTION

IOT Technology - A variety of sensors in IoT are going to play the key role to connect different devices in the world. The IoT-internet of things is a new digital technological innovation contribution numerous advantages to the entire world of technology era. Big or small corporate firms, new or old organizations, and enterprises will advantage from IoT platform implementation. IoT offers real-time business vision and data that meritoriously run an organization when executed appropriately. As you know about COVID-19 shock, new IoT requirements for remote equipment control, easy to tracking using plug play sensors to maintain social distancing and e-monitoring IoT digital applications innovations gives lot of boost for new consumer behavior. In 2030 IoT is a vision to connect all 80 billion devices with the power of the 5G Internet. In this paper we are going to discuss about: 1. IoT protocols, 2. IoT sensors, 3. IoT Gateways, 4. IoT Cloud, 5. IoT systems, 6. IoT 5th Generation and 7. IoT apps.



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II. OBJECTIVES

In IoT business functions like- smart connected workplace, business process monitoring, control & optimization, enhance and extend IT, automation of products and services, business intelligence, engaging and connecting with customers & the marketplace.

A. Protocols in IoT

Coming to IoT protocols like – IoT Technology stack protocols to communication between sensors, devices, WAN connections on the gateway routers, servers and all other user applications that makes the IoT is all about. Add more IoT protocol information here, IoT Network protocols cellular, Wi-Fi, NFC, Bluetooth, Z-Wave, ZigBee, RFID, Smartdust, MEMS, TCP/IP, and HAN etc. Coming to IoT data protocols like – HTTP, MQTT- Message Queuing Telemetry Transport (It is lightwight-messaging protocol developed for battery low powered IoT devices). CoAP- Constrained Application Protocol (Designed CoAP -->translate the HTTP - RESTful model and it has relies CoAP on the UDP-User Datagram Protocol for endpoints communications), AMQP-Advanced Message Queuing Protocol (guarantee security and reliability complete transactions as well as robust communications model it is). Message Queue Telemetry Transport MQTT is an industry standard protocol for IoT.

B. Sensors in IoT

IOT Technology using few IoT sensors like temperature sensors, humidity sensors, pressure sensors, proximity sensors (It converts the images into electrical signals like vehicle reverses and they are 4 types of sub categories we may need to consider:
a. Ultrasonic sensors, b. inductive sensors, c. capacitive sensors and d. photoelectric sensors.
motion sensors, accelerometers, gyroscope, flow & gas sensors, infrared sensors, optical sensors, light sensors, image sensors, magnetic sensors, air quality sensors, water quality sensors, level sensors, chemical sensors, rain sensors, smoke sensors, LDR sensors, alcohol sensors and acoustic and noise IoT sensors are most commonly used sensors.

C. Gateways in IoT

Anytime a new IoT device attempts to connect / access to the gateway, it should permit a device verification process and authorization mode. Gateway can be intelligent to automatically sense devices, make sure the across numerous protocols, in the pool of networks. The response for rapid growing of IoT gateways is - Intelligence to Intelligent device to process - inbuilt run-time environment API. There are two types of API are there, one is RESTful API i.e., Format of data is based on HTTP, text, and JSON and second type of API-Format of data is based on HTTP called as REST API. Manage data locally for fast decisions can build in IoT gateways themselves (As per ABI Research - IoT gateway fingerprints will grow 64 million units in 2023). IoT gateway requirements due to high connectivity to processing of data, high level of redundancy and aggregation of data. A highly interoperability, remote control of IoT devices and its managements gives more mileage for IoT gateways. To add more common protocols in IoT gateway to support multiple wired and multiple wireless connection protocols standards are there i.e., Bluetooth, Ethernet, Wi-Fi, Zig-Bee and Z-Wave etc. IoT independent gateways capability to connect through standard protocols. All IoT devices data should be safe and secure, you can pick any one gateway Services.

D. Cloud in IoT

Any Cloud Services provider offers Internet of Things (IoT) services and resolutions to connect and be able to billions of devices. To collect, store, process and analyze IoT data for manufacturing industrial units, consumer, commercial, homes and automotive job workloads. IaaS- Infrastructure as a service and PaaS-Platform as a service and software as a service -SaaS in IoT visualized cloud-computing resources over the internet. Internet of Things - IoT denotes to a pool of managed services and platform services across cutting edge and cloud that link connect monitor IoT devices and regulate billions of IoT assets. IoT in cloud- includes safety security measures and operating systems for IoT devices and IoT equipment, beside with data and statistics for data analytics that support businesses to shape new deployments and accomplish IoT applications. In General public point of view, to create gorgeous and scalable engineering IoT applications to remotely monitor all operations, continues improve quality, and decrease un-planned downtimes. Easily faster identification of events that can be prevent food spoilage, leftover and waste, saving tons of rupees in potential lost revenue using MQTT-Message Queue Telemetry Transport publish/subscribe (pub/sub) messaging protocol. Well Managed IoT development platforms like – AWS – Amazon web services IoT cloud platform, Microsoft Azure provides IoT suite / hub for developers and Oracle IoT or Google cloud IoT having built-in designer to enables sophisticated fully managed IoT infrastructure.

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E. Systems in IoT

There are few IoT programming languages like JAVA, code development programming like - Python, LUA, PHPoC, Swift, JavaScript, Go and Rust. As far as IoT app development is concerned, as you know, JAVA has the most prominence in the market. Coming to few important IoT Frameworks open sources need to consider - KAA IoT, MACCHINA.io, ZETTA, GE PREDIX, ThingSpeak, DeviceHive, Distributed Services Architecture, Eclipse, Open Connectivity Foundation and OpenHAB are development IoT frameworks.

F. Fifth Generation (5G) in IoT

We know about 2G, 3G and 4G network environments and now we are going to start fifth generation network having very less latency (<5) and potential download speed bandwidth will be (>10) Gbps peak data rates. All our IoT devices are going to use 5G network due to lower latency, increased speed for high bandwidth, and higher density for device-to-device connections, added heavier capacity content load of networks. Finally, all 5G IoT devices are more energy efficiency wireless network equipment (90% lower battery consumption) and resource sharing as well as increased flexibility of IoT devices to process.

G. Apps in IoT

IOT Development platforms needs to acts as an Integrated Development Environment- IDE tool kit for application developments (android APK files, iOS file name .ipa files). Key IoT apps development platforms enables the developers to secure solutions for IOT functionalities applications and management of IOT devices are going to connected through the internet of the world. Few IoT application developments like- “HP enterprise universal” IoT platform, Watson “IBM” IoT platform such as IoT application development as well as management of devices. “Apple” and “GE” focusing IOT powerful software development tool i.e., -Predix IoT platform and one more IoT application development tool provided by “ThingWorx” it is well known for shorter development time take to process, reduce cost of mobile app development for IoT solutions for future technological world. Samsung’s one of the best IoT software application development IDE is “ARTIK” and one more development kit having a combination of software and hardware i.e., “Qualcomm’s IoT” development kit has variety of IoT applications futuristic platform.

III. SPECIFICATION FOR DATA SYNCHRONIZATION WITH IOT

Before reaching to message broker- all sensors raw data in the form of analog to digital format conversions - this process known as data acquisitions system. Digitized data aggregate need to processing to further to reduce data volume before stores data in storage devices. Next generations IoT devices can able to do pre-processing data analysis using machine learning technics provide systems pre-processing on an ongoing basis and it should not wait for the instructions from data storage centers. There are lot to know about IoT with AI, ML, DL, could compute, data science, Virtual & augmented reality and so many platforms we are going use.

IV. CONCLUSION

The Cutting-edge IOT Technology supports, security, challenging, compliance data management and lot of new instances of innovative future in IOT Technology.

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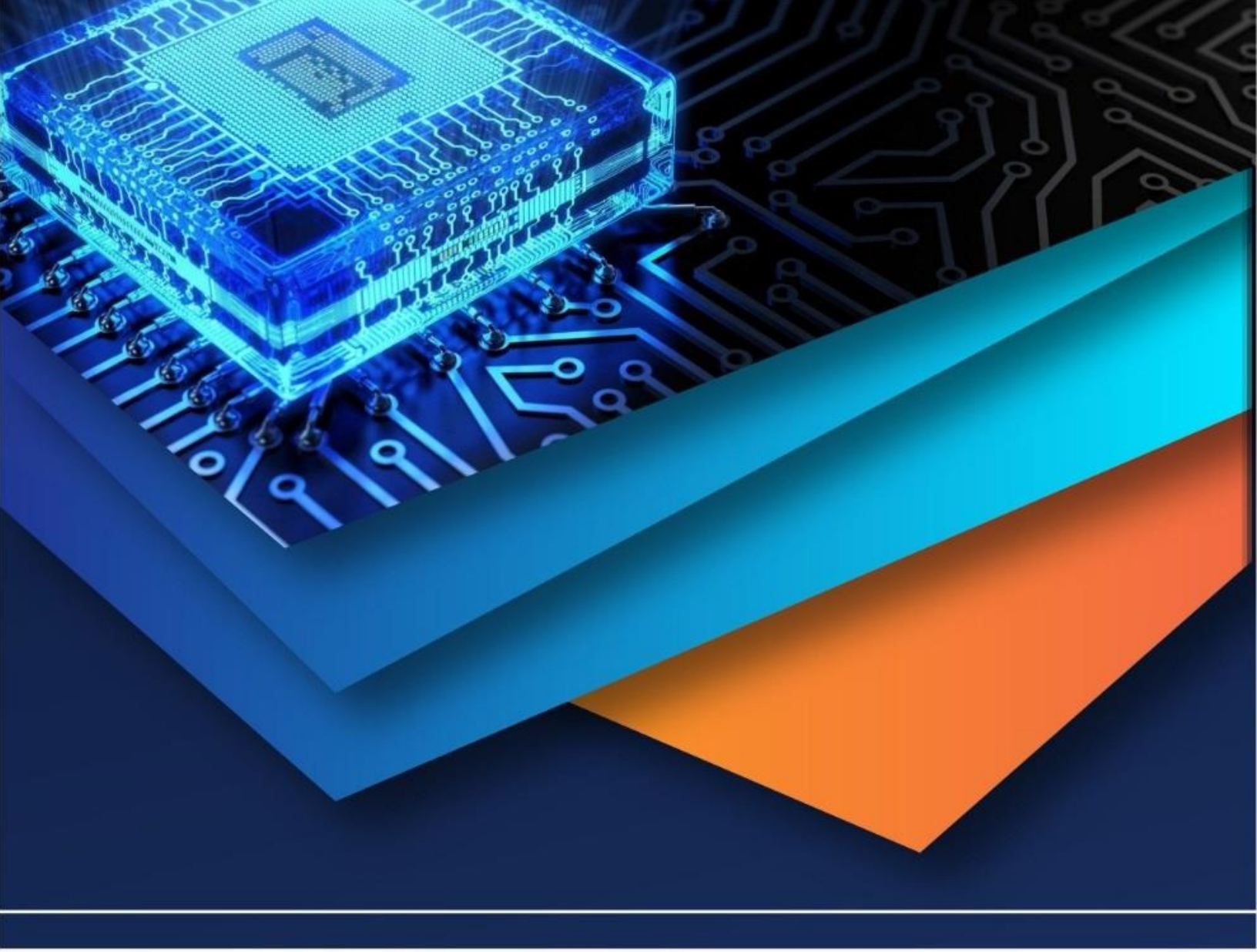

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