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Overview of Co-Operative Communication Model Using Esp8266 for Triangulation of Network Model for IoT Environment

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Abstract: ***The Internet of Things (IOT) allows objects to connect over the internet in order to gather and exchange data. Microcontrollers like as Arduino, sensors, selectors, and internet comparability are commonly used in these devices. In this context, the MQTT is critical for exchanging data or information between devices in the Internet of Things without knowing one other's identities. This paper discusses various communication service models in the Internet of Things. Model A uses serial USB as a transmission medium, whereas Model B employs the Message Queuing Telemetry Transport protocol, which connects the system to the internet via a Wi-Fi module (ESP8266-12). The concept of author and subscriber is utilised in communication. A agentor server is used to publish or subscribe to messages. The agent is in charge of disseminating messages to consumers based on the message's topic. In MQTT, the agent is also known as the server. -Mosquitto, Adafruit, and hiveMQ are some of the agents utilised in MQTT. We have demonstrated the applications of triangulation network for NODE-MCU using co-operative communication using hardware with MQTT protocol.***

I. INTRODUCTION

Internet of Things provide the ability to connect a large number of things or devices or internet. These things or devices have solitary identities. The IOT creates a smart environment by connecting devices with the internet and provision them with the ability to gather and exchange data. These devices are usually connected with micro- controllers, sensors, selectors and internet comparability. Such devices may include regular household items like washing machines, refrigerators, sound systems, coffee makers, alarm clocks etc. The IOT applications in smart cities includes traffic monitoring, air and water pollution monitoring, electrical energy consumption monitoring etc. IOT provides a tenet to different objects where they can communicate with each other while providing them the ability to self-organize. In IOT lightweight protocol like MQTT is used for data transmission. Message Queuing Telemetry Transport is a protocol that is used in IOT for data transmission. It is a author and a subscriber based protocol which allows multiple devices to communicate with each other over a wireless network. In Message Queuing Telemetry Transport author and subscriber do not need to know each other**'**s identity. MQTT bring the information from source to destination and achieved on the TCP layer. It is preferably suited for the IOT nodes which have constrained abilities and assets. Any MQTT connection consider two types of agents: the first is consumers of MQTT and another is MQTT agentserver. The Information disseminated by protocol is known as application message. MQTT consumer refers to the devices or objects connected to the network that take part in communication or exchange messages through MQTT. The MQTT consumers are named as author and subscriber. A author can send the application messages and subscriber can request for that application messages to get the information associated with that message. The agent permits the various consumers to connect with each other. It acknowledges and transmits the application messages among different consumers associated with it. In this paper we use HiveMQ as a agent. Wi-Fi is picked as the method of correlation in the model and the devices are monitored using MQTT convention executed deploys ESP8266.

In this paper, the creators depicted the current designs for home arrangementand proposed a home computerization architecture offering capacity to the entire modern IoT. The publishers have talked about the Arduino service interface programming model, a modern programming model that gives an administration deliberation to effectively compute new capabilities to microcontroller and furthermore offer help for networked boards deploys a scope of systems, including Message Queuing Telemetry Transport, socket connections and so on. A model is deliberated to perform home computerization through SMS. GSM organize and the gadgets are connected deploys a microcontroller. It furthermore centers around the security angles in systems administration and proposes a protected, solid and versatile home arrangementframework.

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II. OVERVIEW

Wireless networks are one of the most transforming technology of the past decade enabling unprecedented comparability, user convenience and mobility . Users are able to access all on-line services (email, web browsing etc) regardless of location, time or circumstances. Users at present are proactive about finding wireless network comparability like looking for a wifi hotspot to connect to but the future wireless network looks forward to an omnipresent comparability. Due to different multiple use cases and applications of wireless networks, many wireless technology exist. These include; WiFi, Bluetooth, ZigBee, Near Field Communication (NFC), earlier 3G standards, Worldwide Interoperability for Microwave Access, Long-Term Evolution, High Speed Packet Access (HSPA), Long-Term Evolution Advance (LTE-A), 5G, Evolution-Data Optimized (EV-DO), satellite services etc. Not withstanding the diversity, most wireless technologies operate on common principles, have common trade-offs, and are subject to common performance criteria and refrainment. Although the mechanics of data bringy through radio communication are fundamentally different, all applications perform well creating the same user experience. This section explores some wireless technologies and their standards with more interest on using small cell to improve capacity.

III. TOPOLOGY

The third main approach to capacity enhancement is by cell densification which can be by adding more macrocells or by dopping of traffic from existing macrocell using small cells like microcell, picocell or femtocells or by using WiFi networks. The difficulty in finding a suitable site and the cost of achieveing more macrocells is a challenge and so small cells are better option. Small cells are of two types, customers or enterprise managed small cell (indoor femtocell) and network operator managed small cells (micro, pico, femto cells). Deploying femtocells and using WiFi are suitable for dopping indoor traffic which constitutes a large proportion of current and expected total demand. Femtocells have the supremacyof being targeted and deployed in specific areas of need and uses licensed spectrum giving operators sole management of the networks. Extensive use of outdoors is a cost effective means of supplying capacity to hotspots but also have a crucial challenge of operators being unable to display the locations of hotspots having in mind that they may significantly change location with time. Small cell can also be used to extends coverage to small settlements in rural areas. Networks densification is the hope for future network capacity requirement and it has good energy saving capability. This approach is supported by mobile devices and it improves both capacity, coverage and user experience. The challenges are interference between small cells and interference between small cells and macro cell, mobility coordination with the umbrella macrocell and other small cells, the availability of suitable back-haul and maintaining or increasing the proportion of offload with time. Interference palliate was discussed in. The easiest approach to interference management in a HetNet is by carrier partitioning in which case cells of different tiers occupy different carriers. For occurance a HetNet where the macrocell is deployed on a frequency band of say 800MHz and picocells are deployed at 3.5GHz. In this case, the carrier apportion difference takes care of the interference between the HetNet tiers. Another crucial challenge is the difficulty in targeting these cells in the most needed locations so as to reduce the cost effectiveness. Network densification has an upper damper beyond which densification becomes destructive or cost-ineffective. This damper is dependent on properties of the channel power distribution, noise level, and pathloss . Well targeted small cell will ensure a good management of this damper.

IV. CONCLUSION

In conclusion, MQTT protocol permits the correlation between devices. Considering the simplicity of remote web access through Wi-Fi, MQTT consumer application is based on ESP8266.

This paper focussed on the execution of Arduino, NodeMcu and MQTT protocol and also describe different possible service models for communication among IoT devices. The administration shows in this paper discuss the communication between consumer and server using wireless (Wi-Fi) and wired (USB) transmission medium. MQTT protocol is the main focused area in this work, we figure out the different tasks using this protocol.

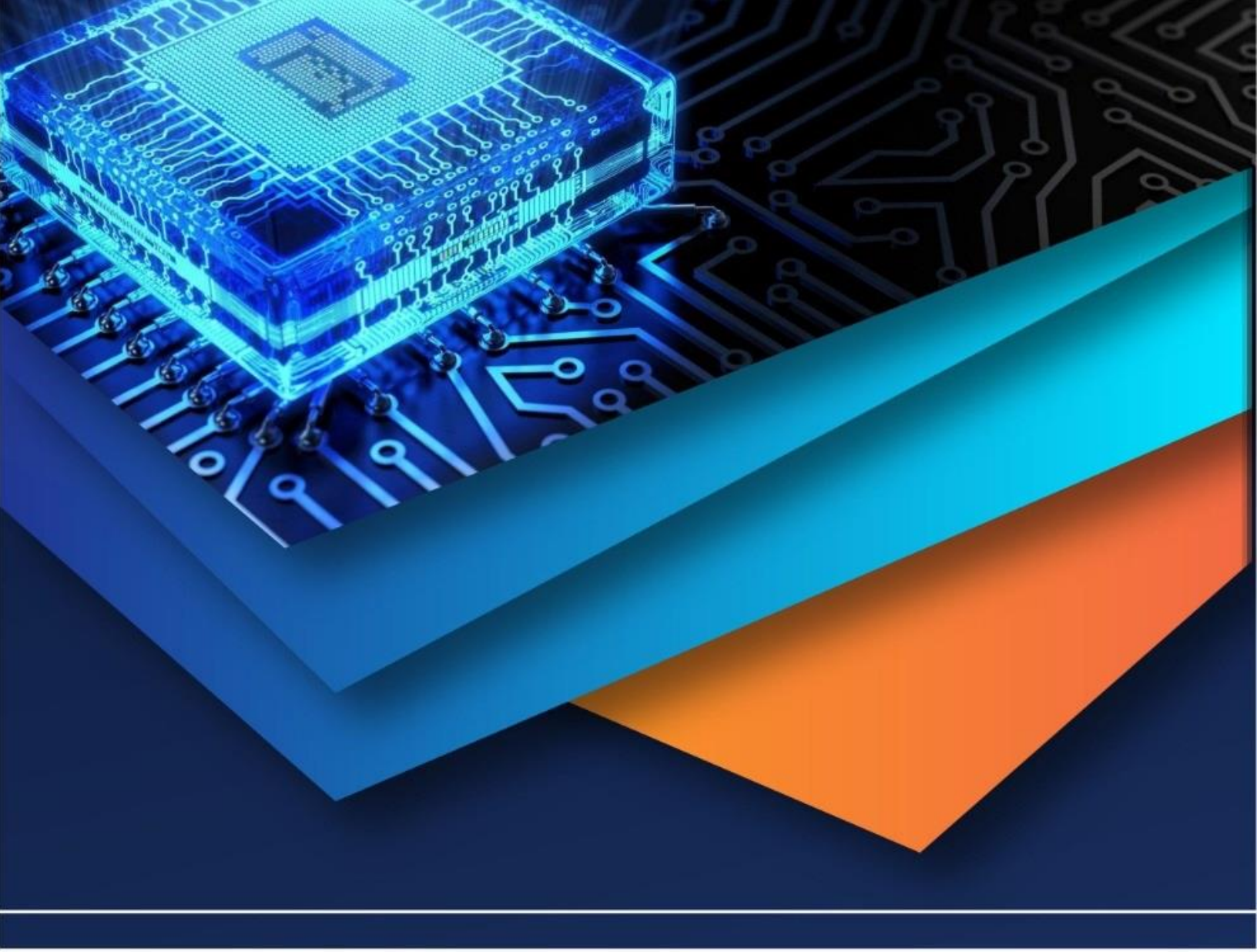
We tested this protocol by publishing and subscribing the message on the same machine, different machine, and then we set up a author on one device and a subscriber on another device. LED is connected to the subscriber, this led ON or OFF according to the message published by the consumer on the agentand also examine the MQTT protocol with various cases like create one author and different audiances, different publishers and one subscriber & different publishers and subscribers along with it also observe that if there is lost information or slack while distributing messages from two subscribers without a moment's delay. Thus, we have found that MQTT protocol is suitable for all cases defines above but speed of transfer information is less than the serial connection because it depends on the speed of Wi-Fi. But this protocol never lost the data while it is connected with Wi-Fi and it saves the data in a queue.

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