

Effective Machine to Machine Communication for Fault Tolerance

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Abstract: To reduce the human work by using M2M communication. The proposed project is to reduce temperature, overload, vibration using M2M communication (semantic engine rule). One or more entities that do not necessarily require human interaction or intervention in the process of scommunication. M2M is also named as Machine Type Communication (MTC).M2M communication is a new technology uses AI to communicate themselves without act of intervening humans. This gives less time to operate with an affordable cost. It mainly uses SCADA technique where sensors and other devices being through connected through computer network to monitor and control industrial processes.

I.INTRODUCTION

Machine to Machine (M2M) communications may be a terribly distinct capability that permits the implementation of the “Internet of things”. It is outlined as info exchange between a Subscriber station and a Server within the core network (through a Base Station) or between Subscriber stations, which can be carried out without any human interaction. Several industry reports have scoped out the huge potential for this market, with millions of devices being connected over the next 5 years and revenues in excess of \$300 billion. Given this potential, it's necessary that the IEEE 802.16 family of standards develop the competitive capabilities, which is able to enable them to expeditiously support M2M use cases of great market potential.

This technical report provides an overview of important M2M use cases that can benefit from wide area network connectivity. It additionally identifies the key options and architectures needed to support the vary of uses cases thought of and assesses their potential impact on the IEEE standard. The main aim of the report is to assist the IEEE working group in developing one or more projects, which will address enhancements to the IEEE standards for enabling M2M communications. The growth of M2M communications today is the pervasive accessibility of low cost, omnipresent connectivity. We have already become used to low price, home and commercial purpose. Nowadays, in many regions around the globe, 3G and LTE mobile networks have been provided equal internet access at highly competitive prices. The use of IP connected devices such as: Sensors, monitors, and actuators, in homes, industries that enabled the growth of new inter-connected and interoperable services, which are capable to revamp our daily lives, so as its easy to convert energy into motion. Exploiting multiple novel sources of information, the M2M technologies present a number of applications, sometimes known as IOT. Sometimes it is collectively called as M2M and IOT which are interchangeably used. However, the most important feature of IOT is the information is to connect things provide us, how this information can be combined and presented, and how the decisions can be made based on it. In this case, we are not really interested to know about connected things.

WAN M2M Capability

The example of this M2M usage class is that the slot machine with WAN M2M capability, that sporadically transmits current fill-levels to the service company or their delivery vehicles. The M2M devices may also monitor purchases to assist the service company perceive shopper behaviour so as to raised arrange promotions and introduce new merchandise.

Metering

Smart metering (e.g. Smart Grid) services meter gas, electricity, or water and bill the metered resource while not human intervention. Smart metering not solely allows remote meter reading. Smart metering helps both the customer and the supplier. For the client, good metering assists with load management programs, web metering, plug-in electrical vehicles, good appliances and energy observation and management.

Consumer Devices

In the Consumer Device market, WAN M2M communication enables navigation, automatic e- reader, photo storage for digital cameras, netbook services, and PSP. In addition, M2M technology supports content and/or knowledge sharing among devices via easy interfaces.

Retail

WAN M2M use case within the retail class presently receiving market discussion is digital assemblage. Digital signage includes applications such as digital billboards along roads and highways. These billboards receive new display information from the M2M server per updates from the M2M service consumer. Another use case for the retail category is a retail management system which facilitates supply chain management (SCM) and customer relationship management (CRM) in an electrically and remotely automated manner. For example, a retail management system connected to an M2M server, that uses sensors embedded into products and shopping tools and their readers via WAN M2M network.

Payment

WAN M2M communication permits bigger flexibility in preparation of location (POS)/ATM terminals, parking meters, vending machines, ticketing machines, etc. It additionally provides higher practicality, quicker service, and simplified management; and in rising markets, M2M enabled payment facilities will overcome a scarcity of wired infrastructure.

Other applications

- M2M Communication is also used to transfer data by using novel Latin square sharing
- M2M Communication is also used in IOT applications like public safety, health care.
- Smart cities construction
- Vital role in Robotics

II. PROBLEM DESCRIPTION EXISTING SYSTEM

M2M devices area unit typically little and cheap, introducing energy, bandwidth, computation, and storage constraints to communications. The potential booming of M2M applications will exponentially increase the quantity and variety of devices and traffic within the next years, that shall introduce additional challenges to communications. Current mobile M2M communications analysis focuses on performance analysis and improvement, either in terms of delay or resource usage potency. In this section, we have a tendency to survey relevant literature and structure current analysis areas.

According to Lu et al., reliability is critical for general acceptance of M2M, since unreliable processing, sensing, or transmission leads to false or lost data, and ultimately to M2M communications' failure from the user's perspective. Although end-to-end service reliableness continues to be a challenge, it's being addressed by standardization efforts. In this Paper, the range of devices competitory for constant channel will increase, the quantity of coincident accesses can increase, and packet collisions, and signal interference in general, will be more common. Zhang et al. propose a joint rate and admission management theme for QOS provision in M2M communications, using an IEEE 802.11 network, by exploiting heterogeneous networks and accurate predictions of QOS. Gallego et al. introduce contention-based mack protocols for sensor-to-gateway communications in wireless M2M, and analyse them in terms of delay and energy potency.

III. PROPOSED SYSTEM**WIRELESS SENSOR NETWORK**

Wireless device network system area unit autonomous and operate unattended additionally reconciling to the atmosphere. The wireless system for observation purpose won't solely scale back the observation system value in term of facilities setup and labour value, however perpetually give flexibility in system in term of distance or location. So these systems area unit wide utilized in military, hospitals, home and other commercial areas. According to these aspects the ZigBee becomes the new normal meant for low value devices in automation, computer peripherals and home controls. ZigBee normal performs well at industrial environments the basic style and implementation of WSN that includes a high power transmission ZigBee based mostly technology⁴. The developed platform is cost-efficient and permits simply in WSN systems and also because the result on reducing energy consumption. In this we can use Arduino Uno, sensors, stepper motor, LCD

ZIGBEE NETWORK STRUCTURES

There are three network topologies which are used. Star Network, Cluster Tree Network, Mesh Network⁵. Different network topologies engineered up by ZigBee devices like star, cluster tree topology and mesh network. For all network topologies, there are often just one organiser in every network. In star topology there is a coordinator which is responsible for all over the network. All alternative devices area unit back-end devices and directly communicate with the organizer. This topology is appropriate for networks with a centralized device and for time crucial applications.

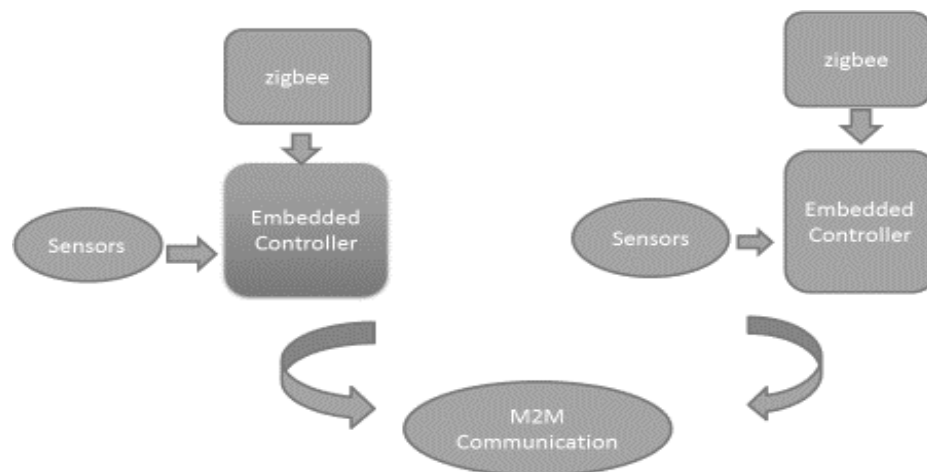


Figure: block diagram of the M2M Communication circuit

The above block consists of two machines. Arduino is used to give inputs and supply to the circuit. The step down transformer is mainly used to step down the voltage values from the supply. ZigBee is a communication protocol. Here we apply three conditions when we apply more vibrations it exceed than the above level that machine stops and the other one starts. The work is continue without any delay. When the temperature is rise than the certain levels, the other machine starts. Likewise overloaded causes many damage to the machines.so this principle also applied in overload also. These are employed under the semantic engine rule.

IV.CONCLUSION

This paper has provided a comprehensive review of M2M communications, discussing a general M2M communication system model, and explaining its three interlinked domains. Then, we have identified and explained the distinctive features of M2M applications and their supporting attributes from those of H2H communications. We have categorized M2M data traffic for a number of different M2M applications based on the three major data traffic characteristics, namely packet length, transmission mode, and priority of the data transfer. We have shown most of the standards developed for M2M communications by various standardization bodies in detail. We have also categorized them into three different classes, namely M2M standardization bodies, technology driven alliances, and application driven alliances, explaining their specific targets. Then, we have described some potential M2M communication challenges and their proposed state-of-the-art solutions. At last, we have pointed some key future research directions in this area to be explored further. It is mainly employed for future scope.

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