

Wireless Area Network Interoperability using IOT Automations

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Abstract— IoT's Internet of Things. The basic set of protocols followed for data transmission and data handling in a secured and safe mode, between various computational devices is known as IOT's. Network interoperability is the continuous receiving and transmitting data which is linked with each other for data transmission and network managements. In this context the paper is all about implementation of Network Interoperability in the fields of telecommunications for wide access areas via Interoperability of IoTs in the fields of telecommunications by zigbee, ARM controllers and SIP, VOIP, IPV4 protocols, IMS packet switch networks.

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Keywords —; **Classification System of IOT interoperability, machine to machine communications, VOIP, SIP, IMS packet switch**

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I. INTRODUCTION

As per the basic features of IoT's Applications which are multiservice data exchange, Broad sensor hardware support. Data integration apps and devices. In cloud storage. Topic based notifications. Controlled firmware "updates. Customized data analytics. Autonomus interoperability. This feature of Autonomous Interoperability is used in extending the range of IoTs in telecommunication. From the above mentioned applications autonomous interoperability is key point selected for discussion and is titled as, "Interoperability of IOT's in Telecommunications". IOT's encourage the communication between devices known as Machine to Machine communication; it also supports man to machine communications, which forms the primary task of any IOT. In man machine the set of commands instructions are predefined by the user. IOT's internet of things which has overtaken the complete world of technology at various levels.

The primary advantages of IoT's such as Fast and This as IoT is a protocol which digitally connects the devices by establishing a communication between them. Compatibility and longitivity IOT applications tend to remain in service for much longer even though they are not in use. In this particular cases they will remain continue. Standards-network protocols, communication protocols, data aggregation standards are sum of all activities handling process and storing data collected from sensors. This aggregation increases the value of data by increasing the scale, scope and frequency of data available for analysis. Standard for handling unstructured data-Structured data are stored in database and queries in SQL. This can be accomplished by Interoperability feature. There is no

specific definition of interoperability because it varies for every individual and concept to concept. But is very important to know what exactly the interoperability is? Interoperability is nothing but the process in which the devices are depending on other devices for the operations to be performed. That operations can be said as data transmission via satellite communication which is biggest advantage of interoperability of devices and due to non accessibility to WAN (Wide Area Network) and accessibility to LAN (Local Area Network) the disadvantage can be overcome by using communication modems such as Zigbee modems.

The need of interoperability is that the transmission of data & receiving is faster and the data transmission will not be related to one concept multilevel data can be transmitted because there are group of devices interacting with each other and finally getting with kernel. The group devices will share and produce more & multilevel data in less time with good efficiency and quality level, interaction and exchange of data with the present devices. This is most precious need of interoperability. The communication can take place whenever needed at anytime. Interoperability can also be said as a kind of devices with a code language used to provide a top level security to each and every source present that may be your data base stores, memory locations etc.

User friendly approach, High secured accessibility Self automation and controlled Priority identification Data handling with security handling feature enables a best mode of communication. The driving Features of Divers protocols, Data logging, Priority resolving, Machine interoperability, Communication, compatibility. IOT is a set of protocol

getting connected digitally. These are encroaching on every aspect of lives, including our homes, office, and cars even our bodies. The execution format which is to be followed in this process is arranged and executed in the following form: Security → connectivity → compatibility and Longevity → standard → analysis and action. How to achieve Interoperability? Interoperability can be achieved by setting a gateway concepts as earlier mentioned all the devices interacting with each other is finally linked to a kernel. So all the devices are sharing a common bond between them. Only we need to work on installing kernel for better transmission of data with other devices depending upon each other.

1. Secure cloud database network - Cloud computing can be said for one of the factor. Cloud computing is virtual storage of data which means if memory is full it will create its own virtual space and complete the data process which is in excess.

2. Big data transmission facility 3. E-mobility platform. The data transmission which is taking place is not only limited towards local area but it can also be extend to wide area network which is exactly the project is based on. The data transmission taking place is in the large factor i.e. wide areas and can be obtained by special communicating devices such as Zigbee and even by the use of ARM microcontroller/GSM (Global System For Mobile Communication) are the factors that make the communication in wide range based on IOT's. Modem can be used for data transmission process.

1. GSM is one of the advantageous in the fields of communications. Zigbee is again the high level communication protocol which creates personal area networks as it consumes less power and less data.

2. Zigbee - high level communication protocol. A kind of modem working wirelessly which is used in data transmission for wide area. The disadvantages which got converted into advantage after few years in the IOT

- Security level - IOT had big issues related to security, as the security initially which was provided at some respective steps was overcome by providing security to all the steps to particular extent of a protocol.

- Integrating new technology in existing environment - The new devices, connectivity and modems were created having high speed data transmission. The existing protocols were made to match with the new inventions and its features of IOT and yet it is still developing.

- Bringing data in edge form - Bringing data in form of edge is nothing but the kind cloud computing process which can also be done via cloud controller, cloud storage. These are the devices which are used in it.

- Communication – IOT encourages the communications between devices also known as M to M communication called as machine to machine communication.

- Man-Machine relationship man-machine communication also is included in this as we give display unit and in return we get output unit which is one of the better example.

- Automation and control - Due to physical objects getting connected and controlled digitally and centrally with wireless communication in the large amount of automation and control working without human support. Machines are able to communicate with each other based on IOT's. Based on that instruction set the machine executes the commands. The IOT's support machine to machine communication through the set of predefined group of instructions to execute a fixed task either at dedicated time or assigned time or dedicated sequence.

A. In this dedicated time or assigned time is set by the programmer based on the current requirement process.

B. In the dedicated sequence based on the availability and priority a machine communicate with the other

The above two points form the basis of interoperability which is used as a point of discussion in automation interoperability in IOT's. Automation & control is primary task which is executed in telecommunications with the help of IOT's. Due to physical objects getting connected & controlled digitally and centrally with wireless communication with large amount of automation and controlled working without human support. Due to Priority identification ability or priority resolving ability. The IOT's helps in making better decision which is very essential part of communication field based on IOT's.

Concerns of security is a vital role in interoperability. A. Generation, B. assignment of security codes are crucial during the design & development of interoperability though there may be few security concern in machine to machine interoperability as well as man-machine interoperability, still to some extent & in some cases the allotment of security codes and decoding them becomes tedious jobs. Achieving the deadlines-Managing of time and allotment of the slots is another vital part in interoperability and this is well obtained and maintained by time-task management system. Flow chart based on interoperability in the telecommunications based on IOT's.

In this part we can clearly make out the IOT linking with interoperability where as in telecommunication the interoperability is vital aspect as the devices interact with each other example which can be considered is man-machine interoperability, machine to machine interoperability.

Start - In the First initial step whenever the input is provided in form of signals get started. Signals which are provided can be in analog form or digital form. Encrypted + Encode - Encrypted encode is process in which a data is encoded to keep the data safely and privately and it is done through by providing it a symmetric key. Symmetric key is digital code given for encrypted formats using parity forms. In this codes are in digital forms. Connect to Gateway -

Connect to is nothing but the process in which devices/protocols are interlinked with each other and linked to single device/protocol for a better operation where interaction between all the devices takes place on one kernel other are dependent for interaction .This is what a gateway is. Gateway is again a kind of condition operator which checks weather the provided signal is correct as well as does it support the system of that protocol as per requirement. Send post - when the signal goes to send post. it post i.e. it transfer the data signal to next function operator only when the data signals are corrected according to gateway if it does not match all though with the gateway the signals are again sent in the initial step for re-execution and operation of particular signals

Payload - When the data is sent to the internet it has its header information and actual data being sent. The actual data is said to be payload. In this we can discuss about the cloud controller .It is a device which manages the complete actions of data storage in virtual space. Example-In phone the external memory is virtual memory that can be sim memory and that card reader is said to be cloud controller. **Receive post/ extracted payload** - In this process when signals are received.

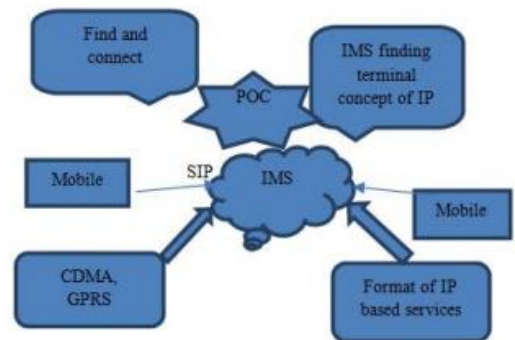
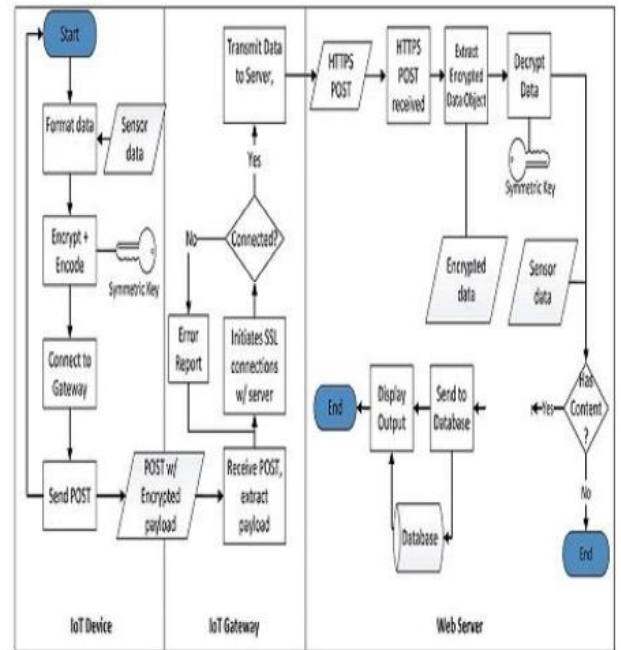
The specific and essential informative signals or codes are extracted from entire signals and is sent to the server system connections to get desired output as per it or it can also be described as execution & display of codes where the security is directly provided to signal. Example - tree-#110100* **Decrypted Data** - this data is the one which gets the information which was earlier in digital form into images pictures and graphs etc. this is what the decrypted data is which again has privacy by a digital code given by symmetric key it keeps data safely. If the condition is YES, then it goes to formatted codes and then to database, which is basically a memory location. If Condition is NO the program gets stopped. After database where the code is stored in memory locations is ready for display and perform the communication task. So all the flow chart exactly states that the devices which are present interact with each other based on IoT.

Although it can be specifically seen via telecommunication because the devices which are interacting are wireless communicators. even though there is no wired connection the communication is taking place, it means that communication in this is through satellite and which can be obtained by zig-bee.

Network Interoperability becomes indispensable in order to achieve end to end connectivity as well as end to end communication.

- Physical level (opto electric radio)
- Network level (homogeneous, heterogeneous and mobile networks and optical and electrical networks)
- Management aspects(managing of networks for LAN, WAN) **Semantic Interoperability:** Based on algorithm which includes declaration of header files and kernel. For Network

Interoperability implementation of IMS architecture is required it helps us to provide fixed mobile wireless convergence.



IMS packet switching networks: initial protocols(SIP), VOIP(Voice over IP services), V4 protocols.

IMS packet switch networks: IMS is basically IP multimedia subsystems. This is 3GP network connections it is basically used for wireless communications and on this our idea is based Network Interoperability for wide access networks via wireless communication with help of interoperability of Iot in the fields of telecommunication. IMS, GPS, EPS are one of the best known network communications. There are two types of interoperability's:

1. **Syntactic Interoperability:** In this interoperability two or more devices communicate and exchange data. It even allows different software components to cooperate all though the interface and programming language are different.

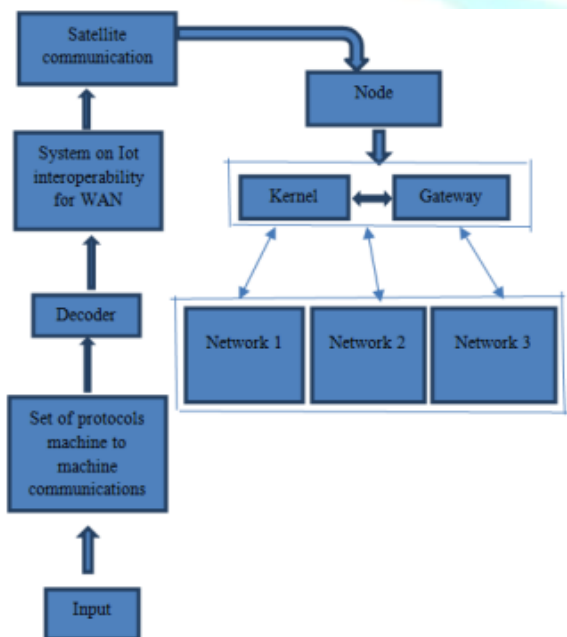
2. Semantic Interoperability: It depends upon useful results defined by the users of systems involved in exchange

II. ACHIEVING INTEROPERABILITY

Well achieving interoperability is easy as well as difficult task, for achieving interoperability we need to provide a gateway which is basically a kind of kernel and translates the information by two protocols. The set of protocols need to be provided, based on which the interfacing and data transmission takes place for achieving the best interoperability we need to make a common peripheral, further when launched with satellite and can get accessed again by the concept of interoperability of Iot in the fields of telecommunications for wide access networks. A kind of nodal to nodal network interoperability management, IP and VOIP's used should be having high quality protocols and individual quality protocols so that interoperability occurs smoothly.

III. CHALLENGES IN NETWORK INTEROPERABILITY

- Execution based on integrated programs.
- Types: Deals with multilevel programs, so signal processing is late, which leads to consume of time for data transmission and receiving.
- Interface Issues: The format of one system network doesn't cooperate with other system with different interface.
- Data type compatibility.
- Security Issues: Web servers are hacked. For solving the issues, systems of networks need to be analyzed and based on analysis we need to make or create a node.



Ones the node is created we need to provide a gateway and kernel. Ones the node is created it can be accessed wirelessly by satellite communications and by providing

some set of protocols from IoT interoperability and for wide access networks. The most important advantage will be that, the networks are interconnected for transmission, but article tells you that networks will be linked with each other but data transmission will be wireless, it means that network interoperability will be just linked but not interconnected. So the benefits can be like time will consumed less and instead of interconnected transmission it is easy to access by satellite communications and if we add Zig-bee modems which is basically a part of Iot interoperability in fields of telecommunications and then the part of network interoperability and data transmission will be possible for wide access areas

- Input: Input is nothing but the set of protocols based on which the task is performed.
- Set of Protocols (machine to machine communications): In this protocol processing is done and sent to decoder.
- Decoder: Decoder is the device which decodes the signals in digital forms.
- System of IoT interoperability for wide access networks: Ones the signals are decodes it goes to the system of IoT interoperability for WAN. Here in this system the commands which are passed are undergoing certain modifications which is based on machine interoperability, then commands are sent to devices which are at wide areas start getting operated.
- System is now launched/connected via satellite: Now as it is a satellite communication the information will be received by system of network interoperability. Node which is there will receive the information and will be checked by kernel and the data will be transmitted to individual networks for the task operation. The data now goes to the system of kernel and gateway where the data is been analyzed and processed as kernel is superior part of system it deals with all the data. Once the data is analyzed it operates the network, the operation of network is nothing but data transmission which is a wireless transmission for wide access area.

This is how data transmission and data handling and network management is done, which leads to better quality data transmission between networks which is wireless communication and IP, VOIP, V4 protocols playing its vital role in electronics and telecommunication having its access over wide areas a biggest advantage. Applications of network-Iot based interoperability in telecommunications for wide access networks. Interoperability of IOT in the fields of telecommunications for wide access as well as network interoperability for wide access areas. Network management interoperability for wide access networks. Network interoperability via optical fibers.

IV. CONCLUSION

The disadvantages which got converted into advantage is the IOT Security level and WAN communication- IOT had

big issues related to security, as the security initially which was provided at some respective steps was overcome by providing security to all the steps to particular extent of a protocol. Integrating new technology in existing environment The new devices, connectivity and modems(Zig-bee) were created having high speed data transmission. The existing protocols were made to match with the new inventions and its features of IOT and yet it is still developing and with bringing data edge by cloud computing. Network interoperability is only linking with other networks for data but the main advantage is data will be transmitted via wireless communications which will be accessed for wide access networks via above mentioned zig-bee and ARM controllers and SIP, VOIP, IMS packet switching networks and Semantic and Syntactic interoperability and system of Iot interoperability for WAN with Gateway and kernel and machine to machine communications, V4 protocols.

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