

# ZIGBEE with XMPP Application Server Instant Message Communications Tools

<sup>1</sup>S.Poorana Senthilkumar, <sup>2</sup>P. Dinesh kumar and <sup>3</sup>Rajeshkanna Rajendran,

<sup>1,2,3</sup>Assistant Professor, Department of Computer Applications, Dr.N.G.P Arts and Science College, Coimbatore, Tamil Nadu, India

**Abstract:** Now a days we are living with mobile apps era. This article basic objective is how we are going to combining existing ZIGBEE with XMPP server. The Instant Messaging (IM) is a relatively new means of online communication. IM uses almost nearly synchronous text chats that allows two individuals or group of people to communicate in real time.

The invention relates to the field of intelligent home and industrial control, in particular to an intelligent application control method and device based on an XMPP server. The intelligent application control method and device is used for controlling intelligent appliances. The intelligent application control method and device based on the XMPP server aims at solving the problems in the prior history.

In a view of IoT technology, two important considerations arise: how to connect the industrial machine and home appliance devices without communication breakage in real time, and how to manage network traffic and the data that a great number of devices will produce. In relation to these issues, as a communication protocol, it stands out that the Extensible Messaging Presence Protocol (XMPP) is a prominent candidate for achieving the realization of the Internet of Things, where everything can be connected and exchange data.

**Keywords :** ZigBee, XMPP, XML, IoT, Instant Message

## I. INTRODUCTION

This basic idea is derived from wireless community the ZigBee protocol playing a main roll in wireless communication. This idea may support both ZigBee and XMPP server concepts. In this paper contains layers of ZigBee and data flow technique from XMPP server to ZigBee and vice versa.

The intelligent applications control method and device uses interaction of a user terminal, the XMPP server, a set top box and a Zigbee wireless terminal to achieve the purpose of remotely controlling appliance equipment to facilitate popularization and application of digital home or industrial based products. Furthermore, inquiring orders can be sent by the user terminal and then transmitted by orders of the XMPP server, operation states of appliances can be indirectly inquired through the Zigbee wireless module, the operation states can be returned back, and accordingly the operation states can be displayed in a display module of the user terminal. The intelligent application control method and device is applied to the field of home or industries appliance control.

## XMPP

XMPP, the Internet Standard eXtensible Messaging and Presence Protocol is being widely adopted for Instant Messaging (IM), Group Chat and Presence services in PAN networks. An open technology for real-time communication, which powers a wide range of applications including multi-party chat instant messaging, presence, , voice and video calls, collaboration,

lightweight middleware, content syndication, and generalized routing of XML data.

The Extensible Messaging and Presence Protocol (XMPP) is the IETF's formalization of the base XML streaming protocols for instant messaging and presence developed within the Jabber community starting in 1999.

## ZigBee

ZigBee is the wireless language that everyday devices use to connect to one another. ZigBee is an IEEE 802.15.4 standard for data communications with business and consumer devices. It is designed around low-power consumption allowing batteries to essentially last forever. The ZigBee standard provides network, security, and application support services operating on top of the IEEE 802.15.4 Medium Access Control (MAC) and Physical Layer (PHY) wireless standard. It employs a suite of technologies to enable scalable, self-organizing, self-healing networks that can manage various data traffic patterns. ZigBee is a low-cost, low-power, wireless mesh networking standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage allows longer life with smaller batteries, and the mesh networking provides high reliability and larger range. ZigBee has been developed to meet the growing demand for capable wireless networking between numerous lowpower devices. In home and industry ZigBee is being used for next generation automated manufacturing, with small transmitters in every device on the floor, allowing for communication between devices to a central computer. [3].

ZigBee Network Topology

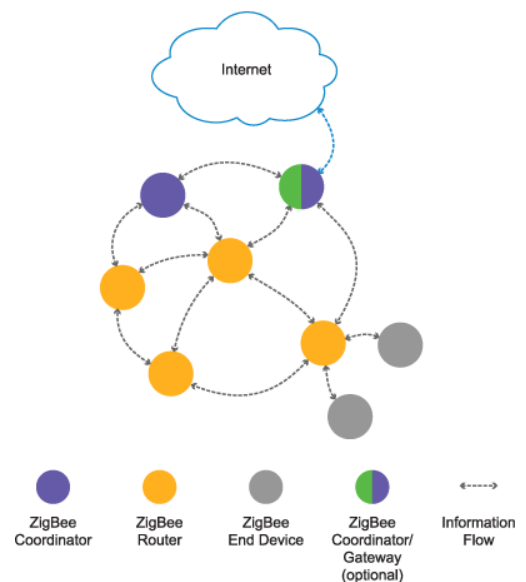


Figure 1: ZigBee Network Topology

## IoT

All the electronic manufacturing objects are directly connected to the internet through by IoT. The IoT referred as Internet of Things or Internet of Object. As that today technologies with many concepts of object are available in market. Concept of IoT achieves wireless technology with internet embedded on electronics, software and sensors devices.

## Methodology

ZigBee PRO networks are composed of several device types: ZigBee Coordinator, ZigBee Routers and ZigBee End Devices. Coordinators control the formation and security of networks. Routers extend the range of networks. End devices perform specific sensing or control functions. Manufacturers often create devices that perform multiple functions, for example a device controls a light fixture and also routes messages to the rest of the network. This figure 1 illustrates an example ZigBee topology that includes one coordinator, five routing devices, two end devices creating a control network and an optional combination coordinator/gateway providing access to the Internet for more control flexibility.

## Data Flow Approach

Through the Mobile Apps we are connecting to XMPP server. The XMPP server protocol is XML structure based protocol it have good data reliability and semantic formatted processing data. That XMPP protocol use TCP connection through IOT to build XML stream flow it carries data as the format of instant message from server to ZigBee device for further communication process. ZigBee services involve several roles as user and multiple service providers.

Steps:

1. Apps establish connection to XMPP server and finish the validation and verifications of authorization and all other formalities.
2. XMPP server receives data (Message) and then server produces the connection with IOT.
3. IoT receive request and connected to ZigBee device.

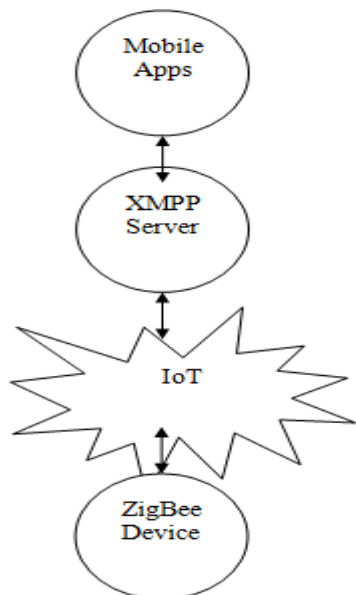


Figure 2: Data flow approach

The data packets are extended as per requirements of ZigBee packages and providers receives the acknowledgement then device play as per roll of device programming.

## ZigBee and Internet of Things

The ZigBee wireless mesh topology is already enabling the growing device -to- Device and Internet of Things (IoT) trends and providing utilities and energy service providers with commercial and consumer applications energy management and efficiency capabilities.

## XMPP and Internet of Things

XMPP is an open technology for real-time communication and it uses a decentralized client-server architecture similar to the architectures for the World Wide Web and email. In addition, it uses Extensible Markup Language (XML) as the base format for exchanging information. In essence, XMPP provides a way to send small pieces of XML from one entity to another in close to real time [8]. Originally, XMPP is developed by the Jabber open source community in 1999, formalized by the IETF in 2002-2004, and continuously extended through the standards foundation. XMPP supports presence, structured conversation, and the generalized routing of XML data.

We can anticipate that in an IoT world there will be a large number of connected devices, the majority of which will have power constraints. In addition, some devices may periodically turn their transceivers on or off to save power during a certain amount of time. However, in XMPP, devices must send messages representing their current condition among themselves. This is called a "Presence" message, and it is exchanged between devices with a subscribed relationship. This Presence message is generated when the device state changes, and the message is broadcast to subscribed devices. Therefore, if this message is too frequently generated, it can severely deplete the energy reserves of power-constrained devices, which would create a critical problem.

## CONCLUSION

This paper analyzes the characteristic of real-time approach for XMPP collaborate with ZigBee protocol Through is technique we can create our own open instance messaging protocol. Numerous developers are creating a wide range of other smart home apps that can work with this system; their information can be displayed and managed on the same basic cloud apps. This approach will be improved in efficiency based on quantities analysis and data compressing.

ZigBee will be the key technologies wherever scalable, low cost, low power networking is required at wireless network. ZigBee will bring a huge civilization in the wireless network. These will consist of billions of devices across the globe as every home appliance more and more devices controlling, monitoring, securing and interfacing with every aspect of our lives.

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