

WBAN and Cloud Computing- 2

Vishesh S¹, Pradhyumna M², Suchit Shavi³, Sujaya HS⁴, Suraj N⁵, Kavya P Hathwar⁶

B.E, Department of Telecommunication Engineering, BNM Institute of Technology, Bangalore, India¹

Student, Department of Med Electronics, BMSCE, Bangalore, India²

Student, Department of ECE, BNMIT, Bangalore, India^{3,4}

Student, Department of CSE, BNMIT, Bangalore, India^{5,6}

Abstract: Computer networks and data communication networks can be classified based on the range or span of the network. One such classification is the Body Area Network. Serious research and an outlook for alternatives in this field are in progress and in this paper; a small module of it is presented. An inter-body network or inter-Body Area Network is considered to be one Autonomous entity and its behaviour within and between two are more autonomous entities are analysed and the result is stored in the cloud. Simple algorithms enable the person or systems entitled to receive or dump the real-time data from/to the cloud. Open Shortest Path First protocol or the OSPF protocol is used as the Interior Gateway Protocol (IGP) and Border Gateway Protocol (BGP) is used as the Exterior Gateway Protocol (EGP). As BANs generate large volumes of data, the need to manage and maintain these datasets is of utmost importance. A robust Database Management System (DBMS) is essential and must dynamically store and share real-time data of the network.

Keywords: Inter-Body network or Inter-Body Area Network, Real-time data from/to the cloud, OSPF protocol, Interior Gateway Protocol (IGP) and Border Gateway Protocol (BGP).

I. INTRODUCTION

The classification of a network based on span or range of the network [1] is also an indicator of the complexity of the network as a whole. The Body Area Network (BAN) is one such classification, though its span is restricted to the circumference of the human body wearing it, its complexity in architecture demands serious network build-up and troubleshooting. Open Shortest Path Fast (OSPF) protocol, which is a dynamic routing protocol [2] provides a serious platform for network convergence in case of change in network topology. An OSPF network can be divided into sub-domains called areas. An area is a logical connection of OSPF networks, routers, switches and links that have the same area identification. Each OSPF network that is divided into different areas must follow the below rules [3]

- A Backbone area must exist
- Each non-backbone area must be directly connected to the backbone
- The backbone area must not be further divided

A BAN will/may consist of several OSPF area types

- Normal
- Stub
- Totally stub
- NSSA (Not-So-Stubby area)
- NSSA totally stub

A server and a proper fixed IP address is the need of the day when the discussion is about the Wireless Body Area Network (WBAN). A server includes a set of computer programs and algorithms that is designed to process requests and deliver data over the network. Cloud servers offer great benefits over the traditional options of shared or dedicated servers. We have opted for virtual server rather than renting or purchasing physical servers. There are multiple cloud servers which are available to each particular client. This allows computing resource to be dedicated to the client if and when it is necessary. Cloud servers offer more redundancy in case of server failures.

II. NETWORK TOPOLOGY

Let us consider numerous sensors embedded on to the body. These sensors may measure

- Physiological parameters of the body.
- Ambient environment.
- Non-physiological parameters.

Figure 1 shows the Block diagram and network topology of a Wireless Body Area Network. It also consists of a Distribution network, which includes relay sensors and relay cloud. The cloud manager is responsible for the activities related to the cloud data transfer or relay. The WBAN and distribution network or interconnected using a Gateway to

WSN (Wireless Sensor Network). The End User can access the data or information and can be shared with his counterparts.

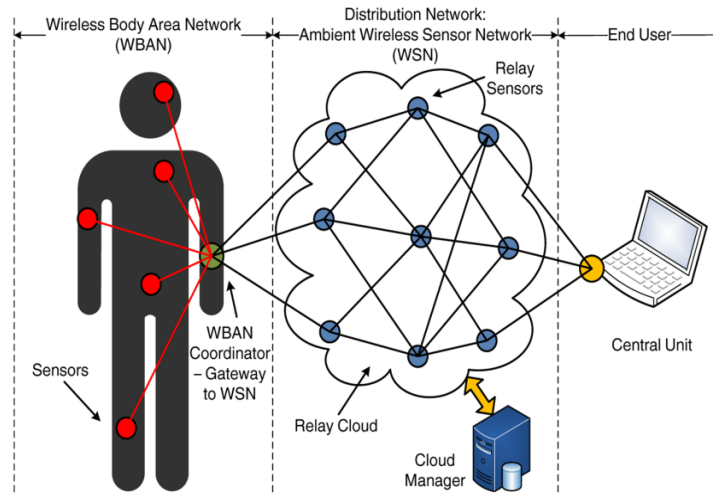


Figure 1 shows the Block diagram and network topology of a wireless Body Area Network.

III. INTER-AS COMMUNICATION

Any Human body embedded with a BAN and the wireless signal selectively restricted to the circumference of the body is called a wireless Intra-Autonomous System. Since an AS is a social being and information must be selectively exchanged between other ASs, Inter-AS communication plays a vital role in doing so. A particular frequency running in a body without any external interference is now made to intervene with another AS running a wireless protocol of some other unique frequency or Bandwidth. Figure 2 shows a typical Inter-AS communication System. AS-200 belongs to Body A. RTB, RTE and RTC run IBPG between them. RTB and RTA are the Border Routers (BR) of AS-200 and AS-100 respectively. EBGP is configured between these two BRs. Similarly, EBGP runs between RTC & RTD of Body A and Body B respectively.

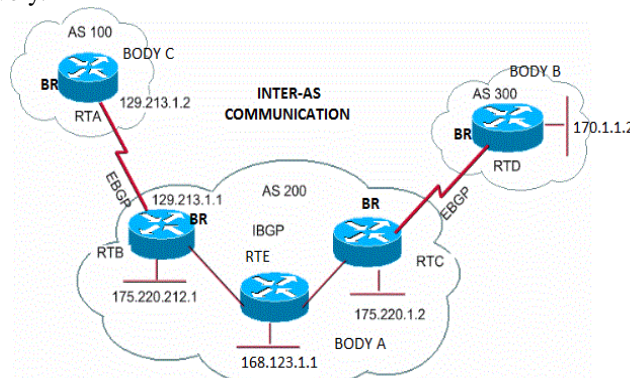


Figure 2 shows a typical Inter-AS communication System

IV. DISCUSSIONS

Advantages in sensor technology and architecture aid the evolution of the WBAN. The sensors used in WBAN would have to be low on complexity, small in form factor, light in weight, power efficient and error-free. Sensitivity and Accuracy of sensors plays a very important role. Even a slightest error can trigger series of offset errors in the network. The problem of signal interference between two ASs has to be resolved. The wireless link used for body sensors should reduce the interference and increase the co-existence of sensor node devices with other network devices available in the environment.

V. CONCLUSION

There is a need for a serious breakthrough in Body Area Networking. It would be a failure on the part of researchers to see physical connections like wires or foils running all round the body. A high impedance shoe is essential in situations where electrons flow through the body and carry the information/data. Since human body is a very good conductor of electricity and acts as a short to the flow of charges in the body. A very good alternative for the above is the wireless Body Area Network. The transmission and reception of data takes place within the circumference of a body (an AS) or between two or more AS. The former is called Intra-AS Communication and the latter is called Inter-AS communication. We have adopted a wireless data routing and sharing system using various protocols that suits the present technological scenario.

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BIOGRAPHY

VISHESH S born on 13th June 1992, hails from Bangalore (Karnataka) and has completed B.E in Telecommunication Engineering from VTU, Belgaum, Karnataka in 2015. He also worked as an intern under Dr. Shivananju BN, former Research Scholar, Department of Instrumentation, IISc, Bangalore. His research interests include Embedded Systems, Wireless Communication, BAN and Medical Electronics. He is also the Founder and Managing Director of the corporate company Konigtronic Private Limited. He has guided over a hundred students/interns/professionals in their research work and projects. He is also the co-author of many International Research Papers. He is currently pursuing his MBA in e-Business and PG Diploma in International Business. Presently

Konigtronic Private Limited has extended its services in the field of Software Engineering and Webpage Designing. Konigtronic also conducts technical and non-technical workshops on various topics.