

Wireless Mesh Networking

^[1] Abhishek Uniyal, ^[2] Somnath, ^[3] Sangeeta
^{[1][2]} Author, ^[3] Assistant Professor

Department of Information Technology, SRM University, India

Abstract:- A promising solution to wireless environments is the wireless mesh technology that envisages supplementing wired infrastructure with a wireless backbone for providing Internet connectivity to mobile nodes (MNs) or users in residential areas and offices. The IEEE 802.11 TGs has started to work in developing a mesh standard for local area wireless networks. Although a lot of progress has been made and a few new drafts have been released recently, there exist many issues that demand enhanced or even new solutions to 802.11s mesh networking.

I. INTRODUCTION

In last few years, the energy consumption, as well as cost of the networking devices, is increasing rapidly. Energy is always a matter of concern for any form of wireless network. It is because the optimal residual energy of a node and its higher retention capability can increase the network longevity [1] [2]. In the area of the wireless network, Wireless Mesh Network (WMN) is one of the frequently selected topics of research owing to its increasing number of research problems. Although WMN seems to have an easier implementation, there are certain sets of common problems which have been addressed by most of the researchers. The first problem in conventional WMN is to perform the selection of a precise radio technique over physical layer [6]. At present, the alternatives of such techniques are Multipleinput Multiple-output (MIMO), Ultra Wide Band (UWB), Code Division Multiple Access (CDMA), etc. [6]. For nodes to work effectively, it is also required to have the faster frequency switching capability. The second problem in WMN is that conventional contention-based methodologies are never enough to enhance the fairness or channel allocations [7]. In order to maintain a mesh topology, it is required for a node to cost-effectively adopt the multiple physical channels, which at present is still an open problem from the viewpoint of channel assignment. Wireless mesh networks, an emerging technology, may bring the dream of a seamlessly connected world into reality.

III. REQUIREMENTS AND ALGORITHM

- CC2640R2F Coreboard Wireless Bluetooth 5.0 Module
- An Arduino
- Connecting wires
- Display Module

IV. EXISTENCE OF PROPOSED SYSTEM

Wireless Mesh Network (WMN) is one of the significant forms of the wireless mesh network that assists in creating highly interconnected communication node. Since a decade, there have been various studies towards enhancing the performance of WMN which is successful to a large extent. However, with the upcoming technology of pervasive and dynamic networks WMN suffers from various routing issues, Quality-of-Service (QoS) issue, channel allocation, sustainability of routes which makes the theory contradicting when considering for real-world challenges in wireless networks.

V. ADVANTAGES

1. Being a mesh network, it is highly scalable
2. It is robust.
3. Each connection can carry its own data load

VI. DISADVANTAGES

1. Installation and configuration are difficult if the connectivity gets more.
2. Cabling cost is more and the most in case of a fully connected mesh topology
3. Bulk wiring is required

VII. FUTURE ENHANCEMENT

In the future, we imagine every city and small scale network to adapt mesh networking. These type of networks can also be used in disasters where any kind of network is not available and would thus help in forming a network with the devices available

VIII. CONCLUSION

- Scalability. Based on existing MAC, routing, and transport protocols, network performance is not scalable with either the number of nodes or the number of hops in the network.
- Security. WMNs are vulnerable to security attacks in various protocol layers. Current security approaches may be effective to a particular attack in a specific protocol layer.
- Self-organization and self-configuration capability is a desired feature in WMNs. It requires protocols in WMNs to be distributive and collaborative.

IX. REFERENCES

[1] F. Giust, L. Cominardi and C. J. Bernardos, "Distributed mobility management for future 5G networks: overview and analysis of existing approaches," in IEEE Communications Magazine, vol. 53, no. 1, pp. 142-149, January 2015

[2] T. Sharma, K. Ritesh, N. Chauhan and S. Agarwal, "Analogous study of 4G and 5G," 2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom), New Delhi, 2016, pp. 2137-2140.

[3] Y. L. Ban, C. Li, C. Y. D. Sim, G. Wu and K. L. Wong, "4G/5G Multiple Antennas for Future Multi-Mode Smartphone Applications," in IEEE Access, vol. 4, no. , pp. 2981-2988, 2016.

[4] V.C. Gungor¹, E. Natalizio², P. Pace³, and S. Avallone, "Challenges and Issues in Designing Architectures and Protocols for Wireless Mesh Networks", Springer Journal for Wireless Mesh Network, pp.1-27, 2008

[5] S. Kolipaka, B. N. Bhandari and A. Dey, "Joint Admission Control and vertical handoff between WLAN and WIMAX in wireless mesh networks for QoS," 2016 IEEE International Conference on Engineering and Technology (ICETECH), Coimbatore, 2016, pp. 1018-

SYSTEM ARCHITECTURE

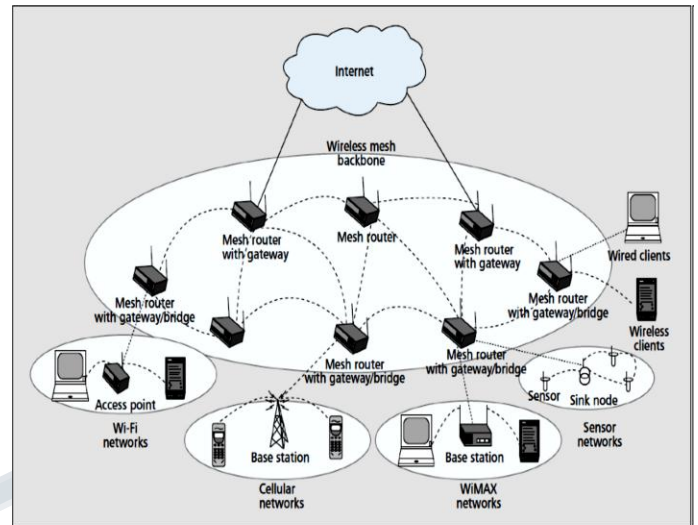


FIGURE 1. Infrastructure/backbone WMNs