

Implementation of Virtual WLAN

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Abstract : Today, Wireless communication is so vital in the field of science and technology. Research regarding this capabilities suggest that Wireless LANs. Virtualization of the wireless network interface, which means to use a single wireless network interface to connect to more than one network simultaneously. This paper provides an introductory study for the Creation of virtual WLAN controller that will implement many of the configuration functions currently running on several Wireless Access point to a centralized box. This will allow seamless management of large numbers of such access points running different hardware to be seamlessly managed. The firmware running on the access point will a OpenWRT open source solution that will use CAPWAP protocol to communicate with the virtual LAN controller.

Keywords: Wireless Networking, Virtualisation, CAPWAP protocol, programming

I. INTRODUCTION

As Computer Technology grows much needed attribute was internet now we need to have networked together to connect online. and as well the transition from wired to wireless, the Wireless Local Area Network has become the most user friendly Networking environments. With the quick evolution of Wi-Fi devices and used applications, additional functions become needed. So, instead of the time-consuming management of each AP separately. The OpenWISP project was improved. The quick expansion of the network was the reason for development of the software responsible for management and control of the network, and also responsible for the enormous future growth of the network.

II. WLAN

To Know WLAN we need to know the LAN, which is simply a way of interconnecting systems together within a single business area or an organization. (Clark et al, 1978) defined WLAN as a data communication network, typically a packet communication network, limited in Geographic scope. A local area network generally provides high-bandwidth communication over inexpensive transmission media.

Wireless Local Area Network (WLAN) links two or more devices using a wireless communication method. it usually provides a connection through an Access Point(AP) to the wider internet(Putman, 2005).

This permits users to access network resources anywhere in the network area. In WLAN Connectivity no longer implies

attachment. Local areas measured in Kilometres or miles. An infrastructure need not be buried in the ground or hidden behind the walls, so we can move and change it at the speed of the organization.

III. LITERATURE SURVEY

Kahn, Joseph M. & Barry, John R[1] suggested that In the early 1990's WLANs found almost no success in selling to enterprise or campus environments as wired LAN replacements or enablers of mobility. The WLAN products of that day were far too slow, too expensive, too bulky, and too power hungry. Furthermore, mobile network connectivity was simply not yet a killer application.

Negus & Petrick[2] suggests that The wireless local area network (WLAN) is today everywhere device often taken for granted as a default interfacing for networked devices by users and manufacturers alike. But not very long ago, it was most definitely not so.

Jie Feng, Liqiang Zhao, Chen Chen, Zhiyuan Ren and Jianbo Du [5] implements that Virtual resource chain catches the four fundamental elements that compose a network control loop, namely REST API, resource pool, ex OpenFlow and VAP API.

Roberto Riggio, Tinku Rasheed and Rajesh Narayanan [3] proposed that NFV-based management and orchestration framework for enterprise WLANs. Its architecture is compatible with the generic ETSI NFV

model and the definition of a SFC request model for enterprise WLANs.

IV. DRAWBACKS OF WLAN

Security & Installation problems [5], Wireless transmission is more vulnerable to attack by unauthorised users, so particular attention has to be paid to security[6]. User may suffer interference if others in the same building also use wireless technology or where other sources of radio signals are present. This could lead to poor communication or, in extreme cases, loss of wireless communication altogether.

V. vWLAN

A software-based approach, called vWLAN. This software solution virtualizes multiple WLAN cards within the same computer. That is, it creates two or more software WLAN cards in computer memory so that multiple Wi-Fi connections can take place essentially at the same time.

vWLAN's architecture unifies the wireless and wired networks to deliver maximum efficiency by separating the data plane from the wireless network management and control plane. This is achieved through the use of smart 802.11n access points which can support traffic forwarding decisions at the edge of the network. Here we implement the concept through the utilization of following Protocols and software programming's.

- OpenWrt
- CAPWAP
- OpenWISP
- Python
- JSON

OpenWrt is a Linux distribution for router. Like other Linux distributions, it offers a built-in package manager that allows installing packages from a software repository. It can be used for anything that an embedded Linux system can be used for, including functioning as an SSH server, VPN, traffic-shaping system, or even a Bit Torrent client.

CAPWAP[7] is based on LWAPP (Lightweight Access Point Protocol). The state machine of CAPWAP is similar to LWAPP's, but with the addition of a full Datagram Transport Layer Security (DTLS) tunnel establishment. The standard provides configuration management and device management, allowing for configurations and firmware to be pushed to access points (APs).

Open Wireless Internet Service Provider [8] is an open-source software platform that provides implementation of a complete Wi-Fi service it is a software suite that includes five applications that can be used for implementing Wi-Fi services. Other use like QOS and it is easy of expanding in distributed networking etc.

Python [8] is processed at runtime by the interpreter. We do not need to compile your program before executing it. This is Similar to PERL and PHP, we can actually sit at

a Python prompt and interact with the interpreter directly to write your programs and it is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages & it is built on two structures:

- A collection of name/value pairs. In various languages, this is realized as an object, record, struct, dictionary, hash table, keyed list, or associative array.

An ordered list of values. In most languages, this is realized as an array, vector, list, or sequence.

VI. ADVANTAGES OF vWLAN

vWLAN [4] offers customers the "3S" Competitive Advantage, Security, Scalability and Sustainability. Virtualizing the Wireless Network leading minimize hardware costs while optimizing wireless network performance with centralized control. The Virtual Wireless Controller can cost-effectively manage, secure, and optimize the performance of local and branch wireless networks. Ideal for small and medium-sized businesses, the Virtual Wireless Controller facilitates server consolidation and improves business continuity in the face of outages.

The flexibility to centrally configure wireless policy, management, or security settings on remote access points through centralized provisioning and management. Wireless intrusion prevention system (WIPS) [9] capabilities.

VII. CONCLUSIONS

The future of wireless local-area networking is now, and it is the solution for communication problems in organizations or any place that need a wide spread of internet connection therefore virtualization of 802.11 interfaces using PSM is good for low traffic networks. WeI have been concluding this with that the WLC will remain to be an important element in WLAN networks and the market demand will just give the direction in which it will evolve and improved. The evolution and development of the software platforms will cause quality solutions without physical controller to become the alternative for smaller or branch organizations, but for bigger enterprises the physical controller will still be a needed element.

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