**CHAPTER 2**

**LITERATURE REVIEW**

**2.1 Introduction**

This literature review is important in order to produce a better system than the existing system. The literature review is a case study that has been conducted that with reference to the existing system with a system that will be developed. The literature review conducted on the equivalent system can also provide system developers with the relevant information. This is especially useful for systems developers when developing the system so as to avoid an errors.

Literature review also helps developers find ideas to meet the needs of consumers. Even, of the few existing literature review, could help developers to make improvements in a system.

**2.2 Research Definition**

In this research definition used to broadcast sense of the word. The definition of research includes any gathering of data information and facts for the advancement of knowledge.

**2.2.1 Raspberry Pi**

The Raspberry Pi is single-board computer without an Ethernet Network Switch. There are many more single-board computers without one. Raspberry Pi is

compiled with the ARM hard-float kernel ABI. This means that non-integer math

is done in hardware instead of in software and support only soft-float which is

slower than hard float.

**2.2.2 System**

A firewall is a network security system designed to prevent unauthorized [access](http://www.webopedia.com/TERM/A/access.html) to or from a private [network](http://www.webopedia.com/TERM/N/network.html). Firewalls can be implemented as both [hardware](http://www.webopedia.com/TERM/H/hardware.html) and [software](http://www.webopedia.com/TERM/S/software.html), or a combination of both. Network firewalls are frequently used to prevent unauthorized [Internet](http://www.webopedia.com/TERM/I/Internet.html) users from accessing private networks connected to the Internet, especially [intranets](http://www.webopedia.com/TERM/I/intranet.html). All messages entering or leaving the intranet pass through the firewall, which examines each message and blocks those that do not meet the specified [security](http://www.webopedia.com/TERM/S/security.html) criteria.

A firewall using Raspberry Pi could be used as a firewall hardware with the default Raspbian distribution with the right configuration, packages, and tweaks. Raspbian is an unofficial port of Debian Wheezy armhf with compilation settings adjusted to produce optimized "hard float" code that will run on the Raspberry Pi. This provides significantly faster performance for applications that make heavy use of floating point arithmetic operations.

**2.3 Previous System**

A firewall is a piece of software and hardware that stands between a computer and the Internet. Most of the company need the firewall to protect their network. The company need to spend a big budget to setup this firewall.

The administrator for the company can’t monitor the incoming and outgoing their network traffic for their safety.

**2.4 Case Study 1**

**2.4.1 Raspberry Pi Firewall and Intrusion Detection System**

[VHome Insurance](http://vhomeinsurance.com/) has been conducting research on various low-cost Raspberry Pi products that could [enhance your home security systems](http://vhomeinsurance.com/tech/home-security+raspberry-pi/). Here are seven of the coolest do-it-yourself home security projects. One of the biggest fears of our generation is losing data. Protect the private network with a Raspberry Pi-powered firewall and intrusion detection system. All the need is a Raspberry Pi, an SD card, an Ethernet cable, a micro-USB power cable, an Arch Linux ARM image, Win32DiskManager software, and one USB keyboard.

Setting up a secure network environment is expensive and really difficult. Don't be afraid in this article we will see how to create a network gateway with a firewall, DHCP and DNS server, and a Network Intrusion Detection System (NIDS), entirely based on a Raspberry Pi.

**2.5 Case Study 2**

**2.5.1 Installing OpenWRT on a Raspberry Pi as a New Home Firewall**

This project was generated by Ben Miller, Ben is a co-founder of Bluelock.com and gets to invent cool new cloud computing services during his day job. [OpenWRT](http://openwrt.org) is an active and vibrant home firewall project that was born on the Linksys WRT54G line of home routers. It has grown and expanded to support an amazing array of old and new hardware alike. The list of compatible hardware is large enough to require its own [index](http://wiki.openwrt.org/toh/start).

With the recent interest in the Raspberry Pi there is of course is an OpenWRT build for it as well. Ben Miller has show how to install OpenWRT on a Raspberry Pi, add a second network interface, and replace the home firewall with new OpenWRT firewall.

This Figure 2.1 shows how the networking is going to configured in the finished product

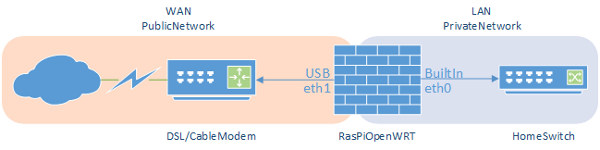


Figure 2.1: OpenWRT Firewall Network Diagram

**2.6 Case Study 3**

**2.6.1 Sweet Security Part 2 – Creating A Defensible Raspberry Pi**

This idea is came from Travis Smith that is a Principal Security Researcher at Tripwire. Travis brushed on the topic of using a Raspberry Pi as a cheap and effective way to secure Internet of Things (IoT) and Industrial Control Systems (ICS) networks where traditional protection mechanisms are not feasible.

His took those concepts and spoke to them at the [IoT Village](https://www.iotvillage.org/) at [DefCon 23](https://www.defcon.org/html/defcon-23/dc-23-index.html) in a level of detail that explained how to actually deploy one of these Sweet Security devices. Travis has show what hardware that will need, how to install the Raspbian OS, how to configure the software, and how to get value out of deploying a sweet security solution.

**2.7 Conclusion**

In conclusion, the literature review is important in the development of the system, where it can help developers to develop a better system than the current system. The literature review conducted on the equivalent system can also provide system developers with the relevant information. This is especially useful for systems developers when developing the system so as to avoid any errors. This may cause high competitiveness that eventually can create a sophisticated and systematic system.