Islington College

SOFTWARE REQUIREMENT SPECIFICATION (SRS) V.1

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Faculty: Computer Networking and IT Security

Module: Final Year Project

Word Count: 1705

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Abstract

This is the project proposal for the Final Year Project "**<u>Personal Network - Packet Sniffer</u>**" implemented for personal home networks. In addition, this packet sniffer doesn't just pile on the technical information on the layman but provide them with simplified information. In Security, as is validated for any tools, the usage of the tool is gravely affected by the user's intention, on the positive side it may be used for detecting malicious activities in the network as well as in the malicious way to hack for the sole intention i.e. theft of private and personal data of others. The goal of this project is to write a sniffer "Personal Network Packet Sniffer" capable of sniffing protocol specific packets across wired and wireless interfaces accompanied with various packet aggregation and analysis features which can be understood easily by the laymen out there who are not specifically tech savvy.

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1.INTRODUCTION

1.1 Introduction

Let us imagine a scenario in any kind of a personal home network, where nowadays it is very much viable for a member to have a device with which s/He uses to access the internet, since the dawn of the internet which has brought about a revolution has its drawbacks specially in the current scenario seen in Nepal the parents really don't have specific control or information about usage of internet in their own respective homes. Now, this is where the technology kicks off what if there was a system where the usage of internet is presented to the parents so that they can know and protect their respective families from the different kinds of the threats that are present in the current internet scenario.

Nepal's internet penetration is 18.28 per cent as of June, 2012, according to Nepal Telecommunication Authority (NTA). This is really astounding for a country where the literacy rate is below 60 per cent. Also, most amazing thing is the growth rate of internet users. In 2010, the internet penetration was 3.69 per cent and it was 10.89 per cent in June, 2011 (Acharya, 2012) . Since, the culture here in Nepal is changing specially among kids; they are astoundingly coping with the technology as assisted by the circumstances provided during their development.

1.2 Product Overview

This Project will be implemented in specifically Linux Kernel Environment using Python Programming Language. Following are some functionalities we will implement:

Basic Functionality

- Personal Network Monitor (i.e. Basic Packet Capture)

  This feature will provide the facility to capture network packets. These packets will be parsed and the packet header details will be listed in a table. The packets can be stored in XML (Extensible Markup Language) serialized formats. These packets can be retrieved later for viewing and analysis.

- Packet Filtering

  The packets can be filtered by protocol type TCP (Transmission Control Protocol), UDP (User Datagram Protocol), ARP (Address Resolution Protocol), ICMP (Internet Control Message Protocol) and IGMP (Internet Group Management Protocol).

- Packet Parsing (i.e. Optimization and ambivalence of captured packet data.)

- Packet Analysis

- Graphical Interface

Advanced Functionality

- User Configuration Monitor

  Various process activities going on the user node of the user.

Note: Advanced functionality is not a part of the project and will be implemented only if time permits.

2.SPECIFIC REQUIREMENTS

2.1. External Interface Requirements:

2.1.1. User Interface

o Graphical Interface is available for ease and convenience of the user

o Variety of the functions use mouse click being dead set on effective user experience.

o Effective Packet Data Visualization, Excluding technical terms making it much for easier for the laymen.

2.1.2. Hardware Interfaces

o The System is dependent upon Mouse application.

o The System is dependent upon Keyboard application.

o The System is dependent upon Monitor application

o Network Interface card is must for process of packet capture.

o 3-5 MB of hard disk space.

o 1 GB of RAM (Random Access Memory)

2.1.3. Software Interfaces

The software is dependent and requires following interfaces

o Python v3.3

o Libpcap

o XML

2.1.4. Communication Protocols

The personal network packet sniffer, sniffs packets on wired as well as on wireless networks.

2.2. Software Product Feature

Some of the specific features of the personal network packet sniffer are as follows:

o   Network Sniffing for Wireless Networks [802.11](By Default)
o   Network Sniffing for Wired Networks [Ethernet] (Optional, In absence of Wireless Interface)
o   Storage of Packet Data and Effective Retrieval.
o   Packet Filtering
o   Web Based Graphical User Interface.

2.3. Software System Attributes

2.3.1. Reliability

Reliability of the tool is one of the very important aspect to be looked upon.

2.3.2. Availability

Further, the availability is also another very important aspect which can be achieved by decreasing the downtime and conclusively making the tool available.

2.3.3. Security

Security Features of the tool is provided by Python Programming Language.

2.3.4. Maintainability

Using Python Programming language is one of the advantages. Thus, making the process of maintenance much easier.

2.3.5. Portability

This application is supported on following operating systems;

Ubuntu 12.04, Ubuntu 12.10, Ubuntu 13.04, Ubuntu 13.10, primarily on Linux Kernel Environment.

2.3.6. Performance

The tool is targeted for small networks and will not be implemented in larger networks.

3.Additional Information

3.1.　Acronyms

UDP	User Datagram Protocol
TCP	Transmission Control Protocol
ARP	Address Resolution Protocol
ICMP	Internet Control Message Protocol
IGMP	Internet Group Message Protocol
XML	Extensible Markup Language
GB	Gigabytes
MB	Megabytes
RAM	Random Access Memory
IP	Internet Protocol
GUI	Graphical User Interface