Software Requirements Specification

for

Packet Sniffer

**Version 1.0 approved**

**Sunil Baliganahalli NarayanMurthy**

**Nehal Kamat**

**Apoorva Bapat**

**University of Colorado, Boulder**

**Feb 17, 2016**

**Table of Contents**

**Table of Contents**

**Revision History**

**1. Introduction**

1.1 Purpose

1.2 Document Conventions

1.3 Intended Audience and Reading Suggestions

1.4 Product Scope

**2. System Requirements**

2.1 Business requirements

2.2 User requirements

2.3 Functional requirements

2.4 Non-Functional requirements

**3. Functional View**

3.1 Use case View

3.2 Logical View

3.2.1 Sequence diagrams

3.2.2 Activity diagrams

3.2.3 State chart diagrams

3.3 Deployment View

**4. UI Mock ups**

**5. Open points**

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
| Sunil Baliganahalli Narayana Murthy | 2/17/2016 | Initial draft | 1.0 |
| Sunil Baliganahalli Narayana Murthy | 2/21/2016 | Incorporated review comments from teammates | 1.1 |
| Sunil Baliganahalli Narayana Murthy | 3/4/2016 |  | 1.2 |
|  |  |  |  |

# Introduction

## Purpose

Packet sniffing is defined as a technique that is used to monitor every packet that crosses the network. A packet sniffer is a piece of hardware or software that monitors all network traffic. Using the information captured by the packet sniffers an administrator can identify erroneous packets and use the data to pinpoint bottlenecks and help to maintain efficient network data transmission. For most organizations packet sniffer is largely an internal threat.

Packet sniffers can be operated in both switched and non-switched environment. Determination of packet sniffing in a non-switched environment is technologies that can be understand by everyone. In this technology all hosts are connected to a hub. There are a large number of commercial and non-commercial tools are available that makes possible eavesdropping of network traffic. Now a problem comes that how this network traffic can be eavesdrop; this problem can be solved by setting network card into a special “promiscuous mode”. Now businesses are updating their network infrastructure, replacing aging hubs with new switches. The replacement of hub with new switches that makes switched environment is widely used because “it increases security”. However, the thinking behind is somewhat flawed. It cannot be said that packet sniffing is not possible in switched environment. It is also possible in switched environment.

## Intended Audience and Reading Suggestions

This document is intended for User, Developer and tester.

## Product Scope

<Provide a short description of the software being specified and its purpose, including relevant benefits, objectives, and goals. Relate the software to corporate goals or business strategies. If a separate vision and scope document is available, refer to it rather than duplicating its contents here.>

# System Features

|  |
| --- |
| **Business Requirements - [Not Applicable]** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **User Requirements** | | | | |
| **ID** | **Requirements** | **Topic Area** | **User** | **Priority** |
| UR-001 | Users should have the option of choosing the client machine to monitor packets from | Freedom | Any | High |
| UR-002 | Users should be able to deploy the application on any operating system/work environment | Deployment | Any | High |
| UR-003 | Users should have the option to run the application either using a graphical interface or via the command | Interaction | Any | Medium |
| UR-004 | Users should be able to extract required information and save it | Logging | Any | High |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Functional Requirements** | | | | |
| **ID** | **Requirements** | **Topic Area** | **User** | **Priority** |
| FR-001 | The user shall we be able to select the client for which he wants to monitor the network traffic. |  | User | High |
| FR-002 | The user shall be able to capture live packet data from a selected network interface. |  | User | High |
| FR-003 | The user shall be able to save the captured packets or discard. |  | User | Low |
| FR-004 | The user shall be able to filter the packets like filter all TCP, ICMP etc. |  | User | Medium |
| FR-005 | The user shall be able to open the saved packets for analysis. |  | User | Medium |
| FR-006 | The user shall be import/export the saved packets. |  | User | Medium |
| FR-007 | The user shall be able to look at the header data or packet data of the captured packet. |  | User | High |
| FR-008 | The user shall be able to stop the capturing of the packets. |  | User | Medium |
| FR-009 | The user shall be able to see the basic stats about the monitored client like # of TCP packets captured, # of UDP packets captured, etc. |  | User | Low |
| FR-010 | The user shall be able to search for packets on many criteria |  | User | Low |
| FR-011 | Colorize packet display based on filters. |  | User | Low |
| FR-012 |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Non-Functional Requirements** | | | | |
| **ID** | **Requirements** | **Topic Area** | **User** | **Priority** |
| NF001 | Sufficient network bandwidth |  |  | High |
| NF002 | The application should be reliable |  |  | High |
| NF003 | Application should be robust and handle at-least 5 clients |  |  | High |
| NF004 | Application should be responsive |  |  | High |
| NF005 | Application should have a reasonable performance (1sec) |  |  | Medium |
| NF006 |  |  |  |  |

**Use case documents:**

|  |  |
| --- | --- |
| **Use Case ID:** | UC-001 |
| **Use Case Name:** | Open Graphical User Interface |
| **Description:** | Select application icon on desktop/ in the start menu to open a graphical interface for running the application |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actors:** | Any | | |
| **Pre-**  **conditions** | User should choose to use graphical interface to application in place of command line access to application | | |
| **Post**  **conditions** | User should understand the layout of the interface and should understand how the information is being displayed | | |
| **Frequency of Use:** | User might use the GUI as primary interaction with application | | |
| **Flow of Events:** |  | Actor Action | System Response |
| 1 | Double-click application shortcut on desktop | Application GUI opens |
| 2 | Click application entry in all programs menu | Application GUI opens |

|  |  |
| --- | --- |
| **Use Case ID:** | UC-002 |
| **Use Case Name:** | Open Command Line Interface |
| **Description:** | Display the network statistics on the command line instead of a graphical interface |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actors:** | Advanced Users | | |
| **Pre**  **conditions** | User should choose to use the command line interface to application in place of a graphical interface | | |
| **Post**  **conditions** | Users should know basic command prompt commands to understand how to navigate and run the application from the command line | | |
| **Frequency of Use:** | Not as frequent as GUI, but equally important | | |
| **Flow of Events:** |  | Actor Action | System Response |
| 1 | Open command prompt | Command prompt displayed |
| 2 | Type in application name and press enter | Text version of application is displayed on prompt |
| 3 | Type in commands to access different functionality of the application | Appropriate command is executed and corresponding information is shown |

|  |  |
| --- | --- |
| **Use Case ID:** | UC-003 |
| **Use Case Name:** | Monitor Packets |
| **Description:** | Allows the user to be displayed the packets being transmitted in real time |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actors:** | All users | | |
| **Pre**  **conditions** | Users should have opened either the graphical interface or the command line interface | | |
| **Post**  **conditions** | Users should have basic knowledge of packet formats and should be able to read them | | |
| **Frequency of Use:** | Frequently | | |
| **Flow of Events:** |  | Actor Action | System Response |
| 1 | Open application | Application user interface is displayed |
| 2 | Click ‘monitor’ | Transmitted packet details are displayed on the UI |

|  |  |
| --- | --- |
| **Use Case ID:** | UC-004 |
| **Use Case Name:** | Save Packet Information |
| **Description:** | Enables the user to store packet information for offline analysis |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actors:** | All users | | |
| **Pre**  **conditions** | Application should be running and packets being monitored | | |
| **Post**  **conditions** | A log file should have been created with the required information saved in it | | |
| **Frequency of Use:** | Very frequent | | |
| **Flow of Events:** |  | Actor Action | System Response |
| 1 | Start application | Application interface displayed to user |
| 2 | Click monitor | Packets start being monitored and their information displayed on the interface |
| 3 | Select packet information to be saved by clicking check boxes against the packet names | Packet information is saved in a log file created in a pre-specified local directory |

|  |  |
| --- | --- |
| **Use Case ID:** | UC-005 |
| **Use Case Name:** | Filter Packets |
| **Description:** | Enables users to view information of packets of their preference |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actors:** | All users | | |
| **Pre**  **conditions** | Users should start the application and select the type of packets to filter | | |
| **Post**  **conditions** | Users should be displayed only those type of packets that have been filtered out by the user | | |
| **Frequency of Use:** | Very frequent | | |
| **Flow of Events:** |  | Actor Action | System Response |
| 1 | Start the application | User interface displayed |
| 2 | Select packet types to view and start monitoring | System displays only filtered packet information |

|  |  |
| --- | --- |
| **Use Case ID:** | UC-006 |
| **Use Case Name:** | Display Packet Header |
| **Description:** | Enables users to view expanded information of selected packet(s) |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actors:** | All users | | |
| **Pre**  **conditions** | Users should start the application, start monitoring packets and select the packet whose header is to be expanded | | |
| **Post**  **conditions** | Users should be displayed the entire packet information in its correct form | | |
| **Frequency of Use:** | Less frequent | | |
| **Flow of Events:** |  | Actor Action | System Response |
| 1 | Start application and click monitor | User interface opens up and transmitted packet information is displayed |
| 2 | Double click on packet to view full header | New application window displays full header of selected packet |

|  |  |
| --- | --- |
| **Use Case ID:** | UC-006 |
| **Use Case Name:** | Display Network Statistics |
| **Description:** | Enables user to view real time statistics of the information being transmitted along the network |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actors:** | All users | | |
| **Pre**  **conditions** | Users should start the applications and start monitoring packets | | |
| **Post**  **conditions** | Users should be displayed real-time statistics of all transmitted packets such as number of a particular type of packet, origin and destination | | |
| **Frequency of Use:** | Very frequent | | |
| **Flow of Events:** |  | Actor Action | System Response |
| 1 | Start application, start monitoring packets | User interface displayed and packet information displayed on interface |
| 2 | Select Show Network Statistics | A new window application windows displays the relevant statistics of the transmitted packets |

|  |  |
| --- | --- |
| **Use Case ID:** | UC-007 |
| **Use Case Name:** |  |
| **Description:** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actors:** |  | | |
| **Pre**  **conditions** |  | | |
| **Post**  **conditions** |  | | |
| **Frequency of Use:** |  | | |
| **Flow of Events:** |  | Actor Action | System Response |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| **Variations:** |  | | |
| **Notes and Issues:** |  | | |
| **Developer Notes:** |  | | |

**6. Functional View**

**6.1 Use case view**



**6.2 Logical View**

**6.2.1 Sequence diagrams**

**Application launch sequence**

****

**Application stop sequence**

****

**Start packet capture**



**Stop packet capture**



**6.2.2 Activity diagrams**

**Start capture**



**6.2.3 State chart diagrams**



**6.2.4 Class diagrams**



**6.3 Deployment View**

**6.3.1 Multi-client deployment**



**6.3.2 Stand-Alone deployment**



**5. UI Mock-ups**





