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Procedia Computer Science 3 (2011) 809–812

Procedia
Computer
Science

www.elsevier.com/locate/procedia

WCIT 2010

Characteristic usage of Turkish Internet Users in Office Environment

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Abstract

In this paper, a lawyer office's network and internet traffic will be examined for determining the characteristics of users and network traffic load. In order to do that, some modifications on the lawyers office is made. Firstly, the switch which was previously used, replaced with a smart switch which can mirror traffic to a special port. Later, the office adsl modem is replaced with a modified Linux distribution. These linux device is used as a adsl modem/router for the network. This device also logged every incoming packet including the payload from it's both interfaces. After a months full run, the data gathered is collected and analyzed.

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Selection and/or peer-review under responsibility of the Guest Editor.

Keywords: Network traffic analysis, TCP packet distribution, HTTP host distribution, Windows packets on network

1. Introduction

In this study a measurement based analysis of a business office network traffic is made in order to define characteristic usage of a Turkish internet users in office environment. For gathering the data, some modifications on the lawyers office is made. Firstly, the switch which was previously used, replaced with a smart switch which can mirror traffic to a special port. Later, the office adsl modem is replaced with a modified Linux distribution. These linux device is used as a adsl modem/router for the network. This device also logged every incoming packet including the payload in tcpdump format from it's both interfaces. After a months full run, the data gathered is collected and analyzed.

In the lawyers office, there are 10 employees. All the employees uses the computer and internet both for work and personal use. All 6 male and 4 female employee has at least one social network account (Facebook, Tweeter etc) which is used at least once per day[3]. The data gathered is analyzed according to the origin, protocol and service. In scope of this paper, we will be focusing on the data which is generated from inside the office. On the first sight, it is clear that all the data is IP. Then the data will be investigated for the usage of TCP, UDP and ICMP usage and percentage. On the last section, TCP will be handled and the services run on TCP will be investigated.

2. Background

The Internet Protocol (IP) is used as a network protocol in computer networks and provides the foundation of the Internet. It is the implementation of the Internet layer of the TCP / IP model or the network layer of the OSI model.

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TCP (Transmission Control Protocol), TCP / IP protocol suite is one of the two transport layer protocols. TCP protocol has been written in order to provide sending lossless data in advanced computer networks and packet-switched computer communication. The Internet's most popular protocols like HTTP, HTTPS, POP3, SMTP and FTP use TCP for data transmission. TCP, send a special adoption package for sending data. This package is send many times until receiving an acception[1].

The User Datagram Protocol (UDP) is one of the core members of the Internet Protocols. With UDP, computer applications can send messages, in this case referred to as datagrams, to other hosts on an Internet Protocol (IP) network without requiring prior communications to set up special transmission channels or data paths. The UDP, is a unreliable but fast network transfer protocol. This protocol does not check the consistency of the data nor the receivment of the data on the client side[2].

The Internet Control Message Protocol (ICMP) is used by the operating systems of networked computers to send error or information messages. For instance, that a requested service is not available or that a host or router could not be reached[1].

3. The Analysis

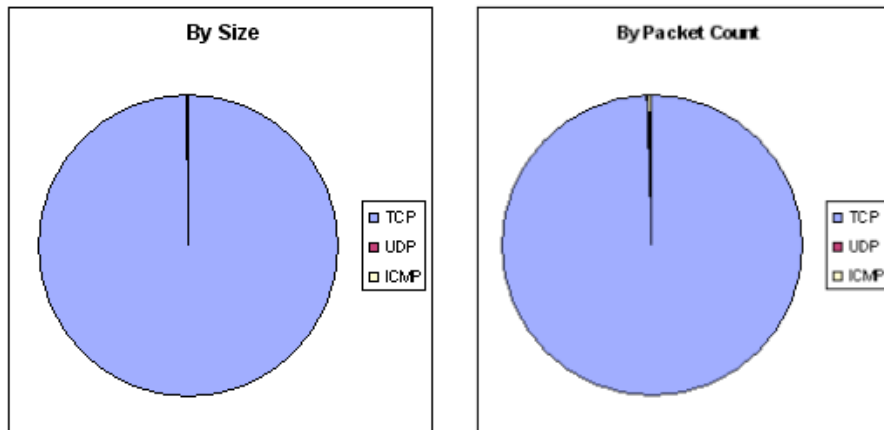
The analysis of the data is made in 3 steps. The first step is transfer protocol. The second one is by the service. And the last one is the analysis of the HTTP (Hyper Text Trasfer Protocol).

3.1. Transfer Protocol Analysis

The percentage of the data according to the transfer protocols are below.

Table 1. Percentage Transfer Protocols

	By Size	By Count
TCP	99,9816	99,5716
UDP	0,0049	0,0698
ICMP	0,0011	0,3586

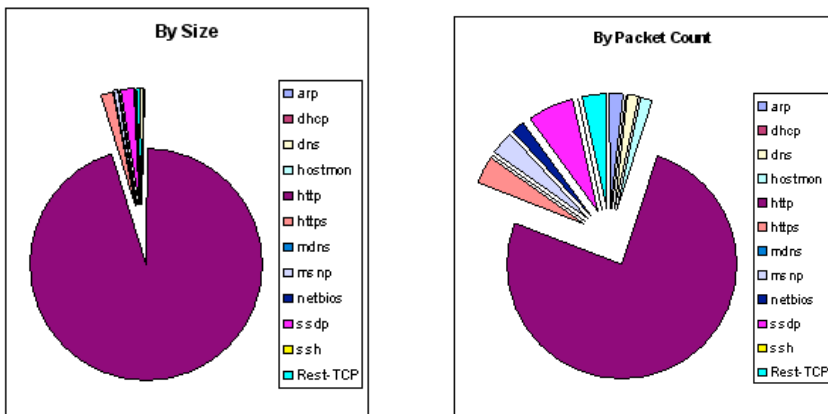


3.2. Service Protocol Analysis

The percentage of the data according to the transfer protocols are below.

Table 2. Percentage Service Protocols

	By Size	By Count
arp	0,04	1,86
dhcp	0,02	0,09
dns	0,20	1,64
hostmon	0,06	1,66
http	95,01	74,42
https	1,64	3,67
mdns	0,02	0,21
msnp	0,37	3,33
netbios	0,13	1,72
ssdp	1,92	6,59
ssh	0,00	0,01
Other	0,54	3,33



3.3. HTTP

Host Analysis

The percentage of the data according to the transfer protocols are below.

Table 3. Percentage of HTTP Hosts

	Percentage
Advertisement Sites	14,8
gazetevatan.com	12,3
hepsiburada.com	11,7
msn.com	10,5
milliyet.com.tr	10,4
google.com.tr	8,8
mynet.com	6,1
facebook.com	4,5
ekolay.net	3,5
live.com	3,3
ankara.edu.tr	2,7
yimg.com	2,1
medyanet.net	2,1

4. Conclusion

It has been clear that the TCP is dominated the network transfer protocols in both total size and packet count.

Eventhough UDP file trasfers are faster, it is not prefered by the end users.

The interesting result is; the office users do not use P2P file sharing programs. This may be caused by the office's true nature because a lawyer office would know the consequences of illegal downloads [4,5].

The traffics' %2,5 by size and %13,71 by packet count is caused by Windows family operating systems. Hence these protocols hostmon, mdns, msnp, netbios and ssdp created by Windows family operating systems, it will be fair to say that "Windows family operating systems allocates the networks resources from %2,5 up to %13,71".

Another interesting result is; news sites attracts more people than social networks. From the analysis, the %45 of the HTTP traffic is caused by the newspaper/new portal sites. But on the other hand, social network usage is only %4,5 .

References

1. Richard Stevens, TCP/IP Illustrated Volume-1
2. Richard Stevens, TCP/IP Illustrated Volume-2
3. Yixin Zhangri, Computers in Human Behavior, Age, gender, and Internet attitudes among employees in the business world
4. Tai-Quan Peng, Jonathan J.H. Zhu, Computers in Human Behavior, Sophistication of Internet usage (SIU) and its attitudinal antecedents: An empirical study in Hong Kong
5. Tel Amiel, Stephanie Lee Sargent, Computers in Human Behavior, Individual differences in Internet usage motives