INTERNET USAGE BEHAVIOR TO DETERMINE NETWORK PERFORMANCE : CASE STUDY IN POLYTECHNIC TUANKU SYED SIRAJUDDIN NETWORK

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ABSTRAK

Kebanyakkan institusi termasuk institusi pendidikan amat bergantung kepada rangkaian untuk menyebarkan maklumat serta menyiapkan kerja. Politeknik Tuanku Syed Sirajuddin (PTSS) merupakan institusi pendidikan yang menggunakan rangkaian untuk tujuan pendidikan serta operasi institusi dapat dilaksanakan dengan efektif. Walaubagaimanapun, operasi yang efektif di PTSS terjejas disebabkan oleh prestasi rangkaian yang semakin lemah. Untuk mengekalkan kadar yang efektif, adalah penting untuk mengawasi bagaimana sistem rangkaian berfungsi dan digunakan oleh pengguna. Tinjauan awal mendapati masalah yang mungkin memberi impak kepada jalur lebar rangkaian ialah sikap buruk pengguna. Untuk menangani masalah tersebut, alat pengawasan rangkaian Cymphonix telah digunakan dalam kajian ini untuk mengawasi rangkaian. Kajian ini hanya fokus kepada rangkaian VLAN 20. Pengawasan dilaksanakan sepanjang lima hari bekerja dalam tempoh semester pembelajaran pada masa waktu bekerja. Data utama yang diambil dari alat pengawasan dalam kajian ini ialah trafik Internet, jalur lebar aplikasi serta jenis-jenis aplikasi yang wujud. Data-data tersebut dianalisis untuk mengenalpasti jenis-jenis aplikasi Internet dan kaitkannya dengan tabiat pengguna rangkaian. Hasil daripada kajian mendapati trafik aplikasi Internet di rangkaian VLAN 20 adalah sentiasa berubah-ubah pada setiap hari. Kebanyakkan trafik adalah dari aplikasi HTTP. Aktiviti utama pengguna dalam VLAN 20 ialah melayari web dan memuat turun fail. Malah, trafik dari aplikasi yang boleh menyebabkan penggunaan rangkaian menjadi lemah seperti P2P dan *media streaming* tidak menunjukkan kadar pengguaan jalur lebar yang banyak. Ini menunjukkan bahawa tabiat pengguna dalam rangkaian VLAN 20 bukan merupakan faktor utama yang menyebabkan penggunaan rangkaian di PTSS menjadi lemah. Walaubagaimanapun, kajian lanjut perlu dilaksanakan untuk mengenalpasti penyebab utama yang menyumbang kepada masalah rangkaian di PTSS seperti menggunakan alat pengawasan yang boleh membaca semua jenis traffik yang tidak dikenali serta melaksanakan kajian ke atas rangkaian VLAN yang lain di PTSS untuk menilai samaada pengguna dalam rangkaian VLAN tersebut memberi kesan negatif kepada penggunaan rangkaian di PTSS.

ABSTRACT

Most of the institutions included education institutions heavily rely on networks to distribute information and to get job done. Polytechnic Tuanku Syed Sirajuddin (PTSS) is one of the educational institution that used network for educational and for effectiveness of institution operational. However, the effectiveness of PTSS operational was disturbed due to the network performance become slowly. To maintain the effectiveness, it is important to monitor how the network system working and used by users. The early observation found that, one of the possible problems impacts the network performance is users bad behavior. To overcome the problems, Cymphonix network monitoring tool used in this study to monitor the network. This study only focuses on network VLAN 20. Monitoring was done during five working days in semester study within office working hours. The main data capture from monitoring tool used in this study are total Internet traffic, application bandwidth and types of application that appear in the network VLAN 20. The data captured were analyzed to identify the Internet application types and relate it to the behavior of the network users. Result from the study indicates that Internet application traffic in network VLAN 20 is fluctuating for every day. Most of the traffic is from HTTP application. Main activities of users in network VLAN 20 is only web browsing and download files. Moreover, the traffic of application that can causes of network performance become slow such as P2P and streaming media are not much consume the range of bandwidth. This is shows that behavior of the users in network VLAN 20 is not main factors that cause network performance in PTSS slow. However, there are some further studies required to identify main causes that contribute to the network problems in PTSS such as used other type of tool that enable to capture all the uncategorized traffic and study on other VLAN network in PTSS to evaluate whether users in that VLAN network causes negative impact to the performance of network in PTSS.

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ABBREVIATION

DNS	–	Domain Name Services
FTP	–	File Transfer Protocol
HTML	–	HyperText Markup Language
HTTP	–	Hypertext Transfer Protocol
HTTPS	–	Hypertext Transfer Protocol Secure
ICMP	–	Internet Control Message Protocol
LAN	–	Local Area Network
NetBIOS	–	Network Basic Input/Output System
OSI	–	Open System Interconnection Model
P2P	–	Peer-to-Peer
POP	–	Post Office Protocol
PTSS	–	Polytechnic Tuanku Syed Sirajuddin
SMTP	–	Simple Mail Transfer Protocol
TCP	–	Transmission Control Protocol
TCP/IP	–	Transmission Control Protocol/Internet Protocol
UDP	–	User Datagram Protocol
URL	–	Uniform Resource Locator
VLAN	–	Virtual Local Area Network
VoIP	–	Voice over Internet Protocol
VPN	–	Virtual Private Network
WWW	–	World Wide Web

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Polytechnic Tuanku Syed Sirajuddin (PTSS) is an education institution having about 4,513 students and 367 staffs. PTSS building construct into several buildings include administrator buildings and eight main academic department buildings which every department have provided with computer labs, classrooms and department main office. Most of the students and staff live on campus and majority of them have at least network devices such as personal computer or laptop. Students and staffs owned computers, along with approximately 3,000 network devices in the form of office and lab computers and servers. Due to the increased of numbers of users and network devices, the campus network has experiences tremendous growth in the volume of traffic and put heavy demand on bandwidth.

Altogether, PTSS has approximately 26 Mbps of Internet bandwidth which is combination of three bandwidth packages include MyRen 10 Mbps, TMNet Direct 4 Mbps and Streamyx Line 12 Mbps. All of the Internet bandwidth packages are purchased from one ISP. The bandwidth packages purchased from the provider is not equal and used to combine altogether in one pipe link as a load balancer. The overall network consists of nineteenth VLAN network segments connected by router and switch. VLAN network are created for each separate department for better control of resources and to minimize the broadcast domain for a certain network segment. However, there are some numbers of VLAN network builded to covers two or more departments or Units such as VLAN 20 is builded to covers two departments which

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