

Intranet Network Design For E-Raport Server Access At Smk Negeri 5 Seluma

Ovi Susanti *, Toibah Umi Kalsum, Hendri Alamsyah

Universitas Dehasen Bengkulu

DOI: <https://doi.org/10.53697/jkomitek.v4i1.1737>

*Correspondence: Ovi Susanti

Email: ovisusanti96@gmail.com

Received: 17-06-2024

Accepted: 19-06-2024

Published: 28-06-2024



Copyright: © 2024 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Abstract: E-raport application is one of the efforts to control the quality of assessment, because e-raport application is a solution in reminding the limitations of existing resources and personal qualifications, with the aim of assisting educators in processing data on knowledge values, skills, spiritual attitudes, and helping to compile reports on assessment results. Research using experimental methods. Intranet is a private network (Private Network) that uses internet protocols (tcp/ip), to share confidential company information or operations within the company to its employees, while the private ip used on the intranet. Clients can perform or access e-raport application via the address smkn5seluma.net:7252. The intranet network at SMK N 5 Seluma runs smoothly with good network quality, where throughput = 0.8, packet loss = 0%, average delay = 0.563 and jitter = 0.76, these results are measured using Wireshark.

Keywords: *E-Raport, Intranet, Network Quality*

Introduction

The use of computer networks is currently increasing rapidly, this can be seen in all aspects of life, this is inseparable from, the use of computer networks both using cables and not computer networks have become part of everyday life. Intranet networks as one part of computer network technology provide significant benefits for the services of an agency both government and private in providing services that are private which are only used to serve the needs of the agency or institution to its employees. Intranet networks are used to help serve the needs of employees at work so that agency or institution services are maximized.

SMKN 5 Seluma is one of the vocational high schools in Seluma Regency. The school already has internet access using the telkomsel flash provider with a bandwidth speed of 10 mbps with several access point equipment, LANs and other computer devices. Based on the results of interviews that have been conducted, the report card at school is currently still using Microsoft Excel and there is no e-report server at school. Therefore, a centralized e-raport server is needed so that the e-raport application can be accessed by all teachers

without having to install it on their laptops one by one so that it can help teachers in assessing report cards at school and can maximize teacher performance.

Methodology

The method used in this research is the experimental method. The experimental method is included in the quantitative method carried out in the laboratory with treatment. The experimental method can be interpreted as a research method used to find the effect of certain treatments on others under controlled conditions. This experimental method includes literature study, analysis, design, implementation and system testing.

Result and Discussion

Result

Intranet network design for e-Raport server access at SMKN 5 Seluma, the intranet network is connected to the modem from the modem to the router from the router to the switch then from the switch to the e-Raport server computer then pulled again to the access point then the access point transfers to the teacher's room so that the laptop in the teacher's room can connect to the intranet network then the teacher's laptop connected to the same network can access the e-Raport server.

Preparation of Tools and Materials

In designing a network for e-Raport server access at SMKN 5 Seluma, the tools and materials used include software (Software) and hardware (Hardware).

1. Software

The software (Software) used in this research:

- a. Windows 10 Operating System
- b. PRTG Network Monitor
- c. E-Raport application

2. Hardware

The hardware (Hardware) used in this study:

- a. Laptop as an e-Raport Server
- b. Laptop as Client
- c. Modem / Wifi
- d. Mikrotik RB-941-2nd router
- e. Switch / Hub Tp-Link Tl-Sf1024d
- f. Tp-Link Tl-Wa801nd Access Point

Installation of Tools and Materials

At this stage, the installation of tools used in building an intranet network for e-Raport access is carried out, in the form of:

- a. Laptop as a server connected to a proxy router,
- b. Modem to the proxy router,
- c. Switch Hub to Mikrotik,
- d. Access Point to switch hub
- e. Client to access point

Network configuration

1. Client Configuration

The computer or laptop used as a client is configured using DHCP IP, then the client is connected to the access point.

2. Mikrotik Configuration

In designing an intranet network for e-Raport server access at Smkn 5 Seluma, which connects all the devices used. After all devices are connected, then configure the proxy.

From a series of tests carried out on , the results are obtained as shown in the table below:

Table 1. Testing Results

No.	Testing	Testing Results	Description
1.	Testing the performance of the e-Raport server computer in serving client computers	The performance of the e-Raport server in serving clients runs smoothly and well, where in serving clients requires a loading time of 3,960 msec, with the performance of the e-Raport server, namely the use of CPU Load less than 10% and Processor Less than 10%.	The e-Raport server can connect to the client marked with a ping reply, and is accessed from the client computer via the intranet network with a response time of +/- 3,960 msec.
2.	Opening the server login page from a browser on several devices to test accessing the e-Raport server.	Clients can open the e-Raport login address installed on the server via the smkn5seluma.net address: 8154	To open the e-Raport application on the server by the client can be done through the server ip address or through the dns name with the address

No.	Testing	Testing Results	Description
			smkn5seluma.net: 8154. The client can access and successfully log in to the e-Raport application properly.
3.	Testing network quality through throughput, packet loss, delay and jitter using wireshark..	Network quality measured using wireshark is throughput = 0.8, packet loss = 0%, average delay = 0.563 and jitter = 0.76. <i>loss = 0%, rata-rata delay = 0.563 dan jitter = 0.76</i>	The quality of the intranet network in running the e-raport application is good with the results of throughput = 0.8, packet loss = 0%, average delay = 0.563 and jitter = 0.76.

Discussion

1. e-Raport server in serving clients runs smoothly and well, where in serving clients requires a loading time of 280 ms, with the performance of the e-Raport server, namely the use of a small CPU Load of 10% and a Small Processor of 10%, as can be seen in the display image below.



Figure 1 Server Performance Display (Processor)

2. The client can open the e-Raport login address installed on the server via the address smkn5seluma.net:8154, as can be seen in the image below:

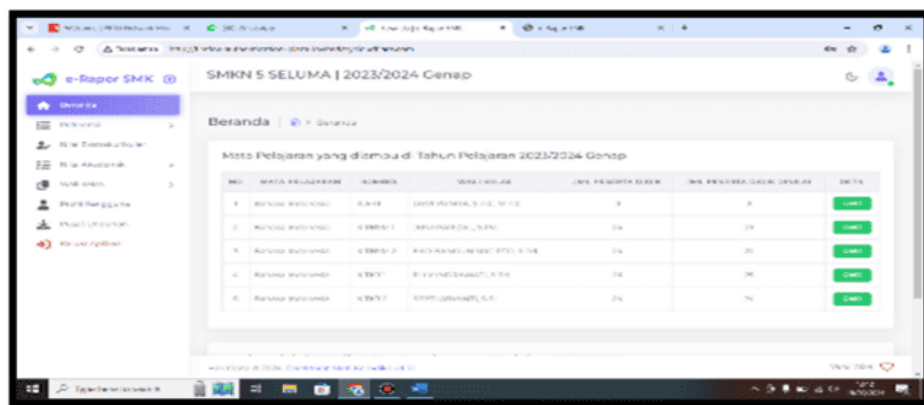


Figure 2 E-Rapor Server Login Results on Client Computer

3. Network quality through throughput, packet loss, delay and jitter using wireshark.
Throughput = 0.8 kbps, Packet loss = 0%, Delay = 0.567, Jitter = 0.76

Conclusion

From the results of research and implementation, it can be concluded that the intranet network design for e-Rapor server access at SMKN 5 Seluma can be concluded:

1. It is an important and relevant step in improving the efficiency of school administration. With a reliable and secure intranet network, the access process to e-Rapor data can be done more quickly and efficiently,
2. Improve staff productivity and facilitate student data management. In addition, the implementation of strong security is also important to protect the confidentiality and integrity of student information. Therefore, the development of an intranet network that is appropriate to the needs and equipped with an adequate security system is a valuable investment for SMKN 5 Seluma in improving the quality of educational services.

Suggestions

From the research that has been done, the author provides the following suggestions:

1. Understand Specific Needs: The first step is to understand the specific needs of the school, teachers, administrative staff, and students. What do they need from this system? How many users will access the system simultaneously? Are there any specific needs for data security

2. Network Infrastructure Design: Come up with an adequate and efficient network design. Consider factors such as network topology, connection type (wired or wireless), bandwidth requirements, and physical location of network devices.
3. Choose the Right Hardware and Software: Choose hardware and software that suits the needs of the school and the e-Raport system. Make sure the hardware has sufficient capacity and reliability, while the software should be easy to implement and integrate with existing systems.

References

- Amanda, Nur Shakila. "Peranan Algoritma Pemrograman Dalam Sistem Operasi Komputer." (2021).
- Ambabunga, Yusri Anugerah Manapa, and Eliyah AM Sampetoding. "Pemanfaatan Sistem Aplikasi E-Rapor Untuk Memudahkan Proses Penginputan Nilai Siswa SMA Negeri 1 Rantepao Kabupaten Toraja Utara Provinsi Sulawesi di Masa Pandemi Covid-19." *Indonesian Journal of Community Service* 1.2 (2021): 336-341.
- Arnomo, I. "Simulasi Pengamanan Database Web Server Repository Institusi Melalui Jaringan Lan Menggunakan Remote Access. *JUST IT: Jurnal Sistem Informasi, Teknologi Informasi dan Komputer*, 9 (1), 64-71." (2018).
- Candra, Arif Mei, Jupriyadi Jupriyadi, and Selamat Samsugi. "Perancangan Dan Implementasi Controller Access Point System Manager (Capsman) Mikrotik Menggunakan Aplikasi Winbox." *TELEFORTECH: Journal of Telematics and Information Technology* 2.2 (2022): 26-32.
- Fitriawan, Helmy, et al. "Pengukuran RSSI Jaringan Sensor Nirkabel Berbasis ZigBee pada Berbagai Topologi." *Jurnal Rekayasa Elektrika* 16.2 (2020): 15-21.
- Halim, Abdul. "SISTEM JARINGAN INTRANET BERBASIS TCP." *Jurnal Ilmiah Sistem Informasi* 1.1 (2021): 20-25.
- Harnawan, Satriya Permana, and Muhamad Taswi. "Perancangan Sistem Informasi Penggajian Karyawan PT. Target Kelola Securindo Jakarta." *Jurnal Teknologi Informatika dan Komputer* 5.2 (2019): 104-110.
- Hasbi, Muhamad, and Naldo Rafli Saputra. "Analisis Quality of Service (Qos) Jaringan Internet Kantor Pusat King Bukopin Dengan Menggunakan Wireshark." *Just IT: Jurnal Sistem Informasi, Teknologi Informasi dan Komputer* 12.1 (2022).
- Hasbi, Muhamad, and Naldo Rafli Saputra. "Analisis Quality of Service (Qos) Jaringan Internet Kantor Pusat King Bukopin Dengan Menggunakan Wireshark." *Just IT: Jurnal Sistem Informasi, Teknologi Informasi dan Komputer* 12.1 (2022).

- Jh, Abdur Rauf, and Agung Tri Prastowo. "Rancang Bangun Aplikasi Berbasis Web Sistem Informasi Repository Laporan PKL Siswa (Studi Kasus: SMKN 1 Terbanggi Besar)." *Jurnal Teknologi dan Sistem Informasi* 2.3 (2021): 26-31.
- Joshi, Jericko Vivaldo, Sastya Hendri Wibowo, and Rozali Toyib. "Unveiling Internet Network Quality: A Wireshark Analysis at SMKN 2 Rejang Lebong." *JURNAL MEDIA INFOTAMA* 19.2 (2023): 572-581.
- Khasanah, Siti Nur, and Liliyani Asri Utami. "Implementasi Failover Pada Jaringan WAN Berbasis VPN." *Jurnal Teknik Informatika STMIK Antar Bangsa*, IV (1) (2018): 62-66.
- Lubis, Mhd Dicky Syahputra, et al. "Membangun Router Pada Jaringan Komputer Menggunakan Ubuntu OS." *JTIK (Jurnal Teknik Informatika Kaputama)* 4.2 (2020): 111-125.
- Michael, Alehandrew, Hendi Hermawan, and Heny Ispur Pratiwi. "Sistem Monitoring Server Dengan Menggunakan SNMP." *Widyakala Journal* 6.2 (2019): 163-166.
- Monalisa, Monalisa, Imron Imron, and Albert Riyandi. "Analisa Kualitas Sistem Informasi E-Raport Pada Sekolah Smpn 5 Kota Tangerang Terhadap Kepuasan Pengguna Menggunakan Metode Webqual 4.0." *INFOTECH journal* 7.1 (2021): 10-21.
- Nugraha, Nunu, and Mohammad Iqbal. "Perancangan dan simulasi jaringan komputer politeknik negeri subang menggunakan packet tracer versi 6.2 dengan metode pppdoo." *Jurnal TEDC* 14.1 (2020): 49-53.
- Papaceda, Dani Daryos, Alfrina Mewengkang, and Stralen Pratasik. "Analisis dan Pengembangan Jaringan Komputer di SMK Negeri 8 Weda Halmahera Tengah." *EduTik: Jurnal Pendidikan Teknologi Informasi dan Komunikasi* 3.1 (2023): 1-13.
- Pratama, Dian Rizki, Umar Ali Ahmad, dan Alif Mustofa. "Perancangan Dan Implementasi Wide Area Network Menggunakan Q-in-q Tunneling Pada Jaringan Sekolah Telkom." *eProsiding Teknik* 7.2 (2020).
- Pratiwi, Dwi Nurmasari, and Denar Regata Akbi. "Penerapan Metode Filtering Video Streaming dan Malware Pada Jaringan Local Area Network." *Techno. Com* 17.4 (2018): 384-394.
- Prestanty, Deva Adelya, et al. "SIMULASI DENSE WAVELENGTH DIVISION MULTIPLEXING (DWDM) DENGAN MENGGUNAKAN APLIKASI CISCO PACKET TRACER." *Jurnal Penelitian Rumpun Ilmu Teknik* 2.2 (2023): 114-123.
- Putra, I. Gede Agus Eka. "Analisis dan Perancangan Topologi Jaringan Studi Kasus: Kantor Kepala Desa Sembiran."
- Rismawati, Nofita, and Muhamad Femy Mulya. "Analisis dan Perancangan Simulasi Jaringan MAN (Metropolitan Area Network) dengan Dynamic Routing EIGRP (Enhanced Interior Gateway Routing Protocol) dan Algoritma DUAL (Diffusing

- Update Algorithm) Menggunakan Cisco Packet Tracer." Jurnal SISKOM-KB (Sistem Komputer Dan Kecerdasan Buatan) 3.2 (2020): 55-62.
- Rizal, Chairul, et al. "Perancangan Server Kantor Desa Tomuan Holbung Berbasis Client Server." Bulletin of Information Technology (BIT) 3.1 (2022): 27-33.
- Rofii, Faqih, and SHOFIE SHOLAWATI. "Kinerja Jaringan Komunikasi Nirkabel Berbasis Xbee pada Topologi Bus, Star dan Mesh." ELKOMIKA: Jurnal Teknik Energi Elektrik, Teknik Telekomunikasi, & Teknik Elektronika 6.3 (2018): 393.
- Rusdan, Muchamad. "Pengujian Jaringan Nirkabel STT Bandung Menggunakan Quality Of Service (Qos)." Jurnal TEDC 13.1 (2019): 35-39.
- Sinaga, Indra Williamsyah, Imam Saputra, and Taronisokhi Zebua. "Pengamanan Data Nilai Pada Aplikasi E-Raport Berdasarkan Algoritma 2Des." KOMIK (Konferensi Nasional Teknologi Informasi dan Komputer) 3.1 (2019).
- Sukendar, Toni, and Mohammad Ikhsan Saputro. "Analisa Jaringan LAN menggunakan Teknologi EtherChannel untuk meningkatkan performa jaringan pada SMU Panca Sakti Jakarta." Jurnal Teknologi Informasi 5.2 (2019): 99-106.
- Sunanto, Sunanto, Rahmad Firdaus, and Makmur Setiawan Siregar. "Implementasi Logika Fuzzy Mamdani Pada Kendali Suhu dan Kelembaban Ruang Server." Jurnal CoSciTech (Computer Science and Information Technology) 2.2 (2021): 128-136.
- Wulandari, Siti, Jupriyadi Jupriyadi, and Muhtad Fadly. "Rancang Bangun Aplikasi Pemasaran Penggalangan Infaq Beras (Studi Kasus: Gerakan Infaq)." TELEFORTECH: Journal of Telematics and Information Technology 2.1 (2021): 11-16