ABSTRACT

The network in Telkom University's TULT Building is crucial for academic activities, yet its performance often cannot be thoroughly diagnosed by general monitoring systems. Hidden issues such as hardware limitations or unexpected workloads can be the primary cause of degraded connection quality. Therefore, this research was conducted to analyze hidden performance risks on the 8th and 9th floors by examining key packet-level parameters such as Packet Rate, Average Inter-Arrival Time, and the occurrence of TCP errors. The study involved recording network traffic using the Wireshark application during busy and idle hours. The collected data was then analyzed quantitatively and visually to diagnose the network's fundamental behavior and stability. The results revealed two very different and unexpected risk profiles. On one hand, the 8th-floor network exhibited a risk of technical instability; despite having a stable average Packet Rate between busy 261 pps and idle 259 pps hours, it generated TCP errors during traffic bursts in busy hours. On the other hand, the 9th-floor network proved to be highly resilient with no TCP errors, but it uncovered an operational risk from a massive anomalous load, where the idle-hour Packet Rate 775.3 pps surged to over three times that of busy hours 225.4 pps. In conclusion, the performance issue at TULT is not a single problem, but two distinct types: the 8th floor has a technical limitation in its device buffer, while the 9th floor has an operational risk from an unmanaged automated system load. Thus, two specific actions are recommended: evaluating and potentially upgrading the hardware on the 8th floor to handle shock loads, and auditing to manage and schedule the anomalous workload on the 9th floor.

Keywords— network performance, packet analysis, traffic dynamics, wireshark*, processing load*