

ABSTRAK

Layanan video streaming terus berkembang dan menuntut sistem yang efisien, mudah dikelola, serta portabel. Penelitian ini bertujuan mengimplementasikan dan mengevaluasi sistem *video streaming server* berbasis NGINX RTMP pada platform Docker. Docker dipilih karena efisiensi penggunaan sumber daya dan kemudahan dalam pengelolaan lingkungan server.

Metode penelitian meliputi perancangan, implementasi, serta pengujian dengan melakukan analisis *quality of service* (QoS) di sisi *client* menggunakan Wireshark dan melakukan *performance monitoring* pada sisi *server* melalui Docker Stats. Hasil pengujian menunjukkan parameter QoS seperti *throughput*, *delay*, *jitter*, dan *packet loss* berada dalam kategori baik hingga sangat baik sesuai standar TIPHON, sementara penggunaan CPU dan memori berada di bawah 10% pada resolusi 480p dan 720p pada RTMP dan HTTPS.

Hasil perbandingan *sniffing* data menunjukkan bahwa protokol HTTPS mampu menyembunyikan data secara terenkripsi, berbeda dengan RTMP yang lebih terbuka, sehingga HTTPS lebih unggul dari sisi keamanan. Pada pengujian *stress test*, kedua protokol masih mencatat indeks QoS baik dan penggunaan sumber daya server dalam batas wajar, namun kualitas *user experience* menurun mulai 60 client ke atas, terutama pada 120–240 client, dengan sering terjadi *freeze*, penurunan *bitrate* pada RTMP, dan penurunan FPS pada HTTPS akibat *buffering*. Secara keseluruhan, sistem yang dibangun menunjukkan performa stabil dan efisien pada beban rendah hingga menengah.

Kata kunci: *Video Streaming Server*, RTMP, HTTPS, Nginx, Docker, *Performance Monitoring*, *Quality of Service*

ABSTRACT

Video streaming services continue to evolve and require efficient, easy-to-manage, and portable systems. This study aims to implement and evaluate an NGINX RTMP-based video streaming server system on the Docker platform. Docker was chosen for its efficient use of resources and ease of managing the server environment.

The research methods include design, implementation, and testing, involving quality of service (QoS) analysis on the client side using Wireshark and performance monitoring on the server side through Docker Stats. Test results show that QoS parameters such as throughput, delay, jitter, and packet loss are in the good to very good category according to TIPHON standards, while CPU and memory usage are below 10% at 480p and 720p resolutions on RTMP and HTTPS.

Data sniffing comparison results show that the HTTPS protocol can encrypt data, whereas RTMP is more open, making HTTPS superior in terms of security. In load testing, both protocols still recorded good QoS indices and server resource usage within reasonable limits, but user experience quality began to decline starting from 60 clients and above, particularly at 120–240 clients, with frequent freezes, bitrate drops on RTMP, and FPS drops on HTTPS due to buffering. Overall, the system demonstrated stable and efficient performance under low to moderate loads.

Keywords: *Video Streaming Server, RTMP, HTTPS, Nginx, Docker, Performance Monitoring, Quality of Service*