

ABSTRACT

This final project designs and implements an internet radio transmitter for the D3 Telecommunication Technology community radio station. The system supports two broadcasting methods: live broadcasting using the external Mixxx application as an encoder, and automated broadcasting using Liquidsoap as a playlist player. The main device used is a Raspberry Pi 4 Model B with the Raspberry Pi OS 64-bit operating system. The design process includes installing and configuring Icecast as the streaming server, Liquidsoap for automated playback, and integrating a public domain via Cloudflared so that broadcasts can be accessed through both local networks and the internet. Testing was carried out to verify the functionality of live and automated broadcasting, ensure service access through the local address <http://localhost:8000> and the public domain <https://telcoradio.site>, and measure maximum listener capacity through load testing. The results show that the system successfully played 10 songs automatically using Liquidsoap and streamed in real time via Mixxx, with input audio instantly heard by listeners. Load testing demonstrated an optimal capacity of 1,200 listeners with a 0% error rate on a router connection, while on a mobile tethering connection, the capacity only reached around 200–300 listeners before significant performance degradation with a 100% error rate occurred. Overall, the designed internet radio transmitter has functioned as intended and has been successfully implemented to support the broadcasting activities of the community radio station.

Keywords: Internet Radio Transmitter, Icecast, Liquidsoap, Raspberry Pi, Audio Streaming, Cloudflared.