

SnapLink-URL Shortner Application

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Abstract: *This research paper presents the design and implementation of SnapLink, a modern URL shortener application built using Spring Boot and React. The system provides core functionality for converting long URLs into short, memorable links while offering comprehensive analytics, user authentication, and link management features. The implementation employs a Base62 encoding algorithm for slug generation, Redis caching for optimized redirection performance, and JWT-based security for user authentication. Performance evaluation demonstrated exceptional results, with cached redirects averaging 12 milliseconds—significantly outperforming industry standards—and the system handling 2,450 requests per second with 500 concurrent users. The research validates that the Spring Boot and React architecture is highly suitable for building scalable, production-ready URL shortening services. Key findings highlight the critical importance of caching layers for redirect performance, the value of analytics features for user engagement, and the effectiveness of proper indexing for database optimization. This study contributes practical insights into full-stack web application development and provides a foundation for future enhancements including geolocation analytics and microservices scalability.*

Keywords: URL shortener, Spring Boot, React, Redis caching, web analytics, REST API, system architecture.

