

# Enhanced Multi-factor Out-of-Band Authentication En Route to Securing SMS-based OTP

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## Abstract

Validation of user's authenticity through authentication played a crucial role to address risks and security issues in today's connected world. Among different authentication methods, OTP sent via SMS was identified as the most commonly used multi-factor authentication mechanism. However, studies have shown that it has not remained attack-proof. It has been branded to be vulnerable to SMiShing, a technique comparable to Internet phishing, and Eavesdropping accomplished through keylogging, screens capturing, shoulder surfing and other social engineering practices. This study introduced an innovative approach to secure SMS-based OTP against its threats through OTP encryption using modified Blowfish algorithm. A mobile application was also employed for capturing and processing encrypted SMS-based OTP to produce new OTP for verification, thus performing end-to-end OTP. Experimentation results and analysis revealed that the proposed architecture was free against the said vulnerabilities and promote tighter security, making it a good alternative for SMS-based OTP multi-factor authentication.

**Keywords:** Blowfish-128, eavesdropping, SMiShing, SMS-based OTP

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