Zero Trust Network and Cloud Security Architecture: A New Wave of Access Control Techniques

Publisher: IEEE Cite This PDF

Ramakrishnan. B ; C. Meenakshi All Authors

Abstract:
The usage of cloud computing and network infrastructure demands security frameworks that go beyond simple perimeter-based tactics. Zero Trust Architecture (ZTA) prevents undesired access with its severe system entrance limitations and real-time user verification procedures. The study evaluates four machine learning models for zero trust anomaly detection: AdaBoost, with an accuracy of 67.84%, Random Forest, with an accuracy of 96.48%, XGBoost, with an accuracy of 95.23% in conjunction with KNN, with an accuracy of 77.39%. Random Forest and "XGBoost" outperform KNN and AdaBoost when analysing AUC scores that approach 1.00 and 0.99. The results of the study show that passwords have inadequate security, underscoring the necessity of biometric solutions and various authentication factors for system security.

Published in: 2025 3rd International Conference on Intelligent Cyber Physical Systems and Internet of Things (ICoICI)

Date of Conference: 17-19 September 2025

DOI: 10.1109/ICoICI65217.2025.11253860

Date Added to IEEE *Xplore*: 01 December 2025

Publisher: IEEE

ISBN Information:

Conference Location: Coimbatore, India