

# Secure Communication Protocols for IoT Devices

**Mrs.V.Dhivya**

*Assistant Professor,  
Department of Artificial Intelligence and Machine Learning,  
SRM Institute of Science and Technology,  
Ramapuram, Chennai, Tamil Nadu, India.*

**Mrs.M.Vedhapriya**

*Assistant Professor,  
Department of Computer Applications,  
Vels Institute of Science, Technology and Advanced Studies (VISTAS),  
Chennai, Tamil Nadu, India.*

**Dr.S.Subbulakshmi**

*Assistant Professor,  
Department of Computer Science,  
Tagore College of Arts and Science,  
Chennai, Tamil Nadu, India.*

Published by

**SK Research Group of Companies**

The International Journals, Conferences, Awards and Books - SKRGC Publication



**142, Periyar Nagar, Madakulam,  
Madurai - 625003, Tamil Nadu, India.**



**skrgc.publisher@gmail.com | www.skrgcpublication.org**

**Admin: +91 8939504237 | Founder: +91 9790120237**

|                          |  |
|--------------------------|--|
| <b>Title:</b>            | <b>Secure Communication Protocols for IoT Devices</b>  |
| <b>Authors:</b>          | <b>Mrs.V.Dhivya<br/>Mrs.M.Vedhapriya<br/>Dr.S.Subbulakshmi</b>   |
| <b>Published by:</b>     | <b>SK Research Group of Companies –<br/>SKRGC Publication,<br/>142, Periyar Nagar, Madakulam,<br/>Madurai - 625003, Tamil Nadu, India.</b> |
| <b>Edition Details:</b>  | <b>I</b>   |
| <b>ISBN:</b>             | <b>978-93-6492-268-5</b>   |
| <b>Month &amp; Year:</b> | <b>December, 2025</b>  |
| <b>Copyright ©</b>       | <b>Department of Publication and Production<br/>SK Research Group of Companies</b>   |
| <b>Pages:</b>            | <b>179</b>   |
| <b>Price:</b>            | <b>₹700/-</b>  |

## CONTENT

| TITLE  | PAGE NO          |
|--|------------------|
| <b>CHAPTER I</b><br><b>FUNDAMENTALS OF IoT SECURITY</b><br>1.1 Overview of IoT Architecture and Components<br>1.2 Security Challenges and Threat Landscape in IoT<br>1.3 IoT Vulnerabilities in Devices, Networks and Cloud<br>1.4 Security Requirements for IoT Systems<br>1.5 Role of Cryptography in IoT Security                               | <b>1 - 33</b>    |
| <b>CHAPTER II</b><br><b>CRYPTOGRAPHIC TECHNIQUES FOR IoT</b><br>2.1 Symmetric and Asymmetric Encryption for IoT<br>2.2 Lightweight Cryptography for Resource-Constrained Devices<br>2.3 Hash Functions and Message Authentication Codes<br>2.4 Digital Signatures and Certificate-Based Security<br>2.5 Key Management and Distribution Techniques | <b>34 - 65</b>   |
| <b>CHAPTER III</b><br><b>SECURE COMMUNICATION PROTOCOLS</b><br>3.1 Network and Transport Layer Security Protocols<br>3.2 TLS, DTLS and Their Adaptations for IoT<br>3.3 MQTT, CoAP and AMQP Security Extensions<br>3.4 IPSec and VPN Approaches for IoT Security<br>3.5 Secure Routing and Data Transfer in IoT Networks                           | <b>66 - 106</b>  |
| <b>CHAPTER IV</b><br><b>AUTHENTICATION AND ACCESS CONTROL IN IoT</b><br>4.1 Device Authentication Techniques<br>4.2 Mutual Authentication Mechanisms<br>4.3 Identity Management for IoT Devices<br>4.4 Role-Based and Attribute-Based Access Control<br>4.5 Token-Based Authentication (OAuth, JWT) for IoT  | <b>107 - 141</b> |

|   |                         |
|---|-------------------------|
| <p><b>CHAPTER V</b></p> <p><b>ADVANCED TOPICS AND EMERGING TRENDS</b></p> <p>5.1 Blockchain for IoT Security and Data Integrity</p> <p>5.2 Zero-Trust Architectures in IoT</p> <p>5.3 AI-Driven Threat Detection for IoT Networks</p> <p>5.4 Secure Firmware Updates and Over-the-Air (OTA) Security</p> <p>5.5 Future Trends in Secure IoT Communication Protocols</p> | <p><b>142 - 179</b></p> |
|---|-------------------------|