

# Chapter 3

## Using Blockchain in Intermittently Connected Network Environments



Souvik Basu, Soumyadip Chowdhury, and Sipra Das Bit

**Abstract** This chapter explores the possible integration of blockchain technology with intermittently connected networks, towards exploiting the utility and availability of blockchain technology in intermittently connected network environments. It also identifies the challenges of such integration and possible solutions using off-the-shelf technology. Finally, the chapter identifies open research areas in the domain of using blockchain in intermittently connected network environments that would foster new research avenues in both industry and academia.

### 3.1 Introduction

Blockchain [1–3] technology represents a technological innovation that is supposed to alter our lives in several aspects like the way we conduct business, manage assets, use machines, visit hospitals, cast votes, rent cars and even prove our identity. Apart from these traditional and urban applications, other specialized blockchain use cases can be disaster management, remote healthcare in developing countries, vehicular communications or even deep-space communications. However, in one hand, these specialized use cases are characterized by absence of traditional communication infrastructure, intermittent connectivity and disconnection of devices due to limitations of power, node mobility and sparse node density. On the other hand, the usage of blockchain is restricted by the user's access to end-to-end internet connection. This limitation restricts the use cases to access blockchain and prevents its adoption in intermittently connected network environments. In fact, reliance on the internet is

---

S. Basu (✉)  
Heritage Institute of Technology, Kolkata, India  
e-mail: [souvik.basu@heritageit.edu](mailto:souvik.basu@heritageit.edu)

S. Chowdhury  
University of Engineering and Management, Kolkata, India  
e-mail: [soumyadip.note@gmail.com](mailto:soumyadip.note@gmail.com)

S. Das Bit  
Indian Institute of Engineering Science and Technology, Shibpur, India  
e-mail: [sdasbit@yahoo.co.in](mailto:sdasbit@yahoo.co.in)