

# Blockchain for Mobile Edge Computing: Consensus Mechanisms and Scalability

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**Abstract** Mobile edge computing (MEC) and next-generation mobile networks are set to disrupt the way intelligent and autonomous systems are interconnected. This will have an effect on a wide range of domains, from the Internet of Things to autonomous mobile robots. The integration of such a variety of MEC services in a inherently distributed architecture requires a robust system for managing hardware resources, balancing the network load and securing the distributed applications. Blockchain technology has emerged a solution for managing MEC services, with consensus protocols and data integrity checks that enable transparent and efficient distributed decision-making. In addition to transparency, the benefits from a security point of view are evident. Nonetheless, blockchain technology faces significant challenges in terms of scalability. In this chapter, we review existing consensus protocols and scalability techniques in both well-established and next-generation blockchain architectures. From this, we evaluate the most suitable solutions for managing MEC services and discuss the benefits and drawbacks of the available alternatives.

## 1 Introduction

The scope of the Internet of Things (IoT) has been growing over the past decade, encompassing an ever larger ecosystem that spans multiple domains. Some of the most prominent research directions are smart cities [1, 2], vehicular technology [3, 4], or smart healthcare systems [5, 6, 7]. In all these domains, a common factor is that IoT systems are evolving towards more distributed architectures [8]. This shift from

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