

Preface

Over the last decade, the unprecedented growth in the number of high data-rate applications and devices has severely constrained the current wireless networks. The operators of wireless networks face a challenge in supporting such demand, whereas at the same time they need to increase the energy efficiency and infrastructure utilization, which are directly related to their revenue. There have been recent advancements in wireless network technologies such as wireless virtualization to accommodate the exponential growth in demand as well as to increase energy and infrastructure efficiencies. The idea of virtualized wireless network (VWN) has been recently envisaged to allow multiple service providers to efficiently share the physical wireless communications infrastructure belonging to the network operator. In a VWN, each service provider expects to have its allocated slice of resources of the various infrastructure components (e.g., base stations) in order to support its own end users with different Quality-of-Service (QoS) requirements. VWN, therefore, presents unique challenges specifically related to user association, dynamic resource allocation, slice isolation, and resource utility that must be addressed to make it practically effective.

This brief discusses the user association and resource allocation aspects in VWNs and highlights key technology innovations to meet their requirements. Various issues in practical implementation of VWNs are discussed along with potential techniques such as Massive MIMO, Cloud-Radio Access Network (C-RAN), and non-orthogonal multiple access (NOMA).

The target audience of this informative and practical Springer Brief is researchers and professionals working on current and next-generation wireless networks. The content is also valuable for advanced students interested in wireless communications and signal processing for communications.

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User Association and Resource Allocation

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