

## Deployment of Beyond 4G Wireless Communication Networks with Carrier Aggregation

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**Abstract :** With the growing demand for a new blend of applications, the users dependency on the internet is increasing day by day. Mobile internet users are giving more attention to their own experiences, especially in terms of communication reliability, high data rates and service stability on move. This increase in the demand is causing saturation of existing radio frequency bands. To address these challenges, researchers are investigating the best approaches, Carrier Aggregation (CA) is one of the newest innovations, which seems to fulfill the demands of the future spectrum, also CA is one the most important feature for Long Term Evolution - Advanced (LTE-Advanced). For this purpose to get the upcoming International Mobile Telecommunication Advanced (IMT-Advanced) mobile requirements (1 Gb/s peak data rate), the CA scheme is presented by 3GPP, which would sustain a high data rate using widespread frequency bandwidth up to 100 MHz. Technical issues such as aggregation structure, its implementations, deployment scenarios, control signal techniques, and challenges for CA technique in LTE-Advanced, with consideration of backward compatibility, are highlighted in this paper. Also, performance evaluation in macro-cellular scenarios through a simulation approach is presented, which shows the benefits of applying CA, low-complexity multi-band schedulers in service quality, system capacity enhancement and concluded that enhanced multi-band scheduler is less complex than the general multi-band scheduler, which performs better for a cell radius longer than 1800 m (and a PLR threshold of 2%).

**Keywords :** component carrier, carrier aggregation, LTE-advanced, scheduling

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