

QoS AND MOBILE TECHNOLOGIES

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IIUM Press

Published by:
IIUM Press
International Islamic University Malaysia

First Edition, 2011
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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

ISBN: 978-967-418-142-0

Member of Majlis Penerbitan Ilmiah Malaysia -- MAPIM
(Malaysian Scholarly Publishing Council)

Printed by :
IIUM PRINTING SDN.BHD.
No. 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan
Tel: +603-6188 1542 / 44 / 45 Fax: +603-6188 1543
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CHAPTER 20

SELF-ORGANIZED FEMTOCELL NETWORKS

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20.1 INTRODUCTION

In this chapter, an overview regarding to femtocells technology is being presented. The principles and explanations regarding to femtocells is given in brief to help understanding on the concept and the architecture of this technology. As femtocell functions to improve indoor coverage, the explanation of the main issues regarding to coverage problem in cellular network is being presented from the beginning.

This chapter covers the principles and issues of the cellular network, starting from the usage of macrocell base stations until further deployment of femtocell base stations. The introduction to femtocells network also being covered including the architecture of the network. Furthermore, OFDM-based femtocell is being introduced to the readers. Issues and challenges of deploying this technology are also being analyzed to promote advantages in implementing this technology. To summarize this chapter, several papers regarding to related works on this technology is being presented in brief.

20.2 OUTDOOR BASE STATIONS

In cellular technology, macrocell BS is a very common type of BS being used by mobile operators company. The term macrocell is referring to the ability of the cell in providing high range of mobile radio coverage through the area. Macrocell BS is a high power transceiver installed in a wide area to cover longer distances. To brief, macrocell BS can cover a wide distances of mobile coverage by utilizing its capability in using high power, but the cost of deployment in this facilities is very expensive. In rural areas, the number of macrocell BS is small due to the low number of subscribers and the high price of deploying and maintaining the BS. Because of this reason, the operators is coming to an approach of ensuring minimal coverage to the area that resulting in poor mobile coverage in certain places in rural areas. In addition, almost every voice calls need to be done outdoors to ensure good quality of mobile signals. Most operators prefer to combine wireless network planning tools and real measurements rather than investing for macrocell BS due to limited number of subscribers. Similar situations occur in urban areas, except the high numbers of subscribers pushing the operators to improve their services towards the areas. Furthermore, the traffic problem in the channels requires the operators to think for new solutions in providing coverage to all its subscribers.