A Practical eNB Off/On Based Energy Saving Scheme for Real LTE Networks

Tong En *, Wang Ye **, Ding Fei **, Pan Zhiwen *, You Xiaohu *

* National Mobile Communications Research Laboratory, Southeast University, Nanjing, China

** Research and Development Center, China Mobile Group Jiangsu Co.,Ltd, Nanjing, China

{tongen, pzw, xhyu}@ seu.edu.cn, {wangyesgs, dingfei}@js.chinamobile.com

(Pt9)Abstract—In this paper, a low-complexity practical energy saving algorithm by switching off/on some eNBs in a real dense urban scenario considering historical and real-time eNB load is proposed. First, eNBs are ranked according to their loads in an ascending order and the first eNB in the list with load decreasing and smaller than a low threshold is pre-selected as target switching off cell. Then, the effect of the target switching off eNB on neighbour eNBs is evaluated. The target eNB switches-off while the load of neighbour eNBs after the eNB switches off is smaller than another threshold. Since estimation of the additional load on the neighbour eNBs due to the switch-off eNB is of high complexity, a fast estimation algorithm considering the whole eNB load by a traffic load conversion coefficient is proposed. Third, the switching-off eNB can be switched on by the active eNBs in a distributed way. Simulation results show that the proposed energy saving scheme can save up to 24% energy consumption.
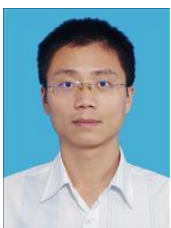
(Pt9)Keyword—energy saving, practical, real LTE network, switch off/on

Tong En was born in Yangzhou city, China, on March 15, 1971. He received the M.S. in Nanjing University of Posts and Telecommunications. He is currently a Ph.D. candidate in School of Information Science and Engineering, Southeast University, Nanjing, China. He is currently a Deputy General Manager of the Data Service department and Director of the R&D center at China Mobile Group Jiangsu Co.,Ltd, Nanjing, China. He has long been engaged in the research of mobile communication and the internet of things (IoT) related technologies, chaired or participated more than 10 mobile communication research projects. He was the winner of China Mobile innovation awards for many times and published nearly 20 academic papers.

Wang Ye was born in Yangzhou city, China, on January 3, 1987. He received the Ph.D. degree in Nanjing University of Posts and Telecommunications, China, in 2013. He is currently an Internet of things (IoT) and mobile network Researcher in the R&D Center, China Mobile Group Jiangsu Co.,Ltd, Nanjing, China. His research interests include the internet of things, mobile communication and key techniques for integrated application between mobile communication and the internet of things (IoT).

Ding Fei was born in Taixing city, China, on August 30, 1981. He received the Ph.D. degree in the School of Instrument Science and Technology, Southeast University, Nanjing, China, in 2010. He is currently an Internet of things (IoT) and mobile network Researcher in the R&D Center, China Mobile Group Jiangsu Co., Ltd, Nanjing, China. His research interests include the internet of things, mobile communication and key techniques for integrated application between mobile communication and the internet of things (IoT).