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IEEE ISCE 2013

The 17th IEEE International Symposium on Consumer Electronics

June 3-6, 2013, National Chiao-Tung University, Hsinchu, Taiwan, R.O.C.

Call for Papers

http://isce.ieee-cesoc.org

Conference Theme: Intelligent Biomedical/Green/Vehicle/3C Consumer **Electronics for Better Life**

Basic Technologies for Consumer Electronics

- Multimedia Signal Processing
- Audio Visual Capture, Storage and Recording
- User Interface and Human Computer Interaction
- Display System Design and Implementation
- Energy Efficient & Energy Aware System Design

Key Entertainment and Information Systems

- Home Entertainment Systems (including Audio, Video and Gaming)
- Automotive Entertainment and Information Systems
- Interactive Digital Media and Virtual Reality Environment
- Digital Imaging and Camera Technology

Consumer Electronics for Health-care & Wellness

- Telemedicine
- Medical Instrumentation and Diagnostic Systems
- Health Care and Support Systems for Old People
- Teaching Aids and Smart Class Rooms

Enabling Technologies and Others

- Radio Frequency Interfaces and Applications High Speed Connectors
- Signal Integrity
- Wireless and Mobile Communication
- Web Technologies and Home Networking
- Security and Rights Management including Steganography, Watermarking

Digital Rights Management, IP and Licensing etc.

- Open Source in CE Applications
- Cloud Computing and Smart Grid for CE
- **Product Safety of Consumer Electronics**

Deadline for 2-Page Paper Submissions: February 28, 2013

Notification of Acceptance: March 29, 2013

Final Paper: April 29, 2013

Deadline for Online Registration: May 8, 2013

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- ➤ Intelligent Image Processing for Consumer Applications
- ➤ Medical Image Processing and Analysis for Consumer Electronics
- Emerging Technologies for Security, Safety, and Privacy
- ➤ Navigation of Mobile Robots
- > Three Dimensional Multimedia Systems and Applications
- ➤ Interactive Digital Media and Virtual Reality Environment
- ➤ Intelligent Computing with Applications for Consumer Electronics
- ➤ Recent RFID/Zigbee Localization and Detection Methods, and Its Applications
- ➤ Recent Advances in Image and Video Analysis
- > RFID in Consumer Electronics
- ➤ Advanced Circuit and System on Green and Biomedical Applications
- ➤ Intelligent Multimedia Processing and Applications
- ➤ Recent Advances in Multimedia Technologies for Consumer Electronics
- ➤ Smart Phone Applications

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- Authors of accepted and presented ISCE 2013 papers are encouraged to submit enhanced and journal quality papers to the Transactions on Consumer Electronics. Authors should read the IEEE website http://www.ewh.ieee.org/soc/ces/publications_trans_ce.html and use the paper template on that site. The paper should make clear reference to and give a clear difference from the ISCE 2013 paper.

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International Symposium on Consumer Electronics

Date: June 3-6, 2013

Venue: National Chiao Tung University

Program Book

















Wednesday, June 5

08:30 - 17:00

Registration Room: Lobby

09:00 - 10:15

Intelligent Computing with Applications for Consumer Electronics - II

Room: Conference Room 1

Chair: Ting-Lan Lin (Chung Yuan Christian University, Taiwan)

09:00 Enhancing Performance of Traffic Safety Guardian System on Android by Task Skipping Mechanism

Kuei-Chung Chang (Feng Chia University, Taiwan); Kuan-Hsiung Wang (Feng-Chia University, Taiwan) pp. 115-116

09:15 Non-invasive Liquid Level Detection with Dielectric Capacitive Method

Fang-Ming Yu (St. John's University, Taiwan); Bing-Kai Hong (St. John's University, Taiwan); Wen-Pin Lin (St. John's University, Taiwan); Chien-Hung Chao (St. John's University, Taiwan); Ko-Wen Jwo (National Central University, Taiwan) pp. 117-118

09:30 Design of LUT based RNS Reverse Converters

Nicholas C H Vun (Nanyang Technological University, Singapore) pp. 119-120

09:45 Consumer Electronics-Based Intelligent Alert System for Unattended Elderly Residents

<u>Yao Shieh</u> (Chang Gung University & University of California Irvine, Taiwan); Mengkai Shieh (Russian Medical Academy of Postgraduate Education, Russia)
pp. 121-122

10:00 Forming Mesh Topology for Bluetooth Ad Hoc Networks

Chih-min Yu (Chung Hua University, Taiwan); Shao-Kai Hung (Dept. of Communication Engineering, Chung-Hua University, Taiwan); Yu-Chih Chen (Dept. of Communication Engineering, Chung-Hua University, Taiwan) pp. 123-124

Smart Phone Applications - I

Room: Conference Room 4

Chair: Jin-Tsong Jeng (National Formosa University, Taiwan)

09:00 Video car recorder in iPhone

Jin-Tsong Jeng (National Formosa University, Taiwan); Chen-Chia Chuang (NIU, Taiwan) pp. 125-126

09:12 The Voice Communication Switch with Peak Power Analysis on Smart Phone Systems

Jin-Tsong Jeng (National Formosa University, Taiwan); Chen-Chia Chuang (NIU, Taiwan); Dong-Han Lin (National Ilan University, Taiwan); Wei-Yang Lin (National Ilan University, Taiwan) pp. 127-128

09:25 Test-based assessment with mobile devices

Wu-Ja Lin (National Formosa University, Taiwan); <u>Sin-sin Jhuo</u> (National Formosa University, Taiwan); Chen Fan (National Formosa University, Taiwan); Ruan Bo-Kai (National Formosa University, Taiwan); Chen Po-Wen (National Formosa University, Taiwan) pp. 129-130

09:37 Developing an Activity-Oriented Open Platform to Support Persuasive Strategies of Health Promotion

<u>Anindhita Dewabharata</u> (National Taiwan University Science and Technology, Taiwan); Don Ming-Hui Wen (China University of Technology, Taiwan); ShienChii Shieh (Tungnan University, Taiwan); Sho Yan Chou (National Taiwan University of Science and Technology, Taiwan) pp. 131-132

09:50 A 2.45-GHz RFID Wireless-Sensor-Network Location Tracking System

Yeong-Lin Lai (National Changhua University of Education, Taiwan) pp. 133-134

10:02 Timing of Resource Releasing for Group Mobility in LTE-Advanced Network

Chun-Chuan Yang (National Chi-Nan University, Taiwan); Jeng-Yueng Chen (Hsiuping University of Science and Technology, Taiwan); Yi-Ting Mai (Hsiuping University of Science and Technology, Taiwan); Ching-Hsiang Liang (National Chi Nan University, Taiwan)

11/19 2013/6/11 上午 08:19

Timing of Resource Releasing for Group Mobility in LTE-Advanced Network

Chun-Chuan Yang, Jeng-Yueng Chen, Member, IEEE, *Yi-Ting Mai, Member, IEEE and, Ching-Hsiang Liang

Abstract—Recently, LTE-Advanced is a mobile communication standard and high wireless bandwidth technology, formally submitted as a candidate 4G solution in the world. The major difference between 3GPP Release 10 (Rel-10) LTE-Advanced and the original LTE (Rel-8) is a new entity called relay node (RN) introduced in Rel-10. Since both backhaul link and access link of relay node are radio interface, the RN might be a portable device to move like a UE, and furthermore RN could move with its served UEs in some wireless network environments (e.g. both the RN and UEs inside the vehicle). When one RN handover to new DeNB as group mobility, it will cause a mount of UEs' handover simultaneously. How to manage huge handover signaling and radio resource in DeNB is an important issue in LTE-Advanced networks. In this paper, we try to design some possible solutions and analyze the performance of proposed schemes.

Keyword: LTE, LTE-Advanced, Mobile relay, Resource releasing

I. INTRODUCTION

In the enhanced LTE version, LTE-Advanced [1], the RN architectures design supporting mobility were still being discussed. To enhance coverage and capacity of existing radio access networks is the major target of fixed RN [2][3], it is also already standardized in 3GPP Rel-10. *Mobile RN (MRN)* refers to the scenario that RN would move like a UE with its served UEs when RN deployment in *high speed train (HSR)* in 3GPP Rel-11 discussion.

A scenario of MRN mobility that UEs connected to a MRN that is located in the vehicle or public transportation such as train, bus, etc. is considered in this paper. From technical aspect, MRN mobility would result in group mobility of the UEs connected to the RN as shown in Fig. 1. Source DeNB is supposed to release RN context when the handover procedure is completed. This paper addresses the timing associated with the trigger event for Source DeNB to release RN context.

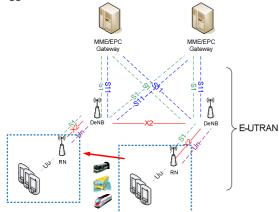


Fig. 1. Group mobility of UEs due to RN mobility

II. TIMING OF RESOURCE RELEASING

A. Timing of Source DeNB to release MRN context

According to the procedure of UE handover between eNBs, the context of UE at the source eNB is released when path switch is completed. However, the situation for RN mobility is more complicated since the handover procedure of MRN between DeNBs should include three stages as illustrated in Fig. 2: (1) MRN handover as a regular UE, (2) Path Switch for MRN, and (3) Path Switch for UEs. The timing as well as the method of activation for the source DeNB to release MRN context has to be investigated.

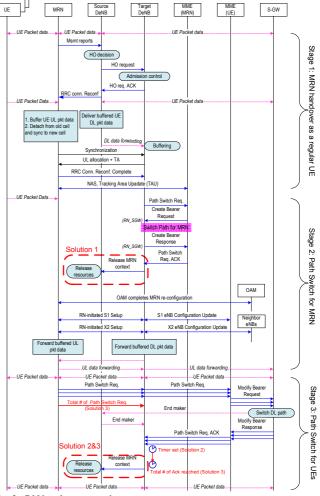


Fig. 2. RN handover procedure

B. Proposed solutions

Solution 1: MRN context is released when MRN path switch is completed (in stage 2)

This solution is similar to the procedure of UE handover between eNBs. The target DeNB sends out the message of "Release MRN Context" to the source DeNB when path switch for MRN is completed as illustrated in Fig. 3.

Solution 2: MRN context is released when path switch for UEs is completed, by means of timer.

Solution 2 and Solution 3 are both to delay the release of MRN context until path switch for UEs is completed. This solution uses a timer to determine when the target DeNB should send out the message of "Release MRN Context", as illustrated in Fig. 4. The timer is reset each time when a new path switch request Ack arrives. When no new path switch request Ack has arrived for a pre-defined period of time, the timer expires and MRN context is released.

Solution 3: MRN context is released when path switch for ALL UEs is completed, by means of explicit signaling.

In this solution, MRN notifies the target DeNB of the total number of path switch requests for UEs. When the number of path switch request Ack has reached the total number, the target DeNB sends out the message of "*Release MRN Context*", as illustrated in Fig. 5.

III. PERFORMANCE ANALYSIS

Table I shows comparison results of the above-mentioned solutions.

With regards to Solution 1, no extra signaling or mechanism is required in this solution at the cost of inevitable UE packet loss, since MRN context is released before path switch for UEs connected to MRN. With regards to Solution 2, timer mechanism is required at the target DeNB. UE packet loss is likely to happen, although it's milder than that of Solution 1. The solution also presents the difficulty of choosing a proper value of timeout. With regards to Solution 3, extra signaling carrying the total number of path switch requests from MRN to the target DeNB and counting for the number of received path switch request Ack at the target DeNB are required. There is no UE packet loss in this solution.

In light of the goal of reducing packet loss as much as possible during handover, and also considering the minor cost of added signaling, Solution 3 is considered to be superior to the other solutions.

TABI	ELS	SOLUTION	COMPAR	RISON

TABLE I SOLUTION COMPARISON					
	Solution 1	Solution 2	Solution 3		
UE packet loss probability	High	Low	No loss		
DeNB impact	No impact	Timer mechanism. Difficult to choose a proper value of timeout.	Recognition of the extra signal Counting for the number of received path switch request Ack.		
RN impact	No impact	No impact	Extra signaling for the total number of path switch request for UEs		

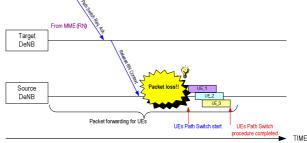


Fig. 3. MRN context is released when MRN path switch is completed

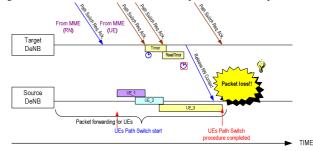


Fig. 4. MRN context is released when path switch for UEs is completed, by means of timer

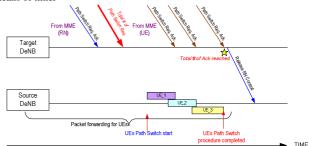


Fig. 5. MRN context is released when path switch for ALL UEs is completed, by means of explicit signalling

IV. CONCLUSION

This paper addresses the timing and associated mechanism of releasing MRN context at the source DeNB for MRN group mobility. Our proposed schemes can provide three alternatives for vendors in HSR environment. In the analysis result, the source DeNB should release MRN context when path switch of all UEs under the MRN is completed, which is notified by the MRN with explicit and aggregate signaling.

ACKNOWLEDGMENT

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