ICT Virtual Organization of ASEAN Institutes and NICT
ASEAN IVO Forum 2016
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I. Title—

Distributed Device-to-Device Wireless Networks to Enable Smart Community

II. Author(s)—Full name (First name family name):

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III. Organization(s):

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IV. Topic selection:

Smart Society: ICT applications for community and environment

A) Smart Community

IV. Abstract:

[*Purpose and background*]
Device-to-Device (D2D) wireless networks are expected to off-load traffics of main infrastructure as well as to reduce latency in the air interface compared to those formed via the network infrastructures. Moreover, D2D wireless networks formed without infrastructure and without centralized coordination are more robust in emergency or disaster situations. The IEEE 802 LAN/MAN Standardization Committee is developing a new standard of IEEE 802.15.8 for D2D wireless networks, which are referred to as Peer Aware Communications (PACs).

[Objective and c*ontent*]
We developed a distributed D2D network test bed, which is a precursor system of PAC without central coordination and for the purposes of facilitating the local community life. We selected Odaiba area of Tokyo as a typical urban model, and Seika Town of Kyoto as a typical rural model for deploying and evaluating the testbed. All devices are connected without centralized coordination. Thus, Single-Point-Of-Failure (SPOF) problem is avoided. Especially, we employ moving buses as carriers of information. Each device holds the obtained information for a certain

period of time. Then, moving buses collect and diffuse information among devices whenever connected.

[*Plan and expected results*]
Based on our experiment and evaluation results with the testbed, we confirm the effectiveness of the developed D2D wireless networks in both urban and rural areas for providing various services for local community such as information sharing, advertisement, and group communications to enable smart community. The testbed is low-cost and independent from other infrastructures, thus it is considered to be suitable to deploy in ASEAN countries. We expect more roles of the system in areas where ICT infrastructure has not developed very well. Through carefully design, the system is also expected to provide some additional functions such as bus location services.

V. Speaker information:

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