# Accepted Manuscript

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PII: S0167-739X(16)30206-0
DOI: http://dx.doi.org/10.1016/j.future.2016.06.021
Reference: FUTURE 3087

To appear in: *Future Generation Computer Systems*

Received date: 27 January 2016
Revised date: 18 April 2016
Accepted date: 20 June 2016

Please cite this article as: W. Tärneberg, A. Mehta, E. Wadbro, J. Tordsson, J. Eker, M. Kihl, E. Elmroth, Dynamic application placement in the Mobile Cloud Network, *Future Generation Computer Systems* (2016), http://dx.doi.org/10.1016/j.future.2016.06.021

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ACCEPTED MANUSCRIPT

# Dynamic Application Placement in the Mobile Cloud Network

William Tärneberg[a,*], Amardeep Mehta[b], Eddie Wadbro[b], Johan Tordsson[b], Johan Eker[c], Maria Kihl[a], Erik Elmroth[b]

[a] *Department of Electrical and Information Technology, Lund University, SE-223 63 Lund, Sweden*
[b] *Department of Computing Science, Umeå University, SE-901 87 Umeå, Sweden*
[c] *Ericsson Research, Lund, Sweden*

**Abstract**

To meet the challenges of consistent performance, low communication latency, and a high degree of user mobility, cloud and Telecom infrastructure vendors and operators foresee a Mobile Cloud Network that incorporates public cloud infrastructures with cloud augmented Telecom nodes in forthcoming mobile access networks. A Mobile Cloud Network is composed of distributed cost- and capacity-heterogeneous resources that host applications that in turn are subject to a spatially and quantitatively rapidly changing demand. Such an infrastructure requires a holistic management approach that ensures that the resident applications' performance requirements are met while sustainably supported by the underlying infrastructure. The contribution of this paper is three-fold. Firstly, this paper contributes with a model that captures the cost- and capacity-heterogeneity of the a Mobile Cloud Network infrastructure. The model bridges the Mobile Edge Computing and Distributed Cloud paradigms by modelling multiple tiers of resources across the network and serves not just mobile devices but any client beyond and within the network. A set of resource management challenges are presented based on this model. Secondly, an algorithm that

*Corresponding author
*Email addresses:* william.tarneberg@eit.lth.se (William Tärneberg), amardeep@cs.umu.se (Amardeep Mehta), eddiew@cs.umu.se (Eddie Wadbro), tordsson@cs.umu.se (Johan Tordsson), johan.eker@ericsson.com (Johan Eker), maria.kihl@eit.lth.se (Maria Kihl), elmroth@cs.umu.se (Erik Elmroth)

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