ETSI TR 122 980 V13.0.0 (2016-01)

Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
LTE;
Network composition feasibility study
(3GPP TR 22.980 version 13.0.0 Release 13)

Reference
RTR/TSGS-0122980vd00

Keywords
GSM,LTE,UMTS

ETSI

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Contents

Foreword

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Introduction

In the last couple of years an increasing number of heterogeneous network types have come to the focus of attention, e.g. heterogeneous access systems (otherwise known as multi-access), Personal Area Networks (PANs), Personal Networks (PNs),moving networks etc. This trend is expected to continue. Different scenarios have been studied in the All-IP Network (AIPN) Feasibility Study in TR 22.978 [5], which lists "network extensibility/composition " as a key aspect of AIPN. The integration of PANs and Personal Networks will be specified within the scope of the Personal Network Management (PNM) work item. Related Technical Specification work is ongoing within the AIPN Stage 1 in TS 22.258 [6] and Personal Network Management Stage 1 in TS 22.259 [7]. It would be desirable for 3GPP networks to be able to integrate many of these heterogeneous network types, or to interwork with them, in an efficient manner that for operators is easy to manage and control.

This Technical Report is the result of a feasibility study on Network Composition, the concept of heterogeneous network/system integration and interworking. It builds on the work of AIPN and studies Network Composition in more detail. This includes integration of networks with different administrative domains, and the dynamic and flexible integration of ad-hoc networks, PANs, WLANs etc. Particularly, the possibility for a uniform Network Composition procedure is explored, independent of what kind of network is "composed" with the 3GPP system. Complementing the AIPN work, in this report a concrete dynamic 'plug&play' and flexible Network Composition procedure is described.

1 Scope

The present document explores the feasibility of a uniform procedure for the integration of, and the interworking with, a large variety of heterogeneous network types. This uniform procedure is called Network Composition. It focuses on ad-hoc networks, PANs, moving networks etc., but also includes access systems. The goal is to avoid the need for defining a new procedure for integration / interworking with each newly emerging network type and to explore the feasibility of making the Network Composition procedure dynamic and to minimize human intervention ("plug and play"). Of course, the high security (authentication, authorization) standards of 3GPP must thereby be maintained. Finally, it is desirable for the Network Composition procedure to be flexible regarding what functionality is assumed in the composing network.

It is conceivable that roaming within a pre-set commercial and technological environment could be established dynamically using the same procedure.

This Feasibility Study covers the following aspects:

- Description of purpose and benefits of composition
- Composition use cases highlighting uniformity, dynamicity, security, manageability, scalability, flexibility, as well as business aspects
- Study of potential composition requirements
- Description of the composition process
- Definition of traits and/or implications of introducing this functionality into the 3GPP system, covering subjects such as management, multi-link radio access, mobility, context & policy awareness, security, and media transcoding & adaptation capabilities.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

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[1] 'D7-2 Ambient Networks Security Architecture', IST–2002-507134-AN/WP7/D02, F. Kohlmayer et al
http://www.ambient-networks.org/publications/D7-1_PU.pdf

[2] 'Host Identity Protocol Architecture', R. Moskowitz, P. Nikander
http://www.ietf.org/rfc/rfc4423.txt

[3] 'D3-2: Connecting Ambient Networks – Architecture and Protocol Design', IST–2002-507137-AN/WP3/D/3-2, J. Colás et al
http://www.ambient-networks.org/publications/AN D3-2 for publication.pdf

[4] 3GPP TR 21.905: 'Vocabulary for 3GPP specifications'

[5] 3GPP TR 22.978: "All-IP Network (AIPN) feasibility study'

[6] 3GPP TS 22.258: 'Service Requirements for the All-IP Network (AIPN); Stage 1'