

## LIAISON STATEMENT TO 3GPP

Title: Liaison statement to 3GPP

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From Organisation: ETSI ISG AFI

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Technical Contact: Ranganai Chaparadza (Chairman)

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Reply by (date): (by 18<sup>th</sup> July 2011 or any date convenient for 3GPP)

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To Organisation: 3GPP

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Contact Person: Balazs Bertenti (Chairman)

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For:

Action:

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Information:

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Dear **Chair of 3GPP TSG SA**,

The ETSI Industry Specification Group: **Autonomic network engineering for the self-managing Future Internet**, called **AFI**, seeks to establish liaison with the 3GPP in the work of introducing the so-called “**autonomic and self-management related concepts and principles**” into the **3GPP and Non-3GPP Mobile Network Architectures**. As demonstrated by SON (Self-Organizing Networks) in LTE, and many other cases where network automation and autonomic principles of network operation have been devised/experimented, it is now widely agreed that autonomic networking and self-management is a new networking paradigm that brings many benefits to network management and operation, such as OPEX reduction and enhanced network intelligence through adaptive control of network resources. The paradigm includes so-called self-\* features of network operation such as self-configuration, self-diagnosing, self-healing/self-repair and self-optimization. In AFI, we interpret “*Future Internet*” as simply meaning “*Multi-Service Self-Managing Future Networks evolved from today’s networking models, architectures, paradigms and protocols*”.

In ETSI AFI, diverse key players are involved as members, including network operators, network equipment vendors, OSS/BSS vendors, service providers, and research organizations. To summarize the on-going AFI activities:

(1) AFI works on specifying “*Scenarios and Use Cases for desired Self-Management operations and adaptive control in diverse network environments and architectures*”, as well as the identification of the main Requirements associated with the scenarios and use cases. This work is driven mainly by operators, and a first release of the Specification will be published by ETSI within this month of July 2011.

(2) AFI has been working on the Design and Specification of an Architectural **Reference Model** for *Autonomic Network Engineering, Cognition and Self-Management*. The Model is a **Conceptual Architectural Reference Model for Autonomic Network Engineering, Cognition and Self-Management**. Its purpose is to serve as a “*blueprint model*” that prescribes *design and operational principles of “autonomic decision-making manager elements” responsible for “autonomic” and “cognitive” management and control of network resources (e.g. protocols, stacks, mechanisms)*.

(3) AFI is now moving to the Design and Specification of **Autonomicity-enabled Reference Architecture(s)** – a result of “**Instantiation**” of the **Reference Model** onto concrete target standardized element/device architecture, standardized network architecture as a whole and for a particular network environment. The process of “*Instantiating the Reference Model*” by mapping, fusion and superposition of its conceptual building blocks takes as input a “*Standardized Reference Architecture*” such as **3GPP architecture**, *Broadband Forum architecture*, *NGN architecture*, etc.

## ETSI ISG AFI

With respect to **introducing Autonomicity into the 3GPP and Non-3GPP Mobile Network architectures**, AFI has created a Work Item that is about to start, called **Autonomicity-enabled 3GPP and Non-3GPP Mobile Network Architectures, Requirements Analysis and Specification of Implementation-oriented Solutions for Autonomicity and Self-Management**. The work will involve the following activities:

*“Instantiation of the Reference Model” onto concrete standardized device/element architectures and the overall standardized network architecture by instrumenting Autonomicity Concepts and Principles i.e. superimposing “autonomic manager elements” called Decision Elements (DEs) defined by the Reference Model, into node/device architectures and the overall network architecture. The DEs and their associated Control-Loops can be further designed to perform autonomic management and control of the specific resources (Managed Entities) in the target architecture. The process of Instantiating the Reference Model onto a target architecture and environment, by mapping, fusion and superimposing the conceptual building blocks for autonomicity, takes as input a “Standardized Reference Architecture” namely: **3GPP Architecture**. Only those entities and interfaces of the **3GPP Architecture** currently implemented will need to be given focus. The result of the instantiation process is an “**Autonomicity-enabled 3GPP Reference Architecture**”. Next: **Analysis of Requirements** and producing detailed DE Specifications, which include: Interaction Flows and Data Flows on DE interfaces; Data Specifications for data communicated on interfaces; and Sequence Diagrams showing how DEs apply Policies and perform autonomic management and control of their assigned Managed Entities (MEs) i.e. the relevant technologies and protocols of the targeted reference architecture and associated network environment(s). The work leads to the production of a set of related documents.*

Essentially, the envisaged work will involve extending the 3GPP architecture with Functional Blocks that orchestrate autonomic management and control behaviours (self-\*) meant to adapt the network to events and challenges and optimize network behaviour and resource utilization. The work is aimed at extending what has been achieved (i.e. specified) for SON functions in the RAN/LTE, so as to introduce autonomic functions into other network segments such as in the Core Network as well as on the Interfaces to other Non-3GPP and 2G networks. Discussions with operators in AFI, as well as at industrial conferences are calling for the introduction of autonomic (i.e. SON-like features) into the other network segments e.g. the core network and interfaces towards other segments and network types.

In parallel to the main activities, AFI aims at producing recommendations on how to evolve the relevant protocols and technologies as necessitated by autonomicity, and to advise the relevant SDOs or Forums responsible of the relevant protocols and technologies.

Therefore, AFI sees the need to establish liaison with 3GPP so that 3GPP can join the efforts with AFI on developing the “**Autonomicity-enabled 3GPP Reference Architecture**” document as well as addressing the related activities described above (as joint/common work).

AFI has been working on two draft specifications that are almost ready to be shared with external organizations as soon as ETSI publishes them. The first draft is a *specification of Scenarios, Use Cases, and Requirements for Autonomic/Self-Managing Future Internet (ETSI GS AFI 001)*, and is expected to be published within July 2011. The specification of Scenarios, Use Cases and Requirements is continuous work, and so the draft specification is expected to be evolved to the next release(s) after the first release has been published, as we expect to gather more operator input on the diverse network environments AFI is covering. The second draft is the *first release of the draft specification of an Architectural Reference Model for Autonomic Networking and Self-Management (ETSI GS AFI 002)* that is being completed. AFI will be in a position to send each of the drafts to the 3GPP in the very near future (i.e. as soon as the draft has been published by ETSI).

Since it may be necessary to elaborate on the AFI activities in order to help in your drafting of the response to the Liaison, the AFI Chairman will be in a position to hold an audio conference with the Chairman of 3GPP TSG SA.

We look forward to very good AFI and 3GPP collaboration on producing a joint Specification(s) in the area of autonomic network engineering for the Self-Managing Networks.

On behalf of the AFI, thank you.

Ranganai Chaparadza,  
AFI Chairman,  
5<sup>th</sup> July 2011