


SEVENTH FRAMEWORK PROGRAMME
THEME ICT-1-1.1
"Network of the future"

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Project full title: Exposing the Features in IP version Six protocols that can be exploited/extended for the purposes of designing/building Autonomic Networks and Services

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Second report on standardization activities, contribution to fora, task forces and bodies

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Abstract:

This Deliverable describes the activities undertaken by the EFIPSANS project for the standardisation efforts during the first 24 months. The standardisation focus has culminated from the strong base of some partners who have been working within ETSI, namely the technical manager of the project, the involvement of one partner in the 3GPP standardisation efforts at board level since its inception, namely the IPv6 Forum based at the University of Luxembourg and the strong industry involved in this project that participate in ETSI and the IETF forming an amazing critical mass to start an innovative approach and space to focus working on formulating novel industry-oriented standards for autonomic networking using IPv6 and its extensions being proposed by EFIPSANS (IPv6++), as well the network architectural extensions being introduced by EFIPSANS.

The platform chosen is the creation within ETSI of an Industry Specification Group (ISG) to be called: Autonomic network engineering for the self-managing Future Internet (AFI). EFIPSANS has pioneered this concept for all EU projects to follow if industry standardisation and research results exploitation are supposed to be the outcome of an Integrated Project.

Keywords: EFIPSANS**,** Autonomic Networking, Future Internet, IPv6, roadmap, ETSI, Interoperability. Industry decision-makers, ISPs, Mobile Operators and content providers.

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Executive Summary

The EFIPSANS Group has taken a bold step in forming an ETSI Industry Specification Group (ISG) after a number of negotiation steps with the ETSI Strategy leader. This initiative is planned to take effect starting January 2009 and will be called: **Autonomic network engineering for the self-managing Future Internet** a.ka. "*Autonomic Future Internet*" (AFI). One of the Sub-Groups of the ISG will focus on the definition of a viable **roadmap of an evolutionary path** for today's network models, architectures, protocols such as IPv6 (towards IPv6++) and paradigms as necessitated by the GANA Reference Model being introduced by EFIPSANS. The definition of a **roadmap of an evolutionary path** should be achieved through recommendations that can then be considered by the relevant bodies towards the evolution of the protocols recommended for evolution or extensions. For this, the ISG would liaise with relevant bodies such as IETF, 3GPP, etc.

EFIPSANS has per se pioneered a new concept for all EU projects to follow if industry standardisation and research results exploitation are supposed to be the outcome of an Integrated Project.

The reason for this initiative is that the landscape of autonomic networking is crowded with researchers with no industrial exploitation plans and no vision for business opportunity and lacking a platform for a harmonized and pragmatic strategy towards establishing European leadership in designing the Future Internet.

This ISG initiative will facilitate harmonisation towards achieving meaningful specifications on the Self-Managing and Autonomic Future Internet that could be adopted by the industry.

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1. Introduction

EFIPSANS has embarked on establishing focused initiatives towards contribution to standards, such as:

1.1. Establishing an ISG in ETSI: Autonomic Network Engineering for Self-Managing Future Networks

After carrying out a review on today's approaches to autonomic networking and having understood their shortcomings, EFIPSANS has established that in order to produce Autonomic Behaviour Specifications of Decision-Making-Elements (DMEs) meant for diverse networking environments, a *reference* Generic Autonomic Network Architecture (GANA) is required and one must first be worked out if non-exists. Therefore, EFIPSANS has started developing a generic reference model for autonomic networking called GANA. It is an innovation of EFIPSANS since no generic reference model for autonomic networking that satisfies the principles on which GANA is founded existed before.

GANA differs from all other approaches to autonomic network engineering in that, GANA captures the generic principles required for an evolvable autonomic network architecture by defining the autonomic elements (DMEs), self-manageability aspects, abstractions where necessary, the required separations and distinctions between autonomic elements and their managed entities, and management interfaces, control loops, hierarchical, peering and sibling relationships among autonomic Decision-Making-Elements (DMEs) of nodes and the network as a whole. GANA is the kind of architecture that allows for the production of standardisable autonomic behaviour specifications due to the fact that the key founding principle of GANA is: *"clearly separate **specification issues** for autonomic behaviours from **implementation issues** of the specified autonomic behaviours"* i.e. specification issues should not be constrained be implementation issues.

As such, GANA is meant to benefit both the "evolutionary" approaches and "revolutionary/clean-slate" approaches to Future Internet design, in the long run, as GANA becomes adopted as the common reference model for autonomic network engineering. Evolvability of GANA will be assured in two ways: (1) Identifying the interfaces and concepts of GANA that must remain constant to allow new components to be added to the architecture; (2) Application of model-based evolution of the elements of the architecture by ensuring that communication between architects and implementers of GANA should be based on model-based development and evolution of the specifications of all elements. Along with the definition of GANA, EFIPSANS is defining the required *Domain-Specific Meta-Model for the Autonomic Networking Domain* (dubbed the GANA Meta-Model), which defines the concepts and semantics for autonomic network engineering, concepts such as control loops, Decision-Making Elements (DMEs) and their associated Managed Entities, as well as other types of "control-loop information suppliers", interfaces, etc, required by a DME. The GANA Meta-Model will also be contributed as a standard along with the GANA. The GANA Meta-Model allows for the application of advanced state-of-the-art systems/software engineering methodologies such as the OMG's MDA approach. This means that, based on the GANA Meta-Model, model-based systems development tool chains can be developed to support *Modelling* and *Validation* of *Autonomic Behaviours of DMEs* using *Formal Description Techniques* (FDTs) such as the well-known and successful SDL (an ITU standard) including code-generation from formal models of DMEs.

1.2. Standardization Bodies and Forums of relevance to EFIPSANS

IETF: EFIPSANS stands for **E**xposing the **F**eatures in **IP** version **S**ix protocols that can be exploited/extended for the purposes of designing/building **A**utonomic **N**etworks and Services. This means EFIPSANS is bound to work closely with the IETF since one of the objectives of EFIPSANS is to produce extensions to IPv6 protocols as necessitated by the autonomic network architectures EFIPSANS is designing. A number of potential extensions to IPv6 protocols are emerging in EFIPSANS, including possible extensions to IPv6 core's Hop-by-Hop Options Header and Destination Options Header, extensions to ICMPv6 family of protocols, SHIM6, MIPv6, DHCPv6, SCTP, BFD, OSPFv3, RIPng. http://www.ietf.org/

ACF: EFIPSANS plans to contribute the Specifications of Autonomic Behaviours of Decision-Making-Elements (DMEs) for selected diverse networking environments, being designed in EFIPSANS, to the ACF (apart from contributing to the ETSI-ISG mentioned earlier). Most of the members of EFIPSANS are key members of the ACF and therefore, EFIPSANS will continue to participate in ACF related developments. http://www.autonomic-communication-forum.org/

3GPP-LTE: EFIPSANS is considering the recommendations put forward by 3GPP-LTE for self-organising, self-configuring and self-optimising (i.e. self-* features) networks in order to incorporate such features into the design of autonomic Decision-Making-Elements (DMEs) for selected diverse networking environments being designed in EFIPSANS. http://www.3gpp.org/.

NGMN: Similarly to the 3GPP-LTE case, EFIPSANS is considering liaising with NGMN so that the issues related to autonomics (self-organising, self-configuring and self-optimising (i.e. self-* features) produced as recommendations by NGMN can be incorporated into the design of autonomic Decision-Making-Elements (DMEs) for selected diverse networking environments being designed in EFIPSANS. http://www.ngmn.org/.

OMG: Following the OMG's MDA approach, EFIPSANS is working on producing the GANA Meta-Model, together with its associated Methodology and Tool chain for model-based systems development that support *Modelling* and *Validation* of *Autonomic Behaviours of DMEs* using *Formal Description Techniques* (FDTs) such as the well-known and successful SDL (an ITU standard), including *code-generation* from formal models of DMEs. http://www.omg.org/.

3G-CDMA: Similarly to the 3GPP-LTE case, EFIPSANS is designing some autonomic Decision-Making-Elements (DMEs) addressing the functionalities being addressed in EFIPSANS. http://www.cdg.org/technology/3g.asp.

ITU: EFIPSANS aims at disseminating the specifications being produced, not only through ETSI and ACF but also to ITU, depending on the needs for liaisons that may emerge in the course of the project or after the project duration. http://www.itu.int.

WLAN-WiFi: Similarly to the 3GPP-LTE and 3G-CDMA cases, EFIPSANS is designing some autonomic Decision-Making-Elements (DMEs) addressing the functionalities being addressed in EFIPSANS. http://www.wi-fi.org/.

2. ETSI ISG: Autonomic network engineering for the self-managing Future Internet (AFI)

EFIPSANS has achieved one of its biggest success stories by creating the ETSI ISG: **Autonomic network engineering for the self-managing Future Internet (AFI)**.

2.1. What is AFI

AFI is a recently launched Industry Specification Group on Autonomic network engineering for the self-managing Future Internet. The previous developments and current research directions in this very vital field of Autonomics and Self-Managing Future Networks are *still not harmonized* towards *a common approach to achieving industrial scale application of autonomics and Self-Management in networks*. AFI will pursue a harmonized approach to its developments and outcome. So far, AFI has two Work Items (WIs) defined towards the production of what are called Group Specifications, to be released to the public in 2010, and will continue to be evolved thereafter. More Work Items will be defined as AFI work progresses.

AFI Work Item (WI) #1: *Scenarios, Use Cases, and Requirements for Autonomic/Self-Managing Future Internet*. It is mainly driven by operators, service and network providers.

AFI Work Item (WI) #2: *Generic Autonomic Network Architecture (GANA).* It is mainly driven by manufacturers and research organizations.

AFI WI#1 is driving WI#2 – which is then focused on developing the Specifications of node/device/network architecture that fulfils the Requirements, Use Cases and the Scenarios put forward by WI#1.

2.2. What "Future Internet" means in AFI terms

"Future Internet" in AFI terms is to be interpreted as networks encompassed in general by "Multi-Service Self-Managing Future Networks that are evolved from today's networking models, paradigms and protocols".

2.3. Types of Network Environments being addressed

AFI does not restrict to a particular network environment and technology. For every Scenario defined by AFI, the associated Use Cases and Requirements, the following parameters are defined: **(1)** the Network Environment involved – Wired (IP, Ethernet, etc), Wireless (802.11x, etc); **(2)** the Actors/Roles Involved – e.g. End-User, Service Provider, Network Provider, Content provider, etc; **(3)** the Assumptions made and the Functional Requirements that enable the realization/implementation of the Scenario.

The approach being taken by the AFI while deriving the building blocks and Functional Requirements that enable the realization/implementation of the Scenario is to identify any Layers and Technologies requiring modification/evolution if that is what the requirements of a Scenario or Use Case entails. On this basis, the AFI shall consider Liaising with the responsible Working Group, Forum or Standardization Body if the AFI sees the Scenario or Use Case as relevant for the Self-Managing Future Internet. The kind of liaisons mean that AFI will produce Recommendations for modifications/evolution of the identified Layers or Technologies to the responsible Working Group, Forum or Standardization Body, which may choose to adopt the AFI recommendations or not. However, those Recommendations will be part of the AFI Specifications.

2.4. What can be standardized in Autonomic Networking and Self-Management

What will be considered for standardization are the Decision-Making-Elements (DMEs/DEs) for the node/device and network architectures defined by the GANA, their Interfaces & Operations and associated Managed Entities (MEs), the Self-* Functions to be implemented by Decision-Making-Elements, Components and Mechanisms for Knowledge Sharing, Data Specifications for Information Flow among all the Building Blocks and the associated Information Models and Policy-Frameworks.

2.5. How AFI works

AFI is process driven, meaning that:

(1) AFI is establishing a framework by which Scenarios, Use Cases and Requirements for the Self-Managing Future Internet can be contributed into the Specifications. The framework includes Templates for describing Scenarios, Use Cases and Requirements for the Autonomic/Self-Managing Future Internet.

(2) AFI seeks to demonstrate that we are establishing and following an evolvable Architectural Reference Model (GANA) for Autonomic/Self-Managing Future Networks.

(3) AFI seeks to demonstrate a selected set of prioritized Scenarios and Use Cases that are prototyped and validated through validation opportunities available in EC funded projects (for example).

(4) AFI is giving attention to immediate and mid-term requirements for Autonomic Networking and Self-Management, while ensuring Evolvability of the GANA Architecture and Concepts for addressing future long-term requirements.

2.6. ETSI ISG: AFI Start-up Steps

The negotiations with ETSI have been finalised successfully at the end of 2008.

- The first meeting took place on 26-27th February 2009.
- The ISG Agreement for ETSI Members document was signed by the organizations between 19th and 23rd of January 2009.

- The ETSI portal site, e-mail lists, etc. were put into place in January 2009.

For a detailed description of start-up steps we refer the reader to Appendix 9.2.

2.7. ETSI ISG: AFI Documents

The following documents form the basis of the creation of AFI.

- Draft AFI ISG Terms of Reference
- Draft AFI ETSI ISG Agreement - ETSI Member
- Draft AFI ETSI ISG Agreement - ETSI Participant

The second document is the legal agreement to establish the ISG, updated with changes we agreed in the Terms of Reference (ToR) document. A copy of the second document is intended to be signed by each ETSI Member who wishes to join the ISG.

The third document is the legal agreement which non-members of ETSI need to sign in order to access the ISG. ETSI Members will never have to sign this document, but should be aware of its contents.

In order to keep this deliverable short and crisp, we only included the "ISG Agreement - ETSI Member" document as Appendix 9.3. The other documents can be easily accessed through the ETSI AFI portal http://portal.etsi.org/afi.

2.8. AFI meetings

On the 9th and 10th of September 2009, the third AFI meeting took place in ETSI, Sophia-Antipolis, France. One of the key agenda items was the presentation of some of the Scenarios, Use cases and Requirements for Self-Managing Future Internet emerging in EFIPSANS as well as presenting the GANA Reference Model from EFIPSANS to the AFI in order to discuss with the AFI at large (it now includes non-EFIPSANS members) how the GANA can be further developed. The fourth AFI meeting took place on 7th-8th December 2009, again in Sophia-Antipolis. The latter meeting was basically a follow-up of the third meeting with the same focus.

In order to get a better insight, we refer the reader to Appendix 9.7, where the minutes of both the third and fourth AFI meetings are included.

2.9. How to get involved

For instructions about how to get involved to AFI we refer the reader to Appendix 9.4.

3. Current and Future Contributions to IETF

3.1. Overview

As part of the EFIPSANS project, we intend to submit drafts to the IETF to extend the IPv6 protocols. The IPv6 protocol allows for 255 predefined extension headers. Currently only six of these have been assigned.

The EFIPSANS Project has identified, as part of its work, several potential extensions to the IPv6 protocol suite in view of enabling autonomic networking capabilities in a variety of contexts. As such, a number of **EFIPSANS proposed Extensions to IPv6 towards IPv6++** have been designed and their Usage contexts are clearly described in e.g. Deliverable D2.3.

The EFIPSANS Project intends to promote these protocols extensions at the IETF in view of having them adopted by the wider (engineering) community. Introducing protocols extensions at the IETF, but most essentially, maximizing their adoption requires to carefully plan standardizations steps. These include (in no particular order) socialization of the technical content in order to rally stakeholders; decision on whether the technical item should be pushed through a Working Group or as an individual submission; if appropriate, selection of the best suited Working Group to submit; writing of an Internet Draft; presentation at IETF meetings so as to get feedback from the community until the item is considered mature enough to be pushed to IESG in view of publication as an RFC. It is important to note that IETF submissions are individual's based, that is the EFIPSANS project will not be able to submit an Internet Draft by itself. Individual members of the EFIPSANS Project shall take responsibility in doing so. The EFIPSANS Project could nevertheless be acknowledged in the appropriate Section of the Internet Draft. It is important to note that protocol extensions must be justified. Therefore, promoting protocol extensions at IETF will also require clearly documenting a problem statement ("what the authors try to achieve") and a protocol evaluation ("why can't that be achieved with existing protocols").

The organization and planning of these steps, between the publication date of D2.3 and the IETF submission deadline early Q4-2009 was too challenging. This resulted in the EFIPSANS Project not submitting and Internet Draft for the 76th IETF meeting in Hiroshima. Nevertheless some EFIPSANS members, attending this meeting, initiated these steps in view of IETF 77th meeting. Furthermore, the EFIPSANS partners are in the process of identifying, which of the envisaged protocol extensions listed in D2.3, should be pushed first. A training session, towards the EFIPSANS partners is also planned to increase the awareness of the EFIPSANS members on the IETF processes. Target is one Internet-Draft, at least, submitted to the 77th IETF meeting Anaheim, March 2010.

The following are examples of the EFIPSANS Proposed Extensions to IPv6 (i.e. IPv6++) for which EFIPSANS has plans to contribute IETF Drafts in the near future as the concepts in D2.3 become mature. Examples of IPv6++ (for which Internet Drafts will be considered for submission in the near future):

- **EFIPSANS proposed IPv6 Extension for Wireless and Autonomic Routing Framework**
- **EFIPSANS proposed IPv6 Extension Header for Intrinsic Monitoring**
- **EFIPSANS proposed ICMPv6 Extension for DE to DE Communication across nodes (ICMPv6++)**

- **EFIPSANS proposed ND Extension for Auto-configuration in Multi-hop Set-ups (ND++)**
- **EFIPSANS proposed DHCPv6 Extension for Accessing ONIX Services (DHCPv6++)**
- **EFIPSANS proposed DHCPv6 Extension for Autonomic DHCP Relaying (DHCPv6++)**

3.2. The contributions already initiated to IETF

EFIPSANS has two IETF drafts currently being planned. In addition, the project has already contributed to a submitted IETF draft.

SHIM6

To demonstrate the effect of adding autonomic components to existing IPv6 standards, EFIPSANS deployed the UCL implementation of SHIM6[1]. This was demoed in the first project review. This work has since continued where we have gathered the timing of SHIM6 operation with and without an autonomic management system to determine the impact of the autonomic network manager on the operation of the network. Publications will be submitted in Q1 2010 from this work. This deployment has been attributed in the IETF draft draft-barre-shim6-impl-03[2].

Intrinsic Monitoring

An IETF draft on active intrinsic monitoring is being prepared. This is intended to allow the Autonomic Network Management System to gather in-route monitoring information from each router on a pre-defined route. The concept involved is that a packet is injected (or a user packet is modified) to request each router to add information in Hop-By-Hop (HBH) extensions to the packet on a specific route. In different situations the packet will request different information from the routers. This could include information such as “Number of Dropped Packets in the previous 5 minutes”, “Number of packets that passed the interface in the last 5 minutes where the ECN bit was turned on”, etc.

Our initial idea in this area was to use a new HBH format to set up this in-route monitoring. This idea was submitted to the IETF email distro (see the e-mail sent out to IETF in Appendix 9.5). From the responses we received, the general understanding and concern is that Hop-By-Hop Options require more processing on the intermediate hops as packets with Hop-By-Hop Options are forwarded in the slow path (which involves processing by the main CPU of the router) rather than in the fast path (in hardware—involving direct forwarding by the ingress NIC out the egress interface towards the next hop). Vendors are working on improving the performance of HBH processing in order to reduce the burden incurred on the routers.

[1] http://www.shim6.org/#impl

[2] http://tools.ietf.org/html/draft-barre-shim6-impl-03

From the feedback obtained by the IETF email distro, we have rethought our IETF submission. Also, a recent internet draft which has been submitted to the IETF seeks to limit the number of HBH formats to the three which are already defined prevent further HBH formats from being defined.[3]

Our plan now is to use one of these existing three formats, specifically the "Router Alert" format to implement our inline monitoring. The work to support this IETF submission is under way. A testbed of Virtual Machines is being set up with adopted Linux Kernel code to support the gathering of information from the routers on a specified route using the Router Alert HBH format.

[3] http://www.ietf.org/id/draft-krishnan-ipv6-hopbyhop-03.txt

4. Liaisons

EFIPSANS established a number of liaisons with standards organisations, vendors and EU FP7 projects collaborations for exchange of know-how, joint trials, dissemination and training events.

4.1. ITU Focus Group on Future Networks (FG-FN)

As EFIPSANS plans to disseminate its work on IPv6 to ITU FG-FN, the chairman of the AFI has submitted on 25th September 2009 a liaison statement to start collaboration with the ITU Focus Group mandated to look into Future Networks.

The request was reviewed on the 2nd FG-FN meeting 16-20th November 2009. In order not to make this section too extensive, we did not include the liaison statement and the answer of FG-FN here, but we refer the reader to Appendix 9.6, where these documents are included.

4.2. Liaison with CERN & EU Project EGEE (Clouds, Grids & Autonomics)

EFIPSANS has proposed to Bob Jones (Head of EGEE project @ CERN) and Xavier Jeannin head of network operations for EGEE to work on the use of the current IPv6 and EFIPSANS proposed Extensions to IPv6 for advanced Self-Managing Networks of the Future, as guided by an architectural Reference Model for the Self-Managing Future Internet we developed, dubbed the Generic Autonomic Networking Architecture (GANA).

CERN suggested using autonomic networking and networking grid as a good domain to put in practice autonomic.

This action item has evolved from the “Grids Meet Autonomic Computing workshop” that took place in conjunction with the IEEE International Conference on Autonomic Computing this year (ICAC 2009). A panel called “Grids/Clouds/Autonomics Convergence” was organized there which focused on key research challenges in grid and cloud computing that autonomic computing techniques could support. The panelists were Marc-Elian Bégin of SixSq, Robert Jones of CERN and director of the European Enabling Grids for E-sciencE (EGEE) project, Manish Parashar of Rutgers University and the US National Science Foundation Center for Autonomic Computing, and Onn Shehory of IBM Haifa Labs. The following questions were asked to consider:

- What two key challenges in grid and cloud computing could autonomics address?
- What one key challenge would you like to focus on in the next two to three years?
- What one action would you take (or encourage) to facilitate better interaction between the grid and cloud computing communities and the autonomics community?

A short excerpt from this report appeared in IEEE Internet Computing's November/December 2009 issue, and on-line under http://www.computer.org/portal/web/computingnow/panel.

4.3. Liaison with Autonomic Communication Forum & Conferences

The chairman of the former Autonomic Communication Forum is Dr. Strassner who works today for our partner WIT/TSSG and the previous Academic Chair is Dr. Donnelly who heads the TSSG Research group.

This allows easy access to first hand information and reports of speakers of the 6th International Conference on Autonomic Computing and Communications (ICAC 2009) bringing together researchers and practitioners addressing aspects of self-management in computing systems. The fitness goal is to develop and nurture a community that can work together to realize the vision of large-scale self-managing systems. The conference builds on previous highly influential meetings in New York, Seattle, Dublin, Jacksonville, and Chicago.

The web site is: http://icac2009.acis.ufl.edu/

4.4. Liaison with IBM and Intel

The first contacts with industry are emerging with IBM and Intel who seem to have invested quite a lot in research in autonomic computing. IBM Israel seems to be far advanced in this area. Both IBM and Intel participate in the Autonomic Communication conference co-chaired by TSSG.

Previous contacts with IBM Israel in the design of the EFIPSANS proposal led to the conclusion that IBM Israel should be contacted after completing the GANA specifications to lead and secure a vendor-independent version of the specifications.

4.5. Liaison with EU FP7 Projects

Ranganai Chaparadza attended the ICT Mobile Summit and also presented at the E3, EFIPSANS and SOCRATES co-organized Workshop on “Self-organisation for Beyond 3G Wireless Networks” Workshop at the Mobile ICT Summit 2009, 10 - 12 June 2009. The joint workshop has attracted membership to the AFI and potential adoption and contributions to the GANA Reference Model from outside EFIPSANS.

EFIPSANS and other projects addressing Self-* functions and Hierarchical Control-Loops such as Self-Net (FIRE) and FP7 SOCRATES plan to co-organize a Workshop.

Collaboration with FP7 Projects: RESERVOIR, 4WARD for the paper: Technological Challenges for Assuring Business Benefits of Future Internet.

A Modelling Workshop was organized with FP6 project Modelplex and the results of the FP6 Modelplex such as the ModelBus can be exploited in the design of a suitable Methodology and Tool-Chain by which DEs can be designed based on model-driven techniques.

5. Relationship to 3GPP Standardisation

The project has assessed potential opportunities for alignment with 3GPP standardisation and to identify areas for potential future input to the standardisation activity. Within the EFIPSANS project the main convergence has been driven from the research on autonomics and mobility (WP3).

3GPP has recently completed the first release of the LTE specification that extends the reach of IP to the LTE base stations. In addition 3GPP has also enhanced the features of LTE over previous systems such as GSM and UMTS to include more self-* functionality. In the current specifications the focus has been on self configuration of base stations (neighbour discovery), however, this is being enhanced with self-optimisation for improved mobility handling and other features.

At least conceptually increased autonomic behaviour in IPv6 will be beneficial to the LTE access network immediate input to 3GPP standardisation is limited as 3GPP maintains an IP version independence approach. In the longer term, as IPv6 becomes mainstream and the universal choice of the mobile network operators, increased dependency between IPv6 autonomics and radio access network self-* features is expected.

With this in mind and given the current emphasis in 3GPP, EFIPSANS has focused on seamless mobility and proficient joint radio resource management in a heterogeneous wireless environment, more specifically mobility between non 3GPP access (WiMAX, WLAN) using IP based mobility and 3GPP cellular access based on 3GPP defined mobility. This issue is considered of high importance in the industry and within the framework of EFIPSANS the autonomicity of nodes/networks has been envisioned as the enabler to devise a QoS-centric architecture for supporting various services within the broadband wireless networks.

The approach taken in EFIPSANS for autonomic mobility management is in tune with current 3GPP/SAE interworking vision. This is achieved by coordinating the (autonomicity enabling) functionalities for the network-based mobility management mechanism. MIPv6 and PMIPv6 are the key protocols of the proposed architecture and a new functional entity, the Mobility Access Router (MAR), is introduced which can also be used to further improve the performance of the inter system mobility between non 3GPP access (WiMAX, WLAN) and 3GPP cellular access based on 3GPP defined mobility. In order to maximise handover performance, the MAR would be implemented in the radio access network at the access node (base stations).

Other techniques developed in EFIPSANS for optimal utility-based resource allocation, QoS provisioning and efficient joint resource management via a flexible network selection mechanism offer similar efficiencies.

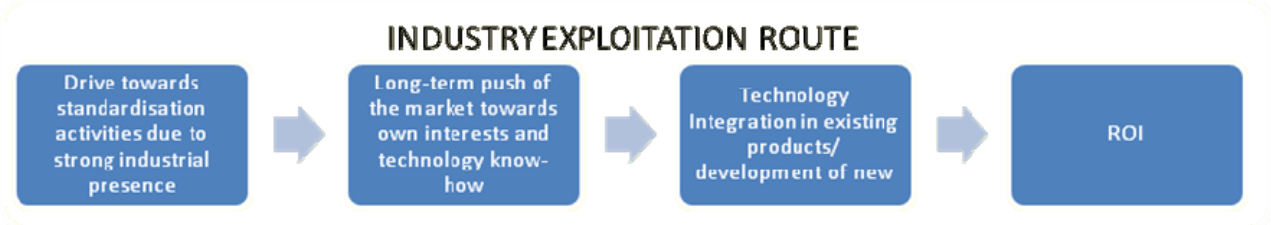
However, given the current priorities in 3GPP namely, (1) Intra LTE handover, (2) Inter 3GPP defined RAN handover (LTE to UMTS and GERAN) and (3) Handover to Non 3GPP defined handover, the opportunity for immediate input to 3GPP standards is limited. However some of the industry members will continue to monitor 3GPP activity and identify opportunities for input.

3GPP Release 9 was completed in December 2009 and focused on Intra LTE Handover, Release 10 scheduled for December 2010 will enhance the LTE specifications for improved inter system handover and handover to Home Base stations. Opportunities for improved handover to non 3GPP systems may follow.

6. Usage of EFIPSANS know-how

The results coming from the EFIPSANS research areas will be integrated to produce the EFIPSANS framework. The results will be driven by the scenarios and the industrial requirements that will influence the research results to make them ready to be exploitable.

As the EFIPSANS framework is gradually becoming available, the basis of contributions to relevant standardisation bodies are formed and project partners are promoting accordingly the EFIPSANS technologies. Exploitation of results will be achieved through different routes but with the common theme of partners incorporating these results in current or planned products and company roadmaps. This long-term process in depicted in the diagram below:



EFIPSANS partners envisage that the produced framework will be used by systems that will delegate the implementation and monitoring of autonomic mechanisms and system providers or end-users that need to control their IPv6 network requirements. The EFIPSANS objectives will be materialized in the end through these tangible results, which will form the basis for exploitation: A specification that will be necessary to draw the EFIPSANS “exploitation” architecture in order to detail and to focus on its main features and specify the map of exploitable results accordingly.

6.1. Technical Exploitation Outlook

EFIPSANS industrial partners in collaboration with their business units attempt to provide an outlook of how they intend to exploit the results of the project and integrate the effort and knowledge gained within the project to their overall business goals and long-term company roadmaps. For this reason a separate document is compiled that documents these intentions. The document referred to as Technical Exploitation Outlook or TEO is based on a questionnaire that was completed by all industrial partners and was intended as a guideline for the documentation of the exploitation intentions of all industrial partners of EFIPSANS. The detailed results of the questionnaire are analysed and documented in the TEO but the overall results and high level intentions are also provided here.

Topics that are addressed by the TEO are among others the following:

- Promotion and support of EFIPSANS research results with respect to autonomics within the IPv6 community
- Influence on business units by developments in the field of next generation IP networks
- R&D and product development within individual companies influenced by EFIPSANS results

- IPv6 research topics not addressed by EFIPSANS and could have an impact on the R&D efforts of individual companies
- Potential of EFIPSANS results to be incorporated in individual company roadmaps and research endeavors
- Gaps in the networks/services market that the results of EFIPSANS will be able to address
- Self-management and autonomics aspects that current EFIPSANS focus is not adequately addressing
- Self-management and self-adaptation in the context of individual business environment

The questionnaire was addressed to industrial partners only in order to stress the importance of feedback received from the industry in what regards IPv6 issues and business intentions towards it. The questionnaire was broken down into two parts. One is a set of questions that industrial partners answered in a narrative, detailed manner and another set of questions in a form of a survey. In the first set partners elaborate on their exploitation views and business intentions, whereas the survey touches on more specific issues and is an attempt to build an exploitation profile for the project (i.e. the sort of output that EFIPSANS will have as a whole) and extract certain statistical data.

A general conclusion that can be extracted from the expressed opinions is that the industry involvement in EFIPSANS has a clear goal to influence standardization bodies (IETF, ETSI AFI Industry Specification Group, 3GPP/LTE/SAE) during and past the projects lifetime. Industry partners view the impact on standardization as a key business goal that will provide the necessary market momentum to carry the EFIPSANS innovative aspects to exploitable levels.

> *The response of Fujitsu to the respective question captures the essence of how industry envisages influencing standardization bodies: "For many of our global communication products standardization is essential to be a player in the marketplace. Standardization is a key starting point for our product development hence our approach with EFIPSANS is to assess and where appropriate input to standardization."*

Further to the clear drive towards influencing industry standards there is a general optimism towards the acceptance of self-manageable/self-adaptive networks and IPv6 technologies in general by the industry. Although such a question posed in an IPv6 centric project would probably receive subjective answers it must be noted that the questionnaire was addressed to the business units within every industry group and not to R&D departments, it can be claimed therefore that answers received were fairly objective and close to the real market requirements. There was a general inclination towards a timely and unavoidable migration to IPv6 with a clear need for self-manageability.

> *According to Ericsson: "Yes, there is [definitely a gap in the networks/services market that the results of EFIPSANS if incorporated in current R&D efforts will be able to address]. Both IPv6 and its applications on autonomicity are gap areas in the market. Autonomics is in a key role in lowering OPEX which otherwise is supposed to grow with ever increasing complexity of network functionality."*

In order to give partners the ability to provide their impressions of the current market trends, a question was posed regarding any aspects of IPv6 that are not covered by EFIPSANS that will

nevertheless drive the IPv6 market. Although EFIPSANS is a pushing the State-of-the-art in autonomics and IPv6 usability, someone might argue that the project goals are too specific to address more imminent market needs. Some indicative responses on the issue were the following:

> *Velti's response to the question was: "An aspect of IPv6 research not adequately addressed that will influence not only the R&D efforts of Velti but the entire market in general is the migration from IPv4 to IPv6. Issues such v6 in v4 tunneling and network infrastructure support (dual stack devices etc.) are issues that may not pose a research challenge but will greatly influence the market trends and the way major players will react to the migration to IPv6."*
>
> *Telefonica felt that there are additional market needs: "Service and network decoupling is not fully addressed by the defined scope in EFIPSANS. How network services (basic services like routing and advanced like mobility) are offered to the control and end-user service planes of the NGN network. We envision a network that offers an API to higher levels hiding technical complexity and capable of achieving operation tasks by its own."*

A more detailed report on the results of the questionnaire is offered in the Technical Exploitation Outlook report.

6.2. Future Actions on Exploitation

While this deliverable provides a first insight on commercial strategy, a more active approach to bringing the research results to the market will need to be made until the end of the project's lifetime, as more concrete results will be delivered. This will allow partners to better adjust their business plan in order to meet both the projects assets and the market needs. The most important aspect however is the active involvement of all partners of the EFIPSANS consortium, and especially the industry players, in promoting the EFIPSANS idea and constantly exploring new ways of capitalizing on its results. This commitment from all partners will allow the refinement of the business plan at the end of the project and design a marketing and commercial plan that will allow all partners to fully exploit the results of EFIPSANS.

7. Dissemination of Knowledge

Many publications have already been made by partners in journals and conferences, during these two years. Others are scheduled for the next reporting period. The tables below summarise the conferences, workshops and publications produced and submitted for future events.

7.1. List of scientific (peer reviewed) publications: M1 – M24

No	Title	Main author	Title of periodical	Date / No	Publisher	Place of publication	Year	Pages	Permanent identifier	Open access
1	Evolution of the current IPv6 towards IPv6++ (IPv6 with Autonomic Flavours)	R. Chaparadza	International Engineering Consortium (IEC), Annual Review of IP Communications Vol.3	Dec 07	IEC		2007		978-1-931695985	No
2	QoS Provisioning in Wireless Data Networks under Non-Continuously Backlogged Users	T. Kastrinogiannis	Proc. 6th Int. Symposium on Modelling and Optimisation in Mobile, Ad-Hoc and Wireless Networks and Workshops (RAWNET 2008)	Apr. 08	IEEE	Berlin	2008	71-76	10.1109/WIOPT.2008.4586041	No
3	An Opportunistic Combined Power and Rate Allocation Approach in CDMA Ad Hoc Networks	T Kastrinogiannis	Proc. of IEEE Sarnoff Symposium on Advances in Wired and Wireless Communications	Apr. 08	IEEE	Princeton, NJ	2008	1-5	10.1109/SARNOF.2008.4520063	No
4	On the Problem of Joint Power and Rate Control in CDMA Ad Hoc Networks	T. Kastrinogiannis	Proc of 3rd International Symposium on Wireless Pervasive Computing (ISWPC)	May 08	IEEE	Santorini	2008	78-82	10.1109/ISWPC.2008.4556170	No
5	Monitoring Issues for Autonomic Networks: The EFIPSANS Vision	A. Liakopoulos	1st European Workshop on Mechanism for Future Internet	July 08		Salzburg (Austria)	2008			
6	Utility-based Uplink Power Control in CDMA Wireless Networks with Real-Time Services	T. Kastrinogiannis	Ad-hoc, Mobile and Wireless Networks, LNCS Vol.5198/2008	Sept. 08	Springer	Sophia Antipolis	2008	307-320		

7	Document Based Network and System Management	E. Hoefig	Proc. 2nd ACM International Conference on Autonomic Computing and Communication Systems (Autonomics 2008)	Sept. 08	ACM	Turin (Italy)	2008	Art. 3, 10 pages	ISBN: 978-963-9799-34-9	No
8	Probability based Information Dissemination in Urban Environments	M.Mate	Proceedings of the 14th EUNICE Open European Summer School	Sept.08		Brest, France	2008			
9	Utility Based Short-Term throughput driven scheduling approach for efficient resource allocation	T. Kastrinogiannis	Wireless Personal Communications Journal, sp. Iss. Resource and Mobility Management and Cross-Layer Design for the Support of Multimedia Services in Heterogeneous Emerging Wireless Networks	Nov. 08	Springer	Netherlands	2008		10.1007/s11277-008-9632-9	No
10	An autonomic interface selection method for mulit-interfaces mobile terminal in heterogeneous wireless environment	F. Wang	The 9th International Conference for young computer scientists 2008	Nov. 08			2008			
11	An enhanced factoring algorithm for reliability evaluation of wireless sensor networks	Y. Xiao	The 9th International Conference for young scientists 2008	Nov. 08	IEEE	Hunan	2008	2175-2179	10.1109/ICCS.2008.240	No

12	Requirements for a Generic Autonomic Network Architecture (GANA), suitable for Standardizable Autonomic Behavior Specifications of Decision-Making-Elements (DMEs) for Diverse Networking Environments	R. Chaparadza	International Engineering Consortium (IEC), Annual Review of Communications Volume 61	Dec 08			2008			
13	Reliable Gossiping in Inter-Vehicle Communication	M. Mate	Infocommunications Journal	Vol. LXIV 2009 / L. Jan.09			2009	17-22		
14	An autonomic interface selection method for multi-interfaces mobile terminal in heterogeneous wireless environments	F. Wang	2009 World congress on Computer Science and Information Engineering (CSIE 2009)	Apr. 09			2009			
15	The adaptive loopback mechanism for LSP failure detection	Y. Xiao	Journal of Beijing University of Posts and Telecommunications	Apr. 09			2009			
16	Address Auto-configuration Methods in IPv6 Networks	F.Nemeth	HSN Workshop	May 09			2009			
17	Efficient QoS-Driven Resource Allocation in Integrated CDMA/WLAN Networks - An Autonomic Architecture	G. Aristomenopoulos	CST Mobilight 2009	May 09		Athens (Greece)	2009			

18	Creating a viable Evolution Path towards Self-Managing Future Internet via a Standardizable Reference Model for Autonomic Network Engineering	R. Chaparadza	FIA 2009 (Published in Future Internet Book, Nov 2009) Feedback from ICT Mobile Summit & SOCRATES workshop (see *)	May 09	IOS Press	Prague	2009	136-147	ISSN 978-1-60750-007-0	No
19	A Utility-based Power Allocation Non-cooperative Game for the Uplink in Multi-Service CDMA Wireless Networks	E.E. Tsiropoulou	IWCMC	June 09	ACM	Leipzig (Germany)	2009	365-370	ISBN 978-1-60558-569-7	No

*: EFIPSANS had been invited to present the broader picture on Self-Management/Self-Organization, not just in the RAN but also the edge and core network environments for mobile and fixed nets. A number of participants were interested to know that we are addressing some Self-features even on the level of Routing, Forwarding, Discovery, etc, through the instantiation of GANA, beyond what they know from SON. Motorola USA has a research group that has recently started working on a similar approach to GANA, establishing some similar abstractions and interworking hierarchical control loops. The research director of the group followed through the GANA presentation and thinks we could have some co-operation. The issue of Stability in control loops was discussed briefly and some approaches were discussed but the conclusion is that there has to be some further research and continuous discussions to share knowledge on the subject. Projects like Self-NET (FIRE) are very much interested in having a joint workshop with EFIPSANS, since we have somewhat common approaches and/or issues to look into. They think a Workshop in November should be jointly organized. SOCRATES-E3-EFIPSANS-Workshop Slides: http://www.fp7-socrates.eu/?q=node/31

No	Title	Main author	Title of periodical	Date / No	Publisher	Place of publication	Year	Pages	Permanent identifier	Open access
20	A Unified Approach for Efficient Network Selection in Multi-Service Integrated CDMA/WLAN Systems	G. Aristomenopoulos	IWCMC	June 09	ACM	Leipzing (Germany)	2009	1263-1268	ISBN: 978-1-60558-569-7	No
21	Realization of QoS Provisioning in Autonomic CDMA Networks under Common Utility-Based Framework	E.E. Tsiropoulou	WoWMoM AOC09	June 09		Kos (Greece)	2009			

No	Title	Main author	Title of periodical	Date / No	Publisher	Place of publication	Year	Pages	Permanent identifier	Open access
22	Evaluate reliability of wireless sensor networks with OBDD	Y. Xiao	2009 IEEE International Conference on Communications (ICC 2009)	June 09			2009			
23	Demystifying Self-awareness of Autonomic Systems	M. Smirnov	ICT ’09 Mobile Summit	June 09	Cunningham	Santander (Spain)	2009	9 pages	ISBN: 978-1-905824-10-0	No
24	An approach to Measurement Based Quality of Service Control for Communications Networks	A. Davy	IM 2009 Dissertation Digest	June 09		Long Island (NY-USA)	2009			
25	Defensive Configuration with Game Theory	S. Becker	IEEE/IFIP IM 2009	June 09		Long Island (NY-USA)	2009			
26	Autonomic Monitoring and Resource Management using P2P techniques	A. Liakopoulos	Terena Networking conference TNC'09	June 09		Malaga, Spain	2009			Yes
27	Using Game Theory to configure P2P SIP	S. Becker	IPTComm 2009	July 2009		Georgia, Atlanta	2009			

28	Joint Throughput Maximization and Fair Uplink Transmission Scheduling in CDMA Systems	S. Papavassiliou	EURASIP Journal on Wireless Communications and Networking, Vol. 2009	2009			2009	15 pages	Art.ID : 564692 10.1155/2009/561692	No
29	QoS-Driven Uplink Power Control in Multi-Service CDMA Wireless Networks - A Game Theoretic Framework	E.E. Tsiropoulou	Journal of Communications (JCM)				2009			
30	Intrinsic Monitoring using Behaviour Models in IPv6 Networks	E.Höfig	Proc. Modelling Autonomic Communication Environments (MACE) Workshop	Oct.09		Venice, Italy	2009			
31	Model-based integrated management: applying autonomic systems engineering to network and systems management	E.Höfig	Int. J. Autonomous and Adaptive Communications Systems	TBA	Inderscience		2009			
32	Network Traffic Simulator 2.0, Scilab Toolbox: Simulating the Internet Traffic	F. Melakessou	Proceedings of the 2009 International Workshop on Open-source Software for Scientific Computation OSSC'09 2nd price of Scilab contest	Sept 09	IEEE	Guiyang, China	2009			

33	An autonomic connection management mechanism based on mobile terminal	X. Zheng	1st International ICST Conference on Mobile networks and Management	Oct. 09			2009			
34	Malware analysis with graph kernels and support vector machines	C. Wagner	4th International Conference on malicious and unwanted software Malware2009	Oct. 09	IEEE	Montreal, CA	2009			No
35	Security Considerations for Intrinsic Monitoring within IPv6 Networks	L. Shi	9th IEEE International Workshop on IP Operations and Management (IPOM)	Oct. 09		Venice, Italy	2009			
36	An Autonomic Flow based Path Selection Method for Multi-homed Nodes	X. Guo	2nd IEEE International Conference on Broadband Network and Multimedia Technology 2009 (IC-BN-MT2009)	Oct. 09						
37	A Context-Aware Autonomic Packet Marking Algorithm	X. Gong	2nd IEEE International Conference on Broadband Network and Multimedia Technology 2009 (IC-BN-MT2009)	Oct. 09	IEEE		2009			
38	Adaptive Local Extrapolation in Event Driven Wireless Sensor Networks	G.Ollos	BioSense 2009	Oct. 09		Novi Sad Serbia	2009			

39	Evaluate reliability of wireless sensor networks with an enhanced OBDD Algorithm	Y. Xiao	Journal of China Universities of Posts and Telecommunications				2009			
40	Calculating the reliability of communication networks using an enhanced OBDD algorithm	Y. Xiao	Journal of Beijing University of Posts and Telecommunications				2009			
41	Uplink Power Control in QoS-aware Multi-Service CDMA Wireless Networks	E.E. Tsiropoulou	Journal of Communications (JCM)		Academy Publisher,		2009			
42	Statechart Interpretation on Resource Constrained Platforms: a Performance Analysis	E. Höfig	MODELS 2009				2009			
43	Future Internet Socio-Economics – Challenges and Perspectives	D. Hausheer	Towards the Future Internet – A European Research Perpective	2009	IOS Press	Netherlands	2009	01/11/09	ISBN: 978-1-60750-007-0	Yes
44	Implementing Autonomic Fault-Management and Reactive Resilience following the GANA Architectural Design Principles	R.Charparadza	IPOMM 2009	Oct. 009			2009			

45	An approach to designing and implementing Autonomic Forwarding in the GANA based Self-Managing Future Internet Architecture	R.Charparadza	IPOM 2009 (part of Manweek)	Oct. 09			2009			
46	Monitoring within an Autonomic Network: A GANA based Network Monitoring Framework	A. Zafeiropoulos	IPOM 2009 (part of Manweek)	Oct. 09			2009			
47	Technological Challenges for Assuring Business Benefits of Future Internet	S.Naqvi	IPOM 2009 (part of Manweek)	Oct. 09			2009			
48	A context-aware Packet Marking algorithm in autonomic networks	X. Gong	2nd IEEE International Conference on Broadband Network and Multimedia Technology IC-BNMT2009	Oct.09			2009			
49	OSPF for Implementing Self-adaptive Routing in Autonomic Networks: a Case Study	G.Rétvári	The fourth IEEE International Workshop on Modelling Autonomic Communication Environments (MACE 2009)	Oct. 09			2009			
50	Towards a Unified Architecture for Resilience, Survivability and Autonomic Fault-Management for Self-Managing Networks	N. Tcholtchev	MONA+ workshop	Nov. 09		Stockholm	2009			

51	ETSI Industry Specification Group on Autonomic network engineering for the self-managing Future Internet (ETSI ISG AFI)	R.Chaparadza	Web information systems engineering conference WISE2009				2009			
52	Non-cooperative power control in CDMA wireless networks	E.E. Tsiropoulou	Game Theory for Wireless Communications and Networking		Auerbach Publications, CRC Press		2009			
53	Game Theoretic Distributed Uplink Power Control for CDMA Networks with Real-Time Services	T. Kastrinogiannis	Computer Communications Journal		Elsevier		2009			
54	QoSPlan: A Measurement based quality of service aware network planning framework	A.Davy	Journal of Networks and System Management, special issue on new advances on measurement based network management,		Springer		2009			
55	An autonomic routing policy control mode based on network state cognization	X. Li	Journal of Beijing University of Posts and Telecommunications				2009			

56	Achieving Self-Management of Steaming applications in autonomic environments	V. Kaldanis	MONA+ 2009				2009			
57	Addressing Stability of Control-Loops in the context of the GANA architecture: Synchronization of Actions and Policies	N. Tcholtchev	Intl. Workshop on Self-Organising Systems, '09 IWSOS 2009		Springer LNCS	Zürich	2009	262-268		
58	Monitoring within an Autonomic Network A GANA based network Monitoring Framework	A. Zafeiropoulos	MONA+ 2009				2009			
59	Mobility in Wireless Sensor Networks	R. Vida	Book Chapter in "RFID and Sensor networks" Architectures, Protocols, Security and Integrations	Nov. 09	CRC Press		2009			
60	Adaptive regression algorithm for distributed dynamic clustering in wireless sensor networks	G. Ollos	IFIP Wireless Days	Dec. 09		Paris, France	2009			

7.2. Future Publications: later than M24

No	Title	Main author	Title of periodical	Date / No	Publisher	Place of publication	Year	Pages	Permanent identifier	Open access
1	An Autonomic QoS-centric architecture for integrated CDMA/WLAN networks	FLE, ICCS	Wireless Communication Magazine. Under Review		IEEE.					TBD
2	Enabling Efficient QoS-Driven Resource Management in Heterogeneous Wireless Networks via Autonomicity	G. Aristomenopoulos			Journal, Under Review					
3	Intrinsic monitoring within IPv6 Networks: Relating Traffic Flows to Network Paths	L-Shi	IEEE ICC-Next generation networking and Internet Symposium			Cape Town, South Africa	2010			
4	The impact of the complexity of Topologies used in Comparative Alnalyses of Congestion-based available Bandwidth estimation tools	B. Meskill	Submitted to 2nd International Workshop on Traffic Monitoring and analysis TMA'10	April 7, 2010		Zurich, CH	2010			
5	Reconstructing Tor sessions	C. Wagner	Submitted to the USENIX Security 2010	August 2010		Washington DC	2010			

6	A holistic reference model for self-Management within node and network architectures	FLE, TSSG, ALF, ICCS	IEEE Communications Magazine. Under review		IEEE					
7	Routing and information spreading in ITS networks	R. Vida	Book Chapter in "Wireless Technologies for Intelligent Transportation Systems"	To appear Mar. 10	Nova Science Publisher		2010			No

7.3. Realized Joint Papers M1-M24

No	Title	All authors	Title of periodical	Date / No	Publisher	Place of publication	Year	Pages	Permanent identifier	Open access
1	Intrinsic Monitoring using Behaviour Models in IPv6 Networks	E.Höfig, H. Coskun	Proc. Modelling Autonomic Communication Environments (MACE) Workshop	Oct.09		Venice, Italy	2009			
2	Demystifying Self-awareness of Autonomic Systems	M. Smirnov, J. Tieman, R. Chaparadza, Y. Rebahi, S. Papavassiliou, V. Karyotis	ICT '09 Mobile Summit	June 09	Cunningham	Santander (Spain)	2009	9 pages	ISBN: 978-1-905824-10-0	No
3	Creating a viable Evolution Path towards Self-Managing Future Internet via a Standardizable Reference Model for Autonomic Network Engineering	R. Chaparadza, S. Papavassiliou, T. Kastrinogiannis, M. Vigoureix, E. Dotaro, A. Davy, K. Quinn, M. Wodczack, A. Toth	FIA 2009 (Published in Future Internet Book, Nov 2009)	May 09	IOS Press	Prague	2009	136-147	ISSN 978-1-60750-007-0	No

4	Monitoring Issues for Autonomic Networks: The EFIPSANS Vision	A. Liakopoulos, A. Zafeiropoulos, A. Polyrakis, M. Grammatikou, J.M. Gonlez, M. Wodczak, R. Charparadza	1st European Workshop on Mechanism for Future Internet	July 08		Salzburg (Austria)	2008			
5	OSPF for Implementing Self-adaptive Routing in Autonomic Networks: a Case Study	G.Rétvári, F. Nemeth, R. Charparadza, R.Szabo	The fourth IEEE International Workshop on Modelling Autonomic Communication Environments (MACE 2009)	Oct. 09			2009			
6	An approach to designing and implementing Autonomic Forwarding in the GANA based Self-Managing Future Internet Architecture	R.Charparadza, A. Prakash, M. Vigoureix, L. Ciaviaglia	IPOM 2009 (part of Manweek)	Oct. 09			2009			
7	Monitoring within an Autonomic Network: A GANA based Network Monitoring Framework	A. Zafeiropoulos	MONA + 2009				2009			
8	Towards a Unified Architecture for Resilience, Survivability and Autonomic Fault Management for Self-Managing Networks	N. Tcholtchev	MONA + 2009 workshop	Nov. 09			2009			
9	Achieving Self-Management of streaming applications in autonomic environments	V. Kaldanis	MONA + 2009				2009			

7.4. Conferences, workshops and meetings

The following table summarises the conferences and workshops EFIPSANS participants attended. All the listed events provided opportunities for EFIPSANS participants to introduce the work carried out as part of the project and disseminate the accumulated knowledge to scientists and professionals. This was performed either during their Keynote speeches or simply by introducing the EFIPSANS concept to people working in the related fields.

No	Date	Location	Topic	Participants
1	24.01.2008	Luxembourg	Kick-off meeting	UL, Ericsson, Fokus, ALL
2	02.02.2008	Boston	MIT OLPC Project	Latif Ladid
3	24.02.2008	Tel Aviv	Internet Society Israel IPv6 Conference - Keynote speech	Latif Ladid
4	14.03.2008	Abu Dahbi	Keynote Speech at the Gulf IPv6 Summit	Latif Ladid
5	31.03.2008	Berlin	Workshop on Resource Allocation in Wireless Networks	Symeon Papavassiliou, Timotheos Kastrinogiannis
6	12.04.2008	Beijing	Beijing IPv6 Summit; Speech at BUPT	Latif Ladid
7	30.04.2008	Bled	Future Internet Bled Conference	Latif Ladid, Andras Toth, Thomas Engel, Ranganai Chaparadza
8	28-30.04.2008	Princeton	IEEE Sarnoff Symposium on Advances in Wired and Wireless Communications	Vassilis Karyotis
9	06.05.2008	Berlin	Keynote Speech at the Berlin IPv6 Summit	Latif Ladid
10	08.05.2008	Berlin	IPv6 and Autonomic Networking at the Berlin IPv6 Summit	Ranganai Chaparadza
11	07-09.05.2008	Santorini	International Symposium on Wireless Pervasive Computing	Symeon Papavassiliou, Timotheos Kastrinogiannis
12	19.05.2008	Manila	Keynote Speech at the Manila IPv6 Summit	Latif Ladid
13	27.05.2008	Stockholm	EFIPSANS GA	All
14	30.05.2008	Brussels	European IPv6 day	LL, AT, RC, KQ, ML, VK (FLE)
15	11.06.2008	London	Informa conference “IP Network Transformation Forum 2008”	TSSG (Speaker)
16	16.06.2008	Seoul	Euro-Korea Cooperation Conference	Latif Ladid
17	17.06.2008	Seoul	OECD Ministerial Meeting Seoul	Latif Ladid
18	18.06.2008	Seoul	Seoul IPv6 Summit	Latif Ladid
19	10-12.09.2008	Sophia, Antipolis	Conference on Ad-Hoc, Mobile, and Wireless Networks, ADHOC-NOW 2008	Symeon Papavassiliou, E.E. Tsiropoulou

20	30.09.2008	Brussels	Self-Management Workshop - 2nd Concertation Meeting	FOKUS (Workshop Organizer)
21	12.+13.01.2009	France	SON Workshop (3GPP)	FLE
22	22+23.01.2009	Brussels	Paradiso conference "ICT for a global sustainable future"	Latif Ladid
23	28.01.2009	Dublin	IPv6 Summit	TSSG (Organizer)
24	28.01.2009	Luxembourg	IPv6 conference for Luxembourg with the Lux government in the presence of Minister Schiltz, Ministry of Communications	UL
25	26+27.02.2009	Sophia Antipolis	ETSI ISG AFI Meeting	TSSG, TARC-PL, Fokus, ALF, Ericsson (Irl), GRNET, UL, FLE,
26	14.03.2009	Abu Dhabi	Keynote Speech at the Gulf IPv6 Summit	Latif Ladid
27	23.03.2009	Brussels	IPv6 Workshop (Chair)	Latif Ladid
28	24.03.2009	Boston	Meeting with Tim Berners-Lee	Latif Ladid
29	15.+16.04.2009	Beijing	Self-Managing Future Internet Workshop - "Self-Managing Future Internet powered by IPv6/IPv6++"	Ericsson AB, FOKUS, BUPT (Workshop Organizer), UL
30	16.04.2009	Beijing	QoS Mobility Management in Autonomic Networks	ICCS, BUPT, FLE
31	11.+12.05.2009	Prague	FIA Prague	TSSG, Latif Ladid
32	14+15.05.2009	Berlin	German IPv6 Summit 2009 (Chairman)	Latif Ladid
33	18-20.05.2009	Athens	International Conference on Mobile Lightweight Wireless Systems	G. Aristomenopoulos
34	10-12.06.2009	Santander	ICT Mobile Summit 2009 - "Self-organization for Beyond 3G Wireless Networks"	FOKUS (Workshop Organizer)
35	14.+15.06.2009	Dresden	IEEE ICC 09 – NGN Symposium (Chair)	Latif Ladid
36	15-16.06.2009	Kos	Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM).	E,E. Tsiropoulou
37	15.06.2009	Kos	Workshop on Autonomic and Opportunistic Communications	Symeon Papavassiliou (Panel Speaker)
38	21-24.06.2009	Leipzig	International Wireless Communications and Mobile Computing Conference	G. Aristomenopoulos, E.E. Tsiropoulou
39	02.07.09	Brussels	Euro-Japan Cooperation Conference	Latif Ladid UL
40	08-10.07.09	Seoul	Seoul IPv6 Summit	Latif Ladid UL
41	26-31.07.09	Stockholm	75th IETF meeting	ALBLF
42	17.07.09	New Delhi	IPv6 Indian Governmet Conference	Latif Ladid UL

43	05.09.09	Monterrey	UN Strategy Council Meeting	Latif Ladid UL
44	09-10.09.2009	Sophia Antipolis	AFI meeting	FOKUS, ALBLF
45	28-30.09.09	Brussels	Future Internet Cluster Meeting	FOKUS
46	25.10.09	Hangzhou	Talk at the conference of "New Network Architecture and reconfigurable Router/Switch Technology (NewARRT'2009)"	BUPT
47	23-24.11.09	Stockholm	MONA+ workshop	TARC, Telefonica, FOKUS (organizer), TSSG, GRNet, Velti, Telefonica, ICCS
48	15.12.09	Zürich	Talk at ETH	Ranganai Chaparadza

8. Conclusion

The project uses several channels for standardisation, dissemination and awareness creation activities to raise the visibility of the project. The scientific and technical achievements of the project are getting a good level of momentum in the right direction, with usage and exploitation routes directly into the development departments of major industrial companies and key people and organisations in the standards arenas.

9. Appendices

9.1. Letter of Intent from ETSI

ETSI has agreed to the proposal of the EFIPSANS consortium supported by its ETSI members to create an ISG working group to use as a platform for Autonomic **network engineering for self-managing Future Networks** which is confirmed in the following email from Ultan Mulligan, Director, Strategy and New Initiatives, ETSI including the procedure and the ISG agreement to be prepared for the creation of the ISG. One of the Sub-Groups of the ISG will focus on the Definition of a viable **roadmap of an evolutionary path** for today's network models, architectures, protocols such as IPv6 (towards IPv6++) and paradigms as necessitated by the GANA Reference Model being introduced by EFIPSANS. The definition of a **roadmap of an evolutionary path** should be achieved through Recommendations that can then be considered by the relevant Bodies towards the evolution of the protocols recommended for evolution or extensions. For this, the ISG would liaise with relevant Bodies such as IETF, 3GPP, etc. For more information on the structure of the ISG, refer to the Terms of Reference (ToR) of the ISG that can be reached under http://portal.etsi.org/afi.

From: Ultan Mulligan [mailto:Ultan.Mulligan@etsi.org]
Sent: Wednesday, June 11, 2008 10:11 AM
To: Chaparadza, Ranganai; Andras Toth
Cc: Laurent Vreck
Subject: ETSI ISG detailed documentation

Hello,

I promised Andras to send some detailed information on the establishment of an ISG.

I've attached a set of documents, and here's an explanation of what is what:

ETSI ISG draft ToR.doc is the main document I suggest you start to work on.
In fact, best not to edit this directly, but start by trying to answer some questions which I've listed below. I'll help you with editing these documents every step of the way. This ToR document contains a summary of the information and justification for the establishment of the ISG. The ETSI Director General will need this information to justify establishment of the ISG, and this document will also be sent to the Board for information.

ETSI ISG Agreement - ETSI Member (final).DOC ETSI ISG Agreement - ETSI Participant (final).DOC These are the template legal agreements needed to establish the ISG. The agreement is between a member and ETSI, and is reasonably straight-forward. Of course, each member company of the ISG must sign the same agreement. This agreement lists the detailed rules of the ISG, or rather, any differences from the basic ETSI rules (our Technical Working Procedures). The ETSI Participant document is to be signed by any non-member of ETSI who wishes to participate in the ISG. Don't bother trying to go through these documents yet - we will need to put in details which we will develop for the ToR document

ETSI ISG draft Rules of Procedure.doc is a consolidated set of rules for the ISG. It's a working document of the ISG: when finalised it will contain the ETSI Technical Working Procedures, with the modifications agreed and detailed in the ISG Member agreement.

b57_41r1 Example Group Specification Title Page.doc is a sample cover page of a Group Specification which would be published by an ISG - this is what your documents will look like.

So, you should start by trying to answer the following questions, and based on your answers I can start to edit the ToR document, and work from there onwards:

What is the scope of the ISG? Probably the most important question. Identify, in 5-10 lines, the intentions and objectives of the ISG. In particular, try to set outer limits of what it could do, rather than being too precise. You need enough information to enable anyone not in the ISG to understand if he should or should not join, without providing so much information that the detail becomes a limit for your work. If you can write this first, I can help you edit it to be something like other ETSI scope statements. We will also need further general text to highlight why the ISG is important, what other alternatives are available, why it's important for ETSI etc. But you probably have much of that in the documentation for the project which you prepared for the Commission.

Who will be involved? i.e. which companies/organisations will be listed as 'founding members' and need to be involved in the negotiation of the ISG agreements (anyone who comes afterwards can only accept/reject the agreements). You won't have an immediate answer for me, I know. We need at least 4 ETSI members or applicant members (those who have applied for ETSI membership)..

Who could be convenor of the first meeting? We need a named individual, and preferably he should be willing to be a candidate for chairman afterwards. You should also consider if the chairman, when elected, should be for the default of 1year or should it be for more (often 2 years).

When do you hope to have your first meeting? Probably time it with a project management or technical meeting in the autumn.

What specifications might you produce? If you think you can identify working titles of one, two or three specifications which might be published by the ISG (maybe a known deliverable of the project?) then you can list it in the ToR. This is not binding - you can change these later when the ISG is established. It's just an indication. If you can't identify anything yet, then no problem.

Will non-members of ETSI be allowed to participate? You can choose to permit them, or exclude them. They will have to pay a per-meeting fee in case they wish to attend (and are permitted).

What about voting etc.? You can choose to have ETSI weighted voting - the larger companies pay more to join ETSI, but get a higher voting weight, or more votes. It means in practice that Ericsson, Alcatel-Lucent and Telefonica together could decide everything in the ISG (assuming they all join). You can also choose, for example, one member one vote (I'd recommend this). You can also add a further rule like an attendance requirement in order to be allowed to vote (3GPP do this). So you could require the organisation to attend one or two of the last 3 meetings, for example, to be allowed to vote in the 4th meeting.

Do you have any other specific rules in mind? If you have something which you'd like to bring in from e.g. your consortium agreement, let me know and I'll see if it's possible.

As I said, I can help you edit and prepare the documents, and even find answers to these questions.

Best regards

Ultan

_____
Ultan Mulligan
Director
Strategy and New Initiatives
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Fax: + 33 4 92 38 52 88
mailto:ultan.mulligan@etsi.org

9.2. AFI Start-up Steps

The negotiations with ETSI have been finalised successfully with the conclusion of following documents and the outline of the start-up steps.

The following statements are extracted from the e-mail sent to the afi_negotiation@list.etsi.org on Saturday, December 13, 2008 1:08 AM:

The first meeting is planned on Thursday/Friday 26/27 February 2009, at ETSI (rooms are available). We need to announce the first meeting of the ISG by Collective Letter (official notice to all ETSI members) minimum 30 days before that meeting, i.e. at the latest on Monday 26th of January 2009. The ISG is officially created when a minimum of 4 ETSI members sign the ISG agreement. Therefore this needs to happen by Monday 26th of January (more organizations can sign afterwards and during February, but I need at least 4 by that date). But all agreements must be identical, so we need a period beforehand where each organization can review the agreement, and if necessary, request changes which they require in order to be able to sign the agreement (I would discourage any changes). So we need a cut-off date after which organizations can start signing the agreement. I suggest this is Friday 16th of January. No changes can be permitted to the Member agreement after this date, if we are to have our first meeting on 26/27 February.

So here is the outline of next steps and dates:

From now to 16th of January 2009:

I will circulate the ToR and the Member and Participant Agreements to our Board, for their consultation. They may have an opinion or ask for clarification, but I doubt they'll suggest any changes.

You should find the person who should sign the ISG Member agreement (*Draft AFI ETSI ISG Agreement - ETSI Member v02.DOC)* and get them to either agree to this agreement, or identify what changes are necessary in order to be able to sign it. (If you don't know who that is, let me know: we have names of official contacts in your companies, and also some of your companies have been involved in the QKD ISG – I can pass you on the right contact.)

They should also review the Participant agreement, but here we can push the deadline out much closer to the meeting, so there's no urgency with that.

All requests for changes or clarification should be sent to the AFI_Negotiation e-mail list.

16th of January 2009:

Closing date for comments/changes to the ISG Agreement (*Draft AFI ETSI ISG Agreement - ETSI Member v02.DOC).*

19th to 23rd January 2009:

Signature week. Each ETSI Member organization should make 2 copies of the ISG Agreement for ETSI Members, fill in the missing information marked in green highlight, print and sign both copies and send both copies to me (don't use registered mail: it takes forever. UPS etc. is best). We will have both copies signed by our Director General and return one copy to you. If you don't manage to get it signed this week, then it's not a problem, but we need at least four to do so.

Monday 26th of January 2009

We will launch the Collective Letter announcing the creation of the ISG, and the invitation to ETSI members to join.

During January 2009

We will put the ISG into place so that the ETSI Portal (portal.etsi.org) site, e-mail list, meeting registration etc. are all ready by the time the Collective Letter is sent.

During February 2009

We can deal with the Participant agreement, in case any changes are required. We can organise Participant signatures during February, but we have more time for this.

Those organizations who didn't manage to sign the member agreement by the 23rd of January can still return signed agreements up to the meeting date.

9.3. AFI ISG Agreement - ETSI Member

Below one can read the AFI ISG agreement for ETSI members.

ETSI
Industry Specification Group Agreement relating to the Autonomic network engineering for the self-managing Future Internet (AFI) ISG

between

The European Telecommunications Standards Institute (hereinafter referred to as "ETSI"), a French non-profit making *association* organized under the law of July 1, 1901, located at 650 route des Lucioles, 06921 Sophia Antipolis Cedex, France, represented by its Director-General, Dr. Walter Weigel (hereinafter referred to as the "Director-General")

and

The member specifically identified in Annex 1 hereof (hereinafter referred to as the "Member").

Whereas:

A. ETSI is a standard-setting organization in the field of telecommunications, officially recognized by the European Commission as a European Standards Organisation;

B. The Member is, as specified in Annex 1 hereof, either (i) a full or associate member of ETSI wishing to participate in the work of the Industry Specification Group identified in Annex 2 hereof (hereinafter, the "ISG"), or (ii) has applied for full or associate ETSI membership and has been authorized by the Director-General to participate in the work of the ISG;

C. The Director-General has approved the creation of the ISG and its Terms of Reference;

D. The Member wishes to participate in the work of the ISG as a member (as this term is defined below) and, in accordance with clause 3.4 of the ETSI Technical Working Procedures, has agreed to enter into and be bound by the terms of this Industry Specification Group Agreement (hereinafter, the "ISG Agreement").

It is agreed as follows:

1. **Incorporation by reference and definitions**

1.1 Incorporation by reference

Subject to Discretionary Decisions, the decision making processes set forth in Article 5 of this ISG Agreement and any authorized deviations from the ETSI Technical Working Procedures provided under Article 6 of this ISG Agreement, the parties hereby agree to be bound by and comply with the terms and rules relating to the creation, organization, operation and cessation applicable to Industry Specification Groups set forth in the ETSI Directives of May 2008, including the ETSI Guidelines for Antitrust Compliance, and their subsequent versions and evolutions (hereinafter, the "ETSI Directives", available at http://portal.etsi.org/directives/home.asp), and the Terms of Reference, which shall be incorporated by reference and form an integral part hereof.

All capitalized terms and expressions not otherwise defined herein shall have the meaning ascribed to them in the ETSI Directives.

1.2 Definitions

In this ISG Agreement, all capitalized terms and expressions not otherwise defined herein shall have the meaning ascribed to them in the ETSI Directives, and, unless otherwise required by the context:

(a) "Additional Costs" shall have the meaning ascribed to it in Article 3.1(c) of this ISG Agreement;

(b) "budget year" shall mean a calendar year, it being provided that the first budget year shall mean the period between the date of the approval of the creation of the ISG and the Terms of Reference by the Director-General and December 31 of that year;

(c) "Director-General" shall have the meaning ascribed to it in the presentation of the parties;

(d) "Discretionary Decisions" shall have the meaning ascribed to it in Article 5.1 of this ISG Agreement;

(e) "ETSI Directives" shall have the meaning ascribed to it in Article 1.1 of this ISG Agreement;

(f) "ETSI IPR Policy" shall have the meaning ascribed to it in Article 2 of this ISG Agreement;

(g) "Initial Resource Requirements" shall have the meaning ascribed to it in Article 3.1(a) of this ISG Agreement;

(h) "ISG Budget" shall have the meaning ascribed to it in Article 3.1(b) of this ISG Agreement;

(i) "member" shall mean, when used in relation to the ISG, any person or legal entity participating in the work of the ISG other than an Observer or a Counsellor and who is a full or associate member of ETSI or an applicant to full or associate ETSI membership authorized to participate in the work of the ISG by the Director-General;

(j) "Member" shall have the meaning ascribed to it in the presentation of the parties; and

(k) "Terms of Reference" shall mean those Terms of Reference (as such expression is defined in the ETSI Directives) approved by the Director-General on the date set forth in Annex 2 hereof as well as their subsequent versions and evolutions, setting out, *inter alia*, the purpose, scope, initial resource requirements and organization of the ISG.

2. **Intellectual property**

The Member agrees to the terms of, and shall abide by, the ETSI IPR Policy set forth in Annex 6 of the ETSI Rules of Procedure of 24 May 2008 and their subsequent versions and evolutions (hereinafter, the "ETSI IPR Policy"), and to treat any specifications produced by the ISG as Technical Specifications under the ETSI IPR Policy. Upon request of ETSI, the Member shall promptly execute any documents and do all things that are required or desirable in order to give effect to, perfect or enforce the assignments or licenses of intellectual property rights provided for or contemplated under the ETSI IPR Policy. The Member agrees that its undertakings under the ETSI IPR Policy and this Article 2 may receive specific performance and waives any right to claim the benefit of the provisions of Article 1142 of the French Civil Code in this respect.

3. Operational costs

3.1 Budget

The costs of operation of the ISG shall comprise the following elements:

(a) initial resource requirements for the first budget year as set forth in the Terms of Reference (hereinafter, the “Initial Resource Requirements”);

(b) a budget setting out the costs of operation of the ISG (beyond the costs of basic administrative support provided by the ETSI Secretariat pursuant to Article 4 of this Agreement) established for each budget year by the members of the ISG (hereinafter, the “ISG Budget”), which the Chairman of the ISG shall notify to ETSI at the latest on November 30 of each year;

(c) additional costs not accounted for in the ISG Budget which the members of the ISG may agree to incur during the course of each budget year (hereinafter, the “Additional Costs”), which shall be notified to ETSI by the Chairman of the ISG.

ETSI shall incur the costs provided for in the Initial Resource Requirements and the ISG Budget, provided however that (i) ETSI shall only incur the costs provided for in the ISG Budget under the condition that such ISG Budget has been notified to ETSI pursuant to Article 3.1(b) of this ISG Agreement, and (ii) ETSI may, at its discretion, refuse to incur costs under certain items provided for in the ISG Budget to the extent that they bear no direct relationship to the purpose or scope of the ISG set forth in the Terms of Reference.

ETSI shall only incur Additional Costs at its discretion.

The members of the ISG shall be responsible for any costs provided for in the ISG Budget or any Additional Costs which have not been approved by ETSI or which ETSI has refused to incur, pursuant to separate arrangements among them. The Member shall be solely liable for any cost it incurs in relation to the ISG and expressly acknowledges that ETSI shall have no liability in that regard and no obligation to reimburse such costs.

Any costs incurred by ETSI under the Initial Resource Requirements, the ISG Budget and the Additional Costs shall be invoiced by ETSI to the members of the ISG pursuant to Article 3.3 of this ISG Agreement.

Except as expressly provided above or in Article 4 of this ISG Agreement, ETSI shall have no obligation to incur any costs for the operation the ISG.

3.2 Allocation of costs

Unless otherwise provided for in Annex 3 hereof, the Member agrees that all members of the ISG shall contribute equally to the Initial Resource Requirements, the ISG Budget and the Additional Costs, and that ETSI shall be entitled to invoice the Member on that basis pursuant to Article 3.3 of this ISG Agreement.

The parties however agree that the members of the ISG may decide to modify the allocation of costs among the members of the ISG. Such decision shall be notified by the Chairman of the ISG to ETSI and become effective as from the date of its receipt by ETSI.

In the event that the Member joins the ISG during the course of a budget year, its contribution to the costs of the operation of the ISG for the remainder of the budget year shall be decided by the members of the ISG pursuant to a decision taken in accordance with the process set forth in Article 5.3 of this ISG Agreement in which the Member shall take part and which shall be notified by the Chairman of the ISG to ETSI and become effective as from the date of its receipt by ETSI.

3.3 Invoices

ETSI shall invoice quarterly the amounts owed by the Member corresponding to its contribution to the Initial Resource Requirements or the ISG Budget.

ETSI shall be entitled to invoice the amounts owed by the Member corresponding to its contribution to the Additional Costs as from the first day of the month after which the Additional Costs have been notified to ETSI by the Chairman of the ISG.

The amounts invoiced by ETSI shall be payable by the Member thirty (30) days following receipt of the relevant invoice by the Member.

4. **Secretariat support**

The ETSI Secretariat shall provide, at no additional cost to the members of the ISG, basic administrative support as described in the Terms of Reference.

The Chairman of the ISG may request that the ISG receive additional administrative support from the ETSI Secretariat, provided that ETSI agrees and:

(a) either the members of the ISG agree to provide voluntary contributions to cover the costs of such additional support and the ETSI Secretariat shall only provide the requested additional administrative support after receipt by ETSI of all payments corresponding to such contributions;

(b) or resources corresponding to such additional support are approved by the ETSI Board upon petition by the Chairman of the ISG.

5. **Decision making**

5.1 Discretionary Decisions

The ISG shall be operated pursuant to the rules set forth in the ETSI Technical Working Procedures, provided however that the members of the ISG may take decisions on issues concerning its organizational structure, the Terms of Reference of its Working Groups, the approval of draft ETSI Group Specifications, the operational costs of the ISG pursuant to Article 3 of this ISG Agreement, and more generally, any matter which is left at their discretion under the ETSI Directives (hereinafter, the “Discretionary Decisions”).

5.2 General decision making process

In accordance with clause 3.7 of the ETSI Technical Working Procedures, and subject to the provisions of Articles 5.3 and 1.1 of this ISG Agreement, the Member agrees that the Discretionary Decisions taken by the members of the ISG shall be binding upon the Member when taken according to the rules laid down in clause 1.7 of the ETSI Technical Working Procedures for Technical Bodies, except for any variations provided for in Annex 4 hereof. The Member undertakes to comply with all applicables laws and regulations, including Community and national competition laws and regulations, and to refrain from implementing any discriminatory or exclusionary decision making process in the context of the ISG.

5.3 Decisions concerning operational costs

Decisions concerning (i) the ISG Budget under Article 3.1(b) of this ISG Agreement, (ii) Additional Costs under Article 3.1(c) of this ISG Agreement, and (iii) the allocation of costs among members of the ISG under Article 3.2 of this ISG Agreement, shall be binding upon the Member when taken by the members of the ISG pursuant to a unanimous decision.

6. **Authorized deviations from the ETSI Technical Working Procedures**

The ISG shall operate pursuant to the rules set forth in the ETSI Technical Working Procedures, with the exceptions provided in Annex 5 hereof.

7. **No assignment**

The rights and obligations of the Member under this ISG Agreement are personal to the Member and shall not be assigned (whether absolutely or by way of security and whether in whole or in part), sub-contracted, delegated, transferred, pledged, declared in trust for a third party, or otherwise disposed of in any manner whatsoever (each of the above an "assignment") and any such purported assignment in contravention of this clause shall be ineffective.

8. **Limitation of liability**

ETSI, its officers, employees and agents shall have no liability to the Member in respect of any actual or expected loss of profits, loss of revenue, loss of goodwill, loss of opportunity, loss of business, or increased costs or expenses. ETSI's total liability to the Member under this ISG Agreement shall be limited to the amounts paid by the Member to ETSI pursuant to this ISG Agreement in the budget year during which the Member's claim against ETSI arose.

9. **Term and termination**

9.1 Date of Termination

This ISG Agreement shall enter into force as from the date of its execution by the parties and shall remain effective until the earlier of (i) the date of cessation of the ISG, (ii) the date of the Member's resignation from the ISG, (iii) the date of the Member's resignation or expulsion from ETSI, (iv) the date of receipt of a notice of termination sent by ETSI at its discretion in the event that the Member commits a material breach of any of its obligations under this ISG Agreement (including the ETSI Directives and the Terms of Reference incorporated by reference pursuant to Article 1.1 of this ISG Agreement) and fails to remedy the same within thirty (30) days after receiving notice to do so (hereinafter, the "Date of Termination"). For the purpose of determining the Date of Termination:

(a) the date and conditions of cessation of the ISG shall be decided by the Director-General pursuant to Article 8.3.9 of the ETSI Rules of Procedure and clause 3.2 of the ETSI Technical Working Procedures;

(b) the Member may resign as member of the ISG at any time by sending a notice of resignation to the Chairman of the ISG and the Director-General, and the date of the Member's resignation from the ISG shall be deemed to be the date of receipt of the notice of resignation by the Director-General;

(c) the date of the Member's resignation or expulsion from ETSI shall be determined pursuant to Article 1.4 of the ETSI Rules of Procedure;

(d) the notice of termination sent by ETSI in the event of a material breach of its obligations by the Member under this ISG Agreement shall be sent to the Chairman of the ISG and the Member, and the date of receipt of the notice of termination shall be deemed to be the date of its receipt by the Member.

9.2 Effect of termination

Upon occurrence of the Date of Termination, this ISG Agreement shall automatically terminate and the Member shall cease to participate in the work of the ISG and to contribute to the costs of operation of the ISG in accordance with the provisions of Article 3 of this ISG Agreement, and shall no longer receive any benefit or information as member of the ISG, it being provided however that termination of this ISG Agreement for any reason:

(a) shall be without prejudice to any rights or obligations which shall have accrued or become due prior to the Date of Termination and the Member shall remain bound to duly perform and complete any and all obligations which shall have arisen out of or in connection with this ISG Agreement prior to the Date of Termination, including any transfer or license of intellectual property rights (or undertakings to transfer or license

intellectual property rights) pursuant to the ETSI IPR Policy and Article 2 of this ISG Agreement;

(b) shall not affect any right or obligation of any party under the ETSI Directives, which shall continue into force after the termination of this ISG Agreement (except in the event of the Member's resignation or expulsion from ETSI, in which case the provisions of Article 1.4 of the ETSI Rules of Procedure shall apply); and

(c) shall not prejudice the rights or remedies which any party may have in respect of any breach of the terms of this ISG Agreement prior to the Date of Termination.

9.3 Cessation of the ISG

In the event of cessation of the ISG, the parties agree that:

(a) any amounts provided for in the Initial Resource Requirements, the ISG Budget, the Additional Costs or Article 4(a) of this ISG Agreement which have been contributed by the members of the ISG but have not yet been committed to be paid by ETSI prior to the date of cessation of the ISG (as determined pursuant to Article 9.1(a) of this ISG Agreement) shall be distributed among the members of the ISG pro rata according to the share of each member's contribution;

(b) the members of the ISG shall, prior to the date of cessation of the ISG (as determined pursuant to Article 9.1(a) of this ISG Agreement), submit to the Director-General recommendations concerning the maintenance of the ETSI deliverables produced by the ISG.

10. **Notice**

A notice (including any approval, consent, request, or other communication) in connection with this ISG Agreement must be in writing, in the English language, and left at the address of the addressee or sent by pre-paid registered delivery with return receipt requested, or express mail (air mail if posted from or to a place outside France) to the address of the addressee or sent by facsimile to the facsimile number of the addressee, and marked for the attention of the person so specified, or to such other address or facsimile number, and/or marked for the attention of such other person as the relevant party may from time to time specify by notice given in accordance with this clause, and, for the avoidance of doubt, must not be sent by e-mail.

The relevant details of the Member are set forth in Annex 1 hereof and the relevant details of ETSI are as follows:

Address: 650 route des Lucioles, 06921 Sophia Antipolis Cedex, France
Facsimile: +33 (0)4 93 65 47 16
Attention: Dr. Walter Weigel, ETSI Director General

In the absence of evidence of earlier receipt, a notice shall take effect and be deemed received:

(a) in the case of a notice left at the address of the addressee, upon delivery at that address;

(b) in the case of a posted letter, the seventh day after posting; and

(c) in the case of a facsimile, on production of a transmission report from the machine from which the facsimile was sent which indicates that the facsimile was sent in its entirety to the facsimile number of the recipient.

A notice received or deemed to be received on a day which is not a Business Day or after 5 p.m. on any Business Day according to local time in the place of receipt, shall be deemed to be received on the next following Business Day. For the purposes of this clause, "Business Day" shall mean a day not being a Saturday on which trading banks are generally open for business in the place where the notice is received.

11. **Severance/unenforceable provisions**

If any provision or part of this ISG Agreement is deemed void or unenforceable due to applicable law, it shall be deemed to be deleted and the remaining provisions of this ISG Agreement shall continue in full force and effect.

12. **Variation and waiver**

12.1 Variation

Subject to the ETSI Directives and the Terms of Reference, this Agreement sets forth the entire agreement of the parties with respect to the subject matter hereof. No variation (including any supplement, deletion or replacement, however effected) of this ISG Agreement shall be effective unless it is in writing (which for this purpose, does not include e-mail) signed by or on behalf of each of the parties to this ISG Agreement.

12.2 Waiver

The rights and remedies of the parties shall not be affected by any failure to exercise or delay in exercising any right or remedy or by the giving of any indulgence by any party or by anything whatsoever except a specific waiver or release in writing and any such waiver or release shall not prejudice or affect any other rights or remedies of the parties. No single or partial exercise of any right or remedy prevents any further or other exercise thereof or the exercise of any other right or remedy.

13. **Third party beneficiary (*stipulation pour autrui*)**

The Member shall have sight of and shall accept the terms and conditions provided for the benefit of members of the ISG in any agreement (hereinafter, the “ISG Participant Agreement”) entered into between ETSI and any Observer, person or legal entity who is not a full or associate member of ETSI and which has been invited or authorized by the Chairman of the ISG to attend the meetings of the ISG (hereinafter, the “Participant”). As a result of such acceptance, all provisions of such ISG Participant Agreement provided for the benefit of the members of the ISG, acting individually or collectively, shall be binding upon the Participant and may be enforced by the Member pursuant to Article 1121 of the French Civil Code.

14. **Governing law, jurisdiction and service of process**

14.1 Governing law

This Agreement shall be governed by and interpreted in accordance with French law.

14.2 Jurisdiction

Each party irrevocably agrees for the benefit of ETSI that the *Tribunal de Grande Instance de Grasse* shall have jurisdiction in relation to any claim, dispute or difference concerning this ISG Agreement and any matter arising therefrom.

The submission to the jurisdiction of the *Tribunal de Grande Instance de Grasse* shall not (and shall not be construed so as to) limit the right of ETSI to bring legal proceedings in any other court of competent jurisdiction including without limitation the courts having jurisdiction by reason of the Member’s domicile. Legal proceedings by ETSI in any one or more jurisdictions shall not

preclude legal proceedings by it in any other jurisdiction, whether by way of substantive action on the merits, emergency or provisional relief, injunction, enforcement or otherwise.

14.3 Service of process

Each party agrees that without preventing any other mode of service, any document in an action (including, but not limited to, a claim form or any other document to be served pursuant to the provisions of the French Code of Civil Procedure) may be served on any party at its address for service of notices under this ISG Agreement and each party undertakes to notify the other party in advance of any change from time to time of the details of such address in accordance with the manner prescribed for service of notices this ISG Agreement.

Made in two (2) originals
In Sophia Antipolis, France
On [date]

For ETSI	For the Member
_____	_____
Dr. Walter Weigel	[signatory's name]
Director-General	[signatory's title]

Annex 1

Identification of the Member

- Full name of the organization:
- Nationality:
- Notification details:

  Address:
  Facsimile:
  Attention:

The Member represents and warrants that it is [a [full]/[associate] member of ETSI] / [has applied for [full]/[associate] ETSI membership and has been authorized by the Director-General to participate in the work of ISG on a provisional basis].

The representative of the Member whose name and title appear on the signature page of this ISG Agreement has been duly authorized for the purposes hereof.

Annex 2

Identification of the ISG

- Name of the ISG: Autonomic network engineering for the self-managing Future Internet (AFI)

- Names of the founding members of the ISG:

  Alcatel-Lucent,
  CHTTL (Chunghwa Telecommunication Co.),
  FOKUS- Fraunhofer Institute for Open Communication Systems,
  France Telecom,
  Fujitsu Laboratories of Europe,
  GRNET,
  Telcordia Technologies,
  Telefon AB LM Ericsson,
  Telefonica S.A.
  Waterford Institute of Technology (WIT)

- Date of approval of the creation of the ISG and the Terms of Reference by the Director-General:
  23 January 2009

Annex 3

Allocation of the costs of operation among members of the ISG

No operational costs are foreseen at the creation of the ISG. No specific provision for the allocation of operational costs has been made, beyond the default provision in clause 3.2 above.

Annex 4

Variations in the general decision making process

The following modifications to the ETSI Technical Working Procedures on Decision Making have been adopted by this ISG:

1.7 Decision making

1.7.1 PRINCIPLES OF DECISION MAKING

~~A *Technical Body*~~ The ISG shall endeavour to reach *Consensus* on all issues, including the approval of draft *ETSI deliverable*s and the adoption of ~~Technical~~ Group Specifications~~ and Technical Reports~~. If *Consensus* cannot be achieved, the Chairman can decide to take a vote which may be performed by a secret ballot. A vote may be conducted during an ISG ~~*Technical Body*~~ meeting or by correspondence.

Where voting is used, vote results shall be evaluated by the Chairman on the basis of one ISG member, one vote. ISG Participants do not have the right to vote.~~using the individual weighting of each ETSI full or associate member as described in Article 11 of the Rules of Procedure.~~

Decisions concerning (i) the ISG Budget under Article 3.1(b) of the ISG Agreement, (ii) Additional Costs under Article 3.1(c) of the ISG Agreement, and (iii) the allocation of costs among members of the ISG under Article 3.2 of the ISG Agreement, require unanimous support. Otherwise, a ~~A~~ proposal shall be deemed to be approved if 71 % of the votes cast are in favour. Abstentions or failure to submit a vote shall not be included in determining the number of votes cast.

~~If a proposal fails to achieve 71 %, the result shall be re-calculated using the votes of ETSI full members only. If the re-calculated result achieves 71 %, the proposal shall be deemed to be approved.~~

For interpreting the result of an election for an ISG ~~*Technical Body*~~ official a simple majority of the votes cast shall be used ~~the procedures in Article 11.4 of the ETSI Rules of Procedure shall apply~~.

1.7.1.1 Voting during a Technical Body meeting

The following procedures apply for voting during an ISG~~a *Technical Body*~~ meeting:

- before voting, a clear definition of the issues shall be provided by the chairman;
- ~~if an ETSI full or associate member has more than one representative, only one may vote;~~
- voting members shall only be entitled to one vote per member;
- if a voting member has more than one representative present, only one representative may vote;
- if manual voting procedures are used, each voting member may only cast the vote once; if electronic voting procedures are used, votes may be changed prior to the closure of the vote;
- ~~the opinions of Counsellors (and in the case of ENs or regulatory documents, associate members) should be noted;~~
- ISG members are only eligible to vote (voting members) if they have participated in at least one of the two meetings preceding any vote,
- Founding members of the ISG as identified in the ISG Agreement shall be eligible to vote during and up to the end of the first two meetings following the creation of the ISG. Thereafter they are subject to the above participation requirements as for all other members.
- voting by proxy is not permitted;
- there are no quorum requirements~~ and vote splitting is not permitted~~;

- the voting weight shall be 1 per voting member;
- the result of the vote shall be recorded in the meeting report.

1.7.1.2 Voting by correspondence

The following procedures apply for voting by correspondence:

- before voting, a clear definition of the issues shall be provided by the Chairman and disseminated to all on the ISG~~Technical Body~~ membership list;
- the voting period shall be defined by the ISG Chairman and communicated to all on the Industry Specification Group membership list;
- voting members shall only be entitled to one vote per member;
- ISG members are only eligible to vote (voting members) if they have participated in at least one of the two meetings preceding any vote;
- Founding members of the ISG as identified in the ISG Agreement shall be eligible to vote during and up to the end of the first two meetings following the creation of the ISG. Thereafter they are subject to the above participation requirements as for all other members.
- electronic voting only shall be used for voting by correspondence;
- ~~if manual voting procedures are used, each ETSI full or associate member may only cast the vote once within the 30 day voting period. If electronic voting procedures are used,~~ votes may be changed prior to the closure of the vote;
- the voting weight shall be 1 per voting member;
- there are no quorum requirements~~ and vote splitting is not permitted~~;
- at the end of the voting period the Chairman shall count the votes as described in clause 1.7.1;

The result of the vote should be disseminated to everybody on the ISG~~Technical Body~~ membership list within 15 days.

1.7.1.3 Voting for the election of a Technical Body official

For the purpose of electing any ISG~~*Technical Body*~~ official the procedures given in clauses 1.7.1, 1.7.1.1 and 1.7.1.2 shall apply.

In the case where there is more than one candidate, a secret ballot shall be used. For interpreting the result of an election for an ISG ~~*Technical Body*~~ official the following procedure shall apply:
the candidate obtaining the highest number of votes in the ballot is elected.~~the procedures in Article 11.4 of the ETSI Rules of Procedure shall apply.~~

The ISG~~*Technical Body*~~ Chairman shall be responsible for the voting process and shall ensure that confidentiality is maintained.

If the vote is conducted during an ISG ~~*Technical Body*~~ meeting only the final result shall be recorded in the meeting report.

If the vote is conducted by correspondence only the final result of the vote shall be disseminated.

1.7.2 Appealing against a Chairman's decision

Any member of ~~*ETSI*~~the ISG who is against the Chairman's ruling on a vote may submit its case to the Board for decision. In such cases the member shall also inform the ISG~~*Technical Body*~~ Chairman.

When the ISG~~*Technical Body*~~ Chairman has made a ruling, his decision shall be taken as the basis for future operations, unless overturned by the Board.

Annex 5

Authorized Deviations from the ETSI Technical Working Procedures

The ISG shall use as its working procedures the ETSI Technical Working Procedures, with the following modifications.

TWP 3.4 Participation in the work of the Industry Specification Group

The text of clause 3.4 of the ETSI Technical Working Procedures is modified as indicated below:

On an exceptional and temporary basis, Observers and non-members which have applied to attend Industry Specification Group meetings, may be invited or authorized by the Chairman to attend meetings of an Industry Specification Group, provided that the presence of this Observer or non-member is justified by a legitimate interest with regard to the work currently in progress. The authorization or refusal of the Chairman shall be made to such an applicant in writing and shall contain appropriate justification of the Chairman's decision. The Industry Specification Group Chairman shall notify the ETSI Director-General of the decision. Observers or non-members authorized to attend Industry Specification Group meetings may participate without the right to vote but shall pay a "per meeting fee", to be specified in the ISG Participant~~Membership~~ Agreement.

Observers or non-members of ETSI must agree to the ISG Participant Agreement in order to be authorized to participate. The Participant Agreement will be terminated if the participant has not participated in any meetings of the ISG in a 24 month period. A revocation notice under 9 (c) of the ISG Participant Agreement is sent to the participant in this case. The ISG Chairman will periodically review the participation record of authorized Participants.

In addition, access to meeting documents, mailing lists etc. will be removed from authorized Participants if they fail to participate in, or register and pay participation fees for two successive meetings. Such access will be restored upon registration for a subsequent meeting of the ISG.

The Director-General may authorize the provisional participation of applicants for full or associate ETSI membership within the Industry Specification Group before the application for membership is formally approved by the General Assembly.

Remote participation in Industry Specification Group meetings (e.g. audio conference, webcast, etc.) should be permitted whenever technically possible. Such participation should, at least, be on the basis of complete agenda items and not misused to influence the outcome of votes where the remote participant has not been involved in the preceding discussions.

TWP 3.5 Convening an Industry Specification Group meeting

The rules for convening meetings as detailed in clause 1.5 shall be used, with the following modifications:

1.5 Convening a Technical Body meeting

1.5.1 Invitation to a Technical Body meeting

The invitation to an ISGa ~~*Technical Body*~~ meeting and the necessary logistical information shall be disseminated by the hosting organization at least 30 days before the meeting to all on the ISG~~*Technical Body*~~ membership list (see clause 1.5.5).

The first meeting of a new ISG~~*Technical Body*~~ will be announced in a Collective Letter, with at least 30 days notice, by the ETSI Secretariat.

1.5.2 Agenda for a Technical Body meeting

The draft agenda shall be disseminated by the responsible Chairman to all on the ISG~~*Technical Body*~~ membership list at least 30 days before a meeting. The draft agenda shall include details of draft *ETSI deliverable*s for approval and officials for appointment. Any other subject matters where voting may be required shall also be included and indicated in the draft agenda.

The draft agenda for the first meeting of a new ISG~~*Technical Body*~~ will be announced in a Collective Letter, with at least 30 days notice, by the ETSI Secretariat.

1.5.3 Documentation for a Technical Body meeting

Documents shall be numbered as shown in the following example:

TBnn_x

This numbering system has four logical elements:

1) **TB**: the name of the *Technical Body* or Working Group;
2) **nn**: to indicate the meeting sequence number;
3) **x**: to indicate any additional information concerning the unique number of the document or its status, etc.

The third item (x) can be used in any way that an individual ISG~~*Technical Body*~~ sees fit.

1.5.4 Registration for a Technical Body meeting

Every *Attendee* shall register on arrival at each meeting. Each *Attendee* who represents an ETSI full or associate member shall declare the precise name of that member. An *Attendee* may only represent one ISG~~ETSI full~~ member or one ISG Participant~~ETSI associate member~~.

1.5.5 Maintaining a Technical Body membership list

Each ISG~~*Technical Body*~~ shall maintain a membership list within an email exploder list established specifically for that purpose. Any individual may join this email exploder list if he/she is a representative of an ETSI member that has signed the "AFI Industry Specification Group agreement" and has an ETSI server user account, and those who join this email exploder list will be considered as being on the Industry Specification Group membership list~~who joins this email exploder list will be considered as being on the *Technical Body* membership list if he/she is a representative of an ETSI member and has an ETSI server user account~~. Failure to reconfirm the intention to remain on the email exploder list at regular intervals (lists are normally reviewed every six months) will result in removal from this email exploder list and thus from the ISG~~*Technical Body*~~ membership list.

The ISG~~*Technical Body*~~ membership list shall be used for the dissemination of information and for the decision making within the ISG~~*Technical Body*~~.

TWP 3.7 Decision Making

The decision making procedures as detailed in clause 1.7 shall be used, with the following modifications:

1.7 Decision making

1.7.1 Principles of decision making

~~A *Technical Body*~~ The ISG shall endeavour to reach *Consensus* on all issues, including the approval of draft *ETSI deliverable*s and the adoption of ~~Technical~~ Group Specifications~~ and Technical Reports~~. If *Consensus* cannot be achieved, the Chairman can decide to take a vote which may be performed by a secret ballot. A vote may be conducted during an ISG ~~*Technical Body*~~ meeting or by correspondence.

Where voting is used, vote results shall be evaluated by the Chairman on the basis of one ISG member, one vote. ISG Participants do not have the right to vote.~~using the individual weighting of each ETSI full or associate member as described in Article 11 of the Rules of Procedure.~~

Decisions concerning (i) the ISG Budget under Article 3.1(b) of the ISG Agreement, (ii) Additional Costs under Article 3.1(c) of the ISG Agreement, and (iii) the allocation of costs among members of the ISG under Article 3.2 of the ISG Agreement, require unanimous support. Otherwise, a ~~A~~ proposal shall be deemed to be approved if 71 % of the votes cast are in favour. Abstentions or failure to submit a vote shall not be included in determining the number of votes cast.

~~If a proposal fails to achieve 71 %, the result shall be re-calculated using the votes of ETSI full members only. If the re-calculated result achieves 71 %, the proposal shall be deemed to be approved.~~

For interpreting the result of an election for an ISG ~~*Technical Body*~~ official a simple majority of the votes cast shall be used~~ the procedures in Article 11.4 of the ETSI Rules of Procedure shall apply~~.

1.7.1.1 Voting during a Technical Body meeting

The following procedures apply for voting during an ISG~~a *Technical Body*~~ meeting:

- before voting, a clear definition of the issues shall be provided by the chairman;
- ~~if an ETSI full or associate member has more than one representative, only one may vote;~~
- voting members shall only be entitled to one vote per member;
- if a voting member has more than one representative present, only one representative may vote;
- if manual voting procedures are used, each voting member may only cast the vote once; if electronic voting procedures are used, votes may be changed prior to the closure of the vote;
- ~~the opinions of Counsellors (and in the case of ENs or regulatory documents, associate members) should be noted;~~
- ISG members are only eligible to vote (voting members) if they have participated in at least one of the two meetings preceding any vote,
- Founding members of the ISG as identified in the ISG Agreement shall be eligible to vote during and up to the end of the first two meetings following the creation of the ISG. Thereafter they are subject to the above participation requirements as for all other members.
- voting by proxy is not permitted;
- there are no quorum requirements~~ and vote splitting is not permitted~~;
- the voting weight shall be 1 per voting member;
- the result of the vote shall be recorded in the meeting report.

1.7.1.2 Voting by correspondence

The following procedures apply for voting by correspondence:

- before voting, a clear definition of the issues shall be provided by the Chairman and disseminated to all on the ISG~~Technical Body~~ membership list;
- the voting period shall be defined by the ISG Chairman and communicated to all on the Industry Specification Group membership list;
- voting members shall only be entitled to one vote per member;
- ISG members are only eligible to vote (voting members) if they have participated in at least one of the two meetings preceding any vote;
- Founding members of the ISG as identified in the ISG Agreement shall be eligible to vote during and up to the end of the first two meetings following the creation of the ISG. Thereafter they are subject to the above participation requirements as for all other members.
- electronic voting only shall be used for voting by correspondence;
- ~~if manual voting procedures are used, each ETSI full or associate member may only cast the vote once within the 30 day voting period. If electronic voting procedures are used,~~ votes may be changed prior to the closure of the vote;
- the voting weight shall be 1 per voting member;
- there are no quorum requirements~~ and vote splitting is not permitted~~;
- at the end of the voting period the Chairman shall count the votes as described in clause 1.7.1;
- The result of the vote should be disseminated to everybody on the ISG~~Technical Body~~ membership list within 15 days.

1.7.1.3 Voting for the election of a Technical Body official

For the purpose of electing any ISG~~*Technical Body*~~ official the procedures given in clauses 1.7.1, 1.7.1.1 and 1.7.1.2 shall apply.

In the case where there is more than one candidate, a secret ballot shall be used. For interpreting the result of an election for an ISG ~~*Technical Body*~~ official the following procedure shall apply:
the candidate obtaining the highest number of votes in the ballot is elected.~~the procedures in Article 11.4 of the ETSI Rules of Procedure shall apply.~~

The ISG~~*Technical Body*~~ Chairman shall be responsible for the voting process and shall ensure that confidentiality is maintained.

If the vote is conducted during an ISG ~~*Technical Body*~~ meeting only the final result shall be recorded in the meeting report.

If the vote is conducted by correspondence only the final result of the vote shall be disseminated.

1.7.2 Appealing against a Chairman's decision

Any member of ~~*ETSI*~~the ISG who is against the Chairman's ruling on a vote may submit its case to the Board for decision. In such cases the member shall also inform the ISG~~*Technical Body*~~ Chairman.

When the ISG~~*Technical Body*~~ Chairman has made a ruling, his decision shall be taken as the basis for future operations, unless overturned by the Board.

9.4. How to get involved to AFI

Who can participate?

- Any ETSI member organization can become a member of the AFI ISG
  - Must sign AFI ISG Agreement
  - 1-member one vote
  - No participation fee
- Any non-member of ETSI (organization, not individual)
  - AFI ISG Participant Agreement required
  - Full right to contribute, no voting rights
  - Per-meeting participation fee
  - Must participate regularly to retain electronic access (e-mail list, ftp site).

IPR Regime: Full ETSI IPR regime applies, with no changes

- For ETSI members, and also non-members who sign Participant agreement

My organization is a member of ETSI (or has applied):

- Download the ISG Member Agreement at http://portal.etsi.org/afi
- Complete the sections marked in green, have 2 copies signed and send both to ETSI (Ultan Mulligan)
- You will receive access to the e-mail list, ETSI portal etc.

My organization is not yet a member of ETSI

- Apply for membership and then follow as above

Or

- Download the ISG Participant Agreement at http://protal.etsi.org/afi
- Complete the sections marked in green, have 2 copies signed and send both to ETSI (Ultan Mulligan)
- You will receive access to the e-mail list, ETSI portal etc. when you have registered and paid for 1 meeting

Further Information

Please consult http://portal.etsi.org/afi

- Detailed scope and rationale behind the creation of the ISG
- List of members (expected to grow significantly)
- Meeting dates
- Work Programme (list of Specifications in the pipe)

Contact points:

- Ranganai Chaparadza, FOKUS
  - Ranganai.Chaparadza@fokus.fraunhofer.de or ran4chap@yahoo.com
- Ultan Mulligan, ETSI
  - ultan.mulligan@etsi.org
- Laurent Vreck, ETSI
  - laurent.vreck@etsi.org

9.5. Engaging IETF in work related to Intrinsic Monitoring

The e-mail below was sent to ipv6@ietf.org on 4th November 2009 by Alan Davy.

Hi All,

We are currently specifying an IPv6 hop by hop option which will be used to carry node related information along a path within a network domain. There has been previous proposals submitted to the IETF within this area, such as IPv6 Route Record [1] and Connection/Link Status Investigation[2]. We are aware of the reasons these proposals have been rejected previously, being mainly related to the problems of the hop by hop option and the operators unwillingness to share private data.

As such a technique has a variety of useful applications to management and monitoring, we believe that a standard method of managing data entry within an IPv6 hop by hop option along with standard data format templates can be of great benefit to the future development of in-line based network management and monitoring protocols. We would like to see if there is much interest in specifying such a draft and whether anyone would like to assist in the specification of such an Internet Draft. We wish to constrain this solution to intra domain (such as DiffServ).

Looking forward to some discussion on this issue.

[1] http://tools.ietf.org/html/draft-kitamura-ipv6-record-route-00
[2] http://tools.ietf.org/html/draft-ietf-ipngwg-hbh-ext-csi-02

Best Regards,
--

Alan Davy

IETF IPv6 working group mailing list
ipv6@ietf.org
Administrative Requests: https://www.ietf.org/mailman/listinfo/ipv6

9.6. Liaison with ITU FG-FN

Liaison statement sent by AFI to ITU FG-FN:

Dear **FG-FN Chairman,**

Owing to the fact that research on the definition and development of Specifications for Autonomic/Self-Managing Multi-Service Future Networks essentially requires co-operation among relevant Forums and Standardization Groups, the recently launched **ETSI Industry Specification Group (ISG**) called **AFI** would like to officially express interest in liaising with the **Focus Group on Future Networks (FG-FN)**.

AFI is a recently launched Industry Specification Group on **A**utonomic network engineering for the self-managing **F**uture **I**nternet. Here, Future Internet is to be interpreted as encompassing Multi-Service Future Networks in general. AFI aims at co-coordinating its activities independently of external Groups. So far, AFI has two Work Items (WIs) defined towards the production of what are called Group Specifications, to be released to the public in 2010, and will continue to be evolved thereafter.

AFI Work Item (WI) #1: Scenarios, Use Cases, and Requirements for Autonomic/Self-Managing Future Internet. It is driven mainly by operators i.e. the likes of service and network providers.

AFI Work Item (WI) #2: Generic Autonomic Network Architecture (GANA). It is driven by manufacturers and research organizations.

AFI WI#1 is driving WI#2, which is then focused on developing the Specifications of node/device/network architecture that fulfils the Requirements, Use Cases and Scenarios put forward by WI#1.

The Autonomic Network Engineering for the Self-Managing Future Internet ISG will develop ETSI pre-standards and Specifications for Autonomic Network Engineering for the Self-Managing Future Internet, including the following activities:

- Encourage harmonization and pragmatism in inviting for contributions from the circles of both the evolutionary approaches and revolutionary approaches to Future Internet design, towards developing common Specifications.

- Definition of an **architectural Reference Model** of a Generic Autonomic Network Architecture (GANA) that defines the autonomic elements and the associated self-manageability properties of the Future Internet. Individuals (experts) from both the evolutionary approaches and the revolutionary approaches should be involved in creating the **Reference Model.**

- Defining ***Interfaces for Governance*** (i.e. the kind of perspectives offered to end-users or operators of autonomic/self-managing networks, such as **the interfaces of Future Internet nodes/devices that are meant to allow humans to define *network-level objectives* that govern** the operation of an autonomic (self-managing) network under the control of an administrative domain or domains). Also worthy for consideration is the aspect of interfaces between the Services Layer and the underlying network services. Interfaces should be developed taking account of the need to translate business goals into network-level objectives, and should have a focus on self-management for improved delivery of services over the network.

- Development and pre-standardization of the GANA Meta-Model, Information Models (including Ontologies, etc), and potentially Policy-based Control Frameworks associated with **the Reference Model**.

- Definition of a viable **roadmap of an Evolutionary Path** for today's network models, architectures, protocols such as IPv6 and paradigms as necessitated by the Reference Model. The definition of a **roadmap of an Evolutionary Path** should be achieved through Recommendations that can then be considered by the relevant Bodies towards the evolution of the protocols recommended for evolution or extensions. For this, the ISG would liaise with relevant Bodies such as IETF, 3GPP, etc.

- Development of Advanced Systems Engineering Methodologies for the engineering of Context-aware autonomic Decision-Making-Elements (DMEs) – potentially with cognitive properties, their Control-Loops, etc, including the application of methods like the OMG's MDA approaches and Formal Description Techniques (FDTs) towards Simulations and Validations of complex autonomic behaviours, as well as *Code-Generation* from formal models of Context-aware DMEs for diverse networking environments, and design principles for the "evolvability" of components (e.g. the DMEs).

- Defining **Use Cases and Scenarios** which can be used for further refinements or evolution of both the **GANA Reference Model** and/or the **Roadmap of an Evolution Path.**

- Measuring the *Benefits* of Autonomics/Self-Management: For example, by carrying out **Cost** related *Calculations* or Estimations with respect to e.g. OPEX/CAPEX reduction (savings) and cost savings on shortening *Time-To-Market* for service/product delivery, thanks to Autonomics/Self-Management in networks.

AFI would be glad to know about your plans and the fields you will be working on.

Looking forward to hearing from you, and to a fruitful co-operation in autonomic network engineering for the Self-Managing Multi-Service Future Networks.

On behalf of the AFI, thank you. **AFI Chairman**, Ranganai Chaparadza

Response of ITU FG-FN:

FG-FN thanks ETSI ISG AFI for its liaison entitled 'Liaison statement initiated by ETSI ISG AFI to ITU-T FG-FN'. It was reviewed in the 2nd FG-FN meeting at Salt Lake City in 16-20 November 2009, and the meeting was interested in your activity.

As shown in the Terms of Reference (ToR) attached to this liaison, FG-FN tries to

- collect and identify visions of future networks, based on new technologies,
- assess the interactions between future networks and new services,
- familiarize ITU-T and standardization communities with emerging attributes of future networks, and;
- encourage collaboration between ITU-T and FN communities,

and tries to develop deliverables on terminologies, technology description on important study areas, and consolidated vision based on reviewing various future network related activities, e.g., research projects or SDO activities.

On future networks, our understandings of the estimated target date for prototyping and phased deployment should roughly fall between 2015 and 2020.

Having that in mind, we are currently reviewing activities such as FP7 projects, GENI, IRTF VNRG BoF, and based on the review and the contributions for the meeting we started to develop documents on network virtualization, identifiers and identification procedures, environmental issues as technology descriptions on particular areas, and a document on consolidated vision.

More information and documents can be obtained from our web site, http://www.itu.int/ITU-T/focusgroups/fn/index.html.

Network management is an important area, and during our 1st meeting in Luleå, Sweden we learned from FIREweek event that technologies that make network autonomic were considered important for future networks. We therefore are collecting information on it from e.g., a presentation on MANA project by our vice-chairman, Prof. Alex Galis at this meeting. Your activity, ISG AFI was reviewed from that point of view, and the meeting expressed its interest in your activity. We are very happy if you could inform us more information on your activity, e.g., availability of IPv6 features, and the current progress of your work.

Attached: Terms of Reference of ITU-T Focus Group on Future Networks (FGFN-TD04),
Meeting plan, tasks, and document structure of FGFN (FGFN-OD11)

9.7. AFI meeting minutes

Please find attached the minutes of the third and the fourth AFI meeting on the next pages.

Title*: Minutes of AFI meeting#03
from **Source***: Chairman, Secretary
Source contact *ranganai.chaparadza@fokus.fraunhofer.de, kquinn@tssg.org*

Submitted **To***: **ISG AFI**

Relevant WI(s), or deliverable(s):
Agenda Item:
Submission date*:

Document for*:

Decision	
Discussion	x
Information	

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1 Opening

1.1 Welcome, Introduction, Local Arrangements

The meeting was opened by the Chairman, Mr. Ranganai Chaparadza who welcomed the participants.

1.2 Roll call

Every participant presented himself/herself.

1.3 IPR Call

Laurent Vreck, Technical officer in the ETSI Standardization Projects department, read the IPR call. There was no response to the call.

1.4 Adoption of the Agenda

The Agenda was adopted without modifications.
Agenda agreement

Add to the Agenda:

Michal Wodczak – update ToR discussion

Michal Wodczak to update the group on the Web Information Systems Engineering (WISE) conference to be held in Poznan, Poland on Oct 5-7

Laurent Vreck reminded all that documents prepared before the meeting for discussion should be submitted to the AFI portal. Documents send around by email cannot be tracked.

Participants uploaded documents to the portal.

2 Decisions and Actions from previous meeting

Previous Actions Items

Action AFI01_03	Chairman	Send a Liaison Statement to ITU group FG-FN to present the ISG AFI group (members, scope, etc). The Liaison statement was created and will be send to the AFI list for comments before it is send to the ITU Group-FG-FN.	Completed
Action AFI01_04	ISG AFI (all)	Use the AFI mailing list to create a list of organizations and projects which could be contacted and define who will contact them. AFI members are encouraged to continue to establish contacts with potential AFI members.	Completed
Action A/AFI02_01	ISG AFI (all)	To send input on use cases, requirements and scenarios.	Completed
Action A/AFI02_02	Rapporteur DGS/AFI-0001	To collect the input into one single document to have an early draft ready one month prior to meeting#3	Completed
Action A/AFI02_03	AFI Chairman – Vice-Chairmen – Brian Lee	To work on the content of the leaflet and website and sends the results to AFI members for comments.	A new Action-Point was created

3 Work Item #1

a. Discussion on the Current State of the Draft.

Draft Group Specification Report

Ultan Mulligan explained the Draft Group Specification form template.

Discussion on best approach for compiling a Draft Group Specification to compile all scenarios in one document.

Decision: Firstly we discussed the scenarios and then the template.

b. Presentations of Scenarios, Requirements and Use Cases by Contributors.

Presentation form University of Athens (Apostolos Kousaridas)

Use Case 1. Capacity Optimization in Future Internet Wireless Systems.

Use Case 2. Intrusion Detection using Cognitive Fault Prediction Mechanisms AFI03_04

Ranganai Chaparadza discussed the parameters to consider for every scenario

- Define the Network Environment involved – Wired (IP, Ethernet, etc), Wireless (802.11x, etc)
- Define the Actors/Roles Involved – Service Providers, etc
- Assumptions and Functional Requirements.

The AFI does not intend to standardise algorithms used to implement autonomics. But only the interfaces in the architecture for the Autonomic/Self-Managing Future Internet. Future Internet in AFI is understood as "Future Multi-Service Self-Managing Networks that are *evolved* from today's networking models, paradigms and protocols". What will be considered for standardization are the Decision-Making-Elements (DMEs/DEs) for the node/device and network architectures, their Interfaces & Operations and associated Managed Entities (MEs), the Self-* Functions to be implemented by Decision-Making-Elements, Components and Mechanisms for Knowledge Sharing, Data Specs for information flow among all the Building Blocks and the associated Information Models and Policy-Frameworks.

Ultan Mulligan suggested that Use Case 1 relates to cognitive radio which has previously been solved (in every cordless phone, for example) and relates to work carried out in other groups working in ETSI. (RRS). The approach to be taken by the AFI is to identify any Layers and Technologies requiring modification if that is what the requirements of the Scenario or Use Case entails. On this basis the AFI shall consider Liaising with the responsible Working Group, Forum or Standardization Body if the AFI sees the Scenario or Use Case as relevant for the Self-Managing Future Internet.

The group recognised it has to be careful to not go outside our remit such as changing physical layers. The AFI has to determine with each Use Case whether it is applicable or not.

University of Piraeus Research Center (Kostas Tsagkaris)

"Coordination of Self-* mechanisms in autonomic networks" AFI03_06

Ranganai Chaparadza commented that the Network Operator should not be expected to define low level policies for the network but rather the high level policies that can then be translated using some tools into technical goals/policies the network should achieve/enforce .

Comments were discussed on how specific/general to make the scenarios.

GRNet Presentation (Tasos Zafeiropoulos)

"Provision of Autonomic Services in self-configurable environments" AFI03_07

Discussion on Auto-Discovery, Topology visualisation.

Are there solutions other than autonomics to the scenarios presented? Is this solution a good approach?

Telcordia Presentation (Michal Wodczak)

"Autonomic and Self-managing Networks" AFI03_08

Discussion on network partitioning, policy dissemination and implementation. Policy exceptions. Policy conflicts.

Telefonica Presentation (Juanma Gonzalez)
"Operators' Requirements for an Autonomic Network" AFI03_09

Discussion on 3GPP view of future networks, IRPs, SON, NGN, Management Plane interaction with Control and Data Planes of the Network.

Alcatel Lucent Presentation (Laurent Ciavaglia)
"Scenarios, Use Cases, and Requirements for Autonomic / Self-Managing Future Internet" AFI03_12

Discussion on specific, general nature of the focus of AFI. Immediate focus and mid-term future of AFI. Evolvability of the Architecture. Which requirements/scenarios to focus on initially?
Best idea is to gather all Scenarios first and then prioritise them. AFI is process driven, meaning that:

(1) It must establish a framework by which Scenarios, Use Cases and Requirements for the Self-Managing Future Internet can be contributed into the Specifications,
(2) Demonstrate that we are establishing and following an evolvable Architectural Reference Model for Autonomic/Self-Managing Future Networks.
(3) Demonstrate a selected set of prioritized Scenarios prototyped and validated through validation opportunities available in EC funded projects (for example).

Fokus Presentation (Ranganai Chaparadza)
"Auto-Configuration/Self-Configuration of Routers using Routing Profiles in Fixed Network Environment" AFI03_13

Discussion on how advanced scenarios should be, ONIX, targets of autonomics (for example, 5 9s availability). The Scenario sets a vision for Auto-Discovery and Auto-Configuration beyond what is available today and aligns with architectural design principles of an evolvable GANA architecture for Autonomic/Self-Managing Future Internet.

c. Identifying Open issues regarding the Draft.

The draft was finalised as part of the meeting - AFI03_16

d. Types of Network Environments.

Due to time constraints Network types were not discussed in the meeting. However, the updated Scenarios (following the AFI Scenarios Template) will include the information about the network environments. The types of network environments will help AFI see the scope of the network environments that are of interest to AFI members.

e. Assumptions and Functional Requirements captured in the current Scenarios.

The Assumptions and Functional Requirements were considered in the final version of the scenario template - AFI03_16

f. Terminology/Glossary of Terms in AFI (whether to create and maintain a separate document or keep that as Appendix to WI Specs)

We agreed to include Terminology/Glossary of Terms into each Specification document. These were rolled into the final version of the scenario template - AFI03_16

g. Working out Templates and identifying Specification Methods/Tools for use in describing Scenarios, Requirements and Use Cases.

Initially we must have a common definition of a scenario.
Suggestion: A scenario is a description of how a user wants to interact with the technology.

Some Comments brought up included:

Should requirements be obvious in the scenario?
Suggest 1 or 2 general scenarios for the AFI to communicate to the outside world.

Discussion of the 3GPP Use Case Description (Fujitsu Labs Europe – Mick Wilson) **AFI03_14a2**

User is typically from a Network Operator. Scenario can bring together a network operator and an equipment manufacturer.

Goal of initial work of AFI should be to get many Network Operators and many Equipment Vendors together.

Template Design – first draft defined.
Ultan uploaded the draft to the meeting documents for meeting #3. AFI03_16

Use Cases should be provided using techniques such as high-level Message-Sequence charts. A common Use Case Description Template will be agreed.

4. Conclusions on Work Item #1

Action AFI03_01	All (who have provided scenarios)	Migrate Scenarios to the new template	Due 15/10/09

Action AFI03_02	Ranganai Chaparadza	Provide an example scenario	Due 18/09/09

Action AFI03_03	Telefonica I+D	Provide an updated version of the requirements	Due 24/09/09

Action AFI03_04	Work Item #1 Rapporteur	Audio Conference on Work Item #1 6 Nov 2009, 10am to 12am CET Meeting URL : https://www2.gotomeeting.com/join/841770835 Meeting Password: AFIVIRTUAL Or, call in using your telephone (national phone number will be provided by the application once logged). Access Code/ Meeting ID: 841-770-835 Audio PIN: Will be assigned to each participant after joining the meeting	Due 6/11/09

5. Work Item (WI) #2 Generic Autonomic Network Architecture (GANA) Progress/Review

a. **Discussions on the Concepts, Design Principles and identifying building blocks and how they articulate.**

b. **Discussion on the Evolution Path for today's network models and protocols like IPv6.**

c. **Discussion on Structuring WI#2 Specifications in terms of GANA and the detailed architecture(s) that must derive from GANA Specs.**

d. **Discussion on the approach to WI#2 Specifications e.g. Identifying relevant Architectures such as the GANA Reference Model from EFIPSANS that need to be looked at by AFI Work Item #2.**

Due to time constraints, WI#2 was not discussed in detail during the meeting. These Agenda Items will be included in the Agenda for the next AFI Meeting (AFI#4).

The Chairman introduced our Guest from the European Commission (Mr. Pertti Juahiainen) to the AFI members.

6. Brief Presentations by representatives of some EU projects represented at the AFI meeting (only for information purposes for the AFI).

Other projects can be encouraged to attend and inform on their Autonomic Networking/Self-Management related developments other projects. Any contributions will be considered as part of the AFI activities.

Hurricane STREP Project presentation
Lambros Sarakis, National Centre for Scientific Research Demokritos.

Policy-based mobility management
Node-level DEs deciding which network to join.
Interaction between decision management entities.

AFI interest in how to move from policy-based mobility to autonomic mobility.

7. ISG AFI budget for 2009 (a few words to let newcomers know: There is no change to ISG AFI budget)

The AFI does not currently provide any budget to its members.

8. Any Other Business

a. [Liaisons Issues and positioning the AFI vs. other initiatives/SDOs e.g. engaging the "PPP initiative"],

Ranganai Chaparadza presented AFI03_10.

Action AFI03_05	Ranganai Chaparadza	Update the Liaison communication text	24/09/09

Action AFI03_06	Ranganai Chaparadza	Identify who is steering the PPP and send information on the AFI	24/09/09

b. [Refining/Updating the Terms of Reference]

Michal Wodczak presented AFI03_05. Since the changes are mostly cosmetic, it was decided not to change the ToR.
The ToR was rewritten as a submission for the WISE conference. It was accepted and will be presented by Michal or Ranganai at WISE in Poznan, Poland on Oct 5-7.

Action AFI03_07	Ranganai Chaparadza, Michal Wodczak, Estelle Mancini	Work to put information on the main ETSI website on the AFI	15/10/09

c. [Communication Package (Preparing a leaflet + presentation)],

The AFI should consider organising an international conference. This will be considered for subsequent meetings.

Action AFI03_08	Laurent Ciavaglia With support from Ranganai Chaparadza	Propose an initial content/material or draft for the AFI brochure.	24/09/09

d. Identifying key Experts from strategic Initiatives or Forums we would like invited for presenting and discussing at the next AFI Meeting.

Ranganai to consider having invited speakers for future ISG meetings. To be arranged with ETSI.

9 Meeting Closure

a. Summary of decision & actions

Done

b. Dates and place of future meetings

AFI confirmed the following dates and places for future meetings:

AFI#4: 7-8 December 2009, Sophia-Antipolis:
http://webapp.etsi.org/MeetingCalendar/MeetingDetails.asp?mid=12318

AFI#5 : scheduled Early March 2010, Sophia-Antipolis, TBC

ANNEX A: List of Participants

Ranganai Chaparadza	Fraunhofer Fokus
Kevin Quinn	TSSG
Michal Wodczak	Telecordia
Laurent Ciavaglia	Alcatel Lucent
Laurent Vreck	ETSI
Ultan Mulligan	ETSI
Estelle Mancini	ETSI
Tasos Zafeiropoulos	GRNet
Thannasis Liakopoulos	GRNet
Said Soulhi	Ericsson
Juan Manuel González	Telefonica I+D
Lambros Sarakis	National Centre for Scientific Research Demokritos
Apostolos Kousaridas	National and Kapodistrian University of Athens
Kostas Tsagkaris	University of Piraeus, Greece
Mick Wilson	Fujitsu Labs Europe
Pertti Juahiainen	European Commission

ANNEX B: List of Documents

AFI03_01	Draft Agenda	ISG Chairman
AFI03_01r2	AFI#3 Agenda (approved)	ISG Chairman
AFI03_02	List of decisions and actions of AFI meeting#2	ISG Chairman
AFI03_03	Minutes of AFI meeting#2	ISG Chairman
AFI03_04	Use Cases contribution for Work Item #1	University of Athens
AFI03_05	Potential updates to ToR	Telcordia
AFI03_06	Use cases contribution to Work Item #1	University of Piraeus Research Center
AFI03_07	Use Cases contribution for Work Item #1	GRNET
AFI03_08	Contribution to Work Item #1	Telcordia
AFI03_09	Operators requirements for an Autonomic Network	Telefónica
AFI03_10	Liaison Statement to ITU FSGN-Group	ISG Chairman
AFI03_11	Paper to 10th International Conference on Web Information Systems Engineering (WISE) 2009	Telcordia
AFI03_12	Orange and Alcatel-Lucent contribution to WI#1	Laurent Ciavaglia, Alcatel-Lucent
AFI03_13	Auto-Configuration/Self-Configuration of Routers using Routing Profiles in Fixed Network Environment	Fraunhofer FOKUS
AFI03_14a2	3GPP Template for SON Use Cases	Fujitsu Labs of Europe
AFI03_15	Minutes of AFI meeting#3 TB	TB Chairman
AFI03_16	Template draft GS AFI 001 v001	Ultan Mulligan, ETSI

All documents available from
http://webapp.etsi.org/rmeetingDocuments/ViewDocumentList.asp?MTG_Id=12317

Title*: Minutes of AFI meeting#04
from Source*: Chairman, Secretary
Source contact *ranganai.chaparadza@fokus.fraunhofer.de, kquinn@tssg.org*

Submitted To*: **ISG AFI**

Relevant WI(s), or deliverable(s):
Agenda Item:
Submission date*:

Document for*:

Decision	
Discussion	x
Information	

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1 Opening

1.1 Welcome, Introduction, Local Arrangements

The meeting was opened by the Chairman, Ranganai Chaparadza who welcomed the participants.

1.2 Roll call

Every participant presented himself/herself.

1.3 IPR Call

Ranganai Chaparadza, AFI Chairman, read the IPR call. There was no response to the call.

Action ID	Assignee	Description	Status
Action AFI04_01	AFI Secretary/ AFI Chairman	Put the IPR text on the agenda for each meeting.	Open

Orange sought some clarification on the details of the IPR text. ETSI members responded.

Read access to AFI documentation will shortly be given to all ETSI members.

1.4 Adoption of the Agenda

The Agenda was adopted with the following modifications.
The following item was added back to the Agenda:

- A time to present new scenarios was added on day 1 – Item 3c

2 Decisions and Actions from previous meeting

Previous Actions Items

Action ID	Assignee	Description	Status
Action AFI03_01	All (who have provided scenarios)	Migrate Scenarios to the new template	Completed
Action AFI03_02	Ranganai Chaparadza	Provide an example scenario	Completed
Action AFI03_03	Telefonica I+D	Provide an updated version of the requirements	Completed
Action AFI03_04	Work Item #1 Rapporteur	Audio Conference on Work Item #1 6 Nov 2009, 10am to 12am CET Meeting URL : https://www2.gotomeeting.com/join/841770835 Meeting Password: AFIVIRTUAL Or, call in using your telephone (national phone number will be provided by the application once logged). Access Code/ Meeting ID: 841-770-835 Audio PIN: Will be assigned to each participant after joining the meeting	Completed
Action AFI03_05	Ranganai Chaparadza	Update the Liaison communication text	Completed
Action AFI03_06	Ranganai Chaparadza	Identify who is steering the PPP and send information on the AFI	Completed

Action AFI03_07	Ranganai Chaparadza, Michal Wodczak, Estelle Mancini	Work to put information on the main ETSI website on the AFI	15/10/09 Discuss further in next meeting #5.
Action AFI03_08	Laurent Ciavaglia With support from Ranganai Chaparadza	Propose an initial content/material or draft for the AFI brochure.	Completed

3 Work Item (WI) #1 [Scenarios, Use Cases and Requirements for Self-Managing Future Internet] Progress/Review

a. Presentation of the current state of the Draft [by WI#1 Rapporteur].

Tayeb Ben Meriem presented recent changes to the different versions of the Scenarios document.

Use Case and Scenario confusion. Scenarios are high-level description of where autonomics and self-management might be employed to solve a problem(s) with current practices in network management and operation and/or to solve problems associated with the limitations of current technologies in the respective domain(s). Scenarios should give rise to Use Cases which are limited, well-defined user interactions with the system (i.e. the autonomic/self-managing system) – defining actors, interfaces (i.e. system boundaries), inputs, outputs, etc.
Systems Engineering has a strict definition of Use Cases.
Currently we have scenarios. Use Cases will be developed from the scenarios.

b. Editing session to address the comments and updates from the individual contributions of Scenarios, Requirements and Use Cases.

Discussion on the suitability of the current **Scenario Description Template** (the Template was then revised and finalized) .

c. Any *New Contributions on Scenarios, Requirements and Use Cases* by Contributors [very brief presentation if possible]

Benoit Radier presented scenarios from Orange Labs:

- Incorporating Legacy Devices, use of Agents, who controls the Home Gateway Agents.
- Future Networks, operator and/or user control, overlay autonomic services
- Requirements: Security, Control, All Self-* functionalities, SLAs.

Thanassis Liakopoulos presented an Autonomic Network Monitoring Scenario. How to provide a service in a MANET. GRNET have shown simulations of the solutions to scale to 400 nodes. Investigating the ability to create services.

Discussion on the process to move from Problem to Requirements to Solution and the players involved.
Discussion on the different players.

Decision: The AFI desires that scenarios should focus on the challenge from the operator point of view.

Decision: For the same scenario, requirements can be different for different player.

Decision: The scenario template is finalised and will be uploaded to the portal.

Extra information on the scenarios can be included in appendixes.

Action ID	Assignee	Description	Status
Action AFI04_02	Tayeb Ben Meriem	Upload Final Scenario Document to AFI Portal	Open Due 8/12/09

The **Requirements Description Template** has been provided by Telefonica and adapted by Orange.
Discussion on the meaning of Autonomic Management Requirements.

Changes were made to the Requirements Template

Decision: AFI Group agreed on Requirements Template.

Action ID	Assignee	Description	Status
Action AFI04_03	Tayeb Ben Meriem	Orange and Telefonica to finalise the Requirement Template and bring any further changes back to the group. Communicate back to the group on whether you think the current Template expresses the Requirements in such a way that requirements analysis is made easier afterwards i.e. when we start mapping to the architecture(s) and technologies.	Open Due 17/12/09
Action AFI04_04	Scenario Owners	Migrate Scenarios to new template	Open Due 21/12/09

Decision: The owner of a Scenario owns the related requirements.

d. Discussion on how Types of Network Environments influence the Structuring of the Specifications, the focus and prioritization of Scenarios and Use Cases

Scenarios should be grouped by Network Environment – some may be Network Environment independent.
For Requirements (RQs), we will make a decision how to group once the requirements are being created. Requirements IDs could be required as well.

Action ID	Assignee	Description	Status
Action AFI04_05	Tayeb Ben Meriem	All Requirements should be clearly written with all terms clearly defined. A reviewer will be assigned to review each requirement	Open ongoing

e. Next actions for progressing the Draft

Discussed above with related action items.

4. Conclusions on Work Item (WI) #1 [Scenarios, Use Cases and Requirements for Self-Managing Future Internet]

Completed.

5. Work Item (WI) #2 Generic Autonomic Network Architecture (GANA) Progress/Review

a. Discussions on the Concepts, Design Principles, and identifying building blocks and how they articulate.

Ranganai Chaparadza presented some of the high-level requirements for the required Architectural Reference Model for Autonomics and Self-Management within individual node/device architectures as well as the network architecture as a whole, as captured by the proposed GANA and the analysis of different architectures carried out to date.

Discussion on how the GANA will be impacted by the requirements.

GANA will be used as a framework to help implement the requirements. GANA will be refined to meet the requirements as the requirements are defined. GANA can be applied as a Reference Model for Autonomics and Self-Management in an incremental/evolutionary approach to evolving today's network technologies and paradigms towards achieving autonomic and self-management functionality.

b. Early ideas on how to *map* the Scenarios, Use Cases and Requirements to GANA.

Laurent Ciavaglia presented the plan for WI #2. We plan incremental approaches to GANA with refinements to the architecture based on the requirements.
The GANA architecture must be evolvable.

Action ID	Assignee	Description	Status
Action AFI04_06	Laurent Ciavaglia	Organise a review of the SDOs and their work in the Future Internet Architecture/Autonomics areas. Prior art from other sources should also be considered (Projects, Publications, etc)	Open Due 31/12/09
Action AFI04_07	Laurent Ciavaglia/ Ranganai Chaparadza	How to capture functional as well as non-functional requirements like Security, Scalability, Stability	Open Due 31/1/09
Action AFI04_08	Ranganai Chaparadza	How to capture conformance and test procedures to show the derived GANA architecture meets the requirements.	Open Due 31/12/09
Action AFI04_09	Laurent Ciavaglia	Send out Table of Contents for WI #2 document - assignments of sections to people.	Open Due 31/12/09

c. Discussion on the Evolution Path for today's network models and protocols like IPv6.

Carried forward to AFI meeting #5

d. Discussion on Structuring WI#2 Specifications in terms of GANA and the detailed architecture(s) that must derive from GANA Specs.

Discussed above.

e. Discussion on the approach to WI#2 Specifications e.g. Identifying relevant Architectures such as the GANA Reference Model from EFIPSANS that need to be looked at by AFI Work Item #2.

Discussed above.
AFI specifications are intended to be submitted to ETSI groups like TISPAN and 3GPP. AFI will create the deliverables already defined in the Work Items but will also consider longer term architecture for the future for the Autonomic Internet.

AFI should be complimentary to the activities taking place in the 3GPP and NGMN. AFI should be concerned with end-to-end network autonomic issues and Fixed Mobile Convergence.

6. Brief Presentations by representatives of some EU projects represented at the AFI meeting (only for information purposes for the AFI).

What the project is doing in Autonomics/Self-Management, **Scenarios, Use Cases, the Self-* functions, Control-Loops and associated autonomic elements [5-10 minutes per presenter]**

1. Magneto Project
   Jesse Kielthy, WIT

   HAN autonomic considerations.

2. CARMEN Project
   Szymon Szott, AGH

   Discovery, Monitoring Functionality

3. E^3 Project
   Marios Logothetis, UPRC

   End-to-End Efficiency

7. ISG AFI budget for 2009 (a few words to let newcomers know: There is no change to ISG AFI budget)
The AFI does not currently provide any budget to its members.

8. Any Other Business

a. [Liaisons Issues and positioning the AFI vs. other initiatives/SDOs e.g. engaging the "PPP initiative"], A few minutes for discussion with invited guests (if any).

AFI read and discussed the received Liaison Statement from the ITUT-FG-FN Group. A response to the ITUT-FG-FN Group will be created at the beginning of 2010 and will be sent to the Group.

Action ID	Assignee	Description	Status
Action AFI04_10	Ranganai Chaparadza	Determine how to interact with the MOI ISG.	Open Due 31/1/10
Action AFI04_11	Ranganai Chaparadza	Respond to FG-FN.	Open Due 31/12/09
Action AFI04_12	Tayeb Ben Meriem	Contact ITU-T Management Group	Open Due 31/12/09
Action AFI04_13	Ranganai Chaparadza	Contact IEEE	Open Due 31/12/09

b. Moderation of the AFI Mailing list by officials outside of ETSI

The AFI cannot edit the AFI mailing list. Estelle Mancini will subscribe new members to the mailing list.

c. Communication Package (Preparing a leaflet + presentation),

Action ID	Assignee	Description	Status
Action AFI04_14	Ranganai Chaparadza, Laurent Ciavaglia, Michal Wodczak	Create an AFI brochure	Open Due 31/1/10

d. Preparation of ETSI workshop on 10-11 March 2010

Action ID	Assignee	Description	Status
Action AFI04_15	Ranganai Chaparadza	Identify Resources who can attend the ETSI workshop 10-11/3/10	Open Due 31/1/10

e. Actions wrt. AFI 1st anniversary (e.g. special news/communication)

Action ID	Assignee	Description	Status
Action AFI04_16	Ranganai Chaparadza	Create a Press Release for the 1st year anniversary	Open Due 31/1/10

f. Plan AFI meeting dates for 2010

This will be agreed on the mailing list

g. AFI web page on the ETSI web site (including presentation and reference areas)

This will be discussed on the next meeting

9 Meeting Closure

a. Summary of decision & actions

Completed

b. Dates and place of future meetings

As above, this will be agreed on the mailing list

ANNEX A: List of Participants

Ranganai Chaparadza	Fraunhofer Fokus
Kevin Quinn	WIT
Jesse Kielthy	WIT
Michal Wodczak	Telecordia
Laurent Ciavaglia	Alcatel Lucent
Samir Ghamri-Doudane	Alcatel Lucent
Marios Logothetis	UPRC
Ultan Mulligan	ETSI
Estelle Mancini	ETSI
Thanassis Liakopoulos	GRNet
Apostolos Kousaridas	National and Kapodistrian University of Athens
Tayeb Ben Meriem	France Telecom
Benoit Radier	France Telecom
Maurice Israel	Thales
Nguengang Gerard	Thales
Mick Wilson	FLE

ANNEX B: List of Documents

AFI04_01	Draft Agenda	ISG Chairman
AFI04_01r1	Draft Agenda	ISG Chairman
AFI04_01r1	LiaisonStatement_to_ITU-FG-GN-Group	WG Chairman
AFI04_03	LiaisonStatement_to_ITU-FG-GN-Group_v2	WG Chairman
AFI04_04	Call for IPRs	ETSI Secretariat
AFI04_05	Draft Report of AFI#3	AFI Chairman
AFI04_06	LiaisonStatement_to_ITU-FG-GN-Group_v4	TB Chairman
AFI04_07	What_is_AFI__xx_DisseminationContent	TB Chairman
AFI04_08	AudioConferenceAgenda	TB Chairman
AFI04_09	Overview of SON Activities within End-to-End Efficiency (E3) project	University of Piraeus Research Center (UPRC)
AFI04_10	E3 Evolution: Vision and Future Plans	University of Piraeus Research Center (UPRC)
AFI04_10r1	E3 Evolution: Vision and Future Plans	University of Piraeus Research Center (UPRC)
AFI04_10r2	E3 Evolution: Vision and Future Plans	University of Piraeus Research Center (UPRC)
AFI04_10r3	E3 Evolution: Vision and Future Plans	University of Piraeus Research Center (UPRC)
AFI04_11	AFI #4 Meeting Minutes	AFI Secretary
AFI04_12	Work Item 2 - Ideas for discussion	WI #2 Rapporteur
AFI04_12r1	Work Item 2 - Ideas for discussion	WI #2 Rapporteur
AFI04_12r2	Work Item 2 - Ideas for discussion - revised with group comment	WI #2 Rapporteur
AFI04_13	Magneto Project Slides	Jesse Kielthy

All documents available from

http://webapp.etsi.org/rmeetingDocuments/ViewDocumentList.asp?MTG_Id=12318