



BIONETS E-News

Bio-Inspired Networks and Services

www.bionets.org

Issue 1, July 2006

Dear BIONETS members,

As always, we welcome your comments and suggestions. If you would like to participate or contribute to the content of the E-Newsletter, please feel free to contact us at bionets-website@bionets.org

BIONETS News

- The DistTrust workshop took place in Barcelona on April 28th, 2006. A report of the workshop outcomes can be found at:
<http://www.disttrust.org/fetgc-45.pdf>
The talks given by D. Schreckling and B. Crispo can be found at:
http://www.bionets.eu/docs/BionetsSecurity_v4.pdf
<http://www.bionets.eu/docs/Distrust.pdf>
- A panel on *Situated and Autonomic Communications* took place in Mykonos on June 7th, within the framework of the IST Mobile Summit. The panel was organized by C. Diot (Thomson), and included speakers from the SAC projects (R. Gass, Intel, representing HAGGLE, D. Miorandi, CREATE-NET, representing BIONETS, K. Salamatian, EPFL/LIP representing ANA) as well as A. Ferschla (Univ. Wien) on behalf

of BTH - Pervasive Computing. The panel was chaired by F. Sestini (EC). The BIONETS presentation given can be found at:
http://www.bionets.eu/docs/miorandi_bionets.pdf

- A panel on *Autonomic Communication and Wireless Cognitive Networks* took place in Mykonos, June 8th, within the framework of the Crown-Com conference (<http://www.crowncom.org/>). The panel included presentations from D. Boscovic (Motorola), R. Popescu-Zeletin (FOKUS), G. Pujolle (LIP6), F. Sestini (EC), M. Smirnov (FOKUS) and J. Strassner (Motorola). A report of the panel outcomes can be found at:
<http://www.autonomic-communication.org/publications/doc/AC-CognitiveRadio-PanelReport-v2.pdf>

Contents of this issue:

BIONETS News	1
Upcoming Project Meetings	2

New Deliverables & Publications	2
Open CfPs and Submission Deadlines	3
Upcoming Conferences and Symposia	3

Upcoming Project Meetings

WP 3.2 Kick-Off Meeting

Berlin, August 14-15

The kick-off meeting of WP3.2, "Autonomic Service Life-Cycle and Service Ecosystems" will take place in Berlin on Aug. 14th-15th, hosted by TU Berlin in Kaiserin-Augusta-Allee 31, 10589 Berlin. The goal of this kickoff meeting is threefold:

- 1) Review the inputs from WP3.2 and the other work packages
- 2) Based on that structure further work of project partners for the next months
- 3) Come up with an initial ToC for the D3.2.1

Preliminary agenda:

Monday (14.08.)

12:00-12:20 Presentation of goals for the Kickoff meeting and the work on WP3.2

12:20-13:00 Overview on inputs from WP3.1

13:00-15:00 Discussions on the Tasks of WP3.2 (Part I)

15:00-15:20 Coffee Break

15:20-18:30 Discussions on the Tasks of WP3.2 (Part II)

Tuesday (15.08.)

10:00-11:30 Discussion on the TOC for D3.2.1

11:30-11:50 Coffee break

11:50-12:15 Agreement on contributions to D3.2.1

12:15-13:00 Milestones and Coordination

Contact person: Ilja Radusch (TUB).

New Deliverables & Publications

Application scenario analysis, network architecture requirements and high-level specification

Authors: D. Miorandi, F. De Pellegrini, I. Carreras, G. Alfano, M. Tahkokorpi, S. Szabo, J. Latvakoski, D. Schreckling, E. Borgia, A. Panagakis, A. Vaios
Type: Deliverable (D1.1.1)

Link: http://www.bionets.eu/docs/d111_v10.pdf

This document outlines the principles and the basic building blocks of the BIONETS network architecture, addressing the requirements and features needed in order to provide an efficient support to self-evolving BIONETS services. As such, the document does not contain in-depth descriptions or analysis of the entities constituting such networks (e.g., devices, protocols, algorithms etc.) but, rather, how such entities shall be put together to achieve the desired goals. The goal of this document is therefore to lay down the foundations of BIONETS networks. The actual study/definition/design/analysis of the solutions to be employed is therefore out of the scope of the document. The document details what are the entities constituting BIONETS networks, and how they interact (in terms of exchanges of information) in order to achieve the goal of efficiently support the needs of self-evolving services. Roughly speaking, the BIONETS network architecture tackles two main issues related to the deployment of pervasive computing/communication environments: heterogeneity of the devices capabilities and scalability of the

overall networked system. This will build on preliminary technical work carried out within the project consortium on architectures for large-scale information systems, as well as on state-of-the-art studies in related fields (e.g., peer-to-peer computing and wireless sensor/ad hoc networks). Security issues will be addressed as fundamental and integrating part of the network architecture.

Service architecture: requirement specification and concept definition

Authors: Janne Lahti, Juhani Latvakoski, Jyrki Huusko, David Linner, Ilja Radusch, Francoise Baude, Ludovic Henrio, Daniel Schreckling, Francesco De Pellegrini

Type: Deliverable (D3.1.1)

The goal for this deliverable is to provide the initial service architecture and to identify the fundamental service requirements for the BIONETS application scenarios, in which the services are no longer isolated and hardly reachable, but form social, self-organizing networks. The service architecture needs to cope with the issues such as the service management, content and terminal adaptation, service discovery and security aspects as well as the evolution of services and life-time. In addition, the service should be able to work properly on top the network architecture. This kind of "disappearing network" environments, where availability of resources, network conditions and user requirements can change

dynamically and where the co-operation of nodes is not guaranteed and disconnected operations are common, generate challenges for service architecture. Based on the requirements rising from the different application scenarios, evolution, service autonomy and underlying network architecture, a new BIONETS service framework, which is able to cope with the challenges in efficient and cost-effective way, will be defined.

A Framework for Opportunistic Forwarding in Disconnected Networks

Authors: I. Carreras, D. Miorandi and I. Chlamtac
Type: Conference Paper (Proc. of Mobiquitous 2006)

Link: <http://www.bionets.eu/docs/mobiquitous2006.pdf>

In this paper, we analyze the performance of a family of opportunistic forwarding schemes (the K -copy relaying strategies) over disconnected wireless networks. We introduce a classification of mobility models based on their dynamic properties, and characterize the M^2 (Marks-Memoryless) class. Statistical tools are combined with numerical simulations to show that some of the most used mobility models in the literature fall within the M^2 class. A mathematical framework is provided for evaluating the performance of opportunistic forwarding schemes in the presence of M^2 mobility, and it is shown that the niteness of the mean time necessary to deliver a message depends only on the mobility characteristics and not

on the relaying protocol specification.

Service Evolution in a Bio-Inspired Communication System

Authors: D. Miorandi, L. Yamamoto and P. Dini
Type: Conference Paper (Proc. of SOAS 2006)

Link: http://www.bionets.eu/docs/myd_soas06.pdf

An autonomic network must work unsupervised, therefore must be able to respond to unpredictable situations. The BIONETS project is working towards resilient network services that are able not only to perform short-term adaptations to the environment but also long-term evolution of new functionalities. To this end, a bio-inspired approach is proposed, based on an extension of evolutionary computing to a pervasive environment where disconnected operation is common, and where the fitness of a service is evaluated at runtime. Crossover or recombination of existing services occurs as opportunistic exchange of parameters or code, producing new generations of services which proliferate in the network or are discarded by a mechanism similar to natural selection. In this paper we review the research lines related to autonomic service evolution currently in progress within BIONETS. A catalytic graph model describes the flow of opportunistic evolutionary interactions, shaped by cascade fitness evaluations. We present a research agenda and possible avenues leading to self-evolving services, and discuss their potential impact on future service engineering.

Open CfPs and Submission Deadlines

- **BIONETICS 2006**
Submission deadline: July 31st
 Web site: www.bionetics.org
- **IEEE INFOCOM 2007**
Submission deadline: August 1st
 Web site: www.ieee-infocom.org/2007/
- **PERCOM 2007**
Submission deadline: September 1st
 Web site: www.percom.org
- **EWSN 2007**
Submission deadline: September 3rd
 Web site: www.dritte.org/ewsn

Upcoming Conferences and Symposia

- **SOAS 2006**
Erfurt (DE) - September 18-20, 2006
 International Conference on Self-Organization and Autonomous Systems in Computing and Communications
- **ACM MobiCom 2006**
Los Angeles, CA - September 23-29, 2006
 The Annual International Conference on Mobile Computing and Networking
- **Autonomic Networking 2006**
Paris (FR) - September 27-29, 2006
 Autonomic Networking will be the first inter-

national conference on all the aspects of autonomic networking (architecture, services, tools, security, communications, ...). This conference groups four past events: SMARTNET focused on tools for the autonomy; INTELLCOMM on autonomic management and services, IWAN on active networks and WAC on autonomic communications.

- **BIONETICS 2006**

Cavalese, Trento, Italy - December 11-13, 2006

The BIONETICS conference aims at bringing together researchers and scientists from several disciplines in computer science and engi-

neering where bio-inspired methods are investigated, with final goal of obtaining methods on how to engineer technical artifacts which have similar high stability and efficiency as biological entities often have.

- **ESAS 2006**

September 20-21, 2006, Hamburg, Germany

Third European Workshop on Security and Privacy in Ad hoc and Sensor Networks (ESAS 2006) in conjunction with the European Symposium on Research in Computer Security (ESORICS 2006)