OneFIT-UniverSelf-One
Federation Workshop
at the
Future Network and Mobile Summit 2011
17 June 2011, Warsaw - Poland

1. Workshop Overview

The different types of networks available, the range of networking technologies, variety of traffic types with their individual requirements in terms of QoS and security and finally the number of administrative domains that separate the networks produces a rather complex communication system. This complexity affects the access and core network as well as the high speed backbone, and managing the resources of all of these efficiently has yet to be accomplished.

Federation of the currently used approaches and complementing them with new management methods will help overcoming the structural limitations of the communication infrastructures and their management systems. Networks should be managed to be able to allow dynamic, efficient and scalable support of the vast set of user requirements and of applications across federated administrative and technology domains.

The workshop discussed the different approaches that are investigated in the ICT FP7 projects OneFIT, UniverSelf and One. The aim was to work out how the integration and interworking problems can be solved, how networks and their management can be federated using the approaches investigated in the three projects. The aim of the workshop was to exploit complementarities between the approaches and to identify any potential omissions when looking at the whole network from access, core to backbone.

2. Workshop Organisers

The workshop was organised jointly by the three FP7 projects UniverSelf (http://www.univerself-project.eu/), OneFIT (http://www.ict-onefit.eu/) and One (http://www.ict-one.eu/). The organisation committee included Laurent Ciavaglia and Samir Ghamri-Doudane (representing UniverSelf), Panagiotis Demestichas and Klaus Moessner (representing OneFIT) and Admela Jukan (representing One).

The discussions were on an advanced technical level, after a round of introductions of the main concepts, and in particular an overview of how federation will be approached by each of the projects, more detailed presentations and a panel discussion followed.

3. Workshop Objectives

The workshop primarily intended to raise further awareness about the problem, but also about the solution approaches being followed. It aimed to help gaining awareness in industry and to identify the most pressing matters in terms of areas for industry consensus.

The second aim was to inspire other researchers and projects to collaborate and contribute to the solution of the problems that UniverSelf, OneFIT and One are tackling. Finally, it was expected to not only federate the networks and management systems of networks, but also to facilitate a more common approach to overcome the complexity and management problem, not only across the organizing projects, but also with other projects that attended the workshop. The outcomes may be discussed in concertation or cluster meetings.

4. Workshop Agenda and Presenters

The workshop was structured in four parts, distributed over two sessions. The workshop was chaired by Klaus Moessner (University of Surrey), and the Panel session was moderated by Antonio Manzalini (Telecom italia Labs).

4.1 Part A "The Management Challenge": Overview of the Approaches

UniverSelf – A Unified Management Framework for Operator - Governed Networks and Services
Gerard Nguengang Fanmegne, THALES COMMUNICATIONS SA, France

OneFIT - Opportunistic Networks for Efficient Application Delivery in the Future Internet
Jens Gebert, Alcatel-Lucent Deutschland, Bell Labs, Germany

One - An IP and Transport Layer Management Ecosystem
Mohit Chamania, Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany

4.2 Part B "Management Systems"

UniverSelf – "Network Empowerment - Finding the Right Key to the Lock"
Markus Gruber, Alcatel-Lucent, Germany

OneFIT - Algorithms for Opportunistic Network Management and Infrastructure Coordination
Oriol Sallent, Universitat Politecnica de Catalunya, Spain

ONE - Architecture and Cooperation with External Components and Management Systems
Maciej Maciejewski, ADVA Optical Networking, Poland

4.3 Part C: Federation Approaches and Way Forward

UniverSelf – Role and Impact of Autonomics in a Federated Eco-system
Laurent Ciavaglia, Alcatel-Lucent France, France

OneFIT - Control Channels for the Cooperation of Cognitive Management Systems
Marcin Filo, Wroclawskie Centrum Badan EIT+, Poland

ONE - Federation Use Cases
Oscar Gonzalez de Dios, Telefonica I+D, Spain

4.4 Part D: Panel "Network Federation - Way Forward"

Antonio Manzalini (TI) - Moderator
Laurent Ciavaglia, Alcatel-Lucent France, France (UniverSelf)
Prof. Panagiotis Demestichas, University of Piraeus, Greece (OneFIT)
Oscar Gonzalez de Dios, Telefonica I+D, Spain (One)

5. Workshop report

Part 1 – Management challenges & management system

45+ attendees, joint initiatives from One, Onefit and UniverSelf, 9 presentations + panel

5.1 Part A "The Management Challenge": Overview of the Approaches

- UniverSelf (G. Nguengang, Thalès, France)

  Operational complexity in current networks: e.g. flooding of alarms when anomaly occurs, poor correlation tools => operators focused on most critical ones

  Needs: automated correlation of alarms and provision of semantically enriched events to ease the work of operators, automated root cause and impact analysis on an e2e basis, …

  Univerself => unified management fwk to enable

  > Technology agnostics for e2e service mgt
  >
  > Unification o existing mgt approaches
  >
  > Network governance
  >
  > Mgt of future networks
  >
  > Embedding autonomic paradigm in any type of network

  Two approaches:

  > Top down based on SoA and reqs
  >
  > Bottom up based on used cases (incl rqs, refinement, implementation)

  SoA: 11 architectures compared with 10 criteria

  Conclusions: most of architecture are closed systems, not interoperable, poor stds, confidence and trust have not been considered previously, very low emphasis on service mgt over multiple network segments

  Groups of Functional groups: Governance, enforcement, Intelligence, ?

- OneFIT (J. Gebert, ALU BL Germany)

  Opportunistic networks and cognitive mgt systems

  > For last mile radio access, coordinating the relations between multiple wireless connected devices

- One (M. Chamania, TU Braunschweig, Germany)

  Focus on facilitating the coordination between the IP and optical network mgt

  Pb: slow provisioning time scale in IP over WDM, due to very different management processes/tools at the two layers.

  3 challenges: still multiple manual interactions between 2 depts; planning operations typically over provision resources, to eliminate frequent multi-layer interactions; duplication of functions

  Design of the ONE adapter between the IP NMS and the transport NMS.

  Interesting presentation. didactic, technical and clear.

  Link with network morphing use case

  Link with umf design (see architecture overview)

5.2 Part B "Management Systems"

- UniverSelf (M. Gruber, ALU BL Germany)

  Clear and didactic. the real meat for algorithms

  Question from Klaus M.: context information, how to avoid the information overkill?

Markus: end goal of the algorithms that will be developed (integrate filtering function)

- OneFIT - Algorithms for Opportunistic Network Management and Infrastructure Coordination
  Oriol Sallent, Universitat Politecnica de Catalunya, Spain

- ONE - Architecture and Cooperation with External Components and Management Systems
  Maciej Maciejewski, ADVA Optical Networking, Poland

5.3 Part C: Federation Approaches and Way Forward

- UniverSelf – Role and Impact of Autonomics in a Federated Eco-system (Laurent Ciavaglia, Alcatel-Lucent France, France)

  Presentation available on the wiki.

  Main messages were: definition of federated eco-system (shared with ETSI/AFI and SotA), common characteristics lead to definition of unified/federation framework ⮕ UMF, role and impact of autonomics expressed via 4 business scenarios, highlight of the opportunities and bottlenecks.

- OneFIT - Control Channels for the Cooperation of Cognitive Management Systems (Marcin Filo, Wroclawskie Centrum Badan EIT+, Poland)

- ONE - Federation Use Cases (Oscar Gonzalez de Dios, Telefonica I+D, Spain)

5.4 Part D: Panel   "Network Federation - Way Forward"

Panelists were: Panagiotis Demestichas, Oscar Gonzalez de Dios and Laurent Ciavaglia.

Moderator was: Antonio Manzalini.

Questions exchanged with the panel and the audience:

- What are the two main challenges for federation in telecommunication networks/environments?

  Laurent; two levels

  > 1st level, single operator, multiple domains: progress toward unified management and control systems needs technological enablers and adoption by operators.

  > 2nd level, multiple operators: not only the technological barrier but also the business (/regulatory) one. So liaison with the business/service plane and control layer, and exchange of information in inter-carrier/inter-domain.

  Panagiotis; two issues

  > 1st challenge derives from the following rationale: network infrastructures are heterogeneous; different management systems and solutions will exist in each domain; the federation of these solutions is of primary importance, in order to obtain an end-to-end, optimal and efficient management ecosystem.

  > 2nd challenge: the Future Internet will encompass concepts like machine-to-machine communications, the Internet of Things, cognitive radio networks, etc.; these will have to operate in a manner that is coordinated with the infrastructure; therefore, this yields the second challenge for federation.

- What are the two main opportunities

  Laurent: trust and certification for sure (see CGE/MEF experience). If Telco's actors, doesn't make the move, then some others will make it (e.g. Apple MVNO initiative…) and the situation (power/ecosystem) will change/be changed.

  Panagiotis: Both challenges presented above are also opportunities for today. It would be a pity to miss them. We have instruments for research and standardisation in Europe (and beyond) that can ensure proper addressing of the challenges and worldwide impact. Work involves the identification of

actual problems that need to be solved today (stated by operators, manufacturers, etc.), the realization of the corresponding specification and development, prototyping, experimentation (followed by pilots and trials), validation and standardization.

(Would be good to get the answers from the panelists in the workshop report)

- Question from Klaus Moessner: past technologies have already failed even with huge effort in specifications and standardization (ex. ATM), what would guarantee this does not happen with autonomic networking?

  Laurent; there is no way to predict future for such situations. However, we can work on steering the technology and adoption in some directions. Standards is undeniably useful and sometimes a pre-requisite for industry-wide adoption. Work with customer on acceptation of the solution is also vital: autonomic networking will change.

  Panagiotis: it is a very important question. Standardization is one phase of the work that needs to be done. The first phase is to define actual problems, understand them, and have in mind things that need and can be improved. This can guarantee that we can avoid the situation indicated by the question.

- Question from the room:

  Working in satellite communications, how could your proposed unified management framework incorporate to include/be compatible with Sat com.?

  Laurent: satellite is a very good example of a case where autonomic (zero touch) management could apply. This is unmanned networks (similar to countries with very limited qualified workforce, Greenfield deployment in "hostile/remote" environments with limited infrastructure).

  Panagiotis: According to the federation approach and the unifying management framework the goal will be to see satellite communications as a component in a Future Internet context