

Introducing the Public Release of the Autonomic Network Architecture (ANA)

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The ANA (Autonomic Network Architecture) project aims at providing a framework to flexibly host, interconnect, and federate multiple heterogeneous “network instances” (e.g., IP, sensornets, MANETs, DTNs, etc) in an autonomic way, i.e. without requiring active human intervention. The guiding design principle is to strive for a maximum degree of flexibility at all levels of the architecture in order to inherently support heterogeneity and evolution.

The goal of this presentation is to describe the core abstractions and concepts of ANA and introduce their basic operation and interaction. While not autonomic themselves, the core architectural principles of ANA are an enabler for autonomicity by not imposing a “one-size-fits-all” approach where protocols and paradigms are fixed by the architecture. We indeed argue that only the capacity of the network to be polyfunctional and fully adaptable will fulfill the requirements of the “future Internet”.

On the technical side, the main pillars of ANA are communication *pivots* called information dispatch points (IDPs) which embed the concept of modularity at all levels of the “network stack”. IDPs provide a uniform way of indirection for decoupling functional entities (e.g., routing, naming, addressing, encryption, etc), thus enabling adaptive recomposition and evolution of protocol stacks with no static binding between rigid layers. Another core feature, or invariant, of ANA is that it provides a simple Application Programming Interface (API) to access node-local or network-wide functionality in a generic manner. This permits interactions between old and newly developed network protocols and algorithms in an easy way and also permits to instantiate unforeseen “protocol stacks”.

To illustrate the architectural concepts of ANA, the presentation will also shortly describe the features available in the first ANA software prototype and reference implementation, which will be released to the public at the end of June 2008.

The 4-years ANA project (2006-2009) is funded by the European Union under the FP6 proactive initiative on “Situating and Autonomic Communications” (SAC). With a budget of above 4 million Euros, ANA includes 10 European partners and 1 Canadian partner.

See <http://www.ana-project.org> for more details.