Motivation

- Today’s highly interconnected and complex networks require simplified management and control
- Autonomic Network Management (ANM) and Software Defined Networking (SDN) are promising solutions
- Focused research and experimentation on GÉANT testbed towards an AUTOmatic openFLOW (AUTOFLOW) facility
- Demystify the ANM/SDN relationship towards bringing “customizable ANM” into reality

Target

- Providing useful insight on the feasibility and prospected efficiency of the interplay among SDN/OpenFlow and Autonomics
- Instantiate and validate an ANM/SDN based framework to problems appearing in modern, core networks e.g. traffic engineering
- Creation and delivery of a “playground” composed of highly reusable software components

Experimentation Framework

**Autonomic Network Management**
- Governance
- Coordination
- Knowledge
- Autonomic Control Loops (ACLs)

A framework for the unified management of these loops

**Software Defined Networking**
- OpenFlow protocol
- Programmable devices
- Virtual Machines
- OpenFlow switches (Open vSwitch)
- Floodlight controller

**Use Cases**
1) ANM/SDN interplay
2) Experimentation set-up diversity
3) Lifecycle Management of ACLs
4) Policy-based Traffic Engineering
5) Coordination of ACLs
6) Knowledge derivation and sharing

**GÉANT OpenFlow facility**

**Northbound API**
- Seamless integration for ACLs
- HTTP/REST transparency
- Further abstraction from Flow → E2EFlow
- Utility methods for E2E flow handling

**Policy-based traffic engineering with OpenFlow**

- Minimization of Links
- Maximum Utilization
- Reduction of Jitter Variation
- Minimization of Packet Losses

**Two High Level Policies**
1) Energy Efficiency
2) Load Balancing

Appropriate configuration of flow tables