



IPv6 and Autonomic Networking

FP7 – EFIPSANS Project: 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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Outline of the Vision on “IPv6 and Autonomic Networking”

• Background

- The research area of **Autonomic Networking/Self-Managing Networks** is becoming hot and hot across the industry and academia, thereby calling for **Future Internet design**.
- The general understanding from the **Bled Conference on the Future of the Internet (April 2008)** is that **evolutionary approaches to Future Internet design are strongly desired**.
- ***The Speed of Transitioning to IPv6*** hinges on having an even richer insight into the benefits of IPv6 and the potential doors to new communication paradigms IPv6 protocols can open, apart from the large address space.
- **EFIPSANS envisions that current IPv6 and the extensibility of the IPv6 protocol framework opens the door to engineering autonomicity (self-managing properties) in systems, services and networks (a richer insight!).**
 - **Because:** IPv6 offers a lot of rich communication features and extensible communication possibilities beyond what is available in IPv4. To mention a few: ***auto-configuration, neighbor discovery, dynamic network re-numbering, improved routing mechanisms, improved QoS (Quality of Service) handling, improved transport efficiency, improved security and flexible protocol extensions, true End-to-End communication, etc.***

• The EFIPSANS Innovation and the Research Strategy

- **Explore and bring IPv6 into other strongly promising avenues** and stir up hot research issues around the hidden potential benefits for Transitioning, given that EFIPSANS seeks to produce a **rich insight into the role of IPv6 and its extensions in engineering "autonomicity" in networks, systems and services.**
- **Produce Extensions to IPv6 (IPv6++) and the corresponding network architectures required for engineering autonomicity in systems and networks.**





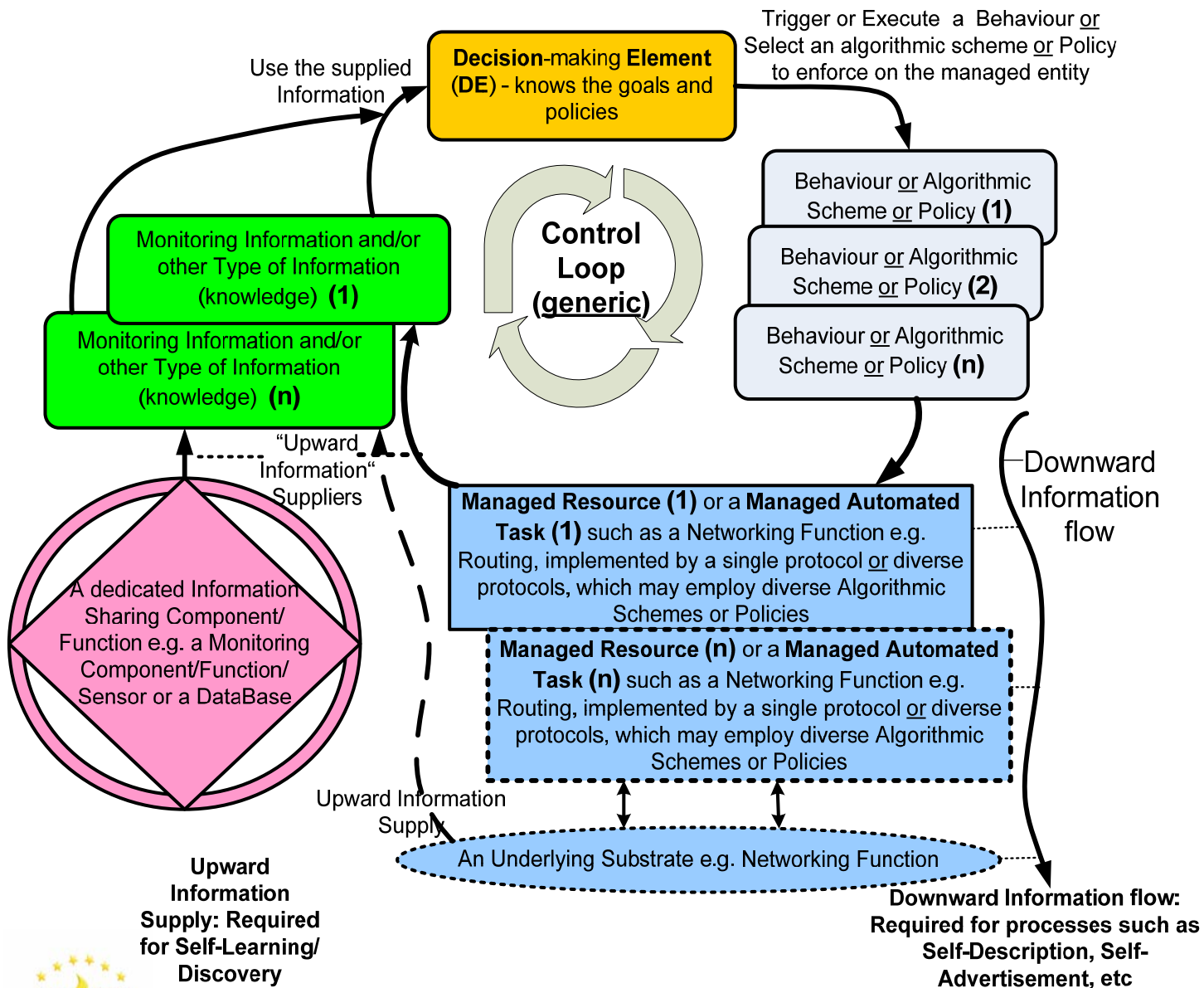
Outline of the Vision on “IPv6 and Autonomic Networking”

- **The EFIPSANS Research Outcome**
 - A set of **Specifications, Technical Reports and/or new Complementary Draft RFCs** consisting of: *the identified exploitable IPv6 features; propositions for extensions to the IPv6 protocols; concrete feature-combination scenarios for engineering autonomicity, and Experimental Results.* The new **Extensions to IPv6 features and network architectures imply New Complementary RFCs, which imply IPv6++ (IPv6 with Autonomic Flavours).**
- **Potential Strong Impact on Industry&Global Market related to IPv6 Evolution[Benefits and Who benefits]**
 - The **Specifications, Technical Reports and new complementary RFCs** will give a *richer documented insight* into the benefits of migrating to IPv6. For manufacturers, the specifications, reports and new complementary RFCs give an opportunity to implement novel extensions to IPv6 protocols in order to offer extended features in their products.
 - For network providers, service providers, researchers and other potential users of IPv6, the **Specifications, Technical Reports new complementary RFCs** give a good picture on how to view IPv6 and extended features as a platform for designing/building autonomic networks and services and, this also gives them a chance to think and contribute innovative ideas on the use of IPv6 protocols. Essentially, this will also help in closing the gap between IPv6 and autonomic networking.





Autonomic Systems Engineering: Concepts



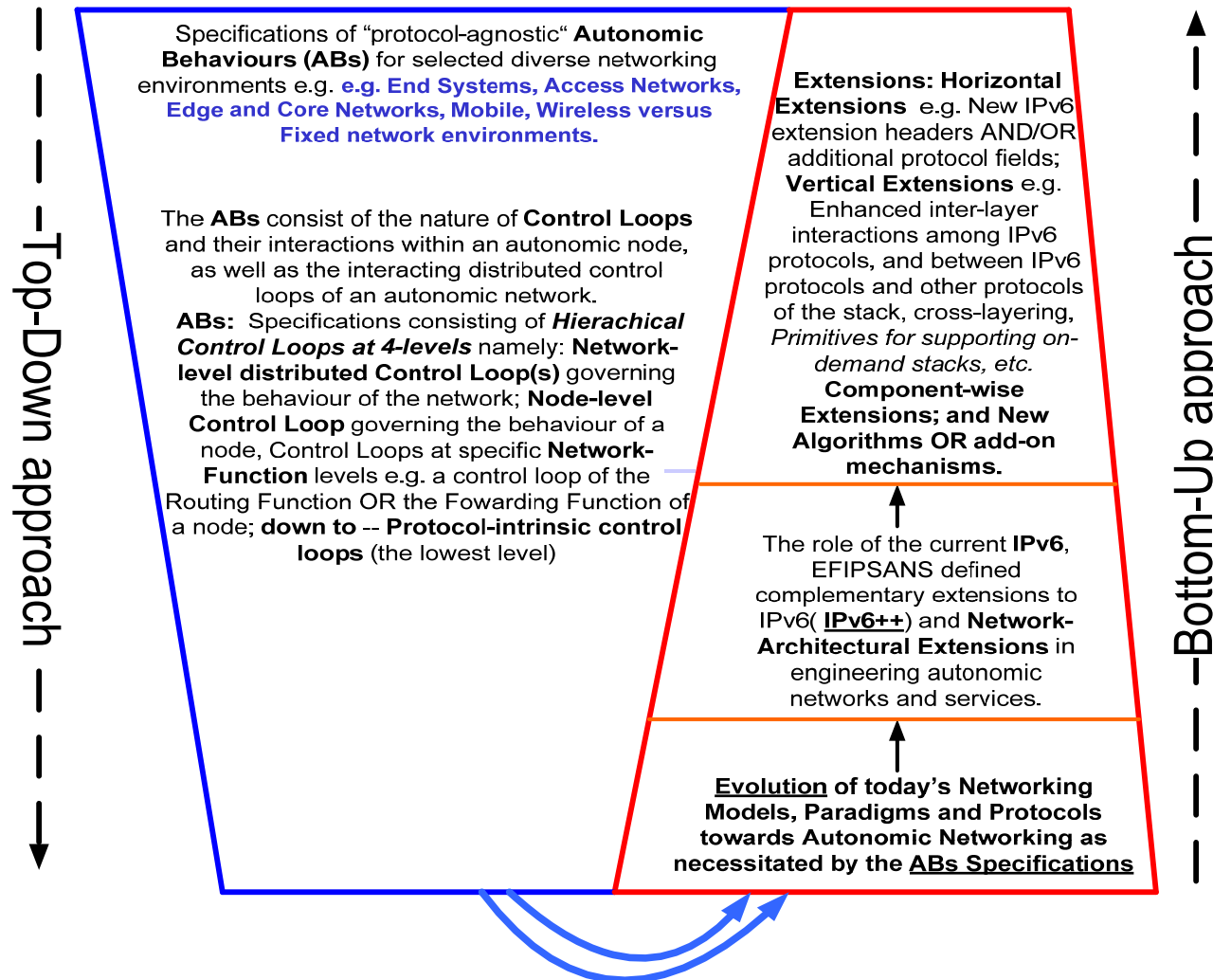
EFIPSANS aims at producing Standardizable Autonomic Behaviour Specifications, from which we should then try to see what role IPv6 can play and what Extensions can we introduce to IPv6 as necessitated by Autonomicity.





EFIPSANS Vision

EFIPSANS Vision: Produce standardizable, protocol-agnostic **Autonomic Behaviour Specifications (ABs)** for selected diverse networking environments; **then** use the **ABs** to create and drive an evolution path for today's Networking Models, Paradigms and Protocols, **in particular IPv6**, towards Autonomic Networking.



The ABs Specifications drive the Bottom-Up approach



IPv6 Day: Organized by the European Commission, May 30, 2008



Information Society