Design Principles for a Service-Aware Future Internet

Contribution by SOFI
Vision

- A service-aware Future Internet should enable and support a permanent, transparent, seamless, context-aware, empowering, and trustworthy interactivity, i.e. the “Perfect interactivity”.

[NESSI and xETPS Vision Document]
Service-awareness

• The FI should become a “service-aware” infrastructure and include services as first order abstractions:
  – core and enabling functionalities for service request and service delivery should be provided by the infrastructure on top of which applications run
• The FI should replace (or complement) the current data-oriented management with solutions more oriented to services and things, even at the layers below application
• The network as a whole should be able to manage these abstractions
Enabling multiple Qualities of Service (QoS)

• The network must be equipped at all layers to provide consumers with the qualities of service they need

• Service Level Agreements (SLA) are usually established at application level

• Guarantees at application level are the “results” of what provided by the entire stack
Naming of services

• To manage identities and names for all these entities at a global level
  – assignment of unique identities for these entities at the different levels of abstraction (e.g., service, service machine, service instance);
  – identification of different names corresponding to the same entity;
  – possibility to define virtual names and hide the real identity;
  – manage changes in names and identities.

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Addressing services

• Future Internet needs service addressing mechanisms that are independent of the physical location (and if possible, technology) of the services and things

• Detachment of service addressing from the URIs is especially important if the other computational entities in the FI (things, objects, sensors, resources) are going to be described as services

• It also requires a proper layer that is able to mask locations and technologies and provide the right abstraction level
Flexibility, dynamicity and adaptability in service delivery

- To transform **service delivery features** from being purely application layer components to being – at least conceptually – integrated FI elements
- The Internet as a platform is further emphasized and the service delivery platform concept is moved closer to the actual data delivery network
- FI allows for a much more **flexible and agile computational network** that can react more quickly to the dynamics and diversity of today’s Internet
- The Future Internet architecture must be designed with dynamics and diversity in mind

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“Shared” access to distributed resource and services

• IoS and IoT requires to incorporate sophisticated notions of content delivery networks, which optimize the access to resources, both static and dynamic – such as services or sensor data aggregators

• The Future Internet architecture must be designed on the basis of a convergent data routing, data delivery and data management infrastructure
Main contributors

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Conclusions

- IoS (closely coupled with IoT) claims for specific architectural principles spanning:
  - Service awareness
  - Enabling Multiple QoS
  - Naming of services
  - Flexibility, dinamicity and adaptability of services delivery
  - Shared access to distributed resources and services