Standardizing ontologies for the IP traffic measurement: A first step in QoS standardization at ETSI

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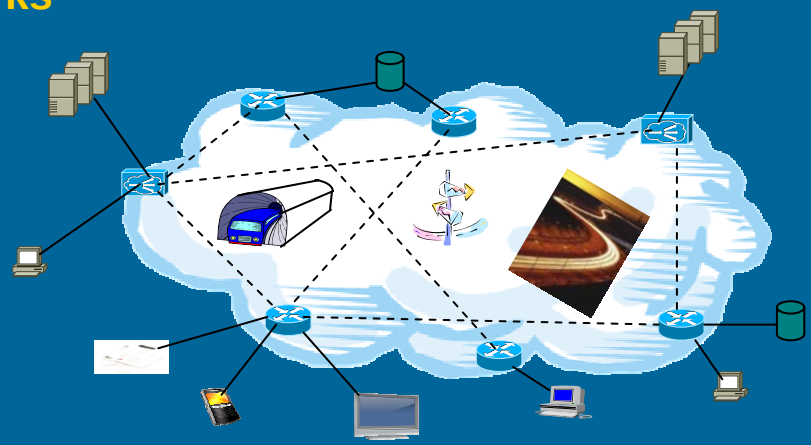
QoS: A strategic issue in Future Internet

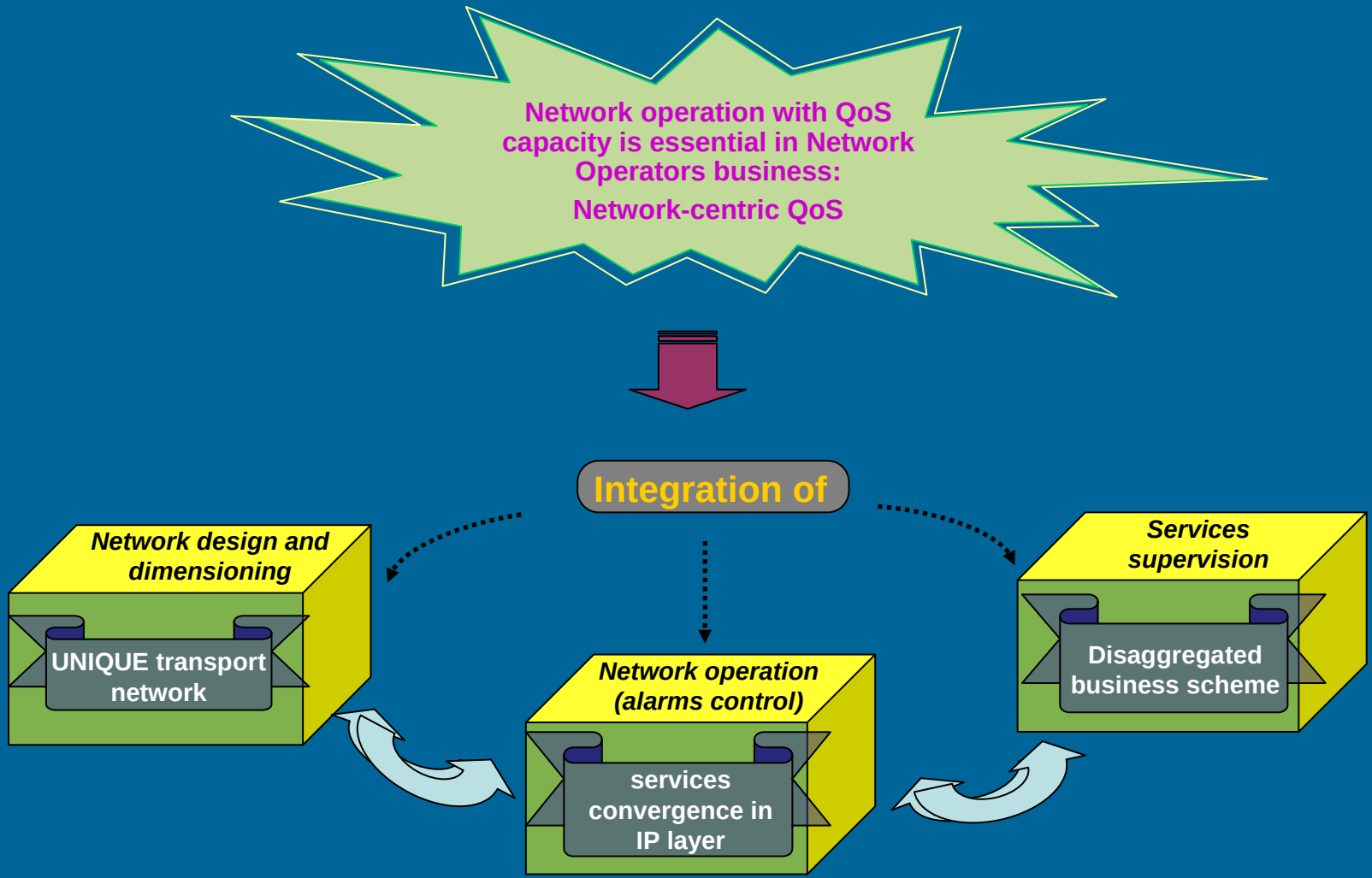
ITU, TMF, FIA, IETF, etc. Show us the scenario ahead:

- IP as convergence layer (network services and applications)
- All services on a unique transport network
  - Service-oriented network design
- Market agents disaggregated: SLA defining interfaces.
- Web2.0 paradigms:
  - Semantic access to all services,
  - prosumers
  - user-centric management of networks
  - Web2.0 paradigms:
- Most of the tools required to achieve these advanced Services are already available

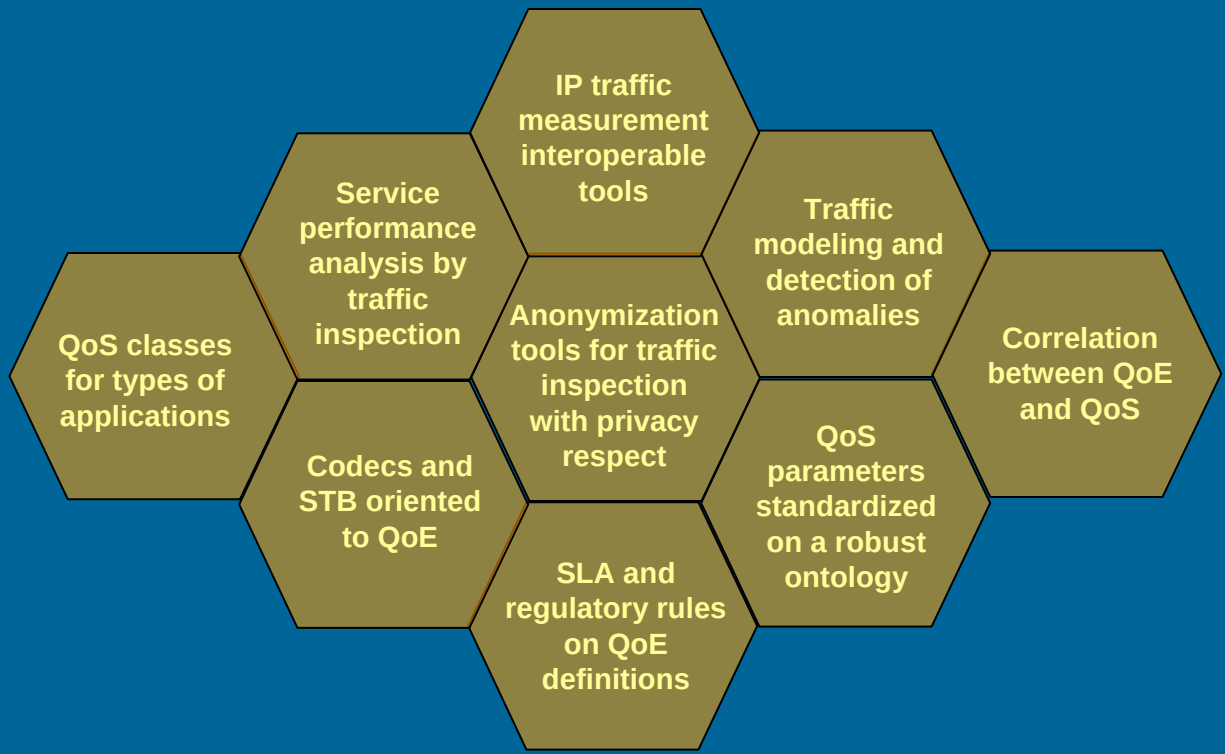
  But security and QoS management still need some effort



QoS in all SLA



QoE and other topics to be integrated



A substrate of interoperability is required for cost reduction and coherent development of Future Internet: That is provided with a common ontology.

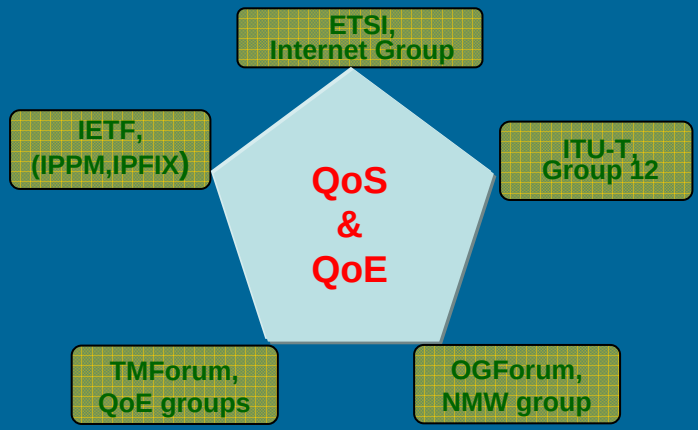
Additionally, regulatory initiatives should relay on the availability of a common knowledge scheme with clear relationships between defined elements.

Standardization bodies: QoS approaches

FIA and all platforms for ICT survey standardization works about new protocols, service definitions, interfaces, architectures, etc.

- IETF is very dynamic in proposing protocols and interfaces to set services on the IP suit.
  - The IPPM and IPFIX groups have contributed to defining QoS parameters and methods for traffic monitoring.
- ITU-T (Group 12) has set a complete and coherent framework of QoS parameters with successive extensions to include classes, parameters of QoS and methods for measuring them: End to end transmission services.
  - In general, ITU builds an ecosystem of standards for a technology or any other tele-communications industry issue, like QoS in international networks
- ETSI offers a way to set standards of industrial interest that can be aligned with IETF RFCs and ITU recommendations
  - The pre-standardization ETSI groups can work very dynamically in an open framework before presenting their proposals to the technical board. In parallel, they can cooperate with other standardization bodies and attract contributions from projects outside ETSI.

Approaches to improve standardization of QoS



Other for a, like OGF and TMF must be considered when surveying QoS and QoE standardization proposals.

- OGF , though its central point of interest is just the GRID computing, has helped to define an ontology of QoS parameters for distributed services.
- TMF is very active in developing proposal of industrial interest for applications like IPTV as far as users satisfaction concerns: QoE

Despite the good work carried out by IETF, ITU and ETSI for QoS parameters definition, their measurement techniques and description of architectures for traffic monitoring and QoS supervision,

- New technologies and services (connection oriented) need additional specifications
- P2mp or mp2mp scenarios were not considered as for QoS management architecture
- FI paradigm like virtualization and open orchestration of services will stress present QoS standardization as for protocols and system interfacing.

Further issues to deal with

To tackle the challenges of QoS standardization in Future Internet and make QoS management fair and profitable, a big effort of all parts involved is required

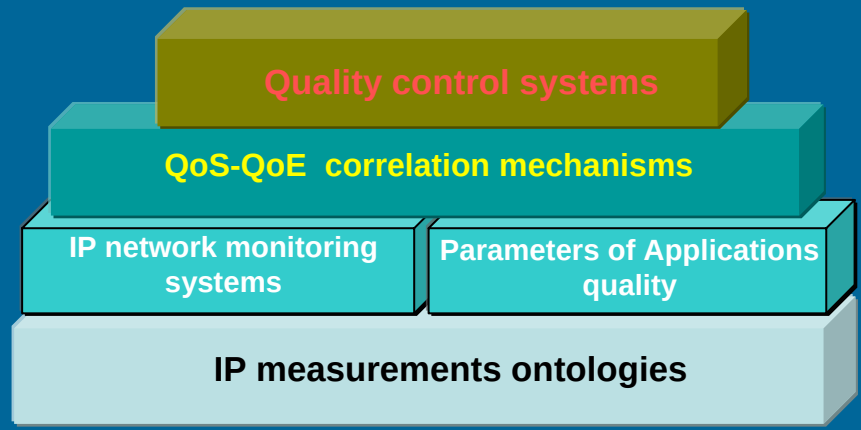
- Definitions of interfaces not only for real network elements but for also for logical elements and the protocols for them to exchange information of traffic monitoring.
- QoS management architecture extended to end users networks
- Framework for differentiated QoS provision and SLA definition.
- Definition of measurement devices roles and their interoperability based on common
  - Ontology of traffic parameters and measurement techniques
- This must take into account the users privacy protection requirements>
  - The ontology, as far as definition of classes and their relationship must be extended to data anonymization to support techniques of data exchange within a legal framework.

Furthermore, QoE must be included in the scope of ontology definition to make it of practical interest in Future Internet

- Definitions of parameters that are not exclusively related to delays or simply packet loses but more complex quality performance indicators (QPI)
  - The precise algorithms to relate QPI with KPI is not a task for the ontology definition but will have to be worked out in a second phase of standardizing QoE.

Standardization of IP traffic ontology

The interest of standardizing the IP traffic measurement ontology arises from observing that several traffic monitoring Infrastructures offer data with completely different formats and based on different concepts of the values they measure



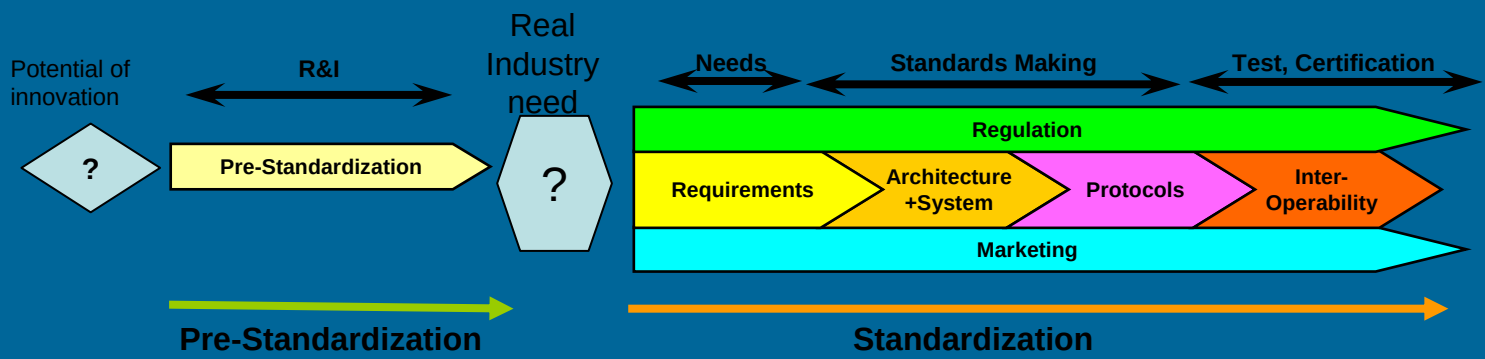
Thus, setting up that ontology is regarded as a keystone to implement interoperable systems for traffic monitoring and beyond, for QoE management and SLA definition upon QoS.

- The information model should be flexible and integrate all precedent ones
- Metadata definitions would allow for a well structured ontology of traffic measurements
- Data definitions should be compliant with all RFCs and QoS recommendations issued from main standardization bodies:
- Parameters would be practically mapped to the ontology classes and their relationships should not difficult defining complex KPI, QPI and BPI (Business performance indicator)

Pre-standardization groups in ETSI

The recent initiative of ETSI to allow for pre-standardization groups is called ISG (Industrial Specification Group)

- ISG are a special type of ETSI committee open to non ETSI members
- They are not directly ruled by the technical board although the ISG Rules of Procedure must respect ETSI Technical Working Procedures
- Focused activity, designed for quick establishment
- Decides its own work programme, approves its own deliverables (Group Specifications)
  - **ISGs work is based on Work Item concept: A task defined by, at least, four members.**
- **An ISG may become an ETSI technical group or part of an existing one**
  - **Requires the approval of the OCG (Operational Co-ordination Group)**



The Measurement Ontology for IP traffic ISG

The main objectives of MOI ISG are:

- Establishing a set of ontologies for IP traffic monitoring including relationships with privacy protection, QoS qnd QoE
- Standardize protocols to request KPI within semantic systems.
- Standardize IP traffic measurement and monitoring devices interfaces as far as they store and exchange data.

The work items already scheduled of MOI ISG are:

- Report on information models for IP traffic measurement:
  - Analysis of information models for IP traffic measurement
- Requirements for IP traffic measurement ontologies development:
  - This document will address the requirements that should be taken into account for the specification of an ontology for IP traffic measurement
- IP traffic measurement ontologies architecture:
  - High level structure of the ontology to meet the requirements for IP measurements

Future works of the MOI ISG

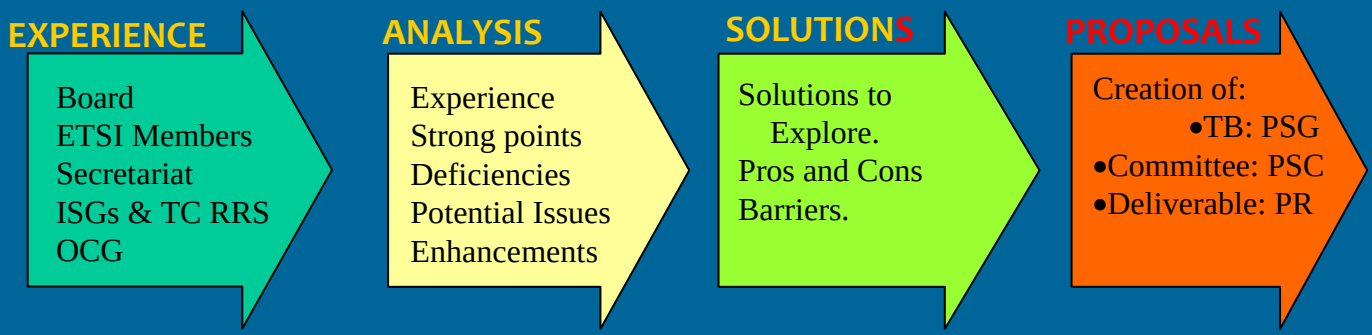
The goal of MOI ISG are:

- **Designing a set of ontologies for IP traffic monitoring. At least, this will include**
  - **A basic ontology, in agreement with non specific and extensively used ontologies, will be described first.**
  - **A metadata ontology definition. This will match available repositories and already developed measuring infrastructures taking care that the ontology can be of practical use and fulfils all requirements rigorously.**
  - **A measurement data ontology definition. This will define all the existing data sources concepts and units to set the vocabulary and relations to which all existing traffic measurement devices comply. A final description of how future eventual measurement systems should be developed to match this data ontology will also be provided.**
  - **A data anonymization ontology definition. This will define the way to describe anonymization rules for the measurement data in order to obscure sensible fields in the data prior to publish them. In this way, it is possible to define acceptable use policies so that clear agreements can be proposed or enforced between the parties producing and consuming the data.**
- **Besides, MOIS ISG will study how the proposed metadata and data ontologies can be seamless spread to other standardization groups.**

Help will be welcome

Any group can join the MOI ISG:

- **Just follow the ETSI procedures found in its portal (http://portal.etsi.org) and sign the specific agreement document (available at the portal)**
- **Remember, ISG are not limited to ETSI members**
- **Work will be mainly developed through virtual meetings but at least one face to face meeting will be scheduled once a year.**
- **Documentation (Group Specifications) issued from the ISG is public (available through ETSI portal)**



Thank you for your attention