



# Standardization of the MOMENT ontologies

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# Need for standardization

- There is no standard to share network measurements between several parties.
  - However, some standards are devoted to obtain measurements (RMON) and format measurements (IPFIX, OGF-NMWWG).
- Our proposal is to use ontologies for such data sharing.
  - Information can be processed at a semantic level.
  - Existing semantic web technologies can be applied in this context, such as SPARQL queries.
  - Data is directly formatted in XML with a well-known schema
  - General concepts can be taken from well-known ontologies such as W3C Time, Units, FOAF, etc.
- Ontologies need to be agreed to be useful (become used)
  - There is a communication gap between ontologies and users of information and communication systems, where such ontologies are used, also on user interfaces.
  - It is important to standardize them!

# Ontologies

- An ontology provides a vocabulary of classes and relations to describe a domain, stressing knowledge sharing and knowledge representation.
- The advantages of using ontologies are manifold:
  - the ontology can be downloaded from the web and read by anyone freely
  - the information is modeled in a more flexible way than using tables;
  - their semantic definition of information enables a classification of knowledge (e.g. a tool that performs active measurement is an active tool) and inference (e.g. if a measurement is over a threshold then the network is overloaded)
  - at the same time it is possible to query this knowledge (e.g. obtain all measurements with a given destination address).

# Ongoing standardization

- MOI ISG of ETSI is carrying out this work:
  - Analyze all information models about IP traffic measurements
  - Specify requirements for useful applications of a complete traffic measurement ontology for IP networks
  - Study mechanisms to map concepts of precedent traffic monitoring systems to such complete ontology
  - Include all elements required to tackle QoS and QoE issues as well as concepts to enable privacy protection when analyzing IP traffic.
  - Design a modular architecture to work out the ontology such as future elements can be added.
  - Next slides show the components considered to build up the ontology aside from a module of “common basic concepts”
    - Find the MOI work items through the [ETSI portal](#).

# Measurements metadata ontology

- Specified to describe the available repositories and measurements.
- It includes all necessary information to access to these repositories: where they are and what they contain.
- For its specification, several sources have been used:
  - Existing metadata schemas, such as CAIDA's DatCat or former MOME project
    - They just provide a syntactic format
  - Domain ontologies such as W3C Time or FOAF.
  - Other information taken from MOMENT use case

# Measurement data ontology

- It contains the concepts about the different measurements.
- For its specification, several sources have been used:
  - Existing common schemas, such as those proposed by OGF NMWG/Perfsonar.
    - They are just XML formats to exchange measurement data
  - All existing data sources in the MOMENT project have been analyzed, taking their schemas to obtain a common one.
  - Domain ontologies such as W3C Time or DAML-Units

# Anonymization ontology

- Construct a taxonomy of possible anonymization approaches, within the context of Internet measurements
- Considers User Roles and data Usage Purposes
- Defines different policies on how to anonymize measurements.
- A reasoner can be used to compute suitable policies