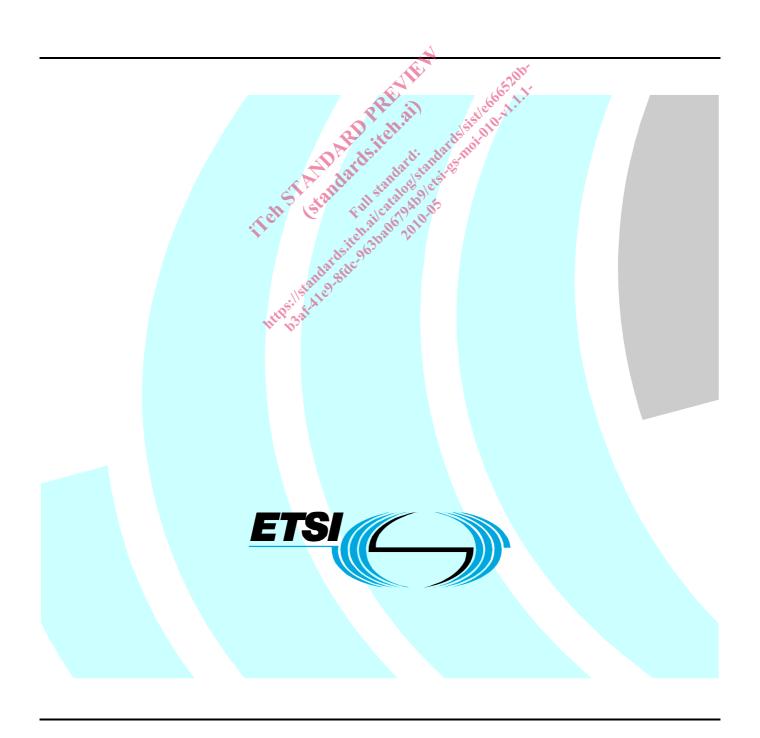# ETSI GS MOI 010 V1.1.1 (2010-05)

Group Specification

Measurement Ontology for IP traffic (MOI);
Report on information models for IP traffic measurement

ETSI

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Foreword

This Group Specification (GS) has been produced by ETSI Industry Specification (ISG) Measurement Ontology for IP traffic (MOI).

Introduction

A number of different models, information schemas and best-pratices have recently been proposed in order to cope with a lack of *de-facto* standards for interoperability and the extreme heterogeneity of tools' operational modes and repositories' internal organization of data that one can observe, as of now, in the Traffic Measurement and Analysis domain. To accomplish any standardization goal in the TMA field, a detailed analysis of such proposals, and of existing information models for IP traffic measurement is mandatory. A further step is then needed in order to unify the existing models into a set of well-defined ontological models, which will fully describe the domain of Internet traffic measurements and will tackle the most problematic aspects such as legally-compliant privacy protection and support for widely accepted QoS/QoE parameters.

1 Scope

The present document constitutes an analysis of information models for IP traffic measurement. This will include the basic definitions and state-of-the-art study, as well as the main guidelines to specify a complete set of vocabulary of classes and relations to describe Internet measurements, supporting QoS parameters and offering privacy protection, by studying existing schemas that are currently used to describe such information.

The present document is to give an initial focus and guide the process of the MOI ISG. The focus is on the key QoS parameters and the key approaches in privacy protection when manipulating, analysing and distributing IP traffic measurements.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

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2.1 Normative references

The following referenced documents are necessary for the application of the present document.

Not applicable

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

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NOTE: See http://www.ietf.org/dyn/wg/charter/ipfix-charter.html.

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[i.3] "Packet Sampling (psamp)" (concluded WG).

NOTE: See http://www.ietf.org/dyn/wg/charter/psamp-charter.html.

[i.4] "Benchmarking Methodology (bmwg)".

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[i.5] "Performance Metrics for Other Layers (pmol)".

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[i.6] "Common Control and Measurement Plane (ccamp)".

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3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CCAMP	Common Control and Measurement Plane
IMDC	Internet Measurement Data Catalog
IPFIX	IP Flow Information export
IPPM	IP performance metrics
IS-IS	Intermediate System to Intermediate System
MIB	Management Information Base
NIC	Network Information Centre
NMWG	Network Measurement Working Group
NOC	Network Operations Centre
OSPF	Open Shortest Path First
OWL	W3C Web Ontology Language
PMOL	Performance Metrics for Other Layers
PQoS	Perceived Quality of Service
QoS/QoE	Quality of Service/Quality of Experience
RELAX NG	Regular Language for XML Next Generation
RRD	Round-Robin Database
SOA	Service Oriented Architecture
TMA	Traffic Monitoring and Analysis

4 Working Groups and Metrics for Network Measurements

We start by reviewing the most common external data representation efforts from IETF. Then this clause includes an outline of the Open Grid Forum work on measurement data standardization, and continues with PerfSonar, a mediator for monitoring services developed by GEANT and other partners. A detailed overview of the MIBS RMON working-group activities and of the DatCat meta-data repository is finally given.

4.1 Network Data Representation Models from IETF

There are a few attempts to standardise network measurement protocols in order to provide a common understanding of measures across different networks and organisations, promoted by IETF. This clause provides a short list of a few of them, their characteristics, progress, future and implementation, if any.

4.1.1 IPFIX (IP Flow Information Export Charter)

The IETF IPFIX [i.1] working group defined a protocol to transmit information about captured flows. It has specified both the Information Model (to describe IP flows) and the IPFIX protocol to transfer IP flow data from IPFIX exporters to collectors, which is used to transmit to a collector the captured information flows. It considers a flow as a group of packets sent from the same source to the same destination through the same protocol.

The work towards standardisation is quite advanced and several drafts have been published as RFCs so far, and some others are about to be reviewed. However, the group activities are still ongoing and new issues are raised. Ongoing activities are now focusing on anonymization, with an initial draft on this specific issue [i.2] made available since November 2009.

4.1.2 PSAMP (Packet Sampling)

PSAMP [i.3] is an IETF group whose target is to define a standard set of capabilities for network elements to sample subsets of packets by statistical and other methods. They should be simple as they are supposed to work at maximal line rate ubiquitously.

The standard will specify a set of selection operations by which packets are sampled, will specify the information that is to be made available for reporting on sampled packets, describe protocols by which information on sampled packets is reported to applications; describe protocols by which packet selection and reporting can be configured. Unreliable transport is permitted to allow ubiquitous deployment.

The standard will specify:

- Selectors for packet solving.

- Packet information available for reporting.

- Sampled packet reports format.

- Report Streams format for a stream of packet reports.

- Multiple Report Streams requirements for parallel packet samplers in one network element.

- Configuration and Management packet format.

- Presentation, Export and Transport of Packet Reports.

4.1.3 BMWG (Benchmarking Methodology)

The BMWG [i.4] group tries to make a series of recommendations concerning the measurement of the performance characteristics of various internetworking technologies focusing on:

- The systems or services that are built from these technologies, describing the class of equipment, system, or service being addressed.

- The performance characteristics that are pertinent to that class.

- The set of metrics that aid in the description of those characteristics.

- The methodologies required to collect said metrics.

- The requirements for the common, unambiguous reporting of benchmarking results.

These standards will be limited to technology characterization using simulated stimuli in a laboratory environment, and will not be prepared for live, operational networks. The most interesting goal of the WG is to produce benchmarks which strive to be vendor independent and have universal applicability to a given technology class, but not to deal with acceptance criteria or performance requirements. Works are well developed, with most of the methodologies taken to AD Review and around 30 RFC have been published so far.

4.1.4 PMOL (Performance Metrics for Other Layers)

This group has finished its activities in November 2008, with the publication of two Internet Drafts, available at [i.5]. The first one is a framework and guidelines memo which describes any necessary elements of performance metrics of protocols and applications transported over IETF-specified protocols (such as the formal definition, purpose, and units of measure) and the various types of metrics that characterize traffic on live networks (such as metrics derived from other metrics, possibly on lower layers).

Most important for other standardization initiatives can be the enclosed guidelines for a performance metric development process that includes entry criteria for new proposals (how a proposal might be evaluated for possible endorsement by a protocol development working group), and how an successful proposal will be developed.