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AND LEASED CIRCUITS

Telecommunications management network

Requirements for QoS/SLA management over the TMN X-interface for IP-based services

ITU-T Recommendation M.3341

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ITU-T Recommendation M.3341

Requirements for QoS/SLA management over the TMN X-interface for IP-based services

Summary

This Recommendation addresses end-to-end Quality of Service (QoS) information collection, aggregation and exchange between Service Customers, Service Providers and Network Operators. In the context of this Recommendation, Service Providers (SPs) include Telecom SPs, Internet SPs, Application SPs and Content SPs. Service Customers include end-Customers and other SPs. Functions and interfaces required to ensure end-to-end QoS classes are specified for the complete service life cycle.

Source

ITU-T Recommendation M.3341 was approved on 14 December 2003 by ITU-T Study Group 4 (2001-2004) under the ITU-T Recommendation A.8 procedure.

Keywords

End-to-end, IP, Management, Measurement Point, Network Operator, Observation, Quality of Service (QoS), Service Customer, Service Provider, X-interface.

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

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ITU-T Recommendation M.3341

Requirements for QoS/SLA management over the TMN X-interface for IP-based services

1 Scope

This Recommendation addresses end-to-end quality of service (QoS) information collection, aggregation and exchange between service customers, service providers and network operators for IP-based services. In the context of this Recommendation, service providers (SPs) include telecom SPs, Internet SPs, application SPs and content SPs. Service customers include end-customers and other SPs. Functions and interfaces required to manage end-to-end QoS are specified for the complete service life cycle. This Recommendation provides requirements in the form of use cases and preliminary information related to the analysis phase. This Recommendation also recognizes the business need to manage QoS across multiple SPs.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation

- [1] ITU-T Recommendation G.1010 (2001), *End-user multimedia QoS categories*.
- [2] ITU-T Recommendation M.1530 (1999), *Network maintenance information*.
- [3] ITU-T Recommendation M.1532 (2000), *Network maintenance service performance agreement (MSPA)*.
- [4] ITU-T Recommendation M.1535 (1996), *Principles for maintenance information to be exchanged at customer contact point (MICC)*.
- [5] ITU-T Recommendation M.1537 (1997), *Definition of maintenance information to be exchanged at customer contact point (MICC)*.
- [6] ITU-T Recommendation M.1539 (1999), *Management of the grade of network maintenance services at the maintenance service customer contact point (MSCC)*.
- [7] ITU-T Recommendation M.2301 (2002), *Performance objectives and procedures for provisioning and maintenance of IP-based networks*.
- [8] ITU-T Recommendation M.3010 (2000), *Principles for a telecommunications management network*.
- [9] ITU-T Recommendation M.3020 (2000), *TMN Interface Specification Methodology*.
- [10] ITU-T Recommendation M.3200 (1997), *TMN management services and telecommunications managed areas: overview*.
- [11] ITU-T Recommendation M.3208.1 (1997), *TMN management services for dedicated and reconfigurable circuits network: Leased circuit services*.
- [12] ITU-T Recommendation M.3350 (Draft) (2004), *TMN service management requirements for information interchange across the TMN X-interface to support provisioning of telecommunication capabilities for disaster relief operations and mitigation*.



- [13] ITU-T Recommendation M.3400 (2000), *TMN management functions*.
- [14] ITU-T Recommendation Q.822 (1994), *Stage 1, stage 2 and stage 3 description for the Q3 interface – Performance management*.
- [15] ITU-T Recommendation X.730 (1992), *Information technology – Open Systems Interconnection – Systems Management: Object management function*.
- [16] ITU-T Recommendation Y.1001 (2000), *IP framework – A framework for convergence of telecommunications network and IP network technologies*.
- [17] ITU-T Recommendation Y.1221 (2002), *Traffic control and congestion control in IP-based networks*.
- [18] ITU-T Recommendation Y.1540 (2002), *Internet protocol data communication service – IP packet transfer and availability performance parameters*.
- [19] ITU-T Recommendation Y.1541 (2002), *Network performance objectives for IP-based services*.
- [20] TeleManagement Forum GB 917 (2001), *SLA Management Handbook – GB 917, Ver. 1.5*.
- [21] OMG Document formal/2003-03-01, *Unified Modeling Language (UML), Version 1.5*.

3 Terms and definitions

This Recommendation defines the following terms:

3.1 measurement point: The physical or logical point at which measurements can be made and to which the data obtained is related, e.g., a measurement point in a network or a step in the business process dependant upon the service life cycle. In the implementation phase of the service life cycle, it could be the time that an order is received by the service provider.

3.2 observation: An observation is used by the service customer to monitor the QoS of the telecommunication service provided to the SC by the SP. An observation is associated with exactly two measurement points.

3.3 end-to-end QoS: The QoS service level metrics relevant to the service being delivered as perceived by the SC.

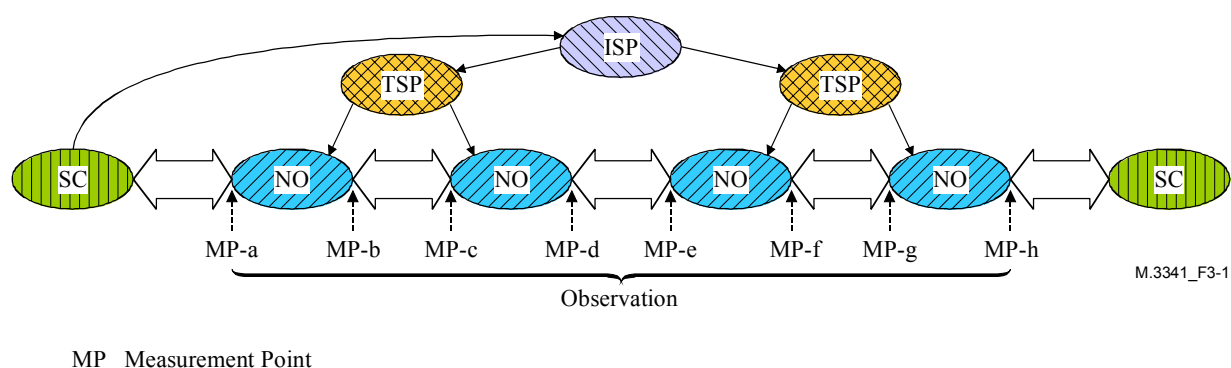


Figure 3-1/M.3341 – Measurement points and observation

Figure 3-1 shows an example of Measurement Points (MP) and an Observation (Ob) in a typical network. The Internet Service Provider (ISP) receives telecommunication services from two Telecommunication Service Providers (TSPs).

Network Operators (NOs) define the Measurement Points (MPs) at each end of their responsible part of the network. They have responsibilities to observe their part of the network. MP-a and MP-b

are defined at the ingress and egress of one NO's network. Likewise, MP-g and MP-h are defined at the ingress and egress of another NO's network.

Each TSP receives services from two Network Operators (NOs). TSPs have responsibilities to observe their part of the networks, in Figure 3-1, spanning across two NO's networks.

The ISP, which has a primary contract with the Service Customer (SC), has the responsibility to observe end-to-end QoS of the entire network, not merely a part of one TSP, and also has the responsibility to provide the observation data to SC. The SC is able to define an observation between the measurement points MP-a and MP-h. The observation provides QoS measurements from the ingress to the egress of the ISP's network regardless of the service providers or network operators involved.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations:

3GPP	Third Generation Partnership Project
C	Customer
ID	Identifier
IP	Internet Protocol
ISP	Internet Service Provider
ITU-T	International Telecommunication Union – Telecommunication Standardization Sector
MP	Measurement Point
NO	Network Operator
NP	Network Performance
Ob	Observation
OMG	Object Management Group
P	Provider
PM	Performance Management
QMS	QoS/SLA Management Service
QoS	Quality of Service
QoSMS	QoS management in a multi-service provider environment
SC	Service Customer
SLA	Service Level Agreement
SP	Service Provider
TMF	TeleManagement Forum
TMN	Telecommunications management network
TSP	Telecommunication Service Provider
VoIP	Voice over IP
XML	eXtensible Markup Language

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