TECHNICAL REPORT

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Information technology — Quality of service — Guide to methods and mechanisms

Technologies de l'information — Qualité du service — Guide pour les méthodes et les mécanismes

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

Attention is drawn to the possibility that some of the elements of this Technical Report may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC TR 13242 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*, in collaboration with ITU-T. The identical text is published as ITU-T Rec. X.642.

Introduction

This Recommendation | Technical Report is intended to promote the use of common methods and mechanisms for managing Quality of Service (QoS) in a number of different communications and systems environments.

The collaborative ITU-T and ISO/IEC JTC 1 project for coordination and harmonization of QoS-related initiatives is aimed at encouraging the use of the QoS Framework (see ITU-T Rec. X.641 | ISO/IEC 13236), facilitating the use of common QoS methods and mechanisms, and promoting consistency between different applications and systems in their treatment of QoS. The collaboration has been extended to include QoS in Open Distributed Processing. Efforts are being made to promote maximum consistency between this activity and the work on development of specifications for QoS in CORBA-based systems in the Object Management Group (OMG).

Organizations developing methods or mechanisms for QoS management are encouraged to make use of the concepts and terms defined in the QoS Framework. Any developments that may be re-usable in other contexts should also be proposed for reference in this Recommendation | Technical Report by submitting a reference, together with explanatory text, to the ITU-T or JTC 1 Secretariat.

It is expected that the convergence of QoS methods and mechanisms will be achieved in a stepwise fashion, using such submitted material as a basis. In its first edition, this Recommendation | Technical Report identifies and catalogues current standards and other widely available specifications that incorporate definitions of QoS characteristics and QoS methods and mechanisms; and it includes definitions of some methods and mechanisms that are considered to be widely applicable. These methods and mechanisms are derived from those used or under development in information technology standards, and have been formulated in a manner consistent with the QoS Framework, with the objective that they can be applied widely and, if appropriate, standardized. Subsequent editions of this Recommendation | Technical Report are expected to add further methods and mechanisms, likewise formulated in a manner consistent with the QoS Framework. Through this process, harmonization of QoS approaches and usage across a wide range of environments will be achieved.

Since this Recommendation | Technical Report includes methods and mechanisms developed elsewhere, in cases of conflict between definitions in this Recommendation | Technical Report and definitions in the source specifications, the latter have precedence.

TECHNICAL REPORT

ITU-T RECOMMENDATION

INFORMATION TECHNOLOGY – QUALITY OF SERVICE – GUIDE TO METHODS AND MECHANISMS

1 Scope

This Recommendation | Technical Report uses the concepts and terminology of the Quality of Service Framework, ITU-T Rec. X.641 | ISO/IEC 13236. It is intended to support those designing, testing and specifying Information Technology (IT) systems, data communications services and protocols, those defining QoS management functions and QoS mechanisms for particular data environments and technologies, and those engaged in other QoS-related activities such as system testing, by providing a source of reference material on QoS. To do this, it brings together references to methods and mechanisms from a variety of sources, and in some cases documents them in a style which will permit their use in many data different environments.

The term "method" is used in a very general sense to include any process, function, etc., that is relevant to QoS at any stage in the life-cycle of a system.

The criterion for reference to or inclusion of definitions or specifications of QoS methods and mechanisms in this Recommendation | Technical Report is that they are thought to be of potentially wider application than solely the environment for which they were originally developed, although still in a data context.

Clause 5 identifies sources of definitions of QoS characteristics and related information. Clauses 6, 7 and 8 discuss methods and mechanisms appropriate to the phases of QoS activity that are defined in the QoS Framework: clause 6 deals with the prediction phase, clause 7 with the establishment phase and clause 8 with the operational phase. Clause 9 describes methods for verification of system behaviour related to QoS. Clause 10 covers the relationships between this Recommendation | Technical Report and Recommendations, International Standards or Technical Reports that reference it.

This Recommendation | Technical Report contains detailed definitions of some QoS mechanisms. Some peer-to-peer QoS negotiation mechanisms are defined in 7.1.1. These involve two peer entities and in most cases also the provider of a communications service between them. Subclause 7.1.2 provides an initial specification of some QoS negotiation mechanisms for 1 × N multicast connections, based on those in 7.1.1. Subclause 7.1.3 discusses QoS negotiation mechanisms for M × N multicast, some of which can make use of those in 7.1.2. Subclause 8.2.1 defines some QoS management mechanisms to support time-critical applications.

This Recommendation | Technical Report does not include methods and mechanisms for security.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | Technical Report. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | Technical Report are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations.

2.1 Identical Recommendations | International Standards

– ITU-T Recommendation X.641 (1997) | ISO/IEC 13236:1998, *Information technology – Quality of Service: Framework*.

– ITU-T Recommendation X.902 (1995) | ISO/IEC 10746-2:1996, *Information technology – Open distributed processing – Reference Model: Foundations*.