INTERNATIONAL TELECOMMUNICATION UNION

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STANDARDIZATION SECTOR
OF ITU

I.356

Amendment 1
(02/2004)

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Overall network aspects and functions – Performance objectives

B-ISDN ATM layer cell transfer performance

Amendment 1: New Appendix V – Support of Y.1541 QoS classes 0 and 2 in ATM-based networks

ITU-T Recommendation I.356 (2000) – Amendment 1

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ITU-T Recommendation I.356

B-ISDN ATM layer cell transfer performance

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New Appendix V – Support of Y.1541 QoS classes 0 and 2 in ATM-based networks

Source

Amendment 1 to ITU-T Recommendation I.356 (2000) was agreed on 12 February 2004 by ITU-T Study Group 13 (2001-2004).

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

ITU-T Recommendation I.356

B-ISDN ATM layer cell transfer performance

Amendment 1

New Appendix V – Support of Y.1541 QoS classes 0 and 2 in ATM-based networks

ITU-T Rec. Y.1541 defines a set of QoS classes for IP-based networks. Two of the Y.1541 classes have an IP packet transfer delay (IPTD) objective of 400 ms (class 1 and class 3) and two have a more stringent IPTD objective of 100 ms (class 0 and class 2). When supporting the transfer of IP packets over an ATM network, I.356 class 1 (stringent class) and class 5 (stringent bi-level class), both of which have a CTD objective of 400 ms, are obvious candidates for supporting Y.1541 classes 1 and 3. As there are no I.356 classes with an end-to-end CTD of 100 ms, support of Y.1541 QoS classes 0 and 2 requires more consideration. This appendix offers guidance on how ATM networks conforming to ITU-T Rec. I.356 can be configured to support the stringent delay Y.1541 QoS classes.

NOTE – All the assumptions and conditions regarding the applicability of the Y.l541 and I.356 QoS classes, including minimum line speeds, apply to the calculations in this appendix.

Both ITU-T Rec. Y.1541 and the related ITU-T Rec. M.2301 indicate that the stringent delay IP QoS classes will not be achievable across the whole set of global IP paths. M.2301 goes so far as to use a 10 000 km reference connection for Y.1541 classes 0 and 2 rather than the more usual 27 500 km reference connection. A subset of ATM connections employing I.356 QoS classes 1 and 5 will be able to support the transfer of IP packets within the delay limits specified by Y.1541 classes 0 and 2. Examples of such connections are given below.

Table V.1/I.356 – Example one: A direct VPC between two national portions directly interconnected by an undersea cable

Portion	Route length	No. of switches	I.356 classes 1 and 5 delay allocation
National portion 1	700 km	4	5.6 ms
IIP	4000 km	0	25 ms
National portion 2	1500 km	4	10.6 ms
		Total VPC delay	**41.2 ms**

NOTE – The delay figures have been rounded up to one decimal place.

Table V.2/I.356 – Example two: A VCC between two national portions interconnected via two international transit portions

Portion	Route length	No. of switches	I.356 classes 1 and 5 delay allocation
National portion 1	1200 km	8	9.9 ms
IIP(0)	50 km	0	0.3 ms
ITP 1	300 km	3	2.8 ms
IIP(0)	700 km	0	4.4 ms
ITP 2	2000 km	3	13.4 ms
IIP(0)	80 km	0	0.5 ms
National portion 2	3500 km	8	24.3 ms
		Total VCC delay	**55.6 ms**

NOTE – The delay figures have been rounded up to one decimal place.

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