



**Speech and multimedia Transmission Quality (STQ);
QoS aspects for popular services in mobile networks;
Part 2: Definition of Quality of
Service parameters and their computation**

PREVIEW
iteh.standards.it
https://standards.iteh.ai/catalog/standards-etsi/102-250-2-v2.5.1-
d799-47ce-bde6-6dd4a812-34b7/etsi-ts-102-250-2-v2.5.1-
201606

ReferenceRTS/STQ-00206m

Keywords3G, GSM, network, QoS, service, speech

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2016.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.
3GPP™ and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.
GSM® and the GSM logo are Trade Marks registered and owned by the GSM Association.

Contents

Intellectual Property Rights	20
Foreword.....	20
Modal verbs terminology.....	20
Introduction	21
1 Scope	22
2 References	22
2.1 Normative references	22
2.2 Informative references.....	24
3 Definitions and abbreviations.....	24
3.1 Definitions.....	24
3.2 Abbreviations	26
4 QoS Parameter Basics	29
4.1 General Overview.....	29
4.2 FTP, HTTP and E-Mail Issues	30
4.2.1 Performance Enhancement Proxies	31
4.3 Timeouts.....	32
4.4 Trigger points	32
4.5 Overview of technology dependent QoS parameters	32
5 Service independent QoS Parameters.....	33
5.1 Radio Network Unavailability [%].....	33
5.1.1 Abstract Definition	33
5.1.2 Abstract Equation	33
5.1.3 Trigger Points	34
5.2 Network Non-Accessibility [%].....	34
5.2.1 {Manual Automatic} Network Selection and Registration Failure Ratio [%]	34
5.2.1.1 Abstract Definition.....	34
5.2.1.2 Abstract Equation.....	35
5.2.1.3 Trigger Points.....	35
5.2.2 {Manual Automatic} Network Selection and Registration Time [s]	37
5.2.2.1 Abstract Definition.....	37
5.2.2.2 Abstract Equation.....	37
5.2.2.3 Trigger Points.....	38
5.3 Attach Failure Ratio [%]	39
5.3.1 Abstract Definition	39
5.3.2 Abstract Equation	39
5.3.3 Trigger Points	39
5.4 Attach Setup Time [s].....	41
5.4.1 Abstract Definition	41
5.4.2 Abstract Equation	41
5.4.3 Trigger Points	41
5.5 PDP Context Activation Failure Ratio [%]	42
5.5.1 Abstract Definition	42
5.5.2 Abstract Equation	42
5.5.3 Trigger Points	43
5.6 PDP Context Activation Time [s].....	44
5.6.1 Abstract Definition	44
5.6.2 Abstract Equation	44
5.6.3 Trigger Points	44
5.7 PDP Context Cut-off Ratio [%].....	45
5.7.1 Abstract Definition	45
5.7.2 Abstract Equation	45
5.7.3 Trigger Points	46
5.8 Data Call Access Failure Ratio [%].....	47

5.8.1	Abstract Definition	47
5.8.2	Abstract Equation	47
5.8.3	Trigger Points	47
5.9	Data Call Access Time [s].....	47
5.9.1	Abstract Definition	47
5.9.2	Abstract Equation	47
5.9.3	Trigger Points	48
5.10	DNS Host Name Resolution Failure Ratio [%].....	48
5.10.1	Abstract Definition	48
5.10.2	Abstract Equation	48
5.10.3	Trigger Points	49
5.11	DNS Host Name Resolution Time [s].....	49
5.11.1	Abstract Definition	49
5.11.2	Abstract Equation	49
5.11.3	Trigger Points	49
5.12	Default EPS Bearer Contexts	50
5.12.1	Default EPS Bearer Context Activation Failure Ratio [%].....	50
5.12.1.1	Abstract Definition.....	50
5.12.1.2	Abstract Equation.....	50
5.12.1.3	Trigger Points.....	51
5.12.2	Default EPS Bearer Context Activation Time[s].....	51
5.12.2.1	Abstract Definition.....	51
5.12.2.2	Abstract Equation.....	51
5.12.2.3	Trigger Points.....	51
5.12.3	Default EPS Bearer Context Cut-off Ratio [%].....	52
5.12.3.1	Abstract Definition.....	52
5.12.3.2	Abstract Equation.....	52
5.12.3.3	Trigger Points.....	53
5.13	Dedicated EPS Bearer Contexts	53
5.13.1	Dedicated EPS Bearer Context Activation Failure Ratio [%].....	53
5.13.1.1	Abstract Definition.....	53
5.13.1.2	Abstract Equation.....	53
5.13.1.3	Trigger Points.....	54
5.13.2	Dedicated EPS Bearer Context Activation Time [s].....	54
5.13.2.1	Abstract Definition.....	54
5.13.2.2	Abstract Equation.....	54
5.13.2.3	Trigger Points.....	55
5.13.3	Dedicated EPS Bearer Context Cut-off Ratio [%].....	55
5.13.3.1	Abstract Definition.....	55
5.13.3.2	Abstract Equation.....	55
5.13.3.3	Trigger Points.....	56
6	Direct Services QoS Parameters.....	56
6.1	File Transfer (FTP).....	56
6.1.1	FTP {Download Upload} Service Non-Accessibility [%].....	56
6.1.2	FTP {Download Upload} Setup Time [s].....	56
6.1.3	FTP {Download Upload} IP-Service Access Failure Ratio [%].....	56
6.1.3.1	Abstract Definition.....	56
6.1.3.2	Abstract Equation.....	57
6.1.3.3	Trigger Points.....	57
6.1.4	FTP {Download Upload} IP-Service Setup Time [s].....	57
6.1.4.1	Abstract Definition.....	57
6.1.4.2	Abstract Equation.....	57
6.1.4.3	Trigger Points.....	58
6.1.5	FTP {Download Upload} Session Failure Ratio [%].....	58
6.1.5.1	Abstract Definition.....	58
6.1.5.2	Abstract Equation.....	58
6.1.5.3	Trigger Points.....	58
6.1.6	FTP {Download Upload} Session Time [s].....	59
6.1.6.1	Abstract Definition.....	59
6.1.6.2	Abstract Equation.....	59
6.1.6.3	Trigger Points.....	59

6.1.7	FTP {Download Upload} Mean Data Rate [kbit/s]	59
6.1.7.1	Abstract Definition.....	59
6.1.7.2	Abstract Equation.....	60
6.1.7.3	Trigger Points.....	60
6.1.8	FTP {Download Upload} Data Transfer Cut-off Ratio [%]	60
6.1.8.1	Abstract Definition.....	60
6.1.8.2	Abstract Equation.....	60
6.1.8.3	Trigger Points.....	61
6.2	Mobile Broadcast	61
6.2.1	Mobile Broadcast Network Non-Availability {Broadcast Bearer}.....	63
6.2.1.1	Abstract Definition.....	63
6.2.1.2	Abstract Equation.....	63
6.2.1.3	Trigger Points.....	63
6.2.2	Mobile Broadcast Program Menu Non-Accessibility {Bootstrapping Bearer, ESG Retrieval Bearer}.....	63
6.2.2.1	Abstract Definition.....	63
6.2.2.2	Abstract Equation.....	64
6.2.2.3	Trigger Points.....	64
6.2.3	Mobile Broadcast Program Menu Access Time {Bootstrapping Bearer, ESG Retrieval Bearer}	64
6.2.3.1	Abstract Definition.....	64
6.2.3.2	Abstract Equation.....	64
6.2.3.3	Trigger Points.....	64
6.2.4	Mobile Broadcast Channel Non-Accessibility {Broadcast Bearer}.....	65
6.2.4.1	Abstract Definition.....	65
6.2.4.2	Abstract Equation.....	65
6.2.4.3	Trigger Points.....	65
6.2.5	Mobile Broadcast Channel Access Time {Broadcast Bearer}.....	65
6.2.5.1	Abstract Definition.....	65
6.2.5.2	Abstract Equation.....	65
6.2.5.3	Trigger Points.....	65
6.2.6	Mobile Broadcast Interactivity Response Failure Ratio {Mobile Network Bearer} {Broadcast Bearer}.....	66
6.2.6.1	Abstract Definition.....	66
6.2.6.2	Abstract Equation.....	66
6.2.6.3	Trigger Points.....	66
6.2.7	Mobile Broadcast Interactivity Response Time {Mobile Network Bearer} {Broadcast Bearer}	67
6.2.7.1	Abstract Definition.....	67
6.2.7.2	Abstract Equation.....	67
6.2.7.3	Trigger Points.....	67
6.2.8	Mobile Broadcast Session Cut-off Ratio {Broadcast Bearer}	67
6.2.8.1	Abstract Definition.....	67
6.2.8.2	Abstract Equation.....	67
6.2.8.3	Trigger Points.....	68
6.2.9	Mobile Broadcast Service Integrity {Broadcast Bearer}	68
6.2.10	Mobile Broadcast Reproduction Soft Cut-off Ratio {Broadcast Bearer}	68
6.2.10.1	Abstract Definition.....	68
6.2.10.2	Abstract Equation.....	68
6.2.10.3	Trigger Points.....	69
6.2.11	Mobile Broadcast Reproduction Hard Cut-off Ratio {Broadcast Bearer}	69
6.2.11.1	Abstract Definition.....	69
6.2.11.2	Abstract Equation.....	69
6.2.11.3	Trigger Points.....	69
6.2.12	Mobile Broadcast Audio Quality {Broadcast Bearer}	70
6.2.12.1	Abstract Definition.....	70
6.2.12.2	Abstract Equation.....	70
6.2.12.3	Trigger Points.....	70
6.2.13	Mobile Broadcast Video Quality {Broadcast Bearer}	70
6.2.13.1	Abstract Definition.....	70
6.2.13.2	Abstract Equation.....	70
6.2.13.3	Trigger Points.....	70
6.3	Ping	71
6.3.1	Ping Round Trip Time [ms].....	71
6.3.1.1	Abstract Definition.....	71

6.3.1.2	Abstract Equation.....	71
6.3.1.3	Trigger Points.....	71
6.4	Push to Talk over Cellular (PoC)	71
6.4.1	Definitions	72
6.4.2	Generic Signal Flow	73
6.4.3	PoC Registration Failure Ratio [%]	74
6.4.3.1	Abstract Definition.....	74
6.4.3.2	Abstract Equation.....	75
6.4.3.3	Trigger Points.....	75
6.4.4	PoC Registration Time [s]	75
6.4.4.1	Abstract Definition.....	75
6.4.4.2	Abstract Equation.....	76
6.4.4.3	Trigger Points.....	76
6.4.5	PoC Publish Failure Ratio [%].....	76
6.4.5.1	Abstract Definition.....	76
6.4.5.2	Abstract Equation.....	77
6.4.5.3	Trigger Points.....	77
6.4.6	PoC Publish Time [s].....	77
6.4.6.1	Abstract Definition.....	77
6.4.6.2	Abstract Equation.....	77
6.4.6.3	Trigger Points.....	78
6.4.7	PoC Registration Failure Ratio (long) [%]	78
6.4.7.1	Abstract Definition.....	78
6.4.7.2	Abstract Equation.....	78
6.4.7.3	Trigger Points.....	78
6.4.8	PoC Registration Time (long) [s].....	79
6.4.8.1	Abstract Definition.....	79
6.4.8.2	Abstract Equation.....	79
6.4.8.3	Trigger Points.....	79
6.4.9	PoC Session Initiation Failure Ratio (on-demand) [%]	80
6.4.9.1	Abstract Definition.....	80
6.4.9.2	Abstract Equation.....	80
6.4.9.3	Trigger Points.....	80
6.4.10	PoC Session Initiation Time (on-demand) [s].....	81
6.4.10.1	Abstract Definition.....	81
6.4.10.2	Abstract Equation.....	82
6.4.10.3	Trigger Points.....	82
6.4.11	PoC Session Media Parameters Negotiation Failure Ratio (pre-established) [%]	83
6.4.11.1	Abstract Definition.....	83
6.4.11.2	Abstract Equation.....	83
6.4.11.3	Trigger Points.....	83
6.4.12	PoC Session Media Parameters Negotiation Time (pre-established) [s]	84
6.4.12.1	Abstract Definition.....	84
6.4.12.2	Abstract Equation.....	84
6.4.12.3	Trigger Points.....	84
6.4.13	PoC Session Initiation Failure Ratio (pre-established) [%]	85
6.4.13.1	Abstract Definition.....	85
6.4.13.2	Abstract Equation.....	85
6.4.13.3	Trigger Points.....	86
6.4.14	PoC Session Initiation Time (pre-established) [s]	86
6.4.14.1	Abstract Definition.....	86
6.4.14.2	Abstract Equation.....	87
6.4.14.3	Trigger Points.....	87
6.4.15	PoC Session Setup Failure Ratio (on-demand) [%]	87
6.4.15.1	Abstract Definition.....	87
6.4.15.2	Abstract Equation.....	88
6.4.15.3	Trigger Points.....	88
6.4.16	PoC Session Setup Failure Ratio (pre-established) [%].....	88
6.4.16.1	Abstract Definition.....	88
6.4.16.2	Abstract Equation.....	88
6.4.16.3	Trigger Points.....	89
6.4.17	PoC Session Setup Time [s].....	89

6.4.17.1	Abstract Definition.....	89
6.4.17.2	Abstract Equation.....	90
6.4.17.3	Trigger Points.....	90
6.4.18	PoC Push to Speak Failure Ratio [%]	90
6.4.18.1	Abstract Definition.....	90
6.4.18.2	Abstract Equation.....	90
6.4.18.3	Trigger Points.....	91
6.4.19	PoC Push to Speak Time [s]	91
6.4.19.1	Abstract Definition.....	91
6.4.19.2	Abstract Equation.....	91
6.4.19.3	Trigger Points.....	92
6.4.20	PoC Session Leaving Failure Ratio (on-demand) [%]	92
6.4.20.1	Abstract Definition.....	92
6.4.20.2	Abstract Equation.....	92
6.4.20.3	Trigger Points.....	92
6.4.21	PoC Session Leaving Time (on-demand) [s]	93
6.4.21.1	Abstract Definition.....	93
6.4.21.2	Abstract Equation.....	93
6.4.21.3	Trigger Points.....	93
6.4.22	PoC Session Leaving Failure Ratio (pre-established) [%]	93
6.4.22.1	Abstract Definition.....	93
6.4.22.2	Abstract Equation.....	94
6.4.22.3	Trigger Points.....	94
6.4.23	PoC Session Leaving Time (pre-established) [s]	94
6.4.23.1	Abstract Definition.....	94
6.4.23.2	Abstract Equation.....	94
6.4.23.3	Trigger Points.....	95
6.4.24	PoC Deregistration Failure Ratio [%]	95
6.4.24.1	Abstract Definition.....	95
6.4.24.2	Abstract Equation.....	95
6.4.24.3	Trigger Points.....	95
6.4.25	PoC Deregistration Time [s]	95
6.4.25.1	Abstract Definition.....	95
6.4.25.2	Abstract Equation.....	96
6.4.25.3	Trigger Points.....	96
6.4.26	PoC Busy Floor Response Failure Ratio [%]	96
6.4.26.1	Abstract Definition.....	96
6.4.26.2	Abstract Equation.....	96
6.4.26.3	Trigger Points.....	97
6.4.27	PoC Busy Floor Response Time [s]	97
6.4.27.1	Abstract Definition.....	97
6.4.27.2	Abstract Equation.....	97
6.4.27.3	Trigger Points.....	98
6.4.28	PoC Talk Burst Request Failure Ratio [%]	98
6.4.28.1	Abstract Definition.....	98
6.4.28.2	Abstract Equation.....	98
6.4.28.3	Trigger Points.....	98
6.4.29	PoC Talk Burst Request Time [s]	98
6.4.29.1	Abstract Definition.....	98
6.4.29.2	Abstract Equation.....	99
6.4.29.3	Trigger Points.....	99
6.4.30	PoC Talk Burst Cut-off Ratio [%]	99
6.4.30.1	Abstract Definition.....	99
6.4.30.2	Abstract Equation.....	100
6.4.30.3	Trigger Points.....	100
6.4.31	PoC Talk Burst Packet Drop Ratio [%]	100
6.4.31.1	Abstract Definition.....	100
6.4.31.2	Abstract Equation.....	101
6.4.31.3	Trigger Points.....	101
6.4.32	PoC Voice Transmission Delay (first) [s]	101
6.4.32.1	Abstract Definition.....	101
6.4.32.2	Abstract Equation.....	102

6.4.32.3	Trigger Points.....	102
6.4.33	PoC Speech Transmission Delay (others) [s].....	102
6.4.33.1	Abstract Definition.....	102
6.4.33.2	Abstract Equation.....	103
6.4.33.3	Trigger Points.....	103
6.4.34	PoC Speech Quality.....	103
6.4.35	Group Management QoS Parameter.....	103
6.4.36	Group Document related QoS Parameter.....	103
6.4.37	Instant Message QoS Parameter.....	103
6.5	Streaming Video.....	103
6.5.1	Definitions.....	103
6.5.1.1	Streaming Session or Session.....	103
6.5.2	Prerequisites.....	104
6.5.3	Streaming Scenarios.....	104
6.5.3.1	Generic Streaming Signalling Flow.....	104
6.5.3.2	Parameter Overview Chart.....	105
6.5.4	Streaming Service Non-Accessibility [%].....	105
6.5.4.1	Abstract Definition.....	105
6.5.4.2	Abstract Equation.....	105
6.5.4.3	Trigger Points.....	106
6.5.5	Streaming Service Access Time [s].....	106
6.5.5.1	Abstract Definition.....	106
6.5.5.2	Abstract Equation.....	106
6.5.5.3	Trigger Points.....	106
6.5.6	Streaming Reproduction Cut-off Ratio [%].....	106
6.5.6.1	Abstract Definition.....	106
6.5.6.2	Abstract Equation.....	106
6.5.6.3	Trigger Points.....	107
6.5.7	Streaming Audio Quality.....	107
6.5.7.1	Abstract Definition.....	107
6.5.7.2	Abstract Equation.....	107
6.5.7.3	Trigger Points.....	107
6.5.8	Streaming Video Quality.....	107
6.5.8.1	Abstract Definition.....	107
6.5.8.2	Abstract Equation.....	107
6.5.8.3	Trigger Points.....	108
6.5.9	Streaming Audio/Video De-Synchronization.....	108
6.5.9.1	Abstract Definition.....	108
6.5.9.2	Abstract Equation.....	108
6.5.9.3	Trigger Points.....	108
6.5.10	Streaming Reproduction Start Failure Ratio [%].....	108
6.5.10.1	Abstract Definition.....	108
6.5.10.2	Abstract Equation.....	108
6.5.10.3	Trigger Points.....	108
6.5.11	Streaming Reproduction Start Delay [s].....	109
6.5.11.1	Abstract Definition.....	109
6.5.11.2	Abstract Equation.....	109
6.5.11.3	Trigger Points.....	109
6.5.12	Streaming Teardown Failure Ratio [%].....	109
6.5.12.1	Abstract Definition.....	109
6.5.12.2	Abstract Equation.....	109
6.5.12.3	Trigger Points.....	109
6.5.13	Streaming Teardown Time [s].....	110
6.5.13.1	Abstract Definition.....	110
6.5.13.2	Abstract Equation.....	110
6.5.13.3	Trigger Points.....	110
6.5.14	Streaming Rebuffering Failure Ratio [%].....	110
6.5.14.1	Abstract Definition.....	110
6.5.14.2	Abstract Equation.....	110
6.5.14.3	Trigger Points.....	110
6.5.15	Streaming Rebuffering Time [s].....	110
6.5.15.1	Abstract Definition.....	110

6.5.15.2	Abstract Equation.....	111
6.5.15.3	Trigger Points.....	111
6.6	Telephony.....	111
6.6.1	Telephony Service Non-Accessibility [%]	111
6.6.1.1	Abstract Definition.....	111
6.6.1.2	Abstract Equation.....	111
6.6.1.3	Trigger Points.....	111
6.6.2	Telephony Setup Time [s].....	121
6.6.2.1	Abstract Definition.....	121
6.6.2.2	Abstract Equation.....	121
6.6.2.3	Trigger Points.....	121
6.6.3	Telephony Speech Quality on Call Basis.....	124
6.6.3.1	Abstract Definition.....	124
6.6.3.2	Abstract Equation.....	124
6.6.3.3	Trigger Points.....	124
6.6.4	Telephony Speech Quality on Sample Basis	124
6.6.4.1	Abstract Definition.....	124
6.6.4.2	Abstract Equation.....	125
6.6.4.3	Trigger Points.....	125
6.6.5	Telephony Cut-off Call Ratio [%]	125
6.6.5.1	Abstract Definition.....	125
6.6.5.2	Abstract Equation.....	125
6.6.5.3	Trigger Points.....	125
6.6.6	Telephony CLIP Failure Ratio [%].....	127
6.6.6.1	Abstract Definition.....	127
6.6.6.2	Abstract Equation.....	127
6.6.6.3	Trigger Points.....	127
6.7	Video Telephony.....	128
6.7.1	Network Accessibility/Availability	128
6.7.2	Parameter Overview Chart.....	128
6.7.3	VT Service Non-Accessibility [%]	130
6.7.3.1	Abstract Definition.....	130
6.7.3.2	Abstract Equation.....	130
6.7.3.3	Trigger Points.....	130
6.7.4	VT Service Access Time [s]	131
6.7.4.1	Abstract Definition.....	131
6.7.4.2	Abstract Equation.....	131
6.7.4.3	Trigger Points.....	131
6.7.5	VT Audio/Video Setup Failure Ratio [%]	132
6.7.5.1	Abstract Definition.....	132
6.7.5.2	Abstract Equation.....	132
6.7.5.3	Trigger Points.....	132
6.7.6	VT Audio/Video Setup Time [s].....	132
6.7.6.1	Abstract Definition.....	132
6.7.6.2	Abstract Equation.....	133
6.7.6.3	Trigger Points.....	133
6.7.7	VT Cut-off Call Ratio [%]	133
6.7.7.1	Abstract Definition.....	133
6.7.7.2	Abstract Equation.....	133
6.7.7.3	Trigger Points.....	134
6.7.8	VT Speech Quality on Call Basis	134
6.7.8.1	Abstract Definition.....	134
6.7.8.2	Abstract Equation.....	135
6.7.8.3	Trigger Points.....	135
6.7.9	VT Speech Quality on Sample Basis	136
6.7.9.1	Abstract Definition.....	136
6.7.9.2	Abstract Equation.....	136
6.7.9.3	Trigger Points.....	137
6.7.10	VT Video Quality	137
6.7.10.1	Abstract Definition.....	137
6.7.10.2	Abstract Equation.....	137
6.7.10.3	Trigger Points.....	138

6.7.11	VT End-To-End Mean One-Way Transmission Time [s].....	138
6.7.11.1	Abstract Definition.....	138
6.7.11.2	Abstract Equation.....	138
6.7.11.3	Trigger Points.....	139
6.7.12	VT Audio/Video Synchronization [%].....	139
6.7.12.1	Abstract Definition.....	139
6.7.12.2	Abstract Equation.....	139
6.7.12.3	Trigger Points.....	139
6.7.13	Signalling Diagrams	140
6.8	Web Browsing (HTTP).....	143
6.8.1	HTTP Service Non-Accessibility [%].....	143
6.8.2	HTTP Setup Time [s].....	143
6.8.3	HTTP IP-Service Access Failure Ratio [%]	143
6.8.3.1	Abstract Definition.....	143
6.8.3.2	Abstract Equation.....	143
6.8.3.3	Trigger Points.....	143
6.8.4	HTTP IP-Service Setup Time [s].....	143
6.8.4.1	Abstract Definition.....	143
6.8.4.2	Abstract Equation.....	144
6.8.4.3	Trigger Points.....	144
6.8.5	HTTP Session Failure Ratio [%]	144
6.8.5.1	Abstract Definition.....	144
6.8.5.2	Abstract Equation.....	144
6.8.5.3	Trigger Points.....	144
6.8.6	HTTP Session Time [s].....	144
6.8.6.1	Abstract Definition.....	144
6.8.6.2	Abstract Equation.....	145
6.8.6.3	Trigger Points.....	145
6.8.7	HTTP Mean Data Rate [kbit/s].....	145
6.8.7.1	Abstract Definition.....	145
6.8.7.2	Abstract Equation.....	145
6.8.7.3	Trigger Points.....	145
6.8.8	HTTP Data Transfer Cut-off Ratio [%]	146
6.8.8.1	Abstract Definition.....	146
6.8.8.2	Abstract Equation.....	146
6.8.8.3	Trigger Points.....	146
6.8.9	HTTP Content Compression Ratio [%]	146
6.8.9.1	Abstract Definition.....	146
6.8.9.2	Abstract Equation.....	147
6.8.9.3	Trigger Points.....	147
6.9	Web Radio.....	147
6.9.1	General.....	147
6.9.2	Preconditions	148
6.9.3	Special remarks on Internet radio audio playback and buffering.....	148
6.9.4	Transaction Definition from User's perspective.....	148
6.9.5	Result Definition.....	148
6.9.6	QoS Parameter Overview	149
6.9.7	Web Radio EPG Retrieval Failure Ratio [%]	149
6.9.7.1	Abstract Definition.....	149
6.9.7.2	Abstract Equation.....	149
6.9.7.3	Trigger Points.....	149
6.9.8	Web Radio EPG Retrieval Time [s].....	149
6.9.8.1	Abstract Definition.....	149
6.9.8.2	Abstract Equation.....	149
6.9.8.3	Trigger Points.....	149
6.9.9	Web Radio Tune-in Failure Ratio [%].....	150
6.9.9.1	Abstract Definition.....	150
6.9.9.2	Abstract Equation.....	150
6.9.9.3	Trigger Points.....	150
6.9.10	Web Radio Tune-in Time [s]	150
6.9.10.1	Abstract Definition.....	150
6.9.10.2	Abstract Equation.....	150

6.9.10.3	Trigger Points.....	150
6.9.11	Web Radio Reproduction Set-up Failure Ratio [%]	150
6.9.11.1	Abstract Definition.....	150
6.9.11.2	Abstract Equation.....	151
6.9.11.3	Trigger Points.....	151
6.9.12	Web Radio Reproduction Set-Up Time [s].....	151
6.9.12.1	Abstract Definition.....	151
6.9.12.2	Abstract Equation.....	151
6.9.12.3	Trigger Points.....	151
6.9.13	Web Radio Reproduction Cut-off Ratio [%]	152
6.9.13.1	Abstract Definition.....	152
6.9.13.2	Abstract Equation.....	152
6.9.13.3	Trigger Points.....	152
6.9.14	Web Radio Audio Quality	152
6.10	WLAN service provisioning with HTTP based authentication	153
6.10.1	Generic Signal Flow	153
6.10.2	WLAN Scan Failure Ratio [%].....	154
6.10.2.1	Abstract Definition.....	154
6.10.2.2	Abstract Equation.....	154
6.10.2.3	Trigger Points.....	154
6.10.3	WLAN Time to Scan [s].....	154
6.10.3.1	Abstract Definition.....	154
6.10.3.2	Abstract Equation.....	155
6.10.3.3	Trigger Points.....	155
6.10.4	WLAN PS Data Service Provisioning Failure Ratio [%]	155
6.10.4.1	Abstract Definition.....	155
6.10.4.2	Abstract Equation.....	155
6.10.4.3	Trigger Points.....	156
6.10.5	WLAN PS Data Service Provisioning Time [s].....	156
6.10.5.1	Abstract Definition.....	156
6.10.5.2	Abstract Equation.....	157
6.10.5.3	Trigger Points.....	157
6.10.6	WLAN Association Failure Ratio [%].....	158
6.10.6.1	Abstract Definition.....	158
6.10.6.2	Abstract Equation.....	158
6.10.6.3	Trigger Points.....	158
6.10.7	WLAN Association Time [s].....	158
6.10.7.1	Abstract Definition.....	158
6.10.7.2	Abstract Equation.....	159
6.10.7.3	Trigger Points.....	159
6.10.8	WLAN IP Address Allocation Failure Ratio [%]	159
6.10.8.1	Abstract Definition.....	159
6.10.8.2	Abstract Equation.....	159
6.10.8.3	Trigger Points.....	159
6.10.9	WLAN IP Address Allocation Time [s]	160
6.10.9.1	Abstract Definition.....	160
6.10.9.2	Abstract Equation.....	160
6.10.9.3	Trigger Points.....	160
6.10.10	WLAN Landing Page Download Failure Ratio [%]	160
6.10.10.1	Abstract Definition.....	160
6.10.10.2	Abstract Equation.....	160
6.10.10.3	Trigger Points.....	160
6.10.11	WLAN Landing Page Download Time [s]	161
6.10.11.1	Abstract Definition.....	161
6.10.11.2	Abstract Equation.....	161
6.10.11.3	Trigger Points.....	161
6.10.12	WLAN Landing Page Password Retrieval Failure Ratio [%].....	161
6.10.12.1	Abstract Definition.....	161
6.10.12.2	Abstract Equation.....	161
6.10.12.3	Trigger Points.....	161
6.10.13	WLAN Landing Page Password Retrieval Time [s]	162
6.10.13.1	Abstract Definition.....	162

6.10.13.2	Abstract Equation.....	162
6.10.13.3	Trigger Points.....	162
6.10.14	WLAN Landing Page Authorization Failure Ratio [%].....	162
6.10.14.1	Abstract Definition.....	162
6.10.14.2	Abstract Equation.....	162
6.10.14.3	Trigger Points.....	162
6.10.15	WLAN Landing Page Authorization Time [s].....	163
6.10.15.1	Abstract Definition.....	163
6.10.15.2	Abstract Equation.....	163
6.10.15.3	Trigger Points.....	163
6.10.16	WLAN Re-accessibility Failure Ratio [%].....	163
6.10.16.1	Abstract Definition.....	163
6.10.16.2	Abstract Equation.....	163
6.10.16.3	Trigger Points.....	164
6.10.17	WLAN Re-accessibility Time [s].....	164
6.10.17.1	Abstract Definition.....	164
6.10.17.2	Abstract Equation.....	164
6.10.17.3	Trigger Points.....	164
6.10.18	WLAN Logout Page Download Failure Ratio [%].....	164
6.10.18.1	Abstract Definition.....	164
6.10.18.2	Abstract Equation.....	165
6.10.18.3	Trigger Points.....	165
6.10.19	WLAN Logout Page Download Time [s].....	165
6.10.19.1	Abstract Definition.....	165
6.10.19.2	Abstract Equation.....	165
6.10.19.3	Trigger Points.....	165
6.11	Wireless Application Protocol (WAP).....	165
6.11.1	WAP Activation Failure Ratio [%] (WAP 1.x only).....	166
6.11.1.1	Abstract Definition.....	166
6.11.1.2	Abstract Equation.....	166
6.11.1.3	Trigger Points.....	167
6.11.2	WAP Activation Time [s] (WAP 1.x only).....	167
6.11.2.1	Abstract Definition.....	167
6.11.2.2	Abstract Equation.....	167
6.11.2.3	Trigger Points.....	167
6.11.3	WAP {Page} IP Access Failure Ratio [%] (WAP 2.x only).....	167
6.11.3.1	Abstract Definition.....	167
6.11.3.2	Abstract Equation.....	167
6.11.3.3	Trigger Points.....	168
6.11.4	WAP {Page} IP Access Setup Time [s] (WAP 2.x only).....	168
6.11.4.1	Abstract Definition.....	168
6.11.4.2	Abstract Equation.....	168
6.11.4.3	Trigger Points.....	168
6.11.5	WAP {Page} Session Failure Ratio [%].....	168
6.11.5.1	Abstract Definition.....	168
6.11.5.2	Abstract Equation.....	168
6.11.5.3	Trigger Points.....	169
6.11.6	WAP {Page} Session Time [s].....	169
6.11.6.1	Abstract Definition.....	169
6.11.6.2	Abstract Equation.....	169
6.11.6.3	Trigger Points.....	169
6.11.7	WAP {Page} Request Failure Ratio [%].....	170
6.11.7.1	Abstract Definition.....	170
6.11.7.2	Abstract Equation.....	170
6.11.7.3	Trigger Points.....	170
6.11.8	WAP {Page} Request Time [s].....	170
6.11.8.1	Abstract Definition.....	170
6.11.8.2	Abstract Equation.....	170
6.11.8.3	Trigger Points.....	170
6.11.9	WAP {Page} Mean Data Rate [kbit/s].....	171
6.11.9.1	Abstract Definition.....	171
6.11.9.2	Abstract Equation.....	171

6.11.9.3	Trigger Points.....	171
6.11.10	WAP {Page} Data Transfer Cut-off Ratio [%].....	171
6.11.10.1	Abstract Definition.....	171
6.11.10.2	Abstract Equation.....	171
6.11.10.3	Trigger Points.....	171
6.11.11	WAP {Page} Data Transfer Time [s].....	172
6.11.11.1	Abstract Definition.....	172
6.11.11.2	Abstract Equation.....	172
6.11.11.3	Trigger Points.....	172
6.12	IMS Multimedia Telephony.....	172
6.12.1	MTSI Registration Failure Ratio [%].....	173
6.12.1.1	Abstract Definition.....	173
6.12.1.2	Abstract Equation.....	173
6.12.1.3	Trigger Points.....	174
6.12.2	MTSI Registration Time [s].....	174
6.12.2.1	Abstract Definition.....	174
6.12.2.2	Abstract Equation.....	174
6.12.2.3	Trigger Points.....	174
6.12.3	MTSI Session Set-up Failure Ratio [%].....	174
6.12.3.1	Abstract Definition.....	174
6.12.3.2	Abstract Equation.....	175
6.12.3.3	Trigger Points.....	175
6.12.4	MTSI Session Set-up Time [s].....	175
6.12.4.1	Abstract Definition.....	175
6.12.4.2	Abstract Equation.....	175
6.12.4.3	Trigger Points.....	176
6.12.5	MTSI Session Add Failure Ratio [%].....	177
6.12.5.1	Abstract Definition.....	177
6.12.5.2	Abstract Equation.....	177
6.12.5.3	Trigger Points.....	177
6.12.6	MTSI Session Add Time [s].....	177
6.12.6.1	Abstract Definition.....	177
6.12.6.2	Abstract Equation.....	178
6.12.6.3	Trigger Points.....	178
6.12.7	MTSI Session Remove Failure Ratio [%].....	179
6.12.7.1	Abstract Definition.....	179
6.12.7.2	Abstract Equation.....	179
6.12.7.3	Trigger Points.....	179
6.12.8	MTSI Session Remove Time [s].....	179
6.12.8.1	Abstract Definition.....	179
6.12.8.2	Abstract Equation.....	179
6.12.8.3	Trigger Points.....	180
6.12.9	MTSI Session Completion Failure Ratio [%].....	180
6.12.9.1	Abstract Definition.....	180
6.12.9.2	Abstract Equation.....	180
6.12.9.3	Trigger Points.....	181
6.12.10	MTSI Speech Quality.....	181
6.12.10.1	Abstract Definition.....	181
6.12.10.2	Abstract Equation.....	181
6.12.10.3	Trigger Points.....	181
6.12.11	MTSI Speech Transmission Delay [s].....	182
6.12.11.1	Abstract Definition.....	182
6.12.11.2	Abstract Equation.....	182
6.12.11.3	Trigger Points.....	182
6.12.12	MTSI Speech Path Delay [s].....	182
6.12.12.1	Abstract Definition.....	182
6.12.12.2	Abstract Equation.....	182
6.12.12.3	Trigger Points.....	183
6.12.13	MTSI Video Quality.....	183
6.12.13.1	Abstract Definition.....	183
6.12.13.2	Abstract Equation.....	183
6.12.13.3	Trigger Points.....	184