

Service Level Agreement (SLA) and Global QoS index for 3G networks

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Outlook

1. UMTS QoS issues and Service level Agreements
2. Parlay for SLA control
3. Global QoS index
4. "Gold-silver-bronze" QoS standard
5. Best practice. New York experience
6. Best practice. LRAIC approach for penalties
7. Conclusion

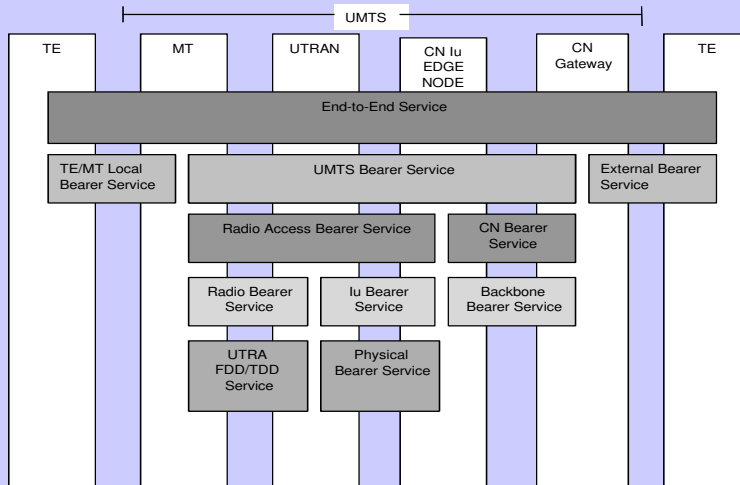
1.1 Service Level Agreement

1. Service Level Agreement (SLA) - formal agreement between two or more entities with the scope to
 - assess service characteristics,
 - responsibilities and
 - priorities of every part.
2. SLA may include **compensations** for an unreached level of quality as a economic issue of the contract.

1.2 Introduction on QoS and SLA studies

1. **ITU-T Rec. E.860 “Framework of a service level agreement” (2002)** – a framework for NGN interconnection studies
2. **ETSI Rec. ETR 138 (1997) – 9 QOS measures (incl. ISDN):**
 - Fault report for access line per year,
 - Unsuccessful call ratio,
 - Call set up time,
 - Supply time for initial network connection,
 - Percentage of orders completed on or before the date confirmed or contracted with the customer,
 - Response time for operator service,
 - Availability of card or coin operated public pay phones,
 - Fault repair time,
 - Service restoration.
3. **ETSI TIPHON project for IP telephony. “Gold-silver-bronze” approach:**
voice packet loss: < .5% for class 1 = gold,
 .5% to 1% for class 2 = silver,
 1% to 2% for class 3 = bronze.

1.3 3GPP QoS Concept and Architecture (3GPP TS 23.107 V5.1.0)



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1.4 Multimedia Services

- **Real Time Communications**
- **Voice**
- **Text**
- **Video**
- **Non-Real Time Communications**
- **audio download;**
- **video download;**
- **audio streaming;**
- **video streaming;**
- **general data files;**
- **text messaging (e.g. SMS);**
- **emails;**
- **general web browsing;**
- **multi-media messaging**

3GPP TR 22.941 V0.7.7

3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; IP Based Multimedia Services Framework; Stage 0 (Release 5)

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1.5 Value ranges for UMTS Bearer Service Attributes

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048	< 2 048	< 2 048	< 2 048
Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502	<=1 500 or 1 502	<=1 500 or 1 502	<=1 500 or 1 502
SDU format information	RCP protocol	RCP protocol		
Delivery of erroneous SDUs	Yes/No	Yes/No	Yes/No	Yes/No
Residual BER	$5 \cdot 10^{-2}$, 10^{-2} , $5 \cdot 10^{-3}$, 10^{-3} , 10^{-4} , 10^{-6}	$5 \cdot 10^{-2}$, 10^{-2} , $5 \cdot 10^{-3}$, 10^{-3} , 10^{-4} , 10^{-5} , 10^{-6}	$4 \cdot 10^{-3}$, 10^{-5} , $6 \cdot 10^{-8}$	$4 \cdot 10^{-3}$, 10^{-5} , $6 \cdot 10^{-8}$
SDU error ratio	10^{-2} , $7 \cdot 10^{-3}$, 10^{-3} , 10^{-4} , 10^{-5}	10^{-1} , 10^{-2} , $7 \cdot 10^{-3}$, 10^{-3} , 10^{-4} , 10^{-5}	10^{-3} , 10^{-4} , 10^{-6}	10^{-3} , 10^{-4} , 10^{-6}
Transfer delay (ms)	100 – maximum value	250 – maximum value		
Guaranteed bit rate (kbps)	< 2 048	< 2 04		
Traffic handling priority			1,2,3	
Allocation/Retention priority	1,2,3	1,2,3	1,2,3	1,2,3

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1.6 IETF activities and 3GPP

Quality of Service Enablers

IETF Integrated Services (IntServ) and Resource Reservation Protocol (RSVP)

Differentiated Services (DiffServ)

Multiprotocol Label Switching (MPLS)

QoS Management Enablers

Service Level Agreements (SLAs)

Common Open Policy Service (COPS) protocol

Simple Network Management Protocol (SNMPv3)

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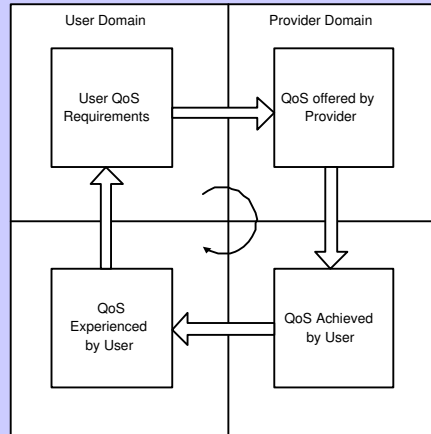
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1.7 Quality of Service (QoS)

ITU-T: *The collective effort of service performance which determine the degree of satisfaction of a user of the service.*

- User Domain
 - Speed
 - Accuracy
 - Dependability
 - Reliability
 - Availability
 - ...
- Provider Domain
 - Delay
 - Loss
 - Utilization
 - ...



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ERROR: invalidrestore
OFFENDING COMMAND: restore

STACK:

-savelevel-
-savelevel-