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Performance from Experience

IP QoS classes: Layered Approach

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ITU - FR and IP QoS classes: Layered Approach

- ITU FR and IP recommended QoS classes metrics related to layer performance
- FR Performance Objectives and QoS classes (Draft ITU-T Recommendation X.146R)
- IP Performance and Availability Objectives and Allocations (Draft ITU-T Recommendations Y.1541)

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X.146 – Frame relay service classes

Class	Network support	FLR_e	FTD (ms)	FDJ (ms)
0	Mandatory, default class	No upper bound specified on FLR_e. But FLR_e will have a practical upper bound and will not be arbitrarily bad.	No upper bound specified on FTD. But delay will have a practical upper bound and will not be arbitrarily large.	NOT APPLICABLE
1	Mandatory	Value $< 1 \times 10^{-3}$, and 95th percentile of weighted 15-minute values $< 3 \times 10^{-3}$.	95th percentile $<$ 400 ms.	95th percentile < 52 ms (see Note 10 and Note 12)
2	Optional	Value $< 3 \times 10^{-5}$, and 95th percentile of weighted 15-minute values $< 1 \times 10^{-4}$.	95th percentile $<$ 400 ms.	95th percentile < 17 ms (see Note 11 and Note 12)
3	Optional	Value $< 3 \times 10^{-5}$, and 95th percentile of weighted 15-minute values for month $< 1 \times 10^{-4}$.	95th percentile $<$ 150 ms (see Note 6).	95th percentile < 17 ms (see Note 11 and Note 12)

Y.1541

Provisional IP QoS class definitions and network performance objectives

			QoS Classes		
	Nature of the network performance objective	**Default objectives**	**Class 1 (Interactive)**	**Class 2 (Non-Interactive)**	**Class 3 (U class)**
IPTD	Upper bound on the mean IPTD	No default	400 ms	1 sec (Note 3)	U
IPDV	Upper bound on the $1\text{-}10^{-4}$ quantile of IPTD minus the minimum IPTD (Note 1)	No default	50 ms	1 sec (Note 3)	U
IPLR	Upper bound on the packet loss probability	No default	$1*10^{-3}$ (Note 2)	$1*10^{-3}$	U
IPER	Upper bound	default TBD	default	default	U
SPR	Upper bound	default TBD	default	default	U

All values are provisional and they need not be met by networks until they are revised (up or down) based on real operational experience

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IP QoS classes: Layered Approach

- IP QoS classes should be defined without regard to application they support (e.g. voice) or without relation to higher layer performance (e.g. “High”, “Best Effort” etc.)
- QoS classes support broad categories of services
- IP QoS classes metrics should be intrinsic to IP layer performance (e.g. Class 0, 1, 2, 3)

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