

# Differentiated Services Delay-and-Loss vs. Loss-Rate-Adaptive Service Classes

draft-polk-tsvwg-delay-vs-loss-ds-service-classes-00.

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# The problem:

## How to achieve “best” performance for RMCAT type traffic ?

- Likely target goals for RMCAT style traffic and RMCAT congestion control
  - Low Delay/Jitter requirements
  - Downspeed before congestion loss (if possible).
  - Sender rate controlled (less bursty in sending than receiver window based congestion control)
  - May survive limited random/burst-accumulation loss without retransmission (interpolation/FEC/...).
- Problems with competing traffic
  - Internet: Default/Best-Effort: TCP traffic
    - Most TCP still loss based
    - Even delay sensitive TCP flow control creates more jitter/delay (receiver based window control)
  - Controlled networks:
    - Assume Multimedia Conferencing (MMC) / AF PBB Group is best-fit Service-Class/PHB group for RMCAT type traffic ?!
    - Problem: existing, Non-rate adaptive eg: video-conferencing traffic in MMC (primarily AF41)  
Often assumes “admission-control” that often is badly/lazily deployed
      - “Overprovisioning” that can not keep up with changes in reality (new apps, users, busy-hour changes,...)
      - If rate-controlled, it is more “circuit-breaker” in nature – stop/downspeed after 1min/30 second loss.

# Proposed direction for RMCAT style traffic

- MUST work in best-effort-queue/Internet (TCP, non-delay sensitive RTCweb flows, ...)
  - But can likely not explore best behavior there (see previous slide).
- SHOULD be made to work best in the absence of incompatible competing traffic
  - Controlled environments:
    - Service Class choice should maximize benefit and likelihood/ease of adoption.
    - Known issue: Today, MMC / AF4 PHB Group can be worse than Standard (BE) in controlled networks (traffic abusing it).
    - Open questions (from discussion on mailing lists)
      - Is MMC the appropriate Service Class for this traffic (ignoring that its commonly used DSCP/PHB group may not be) ?
      - What other non-RMCAT traffic would be sufficiently compatible to be in the same service-class
  - Work also relevant for “Internet”:
    - Persistent congestion primarily an “edge” problem
      - Home<->Broadband-access, Wireless/Mobile (802.11/3G/4G) access
      - “Controlled Network” choices can be applied here as well
      - Related efforts (Metadata/PCP/STUN/RSVP) to simplify classification as in controlled networks if DSCP is a problem.

# Draft Suggestion

- Core suggestion

Separate RMCAT style loss/delay sensitive/rate-adaptive media from existing traffic using AF4.

Assign appropriate DSCPx for RMCAT style traffic.

- *Assumes MMC Service Class / AF4 PHB is correct for this traffic. Just the actual DSCP is abused.*

If that is not the correct assumption, then we should define better PHB/Service-Class.

- Keep AF4x as it is deployed today

Not ideal... but no money in fixing bad legacy deployments.

- Use CS4 as DSCPx for RMCAT style traffic

Any better recommended DSCP ?

- Add DSCPx-discardable

Goal: AF42/AF43 ⇔ DSCPx/DSCPx-discardable

# Other Considerations

- Todo:
  - Revisit what “RMCAT” type classic includes
    - Eg: RMCAT + LEDBAT ?
    - Class should be defined by delay requirements, not congestion control algorithm.
- From RFC4594bis: Permit (not demand) voice part of RMCAT sessions into EF
  - Audio often not well rate-adaptive and often more important than video
  - DSCPx (video) + EF(Audio) likely resulting in better experience under congestion:
    - Audio more likely more loss sensitive than video. Burst collision loss in DSCPx will not affect audio.

# The End

