Framework for Real-time Media Congestion Avoidance Techniques

draft-zhu-rmcat-framework-00

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Motivation and Scope

- Motivation:
  - A viable real-time media congestion control solution needs more than network congestion control (i.e., estimating available bandwidth on the path) to interact with live encoder, or to support multiple media streams sharing the same sender.
  - Outline ***common functionality modules*** needed in such a solution
  - Provide ***a consistent set of terminologies*** for individual solution drafts
- Scope:
  - Describe required/recommended functional modules
  - Describe ***example configurations*** of basic functional modules

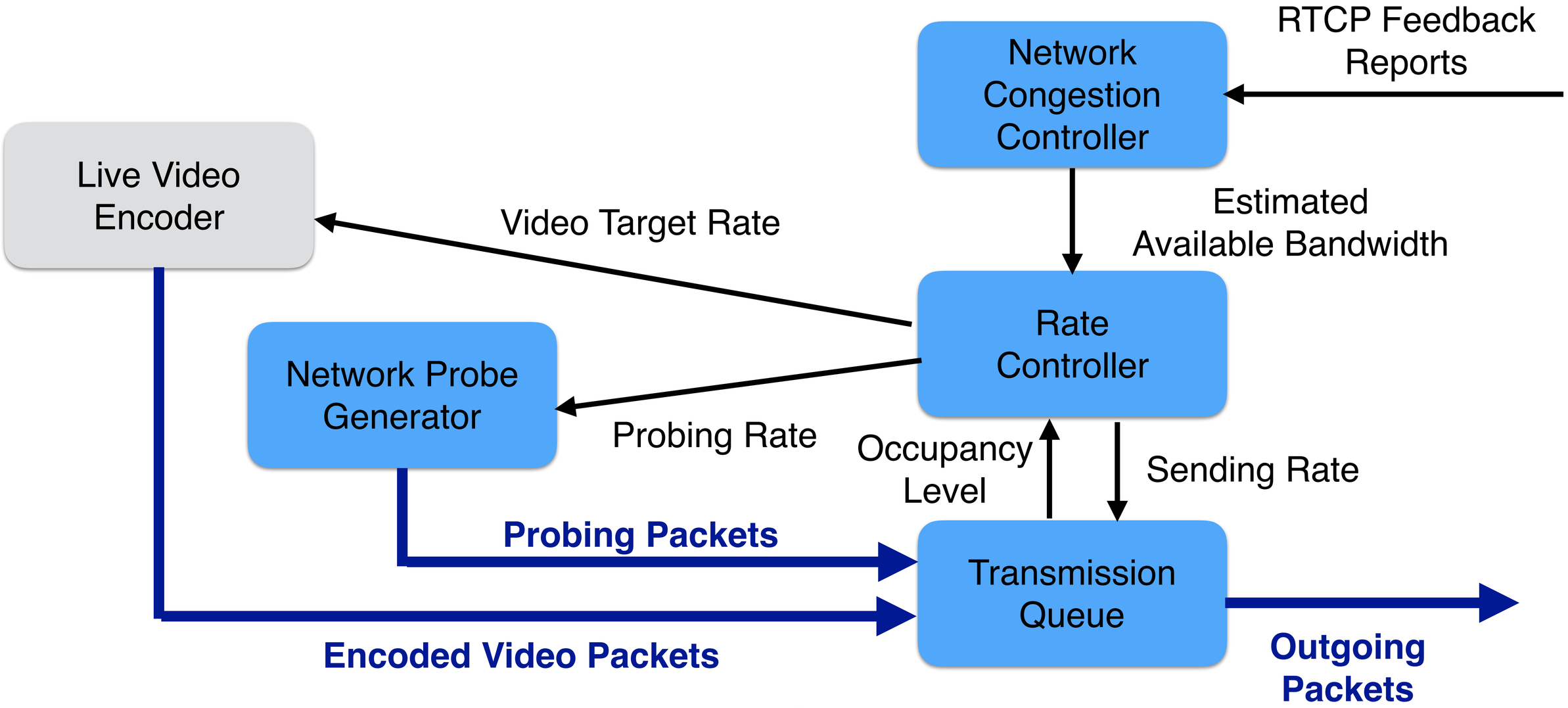
Common Functional Modules (1/2)

- Network congestion controller
  - In charge of congestion detection and available bandwidth estimation based on receiver feedback
  - For multiple streams sharing the same sender, calculates aggregate estimated available bandwidth
- Transmission queue
  - Absorbs instantaneous mismatch between video encoder output and regulated sending rate
  - Reports on current occupancy level to aid Rate Control decisions

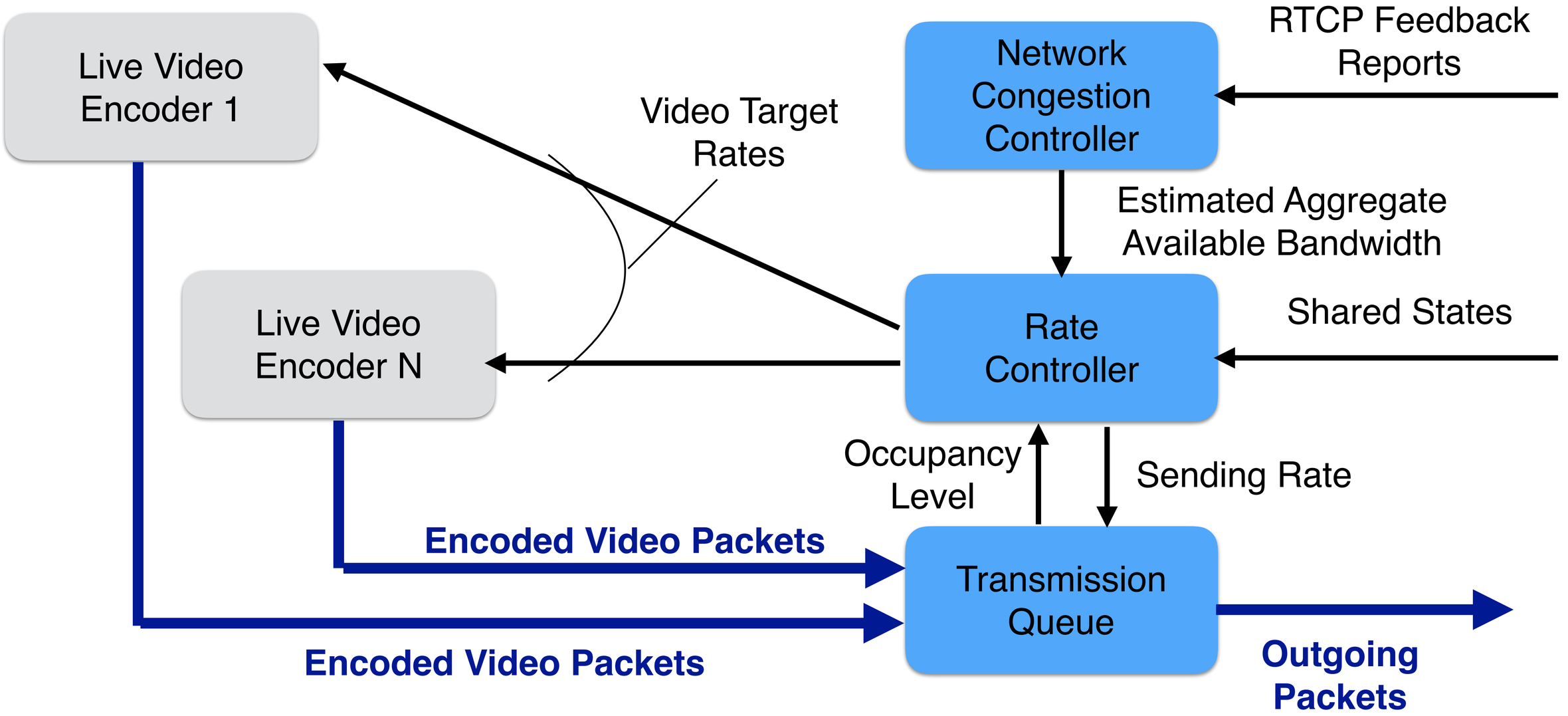
Common Functional Modules (2/2)

- Rate controller
  - Holistically determines ***video target rate***, ***sending rate,*** and ***probing rate*** based on estimated available bandwidth and transmission queue occupancy level
  - Multiple streams sharing the sender: distributes aggregate estimated bandwidth across all streams
- Network probe generator — for generating probing packets (e.g., dummy padding or FEC packets) as dictated by the rate controller, e.g., during initial ramp-up phase
- Shared states — for storage and exchange of congestion control states amongst multiple streams sharing a common sender

Example Configuration for Single Stream



Example Configuration for Multiple Streams



Next Steps

- Needing further input:
  - General WG feedback: is this useful? does this match to what WG had in mind?
  - More detailed description of Shared States
  - Compatibility w.r.t. individual solution drafts
  - Should we merge or stay separate w.r.t. app-interaction and cc-codec-interaction drafts?
- Call for action:
  - Adoption as WG draft
  - General review comments