Networks Research Lab (NetRL)

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Adaptive Video Streaming

- **Problem**
  - Compressed video streams exhibit large variations in their data rates
  - Unpredictable network environment (bandwidth, delay, loss, etc.)
  - Heterogeneity of video-enabled end devices (different capabilities, requirements)

- **Our approach combines**
  - *Network Adaptation Techniques (NATs)*
    - adapts rate using state/load of the network.
  - *Content Adaptation Techniques (CATs)*
    - adapts content to desirable transmission rate using scalable video approaches (layered video streams)

- **Introduce two new modules**

  - **Fuzzy Decision Algorithm**
    Evaluates the available network bandwidth and decides in a fuzzy manner the optimal number of layers that should be sent by adding or dropping layers.

  - **Adaptive Feedback Mechanism**
    Collects (a) receiver’s critical info (packets loss rate per second), and (b) measurements obtained by the core network (packets marked – ECN/RED).

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Adaptive Video Streaming - Results

Evaluation Topology

Fuzzy Rate against CBR

P-QoS vs. Link BW + Delay

P-QoS vs. packet loss

Scalability

Fairness