97-0610 Performance Management Requirements of ATM Networks

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- Why do we need frame level metrics?
- Performance Requirements for:
  - M4 Network Element View
  - M4 Network View

Cell Level vs Frame Level

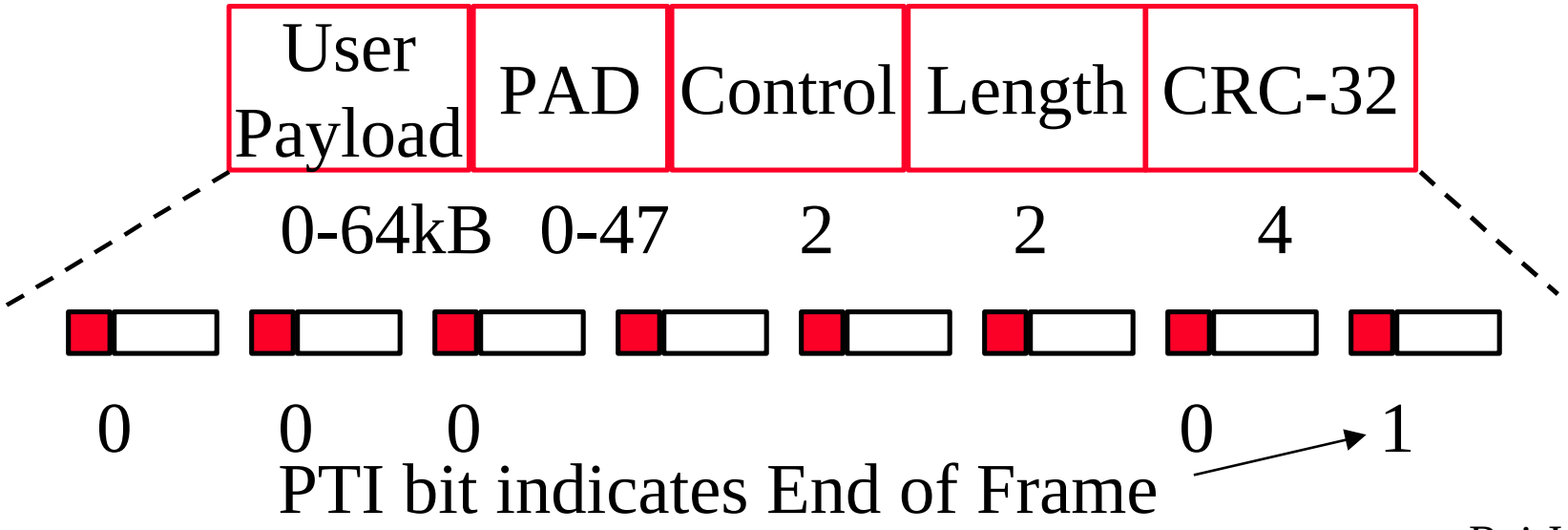
- Performance seen by the user
  ≠ Cell level performance
  For example, CLR = 0.1% may mean a frame loss rate of 0.1% in one switch or 0.001% in another.
- Data applications care for frame loss rate and not CLR.
- Video applications care for
  - Frame loss rate
  - Frame delay variation
  - Frame transfer delay

Frame Level Performance Management

- Shift from cell-level to frame-level performance metrics
- Comparison of the performance of ATM with non-ATM networks
- ATM Forum Test group is working on frame level performance testing
- ATM Forum Traffic Management Group is working on "Guaranteed Frame Rate (GFR)" service

What is a Frame?

- Frame = AAL5 Protocol Data Unit
- Frame boundary is visible even in ATM layer
- Switches are designed to forward/drop complete frames.



Performance Requirements

- M4 Network Element View
  - Cell Level Monitoring
  - Frame Level Monitoring
- M4 Network View

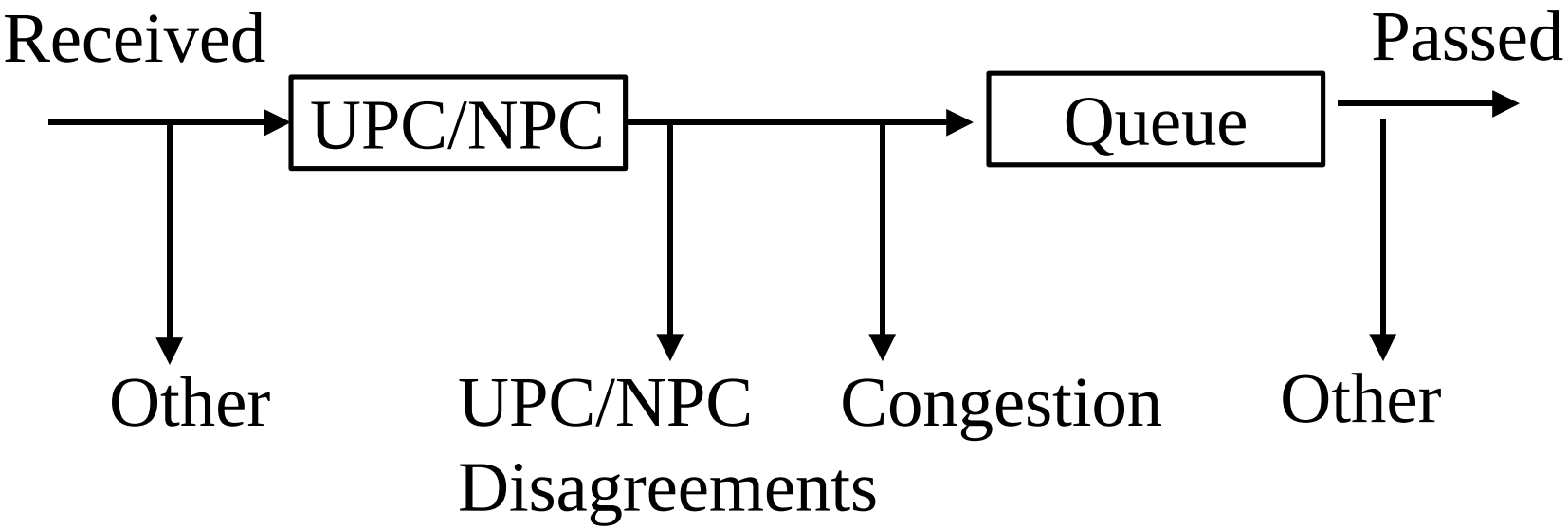
Cell Level Monitoring Requirements

- Retrieve current (15 minute) count of cells discarded due to frame discard
  - Set threshold value
  - Modify threshold value
  - Support autonomous notifications of threshold crossing by ATM Network Element
  - Reset cell count to zero
  - Retrieve history counts (32 fifteen minute counts)
  - Mark defective data as 'suspect' and permit retrieval

Frame Level Monitoring Requirements

- Retrieve current (15 minute) counts of:
  a) Frames received on each connection
  b) Frames successfully passed on each connection
  c) Discarded frames due to UPC/NPC disagreements
  d) Discarded frames due to congestion
  e) Other discarded frames
  f) Successfully passed frames due to UPC/NPC disagreements

Frame Counts



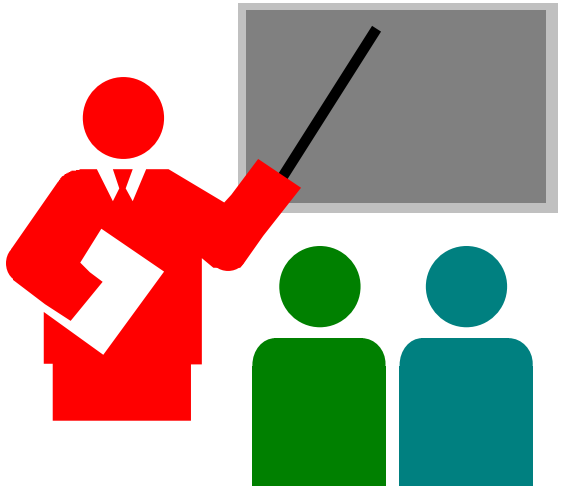
Frame Level (Cont)

- Set threshold values for
  a) Discarded frames due to UPC/NPC disagreements
  b) Discarded frames due to congestion
  c) Total discarded frames
- Modify threshold values for a), b), and c) above
- Provide autonomous notifications of threshold crossing by ATM Network Element
- Reset all six counts to zero
- Retrieve history counts (32 fifteen minute counts)
- Mark defective data as 'suspect' and permit retrieval

M4 Network View

- Support management requests for:
  - Performance information about entire network
  - Performance information about specific part of the sub-network

Summary



- It is important that performance management include frame level metrics
- Addition of cell count and frame counts for M4 Network Element View
- M4 Network View requirements