

97-0610 Performance Management Requirements of ATM Networks

Suba Varadarajan, Raj Jain
The Ohio State University

Aditya Sehgal, Southwestern Bell Communications

Contact: jain@cis.ohio-state.edu

<http://www.cis.ohio-state.edu/~jain/>



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

Cell Level vs Frame Level

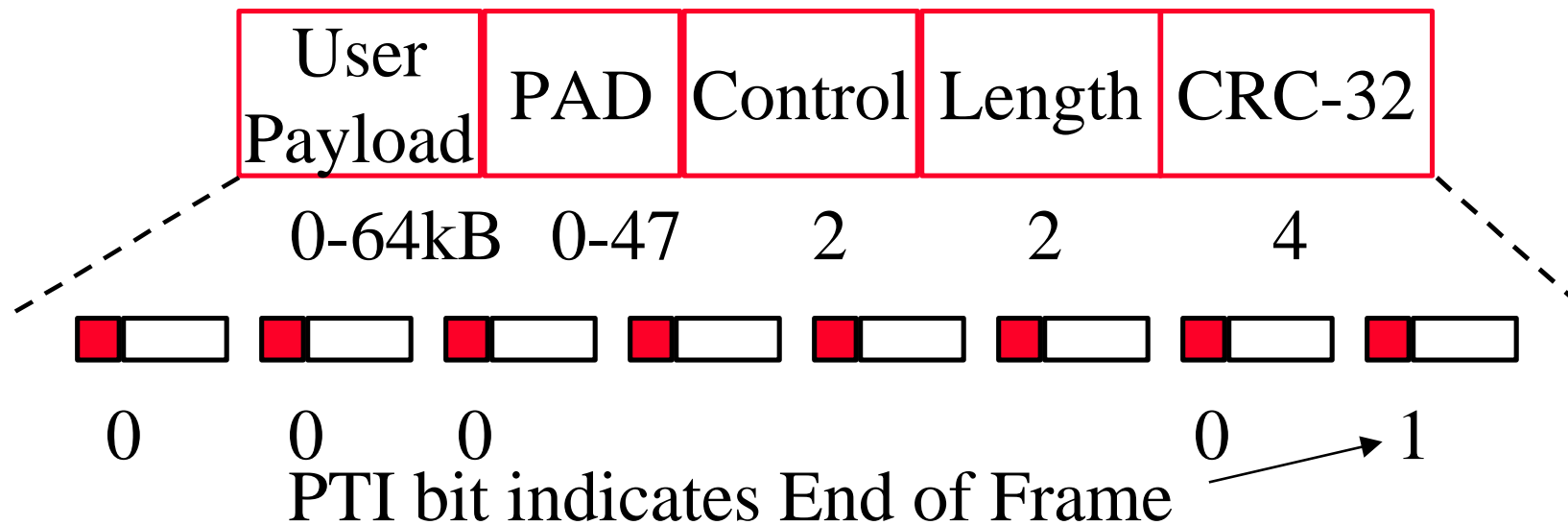
- ❑ Performance seen by the user
≠ Cell level performance
For example, CLR = 0.1% may mean a frame loss rate of 0.1% in one switch or 0.001% in another.
- ❑ Data applications care for frame loss rate and not CLR.
- ❑ Video applications care for
 - ❑ Frame loss rate
 - ❑ Frame delay variation
 - ❑ Frame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

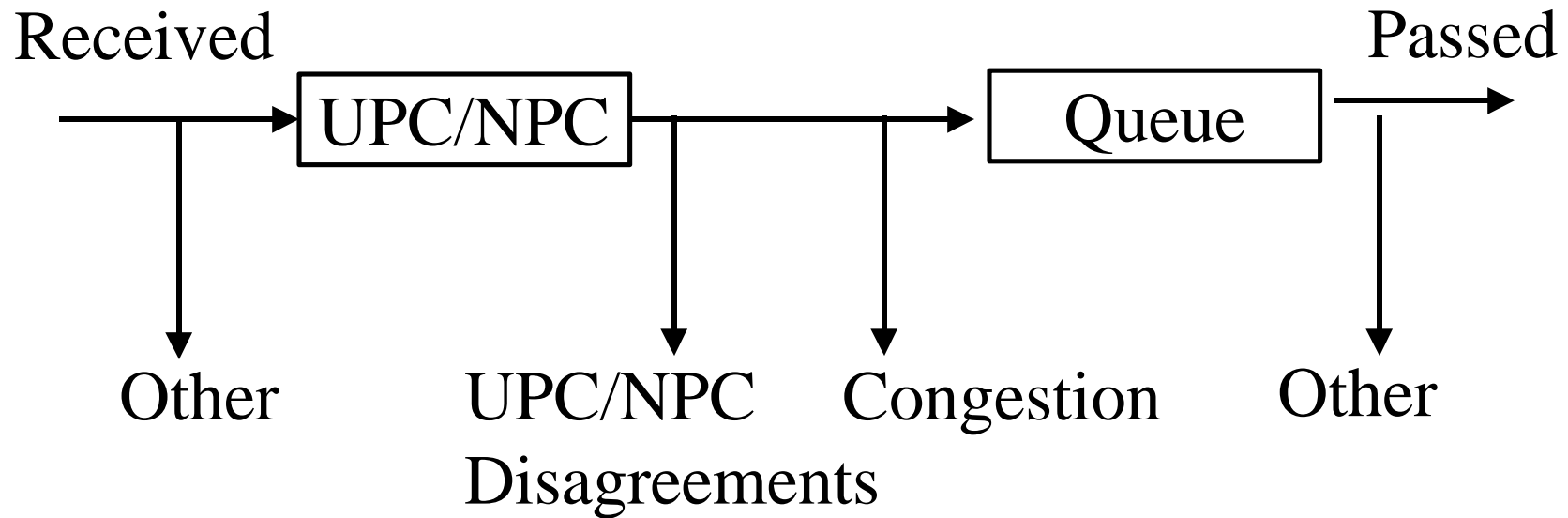
Cell Level Monitoring Requirements

- ❑ 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