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Frame-Level Performance Management Requirements for ATM Networks

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

Why Frame-Level?

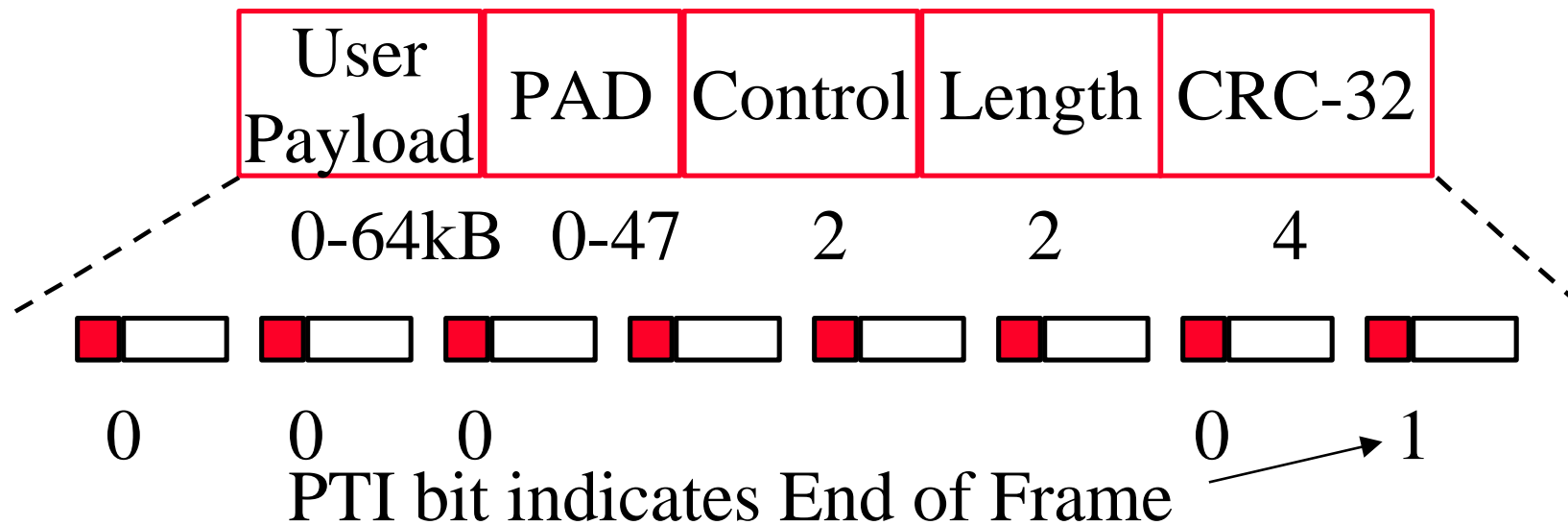
- ❑ ATM Forum TM and signaling allow ABR/UBR users to request frame-level discard also known as early packet discard (EPD)
- ❑ Depending upon the frame size, a congested switch may drop many cells due to frame discard
- ❑ Current network management specs do not allow monitoring any frame-level performance information

Why Frame Level (Cont)?

- ❑ Many users care for frame level performance. However, cell level performance does not give any indication of frame level performance.
1% Cell loss ratio \neq 1% Frame loss ratio
- ❑ Frame-level monitoring becomes more important with the introduction of GFR where frames may be dropped due to UPC/NPC

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
- ❑ Note:
 - ❑ All counters presented here apply only for AAL5 and only if any frame-level services offered.
 - ❑ All counters are optional.
 - ❑ Defining them allows a standard method for requesting and communicating/rejecting info

Cell Level Monitoring Requirements

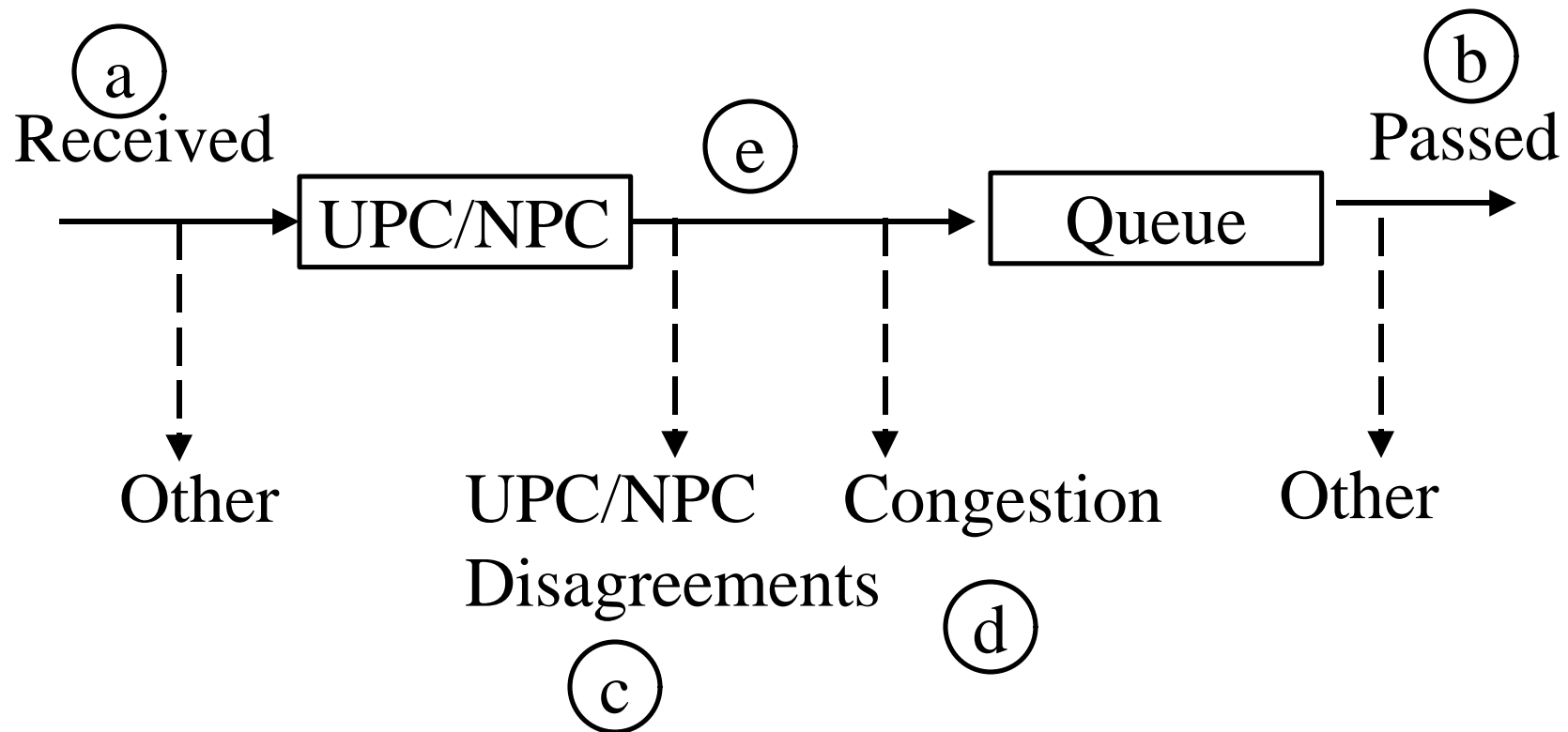
- ❑ Retrieve current (15 minute) count of cells discarded due to frame discard
 - ❑ Set threshold value
 - ❑ Modify threshold value
 - ❑ Support autonomous notifications of threshold crossing by ATM Network Element
 - ❑ Reset cell count to zero
 - ❑ Retrieve history counts (32 fifteen minute counts)
 - ❑ 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) Frames discarded due to UPC/NPC disagreements
 - d) Frames discarded due to congestion
 - e) Frames passed successfully after UPC/NPC

Other discarded frames can be calculated

Frame Counts



Frame Level (Cont)

- ❑ Set threshold values for
 - a) Discarded frames due to UPC/NPC disagreements
 - b) Discarded frames due to congestion
- ❑ Modify threshold values for a) and b) above
- ❑ Provide autonomous notifications of threshold crossing by ATM Network Element
- ❑ Reset all 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