802.3ar/D1.1

Howard Frazier

Patricia Thaler

Shimon Muller

List of issues

- Granularity of ifsStretch
- Draft vs PAR
- Draft vs Objectives
- Draft vs 5 Criteria
- Draft vs 802.3 operating rules

Granularity of ifsStretch

- ifsStretch was originally intended to be used for:

  IEEE Std 802.3ae-2002, 4.2.3.2.2

  “…dynamically adapting the nominal data rate of the MAC sublayer to SONET/SDH data rates (with packet granularity) for WAN-compatible applications of this standard.”

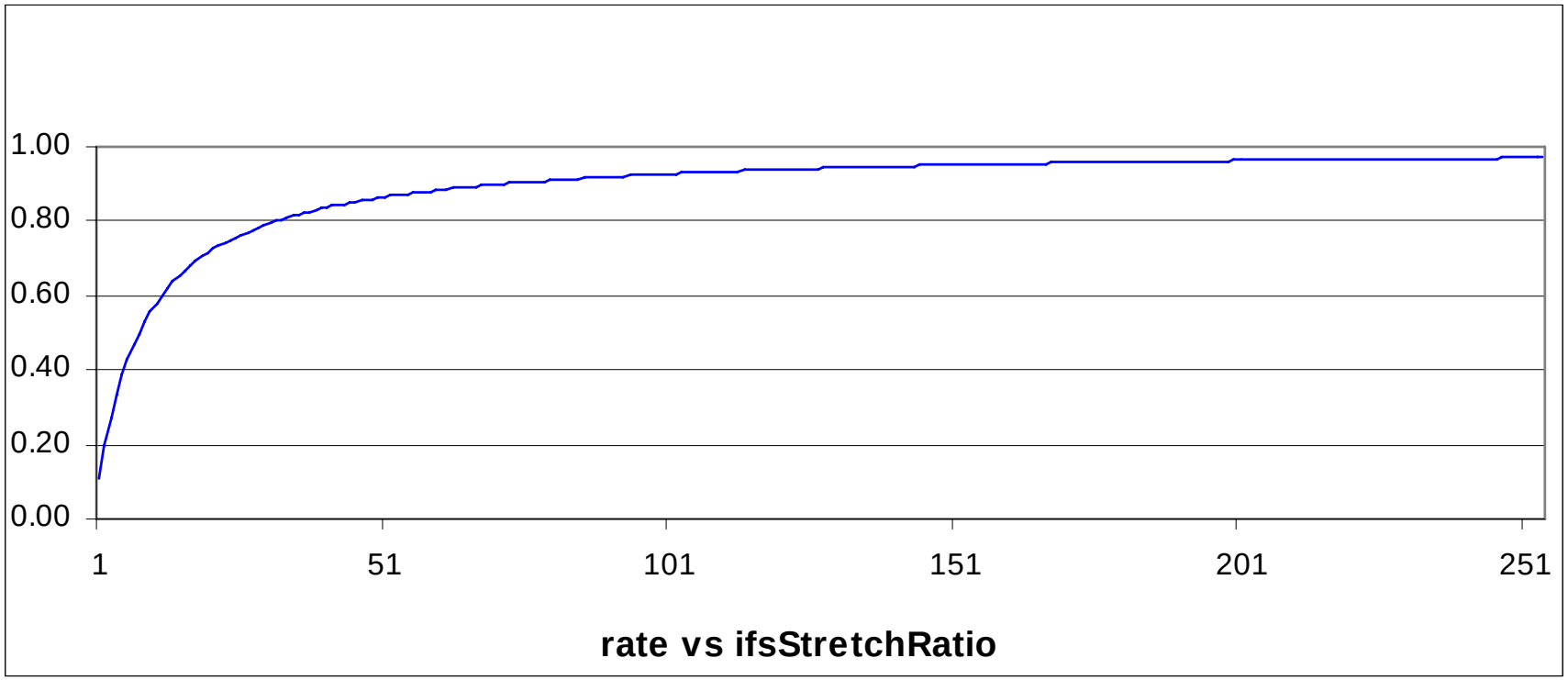
- It does this very well

Granularity of ifsStretch

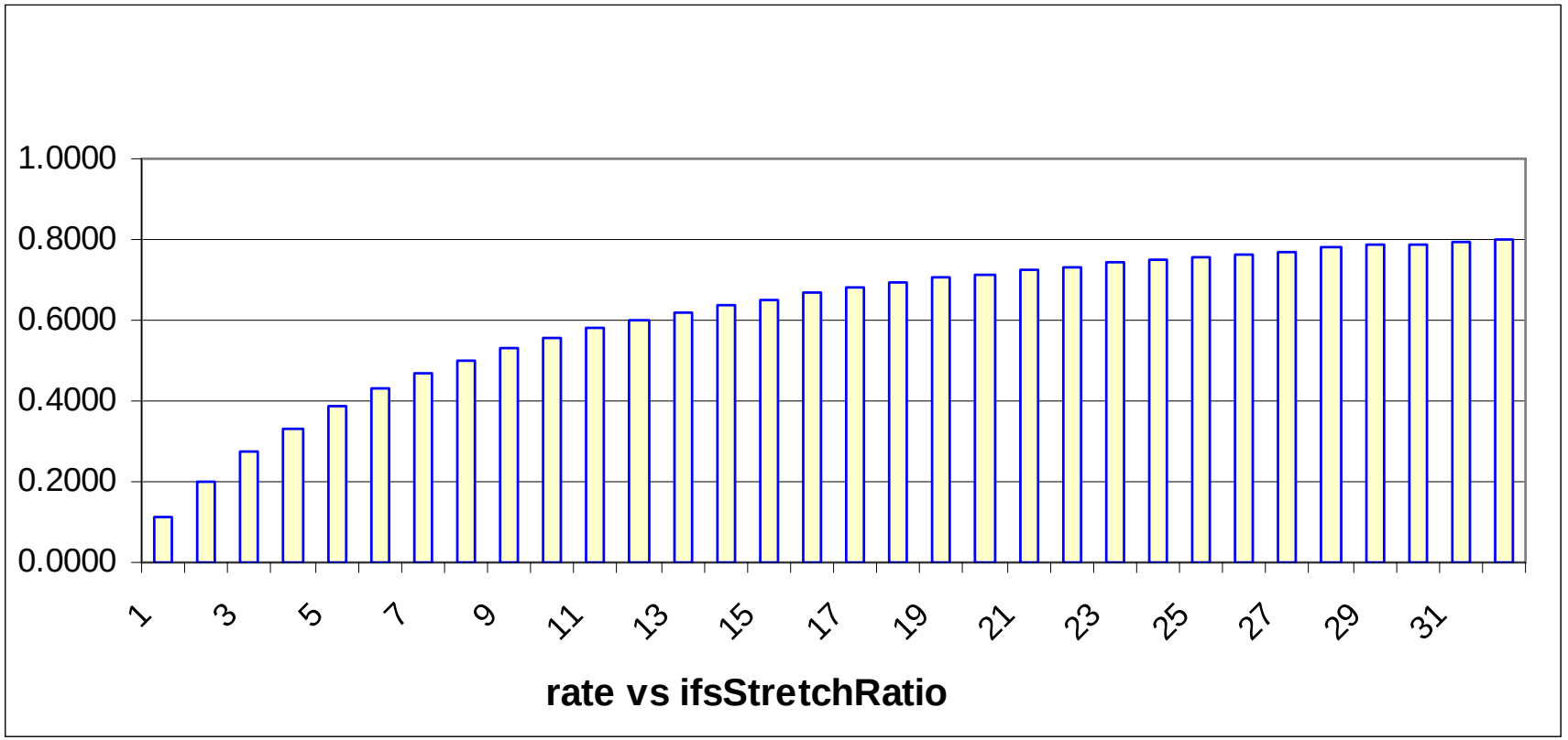
- ifsStretch was not intended to limit the effective data transmission rate to a small fraction (< 70%) of the nominal rate.

- It does this very poorly, because the granularity is quite large

Granularity of ifsStretch



Granularity of ifsStretch



Granularity of ifsStretch

- ifsStretch does not provide a useful means for limiting the effective data rate to a small (<70%) fraction of the nominal rate.
  - not useful for matching 100 Mbps MAC to EFM/DSL/Cable modem
  - not useful for matching 10 Gbps MAC to OC-48
- The bit rate limiting mechanism in the draft does not accomplish what was intended

Draft vs. PAR

- PAR title:

  Information technology -- Telecommunications and information exchange between systems -- Local and metropolitan area networks -- specific requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment: Enhancements for Congestion Management

Draft vs. PAR

- **The draft contains Enhancements for Rate Control, not Enhancements for Congestion Management**
- **The PAR title should be changed to reflect this reality, to avoid confusion in the marketplace**

Draft vs. PAR

- PAR scope:

  To specify IEEE 802.3 MAC parameters and minimal augmentation of MAC operation and management parameters of IEEE Std 802.3 to provide rate control and support of IEEE 802 congestion management.

  - **802.1 Congestion Management PAR is in progress**
  - **It is premature to claim that 802.3ar supports it**
  - **The PAR scope should be changed, or the project put on hold until 802.1 CM makes progress**

Draft vs. Objectives

- X Specify a mechanism to support the communication of congestion information
- ❖ Specify a mechanism to limit the rate of transmitted data on an Ethernet link
- ✓ Preserve the MAC/PLS service interfaces
- X Minimize throughput reduction in noncongested flows

- MIB objects do not constitute a mechanism
- The draft specifies three rate limiting mechanisms, not a mechanism
- None of the mechanisms satisfy the need for adaptation to a small (<70%) fraction of the nominal rate
- The desire to accommodate frame overhead (which is the motivation for the 2nd and 3rd mechanisms) could be met by the first mechanism, or could be performed in MAC control, a la 802.3ah
- All of the mechanisms indiscriminately reduce throughput on all flows

Draft vs. 5 Criteria

- Broad Market Potential:

“During the discussion of the WG 802.3 motion to initiate this study group, 23 people from 16 companies indicated that they plan to participate in the standardization effort for congestion management. This level of commitment indicates that a standard will be developed by a large group of vendors and users. During the study group meetings, there have been up to 30 people from at least 16 companies in attendance.”

  - If attendance at task force meetings is any indication, the market potential seems to have diminished

Draft vs. 5 Criteria

- Broad Market Potential:

“Ethernet networks are being used in an increasing number of application spaces (clustering, backplanes, storage, data centers, etc.) that are sensitive to frame delay, delay variation and loss. Study Group presentations have shown that Ethernet networks can experience higher throughput, lower delay, and lower frame loss by performing congestion management. This will improve Ethernet in its growing number of applications.”

  - The content of the draft does not relate to this in any meaningful way

Draft vs. 5 Criteria

- Compatibility:

  “The proposed standard will conform to the 802.3 MAC, and therefore will be consistent with 802.1d, 802.1Q, and relevant portions of 802.1f.”

  – In reality, the proposed standard *changes* the 802.3 MAC

  “As was the case in previous 802.3 standards, additional MAC Control sublayer functionality and MAC Control frame opcodes may be defined.”

  – Things seem to have gone in a different direction

Draft vs. 5 Criteria

- Technical feasibility:

“Mechanisms for congestion management using congestion indication are known in the industry for some protocols and standards. Simulations of similar protocols show there are alternatives that can be feasibly implemented to accomplish the objectives within IEEE 802.”

  – Not addressed in this project

“The inclusion of congestion indication in layer 2 devices was anticipated in RFC 3168 ‘The Addition of Explicit Congestion Notification (ECN) to IP’.”

  – Not addressed in this project

“Rate control is commonly implemented in Ethernet devices.”

  – This project includes two new ways of doing it

Draft vs. 802.3 operating rules

2.8.2 Draft Standard Balloting Requirements

Before a draft is submitted to WG letter ballot it shall in addition have met the following requirements:

a) It must be complete with no open technical issues.

b) It must be made available for pre-view by the membership by the Monday prior to the plenary week. If any changes are made to the draft after the draft was made available for pre-view the textual changes shall be presented for review during the closing plenary immediately prior to the vote for approval to go to WG ballot.

…

Draft vs. 802.3 operating rules

- D1.1 is not complete:
  - **Pascal changes depicted for Annex 4A, but not for Clause 4**
  - **Pascal changes are fragmentary, e.g.:**

"Insert following into top of procedure StartTransmit in 4A.2.8:"

  - **Missing Annex 30A and Annex 30B**

Conclusions

- Draft 1.1 does not match the PAR
- Draft 1.1 does not satisfy the objectives
- Draft 1.1 does not satisfy the 5 Criteria
- Draft 1.1 does not satisfy the 802.3 operating rules
- Draft 1.1 is not ready for WG ballot