



Broad Market Potential

Broad set(s) of applications

Multiple vendors, multiple users

Balanced cost (LAN vs. attached stations)

- **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.**
- **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.**
- **A standard to support congestion management will respect the balance of cost between LAN and attached stations.**



Compatibility with IEEE Std 802.3

Conformance with CSMA/CD MAC, PLS

Conformance with 802.2

Conformance with 802

- 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.
- As was the case in previous 802.3 standards, additional MAC Control sublayer functionality and MAC Control frame opcodes may be defined.
- The proposed standard will conform to the 802.3 MAC Client Interface, which supports 802.2 LLC.
- The proposed standard will conform to the 802.1 Architecture, Management and Internetworking.
- The proposed standard will define a set of systems management objects, which are compatible with OSI and SNMP system management standards.
- The proposed standard will conform to the requirements of IEEE Std 802-2001.



Distinct Identity

Substantially different from other 802 & 802.3 specs

One unique solution for problem

Easy for document reader to select relevant spec

- **The current 802.3 standard specifies a means of flow control using PAUSE. While this can decrease the frame loss due to oversubscription, the periods of no data transmission result in increased delay in the Ethernet link. The use of PAUSE as back pressure can result in congestion spreading and therefore it is rarely used.**
- **Congestion management, when used, may reduce the offered load at the congestion points without spreading congestion. This specification will define a means of decreasing frame loss while permitting increased efficiency in the Ethernet network.**
- **The specification will be done in a format consistent with the IEEE document requirements thus making it easy for implementers to understand and to design.**



Technical Feasibility

Demonstrated system feasibility
Proven technology, reasonable testing
Confidence in reliability

- **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.**
- **The inclusion of congestion indication in layer 2 devices was anticipated in RFC 3168 “The Addition of Explicit Congestion Notification (ECN) to IP”.**
- **Rate control is commonly implemented in Ethernet devices.**



Economic Feasibility

Cost factors known, reliable data
Reasonable cost for performance
Total installation costs considered

- **Possible solutions investigated for technical feasibility do not add significant complexity to Ethernet devices.**
- **Congestion management standardization will increase the broad market potential of Ethernet which will increase deployment and further reduce cost.**
- **System design, installation and maintenance costs are minimized by utilizing Ethernet system architecture, management, and software.**