Broad Market Potential

Broad set(s) of applications
Multiple vendors, multiple users
Balanced cost (LAN vs. attached stations)

- **Ethernet links are being used in an increasing number of application spaces (clustering, backplanes, storage, data centers, etc.) that are sensitive to frame discard and latency. Frame discard occurs when the MAC Client is oversubscribed in comparison to the capabilities of today's Ethernet full duplex links. Available solutions trade off latency for reduced frame discard. Presentations have shown that Ethernet networks can experience higher throughput, lower latency, and fewer frame discards by performing congestion management within 802.3, which will improve Ethernet in its growing number of application spaces.**

- **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 22 people from 16 companies in attendance.**

- **A standard to support congestion management will maintain 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 XON/XOFF flow control using PAUSE. While this can decrease the frame loss due to oversubscription, the periods of no data transmission results in increased latency in the Ethernet link.**
- **Congestion management will be performed to prevent oversubscription of the MAC Client without halting data transmission. This specification will define a means of decreasing frame loss while permitting decreased latency in the Ethernet link.**
- **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

- **Ethernet supports a link level PAUSE mechanism using MAC Control frames, today. The means of exchanging congestion management information will use comparable technology.**
- **The testing for the generation of and response to any new MAC Control frame opcodes will be similar to the testing currently available for the MAC Control frame's PAUSE opcode. Any such testing would rely on upper bounds on propagation delays for the media and the sublayers within an endstation and would need to be well defined throughout the document as they are today for PAUSE.**
- **This standard will maintain the reliability of the current implementations of the MAC Control sublayer.**
- **Simulation efforts will evaluate the interaction with common protocols running above the MAC Client interface.**

Economic Feasibility

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

- **Possible solutions investigated for technical feasibility do not add complexity to the MAC or the MAC Control. Cost for the support of additional MAC Control opcodes is negligible.**
- **Simulations illustrate how congestion management reduces frame loss and consequently the costs of buffering frames in Ethernet switches and end stations. Simulations have shown reduced latency and increased throughput, which improves the overall performance of Ethernet.**
- **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.**