Broad Market Potential

a) Broad sets of applicability.
b) Multiple vendors and numerous users.
c) Balanced costs (LAN versus attached stations).

- Ethernet has become widely deployed as a preferred backplane solution. Examples include Modular Servers and Enterprise and Telecom Network Equipment. Ethernet is also widely deployed over twinaxial copper cables for both intra-rack and inter-rack connections.

- Internet, cloud, and higher performance computing applications, along with advances in processors, server virtualization and converged networking, are driving the need for higher bandwidth blade and rack server connections. Increasing the backplane data rate to 100 Gb/s and providing cost effective 100 Gb/s rack server solutions are required to maintain pace with new demands.

- 120 participants attended the "100 Gb/s Ethernet Electrical Backplane and Twinaxial Copper Cable Assemblies" Call-For-Interest, representing at least 43 companies. This level of interest indicates that a standard will be developed by a large group of vendors and users.

- A 100 Gb/s Ethernet interface will maintain a favorable cost balance for backplane and twinaxial copper cable applications.

Compatibility

- **IEEE 802 defines a family of standards. All standards should be in conformance with the IEEE 802.1 Architecture, Management, and Interworking documents as follows: IEEE 802. Overview and Architecture, IEEE 802.1D, IEEE 802.1Q, and parts of IEEE 802.1F. If any variances in conformance emerge, they shall be thoroughly disclosed and reviewed with IEEE 802.1.**
- **Each standard in the IEEE 802 family of standards shall include a definition of managed objects that are compatible with systems management standards.**
- **Compatibility with IEEE Std 802.3**
- **Conformance with the IEEE Std 802.3 MAC**
- **Managed object definitions compatible with SNMP**

- As an amendment to IEEE Std 802.3, as amended by IEEE Std 802.3ba-2010, the proposed project will remain in conformance with the IEEE 802 Overview and Architecture, the bridging standards IEEE Std 802.1D and IEEE Std 802.1Q, and clause 80 introduced by IEEE Std 802.3ba-2010.

- The proposed amendment will conform to the full-duplex operating mode of the IEEE 802.3 MAC.

- The proposed amendment will conform to the 100 Gb/s Media Independent Interface (CGMII) specified by IEEE Std 802.3ba-2010.

- The project will include a protocol independent specification of managed objects with SNMP management capability to be provided in the future by an amendment to or revision of IEEE P802.3.1.

Distinct Identity

a) **Substantially different from other IEEE 802 standards.**
b) **One unique solution per problem (not two solutions to a problem).**
c) **Easy for the document reader to select the relevant specification.**
d) **Substantially different from other IEEE 802.3 specifications/solutions.**

- There is no standard that supports Ethernet on backplane media at operating speeds of 100 Gb/s. While IEEE Std 802.3ba-2010 does include a specification for 100 Gb/s Ethernet on twinaxial copper cables (100GBASE-CR10) the cables are bulky and relatively costly due to the fact that they are constructed with twenty twinaxial wire pairs.

- The standard will define at most one PHY for each medium.

- The proposed amendment to the existing IEEE 802.3 standard will be formatted as a collection of new clauses, making it easy for the reader to select the relevant specification.

Technical Feasibility

a) **Demonstrated system feasibility.**
b) **Proven technology, reasonable testing.**
c) **Confidence in reliability.**

- Systems with an aggregate bandwidth of greater than or equal to 100 Gb/s have been demonstrated and deployed in operational networks.

- The proposed project will build on the array of Ethernet component and system design experience, and the broad knowledge base of Ethernet network operation.

- Component vendors have presented data on the feasibility of the necessary components for this project. Proposals, which either leverage existing technologies or employ new technologies, have been provided.

- The reliability of Ethernet components and systems can be projected in the target environments with a high degree of confidence.

Economic Feasibility

a) **Known cost factors, reliable data.**
b) **Reasonable cost for performance.**
c) **Consideration of installation costs.**

- The cost factors for Ethernet components and systems are well known. The proposed project may introduce new cost factors which can be quantified.

- Prior experience in the development of backplane and twinaxial physical layer specifications for Ethernet indicates that the specifications developed by this project will entail a reasonable cost for the resulting performance.

- 100 Gb/s backplane and twinaxial copper links will make it possible to achieve the desired density, power and cost targets for computer systems and network equipment.

- In consideration of installation costs, the project is expected to use proven and familiar media, including electrical backplanes, and twinaxial copper cabling technology.

- Network design, installation and maintenance costs are minimized by preserving network architecture, management, and software.