

1. Identification of Proposed Project

1.1 Title: SCSI-3 Physical Level

1.2 Proposer

This project is proposed by the X3T9 Technical Committee. For additional information, please contact John B. Lohmeyer, X3T9.2 Chairman, at NCR Corporation, 3718 N. Rock Rd., Wichita, KS 67226 (Phone: 316-636-8703 FAX: 316-636-8889).

1.3 Date Submitted: August 24, 1990

1.4 Project Type: Development

2. Justification of Proposed Standard or Technical Report

2.1 Needs

While the SCSI-2 standard was being approved, it became apparent that some applications require a method to transfer data using a single-cable 16-bit data path. SCSI-2 provides for 16-bit data paths, but it requires two cables and hence two connectors. New small form factor storage devices do not have the physical space for two connectors.

It has also become apparent that greater precision is needed in specifying the physical medium used for SCSI cables. Data transfer rates are increasing and put increasing demands on the cable parameters.

Other needs for expanded capabilities in the SCSI physical layer such as multiple ports are being currently being investigated within X3T9.2.

2.2 Recommended Scope of Standard or Technical Report

The proposed SCSI-3 Physical Level standard should maintain a high degree of compatibility with SCSI-2 while providing documentation for new capabilities including the following candidates:

- a) An option to permit 16-bit data transfers on a single cable.
- b) Expanded bus connectivity options to increase the maximum number of SCSI devices on a cable from 8 to 16 or more.
- c) Other capabilities which fit within the general application scope of the SCSI physical level that may be proposed during the development phase by the participants in the project.
- d) Maintenance of the SCSI physical level standard that may result from further implementation of the SCSI standard.

This proposed standard is not intended to address areas above the physical level (such as command sets). It is intended that this proposed standard could be used in conjunction with the command sets defined in SCSI-2 and/or subsequent versions of SCSI.

2.3 Existing Practice in Area of Proposed Standard or Technical Report

The proposed project involves evolutionary expansion of the present SCSI-2 standard. In addition complementary work is under way in the X3T9 project for faster and wider IPI. That work can be used as a helpful input to SCSI-3 Physical Level.

2.4 Expected Stability of Proposed Standard or Technical Report with Respect to Current and Potential Technological Advance

The nature of the proposed project is to insure that SCSI has an upward, highly compatible growth path. This will insure that current investments in SCSI are provided with more stability in the face of technological developments.

3. Description of Proposed Project

3.1 Type of Document (Standard or Technical Report): Standard

3.2 Definition of Concepts and Special Terms (if any): none

3.3 Expected Relationship with Approved X3 Reference Models (e.g., DBMS, OSI)

The SCSI-3 Physical Level is for use in closed systems.

3.4 Recommended Program of Work

The following program of work is planned for the SCSI-3 Physical Level standard:

- o Solicit continuing participation by the present SCSI-2 participants through X3T9.2 procedures and new participants through press releases. Invite comments by end-user organizations and invite proposals from SCSI development organizations and other organizations that may have a contribution to a viable SCSI-3 Physical Level standard.
- o Establish functional requirements for SCSI functional additions along with downward compatibility requirements.
- o Prepare a draft standard based on proposals submitted and other information gathered during the initial investigation.
- o Consider the results of SCSI-3 Physical Level testing as may be available to the committee through the voluntary efforts of the various participants in X3T9 and its assigned task group.
- o Submit the draft proposed standard to X3 for further processing.

109

3.5 Resources - Individuals and Organizations Competent in Subject Matter

The current membership of X3T9.2 includes representatives from all parts of the computer industry from semiconductor chip manufacturers to large mainframe system manufacturers as well as Government agencies. The members of X3T9.2 have expressed their desire to participate and cooperate in the development of this proposed standard.

There are sufficient resources to complete the development of this standard without delaying work on other standards.

3.6 Recommended X3 Development Technical Committees (Existing or New)

It is recommended that the development work be done in task group X3T9.2 which was responsible for developing the SCSI-1 and SCSI-2 standards.

3.7 Anticipated Frequency and Duration of Meetings

Task group X3T9.2 meets for two days bi-monthly. Specific task ad hoc groups are called as may be required for one to three days between the regular meetings but their results are not binding.

3.8 Target Date for dpANS to X3 (Milestone 10): December 1991

3.9 Estimated Useful Life of Standard or Technical Report

It is anticipated that this standard will have a life of over 10 years.

4. Implementation Impacts

4.1 Impact on Existing User Practices and Investments

The proposed SCSI-3 Physical Level standard will provide an upward growth path complementary to the existing practices and investments. It is likely that any isolated negative impacts would occur in any case through non-standard evolution or revolution.

4.2 Impact on Supplier Products and Support

The proposed SCSI-3 Physical Level standard will provide an upward growth path complementary to the existing practices and investments. It is likely that any isolated negative impacts would occur in any case through non-standard evolution or revolution.

4.3 Techniques and Costs for Compliance Verification

The committee will consider the results of SCSI-3 Physical Level testing as may be available to the committee through the voluntary efforts of the various participants in X3T9 and its assigned task group. With this method all costs are borne by the organizations of the various participants and have for the most part been mainly an adjunct of their normal development costs.

4.4 Legal Considerations

No new legal considerations are expected that are not already attendant with SCSI and in accordance with accepted X3 patent policies.

5. Closely Related Standards Activities

5.1 Existing Standards

X3.131-1986 Small Computer System Interface (SCSI)
X3.131-1990 Small Computer System Interface (SCSI-2)

5.2 X3 Standards Development Projects

A project (685-D) has been approved to develop a SCSI-3 standard which includes the SCSI-3 Physical Level plus the SCSI command sets. This whole interface-in-one-document structure was fine for SCSI-1 when the entire document was 212 pages. SCSI-2 is close to 600 pages and it has become increasingly difficult to manage such a large document. Thus X3T9.2 wishes to break SCSI-3 into several documents with the SCSI-3 Physical Level being the first such document.

Project proposals for alternative physical levels such as Fiber Channel and for one or more SCSI-3 command set projects may be submitted as X3T9 gains better visibility into the requirements for such standards.

5.3 X3/SPARC Study Groups: none

5.4 Other Related Domestic Standards Efforts: none

5.5 ISO Standards Development Projects

IS 9316 (SCSI-1) has been published. DP 10288 (SCSI-2) is in development in ISO JTC1/SC25 WG4.

5.6 Other Related International Standards Development Projects

ECMA SCSI (ECMA-111:1985). This is partly equivalent to ANSI SCSI-1 (X3.131-1986). There are no current development activities within ECMA on SCSI.

5.7 Recommendations for Coordinating Liaison: none

5.8 Recommendations for Close Liaison: none