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Information Technology - Scheduled Transfer (ST) Profiles

Secretariat: National Committee for Information Technology Standardization (NCITS)

ABSTRACT

This document selects and restricts parameter choices and behaviors of the Scheduled Transfer protocol so that any device accepting these restrictions should be able to interoperate.

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A ???

Foreword (This Foreword is not part of American National Standard X3.xxx-199x.)

This American National Standard specifies additional limitations and requirements that may be accepted within the Scheduled Transfer protocol in order to improve interoperability.

This document includes annexes which are informative and are not considered part of the standard.

Requests for interpretation, suggestions for improvement or addenda, or defect reports are welcome. They should be sent to the National Committee for Information Technology Standards (NCITS), ITI, 1250 Eye Street, NW, Suite 200, Washington, DC 20005.

This standard was processed and approved for submittal to ANSI by Accredited Standards Committee on Information Processing Systems, X3. Committee approval of the standard does not necessarily imply that all committee members voted for approval. At the time it approved this standard, the NCITS had the following members:

Karen Higgenbottom, Chairman (Acting)
Karen Higgenbottom, Vice-Chair
Monica Vago, Secretary

Organization Represented	Name of Representative

Technical Committee T11 on Device Level Interfaces, which reviewed this standard, had the following members:

Kumar Malavalli, Chairman
Ed Grivna, Vice Chairman

Task Group T11.1 on the High Performance Parallel Interface, which developed this standard, had the following participants:

Roger Ronald, Chairman and ST Profile Technical Editor
Don Woelz, Vice Chairman

Introduction

This American National Standard specifies additional limitations and requirements that may be accepted within the Scheduled Transfer protocol in order to improve interoperability for basic data transfers.

This Profile is an interoperability specification. The Profile provides implementation guidelines for systems manufacturers, system integrators, component manufacturers, and users seeking to design and select interoperable ST peripherals, hosts and components. This Profile specifies which settings of the ST parameters and protocol options have been selected for interoperable implementation.

This Profile is not a certification document; conformance can only be assured by actual testing of interoperability with independently developed products having the same Profile.

American National Standard
for Information Technology –

Schedule Transfer (ST) Profile

1 Scope

This American National Standard specifies additional limitations and requirements that may be accepted within the Scheduled Transfer protocol in order to improve interoperability for basic data transfers.

This Profile is an interoperability specification. The Profile provides implementation guidelines for systems manufacturers, system integrators, component manufacturers, and users seeking to design and select interoperable ST peripherals, hosts and components. This Profile specifies which settings of the ST parameters and protocol options have been selected for interoperable implementation.

This Profile is not a certification document; conformance can only be assured by actual testing of interoperability with independently developed products having the same Profile.

This report is intended to serve as an implementing guide whose primary objective is to maximize the likelihood of interoperability between conforming implementations. This report prohibits or requires features that are optional, and prohibits the use of some non-optional features in the referenced ANSI standards.

A second objective of this Technical Report is to simplify implementations and their associated documentation, testing, and support requirements. This means that there will be some optional features which are not mutually exclusive, but are still prohibited or required solely for the purpose of this simplification.

Internal characteristics of conforming implementations are not defined by this Technical Report.

2 Normative references

The following standards contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard listed below.

Copies of the following documents can be obtained from ANSI: Approved ANSI standards, approved and draft international and regional standards (ISO, IEC, CEN/CENELEC, ITUT) and approved and draft foreign standards (including BSI, JIS, and DIN). For further information, contact ANSI Customer Service Department at 212-642-4900 (phone), 212-302-1286 (fax) or via the World Wide Web at http://www.ansi.org. Additional availability contact information is provided below as needed.

2.1 Approved references

ANSI X3.183-1991, *High-Performance Parallel Interface – Mechanical, Electrical, and Signalling Protocol Specification (HIPPI-PH)*

ANSI X3.210-1992, *High-Performance Parallel interface, Framing Protocol (HIPPI-FP)*

ANSI X3.222-1993, *High-Performance Parallel interface, Physical Switch Control (HIPPI-SC)*

ANSI X3.323-1998, *High Performance Parallel Interface 6400 Mbits/s, Physical Layer (HIPPI-6400-PH)*

ISO/IEC 10038/ANSI/IEEE 802.1D-1990, *Media access control (MAC) bridges, (Specifies the oper-*

ation of transparent bridges between IEEE 802 conferment networks)

IEEE Std 802-1990, *IEEE Standards for Local and Metropolitan Area Networks: Overview and Architecture*

ISO/IEC 8802-2:1989 (ANSI/IEEE Std 802.2-1989), *Information Processing Systems - Local Area Networks - Part 2: Logical Link control*

2.2 References under development

At the time of publication, the following referenced standards were still under development. For information on the current status of the document, or regarding availability, contact the relevant standards body or other organization as indicated. For more information about obtaining copies of this document or for more information of the current status of the document, contact National Committee for Information Technology Standards, 1250 Eye Street, NW, Suite 200, Washington, DC 20005, 202-626-5746.

ANSI X3.xxx-199x, *Scheduled Transfer (ST)*

3 Definitions and conventions

3.1 Definitions

For the purposes of this standard, the following definitions apply.

3.1.1 administrator: A station management entity providing external management control.

3.1.2 Destination: The receiving end of a physical link.

3.1.3 Device: Any system level component (e.g. endpoint or switch) with a HIPPI-6400 port.

3.1.4 endpoint: A Final Destination and/or an Originating Source.

3.1.5 fabric: All of the switching equipment and resulting pathways connected together in a configuration.

3.1.6 Final Destination: The end device that receives, and operates on, the data payload portion of the micropackets. This is typically a host computer system, but may also be a translator, bridge, or router**.**

3.1.7 log: The act of making a record of an event for later use.

3.1.8 Message: An ordered sequence of one or more micropackets which have the same VC, Originating Source, and Final Destination. Messages are the basic transfer unit between an Originating Source and a Final Destination. The first micropacket of a Message is a Header micropacket. The last micropacket, which may also be the first micropacket, has the TAIL bit set.

3.1.9 optional: Characteristics that are not required by HIPPI-6400-SC. However, if any optional characteristic is implemented, it shall be implemented as defined in HIPPI-6400-SC.

3.1.10 Originating Source: The end device that generates the data payload portion of the micropackets. This is typically a host computer system, but may also be a translator, bridge, or router.

3.1.11 Source: The sending end of a physical link.

3.1.12 Universal LAN MAC Address (ULA): A logical address stored in a Source or Destination field that uniquely identifies an Originating Source or Final Destination. The ULA conforms to the 48-bit MAC address specified by the IEEE 802 Overview Standard.

3.2 Editorial conventions

In this standard, certain terms that are proper names of signals or similar terms are printed in uppercase to avoid possible confusion with other uses of the same words (e.g., FRAME). Any lowercase uses of these words have the normal technical English meaning.

A number of conditions, sequence parameters, events, states, or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g., State, Source). Any lowercase uses of these words have the normal technical English meaning.

The word *shall* when used in this American National standard, states a mandatory rule or requirement. The word *should* when used in this standard, states a recommendation.

3.2.1 Binary notation

Binary notation is used to represent relatively short fields. For example a two-bit field containing a binary value of 10 is shown in binary format as b'10'.

3.2.2 Hexadecimal notation

Hexadecimal notation is used to represent some fields. For example a two-byte field containing a binary value of b'1100010000000011' is shown in hexadecimal format as x'C403'.

3.2.3 Bit/Byte naming conventions

In a parameter that uses multiple bytes, the most-significant byte is the lowest-numbered byte.

In a parameter that uses multiple bits, the most-significant bit is the highest-numbered bit.

3.2.4 Acronyms and other abbreviations

FTP	File Transfer Protocol
HIPPI	High-Performance Parallel Interface
IP	Internet Protocol
LAN	local area network
MAC	media access control
ULA	universal LAN address
WAN	Wide Area Network

3.3 Applicability and use of this document

Since the nature of this document is a profile, the usual definitions of the following words do not apply!

Please read these definitions carefully!

Prohibited: If a feature is Prohibited, it means that it shall not be used between compliant implementations. An implementation may use the feature to communicate with non-compliant implementations.

This document does not prohibit the implementation of features, only their use between compliant implementations.

Required: If a feature or parameter value is Required, it means that it shall be used between compliant implementations. Compliant implementations are required to implement the feature. An implementation may use the feature or other features to communicate with non-compliant implementations.

Allowed: If a feature or parameter value is Allowed, it means that it may be used between compliant implementations. Compliant implementations are not required to implement the feature, but if they do, the feature shall be implemented as described in this document. Typically, the potential user of a feature may determine if the potential recipient supports that feature via a Required discovery process.

Invocable: If a feature or parameter value is Invocable, it means that it may be used between compliant implementations. Compliant implementations are required to implement the feature, and make available the use of the feature. Invocable is different than Allowable or Required in that an originator may invoke the feature if needed, but the originator is not required to invoke it, and may never need to.

Typically, an Invocable feature is Required for implementation by the recipient of the feature.

The table in the following clauses list features described in the Scheduled Transfer protocol. These tables indicate whether the feature is Required, Prohibited, Invocable, or Allowed for compliance with this report; or whether a parameter is Required to be a particular value or limited range of values for compliance with this report.

Features or parameters that are not listed do not affect the interoperability of ST implementations.

The following legend is used for table entries in these clauses:

- **'P'** the implementation is Prohibited from using the specified feature
- **'R'** the implementation is Required to support the specified feature
- **'A'** use of the specified feature is Allowed
- **'I'** the implementation may Invoke the specified feature
- **'n'** the parameter shall be set to this value
- **'X'** this parameter has no required value; any value is allowed
- '-' this parameter or feature is not meaningful

4 System overview

This paragraph provides an overview of the structure, concepts, and mechanisms used in the ST Profile.

This profile is designed to support interoperability for applications that need the general ability to transfer data between one another. One example might be a File Transfer Protocol (FTP) implemented on top of ST.

In exchange for providing interoperability, this profile reduces flexibility and may reduce performance over less constrained implementations. For example, this profiles does not allow using variable Block sizes, a mode of ST operation that could provide flow control that might work better and faster than consistent Blocks over a Wide Area Network (WAN).

Applications that require added flexibility will need to arrive at a different agreement:

- negotiations at the ANSI standards level can establish a new, more suitable profile; or
- negotiations between application developers can establish a defacto working arrangement where consistency in settings and options is agreed upon; or
- negotiations between hardware can select the appropriate behavior of that hardware.

5 Profile Settings

Table 1 lists the variables in connection behavior and assigns a behavior or parameter value. Notes point to additional text when the table format is insufficient to provide a suitable explanation.

Table 1 - Options and Parameters

Parameter or Characteristic	Setting	Note
Variable Block Sizes	P	
Consistent Block Sizes	R	
Silent flag on any STU, other than the last one within a Block	R	
Silent flag on the last STU within a Block	P	
Checksums	A	
Out of Order Blocks	R	
Out-of-order STU tiling	P	
Retransmission to correct errors	R	
Timer Settings		
Endian behavior		
Profile identifier		
Push Semantics (i.e., RTS, CTS, DATA, DATA.....)	R	
Pull Semantics (i.e., RTR, RTS, CTS, DATA, DATA.....)	P	
Persistent Memory Semantics (i.e., PMR, MRA, DATA, DATA.....)	P	
Timeout on op pairs as described in section 10	R	
Connect process, what initial ports, Ethertypes, etc.		

Table 1 - Options and Parameters

Parameter or Characteristic	Setting	Note
Party line connections (i.e.,multiple connections from different points that use the same S_Port value	P	