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**Information technology — High-Performance
Parallel Interface —**

Part 6:
Physical Switch Control (HIPPI-SC)

Technologies de l'information — Interface parallèle à haute performance —

Partie 6: Commande de commutation physique (HIPPI-SC)

ISO/IEC 11518-6:1996

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75% of the national bodies casting a vote.

International Standard ISO/IEC 11518-6 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 25, *Interconnection of information technology equipment*.

ISO/IEC 11518 will consist of the following parts, under the general title *Information technology – High-Performance Parallel Interface*:

- Part 1: *Mechanical, electrical, and signalling protocol specification (HIPPI-PH)*
- Part 2: *Framing Protocol (HIPPI-FP)*
- Part 3: *Encapsulation of ISO/IEC 8802-2 (IEEE Std 802.2) Logical Link Control Protocol Data Units (HIPPI-LE)*
- Part 4: *Mapping of HIPPI to IPI device generic command sets (HIPPI-IPI)*
- Part 5: *Memory Interface (HIPPI-MI)*
- Part 6: *Physical Switch Control (HIPPI-SC)*

Annexes A to C of this part of ISO/IEC 11518 are for information only.

ISO/IEC 11518-6:1996

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Introduction

This part of ISO/IEC 11518 defines the control for HIPPI physical layer switches. HIPPI by itself is an efficient simplex high-performance point-to-point interface. The physical switch control allows the interconnection of multiple HIPPI based equipments with HIPPI physical layer switches.

Characteristics of this HIPPI physical switch control protocol include

- Support for both source routing and destination addresses.
- I-Fields and CCIs can span multiple physical layer switches within a fabric.
- When a Destination end-point receives a packet, it can easily manipulate the I-Field received to return a reply packet to the Source.
- Support for physical layer switches with differing numbers of ports, all within the same fabric.

Figure 1 shows the relationship of this part of ISO/IEC 11518 (in the solid rectangle) to the other entities shown. HIPPI-SC may be considered a HIPPI component which interprets the signalling information provided to HIPPI-PH in certain switched HIPPI configurations.

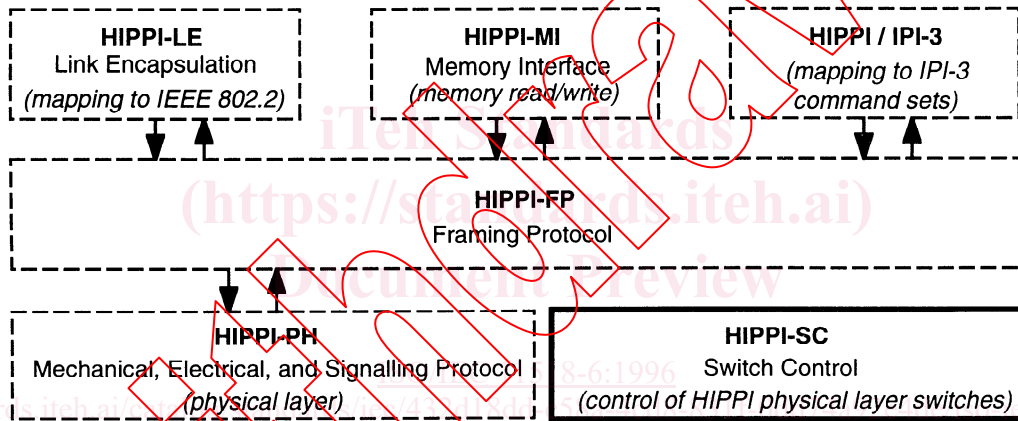


Figure 1 - HIPPI documents

Information technology – High-Performance Parallel Interface –

Part 6: Physical Switch Control (HIPPI-SC)

1 Scope

This part of ISO/IEC 11518 provides switch control for physical layer switches using the High-Performance Parallel Interface (HIPPI), a high-performance point-to-point interface between data-processing equipment. This part of ISO/IEC 11518 does not protect against errors introduced by intermediate devices interconnecting multiple HIPPI-PHs.

The purpose of this part of ISO/IEC 11518 is to facilitate the development and use of the HIPPI in computer systems by providing common physical switch control. It provides switch control structures for physical layer switches interconnecting computers, high-performance display systems, and high-performance, intelligent block-transfer peripherals. This part of ISO/IEC 11518 also applies to point-to-point HIPPI topologies.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 11518. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 11518 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 11518-1:1995, *Information technology, High-Performance Parallel Interface – Part 1: Mechanical, electrical, and signalling protocol specification (HIPPI-PH)*.

ISO/IEC 11518-3:1996, *Information technology, High-Performance Parallel Interface – Part 3: Encapsulation of ISO/IEC 8802-2 (IEEE Std 802.2) Logical Link Control Protocol Data Units (HIPPI-LE)*.

3 Definitions and conventions

3.1 Definitions

For the purposes of this part of ISO/IEC 11518, the following definitions apply.

3.1.1 connection: Condition of the HIPPI-PH when data transfers from a Source end-point to a Destination end-point are possible.

3.1.2 connection control information (CCI): A parameter sent as part of the sequence of operations establishing a connection from a Source to a Destination.

3.1.3 end-point: The equipment at either end of the fabric for a particular connection.

3.1.4 Destination: The equipment at the end of the interface that receives the data.

3.1.5 Destination end-point: The equipment at the end of the fabric that receives the data.

3.1.6 fabric: A group of one or more physical layer switches that can be traversed with one I-Field.

3.1.7 I-Field: A 32-bit field that is sent as part of the sequence of the physical layer operations establishing a connection from a Source to a Destination.

3.1.8 interface: The set of protocols and control signals used to connect a Source and Destination, as defined by HIPPI-PH. Within a fabric, an interface connects an end-point to a switch or a switch to a neighbouring switch.

3.1.9 Logical Address: An address stored in an I-Field that uniquely identifies a Destination end-point or set of end-points.

3.1.10 optional: Features that are not required by this part of ISO/IEC 11518. However, if any optional feature defined by this part of ISO/IEC 11518 is implemented, it shall be implemented according to this part of ISO/IEC 11518.

3.1.11 packet: A data set, as defined by HIPPI-PH, sent from Source to Destination. A packet is composed of one or more bursts.

3.1.12 physical layer switch: A device which allows a single HIPPI physical layer interface to switch between multiple HIPPI physical layer interfaces without involving protocols above the HIPPI Mechanical, Electrical, and Signalling Protocol Specification (HIPPI physical layer).

3.1.13 Source: The equipment at the end of the interface that transmits the data.

3.1.14 Source Address: An address stored in an I-field that uniquely identifies a Source end-point or set of end-points.

3.1.15 Source end-point: The equipment at the end of the fabric that transmits the data.

3.1.16 source routing: A means of packet routing whereby the Source end-point specifies the action of each switch on the way to the Destination.

3.2 Editorial conventions

In this part of ISO/IEC 11518, certain terms that are proper names of signals, state mnemonics, or similar terms are printed in upper case to avoid possible confusion with other uses of the same words (e.g., REQUEST). Any lower case uses of these words have the normal technical English meaning.

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

4 CCI and I-Field formats

4.1 Format

The connection control information (CCI) shall be used for controlling HIPPI physical layer switches. Within ISO/IEC 11518-1 (HIPPI-PH) the CCI is used as the I-Field, and is asserted on the HIPPI-PH Data Bus during a connection sequence. The format of the CCI (I-Field) is shown in figure 2. Examples of CCI and I-Field usage for routing are contained in annex A.

L = Locally Administered (bit 31) = 0 designates that the I-Field is defined by this part of ISO/IEC 11518. L = 1 designates that the rest of the I-Field, bits 30 - 0, are locally administered and are not defined by this part of ISO/IEC 11518.

VU = Vendor_Unique (bits 30,29). The contents of the Vendor_Unique bits are not defined in this part of ISO/IEC 11518. Switches shall pass these bits unmodified to the Destination.

NOTE 1 - These bits are available for providing signals to Destinations. Such signals can be used to modify the Destination's behaviour or supply it with additional information on the purpose of the attempted connection.

W = Double-wide (bit 28) = 0 designates that the Source is using the 800 Mbit/s data rate option (DATA BUS is 32 bits wide as defined in HIPPI-PH); the switch shall connect through Cable-A. W = 1 designates that the Source is using the 1 600 Mbit/s data rate option (DATA BUS is 64 bits wide); the switch shall connect through both Cable-A and Cable-B.

NOTE 2 - The W bit is used in conjunction with the INTERCONNECT signals on Cable-A and Cable-B. The INTERCONNECT signals, as defined in HIPPI-PH, tell a switch or end-point that the cable is physically attached to an active HIPPI port. The W bit is used to tell the switch, or Destination end-point, whether or not Cable-B is being used in particular connection.

D = Direction (bit 27) = 0, designates that the right-hand end (least significant bits) of the Routing Control field shall be the current sub-field. D = 1 designates that the left-hand end (most significant bits) of the Routing Control field shall be the current sub-field.

NOTE 3 - When a reverse path exists, a Destination end-point may return a reply to a received packet by simply using the same I-Field that it received with the D bit complemented. For this to work correctly with source routing (PS = 00) then the return path must be symmetrical with the forward path.

PS = Path Selection (bits 26,25). Used to select either (1) a source route, i.e., a specific route through the switches, with output port numbers specified for each switch, or (2) to specify the Logical Address.

00 = source routing: Source selects the route through the switches.

01 = Logical address: Switches select the first route from a list of possible routes.

10 = reserved

11 = logical address: Switches select a route.

C = Camp-on (bit 24) = 0 specifies that the switch shall reply with a connection reject sequence if unable to complete the connection. C = 1 specifies that the switch shall attempt to establish a connection until either the connection is completed or the Source aborts the connection request.

Camp-on is used by the Source to tell a switch to wait for the selected path (or paths) to become available, i.e., the switch should not generate a rejected connection sequence because the selected path is busy. The algorithm used by a switch to select among multiple Sources camped-on to a single Destination is implementation-specific and is not specified in this part of ISO/IEC 11518.

NOTE 4 - A HIPPI rejected connection has a different set of meanings depending on whether or not the Camp-on feature is being used. See clause B.1 for details.