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Foreword

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This document was prepared by DMTF [as DMFT Network Controller Sideband Interface (NC-SI) Specifications Collection] and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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Foreword

The *Network Controller Sideband Interface (NC-SI) Specification* was prepared by the PMCI Working Group. DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems management and interoperability.

Component documents

Table 1 lists the component documents for this specification:

Table 1 – Component documents

Document number	Document title	Version
DSP0222	Network Controller Sideband Interface (NC-SI) Specification (DSP0222)	1.1.1
DSP0261	Network Controller Sideband Interface (NC-SI) Collection (DSP0261)	1.2.3

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Introduction

Network Controller Sideband Interface (NC-SI) Specification (DSP0222)

In out-of-band management environments, the interface between the out-of-band Management Controller and the Network Controller is critical. This interface is responsible for supporting communication between the Management Controller and external management applications. Currently there are multiple such proprietary interfaces in the industry, leading to inconsistencies in implementation of out-of-band management.

The goal of this specification is to define an interoperable sideband communication interface standard to enable the exchange of management data between the Management Controller and Network Controller. The Sideband Interface is intended to provide network access for the Management Controller, and the Management Controller is expected to perform all the required network functions.

This specification defines the protocol and commands necessary for the operation of the sideband communication interface. This specification also defines physical and electrical characteristics of a sideband binding interface that is a variant of RMII targeted specifically for sideband communication traffic.

The specification is primarily intended for architects and engineers involved in the development of network interface components and Management Controllers that will be used in providing out-of-band management**.**

NC-SI over MCTP Binding Specification (DSP0261)

The *NC-SI over MCTP Binding Specification* defines new MCTP messages used to convey NC-SI Control packets and Ethernet traffic over MCTP to allow NC-SI Pass-through traffic over MCTP. This specification is based on the DSP0222 1.1 specification and uses the same NC-SI Control packet definitions.

Document conventions

Typographical conventions

The following typographical conventions are used in this document:

- Document titles are marked in *italics*.
- Important terms that are used for the first time are marked in *italics*.
- Terms include a link to the term definition in Terms and definitions, enabling easy navigation to the term definition.
- ABNF rules are in `monospaced font`.

ABNF usage conventions

Format definitions in this document are specified using ABNF (see RFC5234), with the following deviations:

- Literal strings are to be interpreted as case-sensitive Unicode characters, as opposed to the definition in RFC5234 that interprets literal strings as case-insensitive US-ASCII characters.

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Reserved and unassigned values

Unless otherwise specified, any reserved, unspecified, or unassigned values in enumerations or other numeric ranges are reserved for future definition by the DMTF.

Unless otherwise specified, numeric or bit fields that are designated as reserved shall be written as 0 (zero) and ignored when read.

Byte ordering

Unless otherwise specified, byte ordering of multibyte numeric fields or bit fields is "Big Endian" (that is, the lower byte offset holds the most significant byte, and higher offsets hold lesser significant bytes).

Other conventions

See ANNEX C
(informative)

Notation and conventions for other conventions.

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Information technology — Network Controller Sideband Interface (NC-SI) Specifications Collection

1 Scope

Network Controller Sideband Interface (NC-SI) Specification (DSP0222)

This specification defines the functionality and behavior of the Sideband Interface responsible for connecting the Network Controller to the Management Controller. It also outlines the behavioral model of the network traffic destined for the Management Controller from the Network Controller.

This specification defines the following two aspects of the Network Controller Sideband Interface (NC-SI):

- behavior of the interface, which include its operational states as well as the states of the associated components
- the payloads and commands of the communication protocol supported over the interface

The scope of this specification is limited to addressing only a single Management Controller communicating with one or more Network Controllers.

This specification also defines the following aspects of a 3.3V RMII Based Transport (RBT) based physical medium:

- transport binding for NC-SI over RBT
- electrical and timing requirements for the RBT
- an optional hardware arbitration mechanism for RBT

Only the topics that may affect the behavior of the Network Controller or Management Controller, as it pertains to the Sideband Interface operations, are discussed in this specification.

NC-SI over MCTP Binding Specification (DSP0261)

This specification defines the bindings between NC-SI protocol elements and MCTP elements in order for NC-SI Control and Pass-Through traffic to be transported using MCTP.

Portions of this specification rely on information and definitions from other specifications, which clause 2 identifies. Two of these references are particularly relevant:

- DMTF DSP0222, *Network Controller Sideband Interface (NC-SI) Specification*, provides the NC-SI base control that is to be bound over MCTP by this specification.
- DMTF DSP0236, *Management Component Transport Protocol (MCTP) Base Specification*, defines the MCTP transport on which the NC-SI Control and Pass-through packets are to be conveyed.

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2 Normative references

The following referenced documents are indispensable for the application of this document. For dated or versioned references, only the edition cited (including any corrigenda or DMTF update versions) applies. For references without a date or version, the latest published edition of the referenced document (including any corrigenda or DMTF update versions) applies.

ACPI, *Advanced Configuration and Power Interface Specification Revision 4.0a*, April 5, 2010, http://www.acpi.info/DOWNLOADS/ACPIspec40a.pdf

DMTF DSP0004, *CIM Infrastructure Specification 3.0*, http://www.dmtf.org/standards/published_documents/DSP0004_3.0.pdf

DMTF DSP0222, *Network Controller Sideband Interface (NC-SI) Specification 1.1,* http://www.dmtf.org/sites/default/files/standards/documents/DSP0222_1.1.0.pdf

DMTF DSP0223, *Generic Operations 1.0*, http://www.dmtf.org/standards/published_documents/DSP0223_1.0.pdf

DMTF DSP0236, *Management Component Transport Protocol (MCTP) Base Specification 1.3,* http://www.dmtf.org/standards/published_documents/DSP0236_1.3.pdf

DMTF DSP0237, *Management Component Transport Protocol (MCTP) SMBus/I2C Transport Binding Specification 1.1,* http://www.dmtf.org/standards/published_documents/DSP0237_1.1.pdf

DMTF DSP0238, *Management Component Transport Protocol (MCTP) PCIe VDM Transport Binding Specification 1.0,* http://www.dmtf.org/standards/published_documents/DSP0238_1.0.pdf

DMTF DSP0239, *Management Component Transport Protocol (MCTP) IDs and Codes 1.4,* http://www.dmtf.org/standards/published_documents/DSP0239_1.4.pdf

DMTF DSP0240, *Platform Level Data Model (PLDM) Base 5 Specification 1.1.0,* https://www.dmtf.org/sites/default/files/standards/documents/DSP0240_1.1.0.pdf

DMTF DSP0261, *NC-SI over MCTP Binding Specification 1.0,* http://www.dmtf.org/standards/published_documents/DSP0261_1.0.pdf

DMTF DSP1001, *Management Profile Specification Usage Guide 1.2,* http://www.dmtf.org/standards/published_documents/DSP1001_1.2.pdf

IEEE 802.3*, 802.3™ IEEE Standard for Information technology— Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications,* December 2005, http://www.ieee.org/portal/site

IEEE 802.1Q*, IEEE 802.1Q-2005 IEEE Standard for Local and Metropolitan Area Networks—Virtual Bridged Local Area Networks*, http://www.ieee.org/portal/site. This standard defines the operation of Virtual LAN (VLAN) Bridges that permit the definition, operation and administration of Virtual LAN topologies within a Bridged LAN infrastructure.

IETF RFC2131, *Dynamic Host Configuration Protocol* (DHCP), March 1997, http://www.ietf.org/rfc/rfc2131.txt

IETF RFC2373, *IP Version 6 Addressing Architecture*, July 1998, http://www.ietf.org/rfc/rfc2373.txt

IETF RFC2461, *Neighbor Discovery for IP Version 6 (IPv6)*, December 1998, http://www.ietf.org/rfc/rfc2461.txt

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IETF RFC2464, *Transmission of IPv6 Packets over Ethernet Networks*, December 1998, http://www.ietf.org/rfc/rfc2464.txt

IETF RFC3315, *Dynamic Host Configuration Protocol for IPv6 (DHCPv6)*, July 2003, http://www.ietf.org/rfc/rfc3315.txt

IETF, RFC4122, *A Universally Unique Identifier (UUID) URN Namespace*, July 2005, http://datatracker.ietf.org/doc/rfc4122/

IETF RFC5234, *ABNF: Augmented BNF for Syntax Specifications, January 2008*, http://tools.ietf.org/html/rfc5234

ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards,* http://isotc.iso.org/livelink/livelink.exe?func=ll&objId=4230456&objAction=browse&sort=subtype

Reduced Media Independent Interface (RMII) Consortium, *RMII Specification*, revision 1.2, March 20, 1998, http://ebook.pldworld.com/_eBook/-Telecommunications,Networks-/TCPIP/RMII/rmii_rev12.pdf

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

In this document, some terms have a specific meaning beyond the normal English meaning. This clause defines those terms.

The terms "shall" ("required"), "shall not", "should" ("recommended"), "should not" ("not recommended"), "may", "need not" ("not required"), "can" and "cannot" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 7. The terms in parentheses are alternatives for the preceding term, for use in exceptional cases when the preceding term cannot be used for linguistic reasons. Note that ISO/IEC Directives, Part 2, Clause 7 specifies additional alternatives. Occurrences of such additional alternatives shall be interpreted in their normal English meaning.

The terms "clause", "subclause", "paragraph", and "annex" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 6.

The terms "normative" and "informative" in this document are to be interpreted as described in ISO/IEC Directives, Part 2, Clause 3. In this document, clauses, subclauses, or annexes labeled "(informative)" do not contain normative content. Notes and examples are always informative elements.

The terms that DSP0004, DSP0223, DSP0236, and DSP1001 apply to this document. The following additional terms are used in this document.

3.1 Requirement term definitions

This clause defines key phrases and words that denote requirement levels in this specification.

3.1.1
deprecated
indicates that an element or profile behavior has been outdated by newer constructs

3.1.2
obsolete
indicates that an item was defined in prior specifications but has been removed from this specification

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