

# DTCP Volume 1 Supplement B Mapping DTCP to MOST (Informational Version)

*Hitachi, Ltd.*

*Intel Corporation*

*Matsushita Electric Industrial Co., Ltd.*

*Sony Corporation*

*Toshiba Corporation*

*Revision 1.0*

*February 25, 2002*

## **Informational Version**

## Preface

### Notice

THIS DOCUMENT IS PROVIDED "AS IS" WITH NO WARRANTIES WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY, NONINFRINGEMENT, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY WARRANTY OTHERWISE ARISING OUT OF ANY PROPOSAL, SPECIFICATION OR SAMPLE. Hitachi, Intel, MEI, Sony, and Toshiba (collectively, the "5C") disclaim all liability, including liability for infringement of any proprietary rights, relating to use of information in this specification. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted herein.

Some portions of this document, identified as "Draft" are in an intermediate draft form and are subject to change without notice. Adopters and other users of this Specification are cautioned these portions are preliminary, and that products based on it may not be interoperable with the final version or subsequent versions thereof.

Copyright © 1997 - 2002 by Hitachi, Ltd., Intel Corporation, Matsushita Electric Industrial Co., Ltd., Sony Corporation, and Toshiba Corporation (collectively, the "5C"). Third-party brands and names are the property of their respective owners.

### Intellectual Property

Implementation of this specification requires a license from the Digital Transmission Licensing Administrator.

### Contact Information

Feedback on this specification should be addressed to [dtla-comment@dtcp.com](mailto:dtla-comment@dtcp.com).

The Digital Transmission Licensing Administrator can be contacted at [dtla-manager@dtcp.com](mailto:dtla-manager@dtcp.com).

The URL for the Digital Transmission Licensing Administrator web site is: <http://www.dtcp.com>.

# Table of Contents

<b>PREFACE .....</b>	<b>2</b>
<b>Notice .....</b>	<b>2</b>
<b>Intellectual Property.....</b>	<b>2</b>
<b>Contact Information.....</b>	<b>2</b>
<b>VOLUME 1 SUPPLEMENT B DTCP MAPPING TO MOST .....</b>	<b>4</b>
<b>V1SB.1 Introduction.....</b>	<b>4</b>
V1SB.1.1 Related Documents .....	4
V1SB.1.2 Terms and Abbreviations .....	4
<b>V1SB.2 Modifications to Chapter 6 (Content Channel Management and Protection).....</b>	<b>5</b>
V1SB.2.1 Exchange Key Expiration .....	5
V1SB.2.2 $N_c$ Update Process.....	5
V1SB.2.3 Protected Content Header .....	5
V1SB.2.4 Embedded CCI.....	5
V1SB.2.4.1 DTCP_Descriptor for MPEG-PS .....	5
V1SB.2.5 Content Encryption Formats .....	5
<b>V1SB.3 Modifications to Chapter 8 (AV/C Digital Interface Command Set Extensions).....</b>	<b>6</b>
V1SB.3.1 Control Packet Format .....	6
V1SB.3.2 Status Packet Format.....	7
<b>V1SB.4 MOST DTCP Protocols.....</b>	<b>7</b>

## Figures

Figure 1 MOST Protected Content Packet .....	5
Figure 2 MOST DTCP Control Packet Format .....	6
Figure 3 MOST DTCP Status Packet Format.....	7

# Volume 1 Supplement B DTCP Mapping to MOST

## V1SB.1 Introduction

This supplement maps DTCP onto the Media Oriented Systems Transport (MOST). All aspects of IEEE 1394 DTCP functionally are preserved and this supplement only details MOST DTCP specific changes or additions.

### V1SB.1.1 Related Documents

This specification shall be used in conjunction with the following publications. When the publications are superseded by an approved revision, the revision shall apply.

- Digital Transmission Content Protection Specification Volume 1 and Volume 2
- MOST Content Security Specification
- MOST Content Protection Scheme – DTCP Implementation
- MOST Specification ( Media Oriented Systems Transport Specification ) Rev2.0

### V1SB.1.2 Terms and Abbreviations

DTCP	Refers to Digital Transmission Content Protection Specification Volume 1
MOST	Media Oriented Systems Transport

## V1SB.2 Modifications to Chapter 6 (Content Channel Management and Protection)

### V1SB.2.1 Exchange Key Expiration

Sources of protected content expire their Exchange Keys:

- When they stop output of protected content.

### V1SB.2.2 $N_c$ Update Process

MOST provides Synchronous and Asynchronous data transfer services. For Synchronous data transfer, there is no change to the description in Section 6.3.2 of update procedure and timing for  $N_c$ .

For Asynchronous data transfer, the  $N_c$  shall be updated after transmitting no greater than 4 Mbytes.

### V1SB.2.3 Protected Content Header

Protected content transferred over MOST has a four byte header. This header is used to carry the bits described in Sections 6.3.3 “Odd/Even Bit” and 6.4.2 “Encryption Mode Indicator (EMI)”.

The Reserved bits are reserved for future definition and are currently defined to have a value of zero.

The Sync Bytes ( Sync-High and Sync-Low ) are defined in “MOST Content Protection Scheme – DTCP Implementation”.

	msb						lsb
Header [0]	Sync-High						
Header [1]	Sync-Low						
Header [2]	reserved (zero)	EMI	Odd/Even	reserved (zero)			
Header [3]	reserved (zero)						
PC[0]	Protected Content						
-							
-							
-							
PC[N]							

Figure 1 MOST Protected Content Packet

### V1SB.2.4 Embedded CCI

The Embedded CCI (Section 6.4.1 or Section 6.4.5.1) is carried as part of the content stream. The Embedded CCI transmission format for MOST bus is defined in “MOST Content Protection Scheme – DTCP Implementation”.

#### V1SB.2.4.1 DTCP\_Descriptor for MPEG-PS

The DTCP\_descriptor delivers Embedded CCI over the DTCP system when an MPEG-Program Stream (MPEG-PS) is transmitted. The DTCP\_descriptor described in Appendix.B is used for DTCP\_descriptor for MPEG-PS.

### V1SB.2.5 Content Encryption Formats

Protected content sent over MOST is encapsulated in the Protected Content Packet (See Figure 1). The encryption frame size of all forms of content shall be in the inclusive range 8 to 4096 bytes and be a multiple of 4 bytes in length. The encryption frame size is defined in “MOST Content Protection Scheme – DTCP Implementation”.

## V1SB.3 Modifications to Chapter 8 (AV/C Digital Interface Command Set Extensions)

### V1SB.3.1 Control Packet Format

This section maps the AKE control command specified in Section 8.3.1 to the MOST DTCP Control Packet Format. The AKE control command sub fields used with MOST have the same values and functions as detailed in Chapter 8.

	Msb						lsb
Byte [0]	reserved (zero)				ctype/response		
Byte [1]	category = 0000 <sub>2</sub> (AKE)				AKE_ID		
Byte [2]	AKE_ID dependent field						
Byte [3]							
Byte [4]							
Byte [5]							
Byte [6]							
Byte [7]	blocks_remaining					reserved (zero)	
Byte [8]	data						
-							
-							
Byte [7+m]							

**Figure 2 MOST DTCP Control Packet Format**

- ctype/response has the same values as referenced in chapter 8 of DTCP specification and specified by the AV/C Digital Interface Command Set.
- The Reserved bits are reserved for future definition and are currently defined to have a value of zero.
- Byte[1]..Byte[5] are identical to Operand[0]..Operand[4] as specified in section 8.3.1.
- Byte[6] is identical to Operand[6] as specified in section 8.3.1.
- MOST DTCP fragmentation rule is defined as follows: The data fields of MOST DTCP Control Packets are limited to a maximum length of 128 bytes. When a given AKE Info is larger than 128bytes, the **blocks\_remaining** field is used to fragment it. When this fragmentation is required, the AKE Info is divided into N blocks that are sent sequentially via the **data** fields. The size of the **data** field in the first N-1 fragments shall be 128bytes.
- The **blocks\_remaining** field is identical to the data field specified in section 8.3.1 except for the fragmentation rule.
- The **data** field is identical to the data field specified in section 8.3.1 except for the fragmentation rule.
- The unique tag supported by exchanging values via the **AKE\_label** field and described in section 8.3.1 is not used because the unique tag supported by exchanging value via a pair of FBlockID and InstID on MOST is equivalent to AKE\_Label
- The data length supported by exchanging values via the **data\_length** field is not used because the data length of MOST DTCP Control Packet is exchanged via a Length field defined in “MOST specification”.

### V1SB.3.2 Status Packet Format

This section maps the AKE status command specified in Section 8.3.2 to the MOST DTCP Status Packet Format. The AKE status command sub fields used with MOST have the same values and functions as detailed in Chapter 8.

	msb						lsb
Byte [0]	reserved (zero)				ctype/response		
Byte [1]	category = 0000 <sub>2</sub> (AKE)				AKE_ID = 0000 <sub>2</sub>		
Byte [2]	AKE_ID dependent field						
Byte [3]							
Byte [4]							
Byte [5]							
Byte [6]	F <sub>16</sub>				status		

**Figure 3 MOST DTCP Status Packet Format**

- ctype/response has the same values as referenced in chapter 8 of DTCP specification and specified by the AV/C Digital Interface Command Set.
- The Reserved bits are reserved for future definition and are currently defined to have a value of zero.
- Byte[1]..Byte[5] are identical to Operand[0]..Operand[4] as specified in Section 8.3.2.
- Byte[6] is identical to Operand[6] as specified in Section 8.3.2
- The fixed value of Operand[5] as specified in Section 8.3.2 is not used.
- The maximum data field query supported by exchanging values via the **data\_length** field and described in the last paragraph of section 8.3.2 is not used because the device supporting MOST DTCP can accept the maximum size of MOST DTCP Control Packet.

### V1SB.4 MOST DTCP Protocols

This section describes the exchange of DTCP AKE commands, responses, and status frames by MOST DTCP Function.

It is important to review the following references in order to understand MOST Security protocols.

- MOST Content Security Specification
- MOST Content Protection Scheme (CPS) - DTCP Implementation
- Chapters 2 and Section 3.1, 3.4 and 3.7 of the MOST Specification Rev2.0

The MOST DTCP Implementation has similar device states as described in the DTCP Volume1 specification.

The HMI manages the synchronous connection via MOST. Authentication may take place after synchronous connection is established, or upon demand as needed.

The Function Block supporting CPS enables a MOST device to asynchronously send AKE command and response via MOST NetService. The Functions used by the Function Block supporting CPS are described in Chapter 3 of the “MOST Content Security Scheme – DTCP Implementation”. The Function Blocks supporting CPS are used by Source and Sink devices.

The HMI and the Function Blocks supporting CPS exchange the SourceInfo and SinkInfo. If HMI received SourceInfo that denotes DTCP, the HMI activate DTCP scheme. The HMI sends Sink.DTCP\_StartProcess.StartResult() or Sink.ConnectTo.StartResult() to Sink device. Then the Sink device starts DTCP Authentication exchange, after receiving protected content via synchronous connection. After the authentication is completed, the Sink device notifies it to HMI by sending HMI.DTCP\_StartProcess.Result() or HMI.ConnectTo.Result().