

ANSI/CTA Standard

AV Adapter to Connect Ethernet and 1394 Devices

ANSI/CTA-2005 R-2013

(Formerly ANSI/CEA-2005 R-2013)

February 2013



NOTICE

Consumer Technology Association (CTA)™ Standards, Bulletins and other technical publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards, Bulletins and other technical publications shall not in any respect preclude any member or nonmember of the Consumer Technology Association from manufacturing or selling products not conforming to such Standards, Bulletins or other technical publications, nor shall the existence of such Standards, Bulletins and other technical publications preclude their voluntary use by those other than Consumer Technology Association members, whether the standard is to be used either domestically or internationally.

Standards, Bulletins and other technical publications are adopted by the Consumer Technology Association in accordance with the American National Standards Institute (ANSI) patent policy. By such action, the Consumer Technology Association does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the Standard, Bulletin or other technical publication.

Note: The user's attention is called to the possibility that compliance with this standard may require use of an invention covered by patent rights.

By publication of this standard, no position is taken with respect to the validity of this claim or of any patent rights in connection therewith. The patent holder has, however, filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license. Details may be obtained from the publisher.

This document does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

This document is copyrighted by the Consumer Technology Association and may not be reproduced, in whole or part, without written permission. Federal copyright law prohibits unauthorized reproduction of this document by any means. Organizations may obtain permission to reproduce a limited number of copies by entering into a license agreement. Requests to reproduce text, data, charts, figures or other material should be made to the Consumer Technology Association.

(Formulated under the cognizance of the CTA **R7 Consumer Electronics Networking Committee**.)

Published by
©CONSUMER TECHNOLOGY ASSOCIATION 2015
Technology & Standards Department
www.CTA.tech

All rights reserved

FOREWORD

This standard was developed under the auspices of the Consumer Electronics Association (CEA) R7 Home Network Committee.

(This page intentionally left blank.)

Copyright Consumer Technology Association
Provided by IHS Markit under license with CTA
No reproduction or networking permitted without license from IHS
Full document details: CTA CTA-2005 2013

Table of Contents

Table of Contents	iii
Figures	iv
1 Introduction	1
1.1 Scope of This Document	1
2 References	1
2.1 Normative References	1
2.1.1 Normative Reference List	2
2.2 Informative References	2
2.3 Reference Acquisition	2
3 Definitions	3
3.1 Key Concepts	3
3.1.1 Adapter	3
3.1.2 Cluster	4
3.1.3 Digital Media Player (DMP)	4
3.1.4 Digital Media Server (DMS)	4
3.1.5 End Devices	4
3.1.6 Local Area Network	4
3.1.7 Proxy	4
3.1.8 Stream	4
3.2 Acronyms	5
3.3 Conventions	5
4 AV Network Architecture	6
4.1 Network Topology	6
4.2 Adapter Functional Overview	7
4.2.1 Cluster to Cluster Communications	8
4.3 Adapter Physical Layers	8
4.4 Adapter Architecture for Serving Content from a 1394 C/CE Device to a DLNA Device	8
4.4.1 Discovery	9
4.4.2 Control	10
4.4.3 Transport	11
4.4.4 Media Formats	12
4.5 Adapter Architecture for Providing Content from a DLNA Device to a 1394 C/CE Device	12
4.5.1 Discovery	13
4.5.2 Control	14
4.5.3 Transport	14
4.5.4 Media Formats	15
Annex A: UPnP Commands and Adapter Functionality Diagram for Providing Content from a 1394 C/CE Device to DLNA Device	16

**Annex B – UPnP Commands and Adapter Functionality Diagram for Providing
Content from a DLNA Device to a 1394 C/CE Device 18**

Figures

Figure 1 A Possible Home Network Scenario.....6

Figure 2 An In-Room Network with 1394 and Ethernet.....7

Figure 3 Adapter Function Blocks for Connecting Dissimilar Clusters.....8

Figure 4 Diagram for Use Case 1.....9

CEA-2005

AV Adapter to Connect Ethernet and 1394 Devices

1 Introduction

The AV network is envisioned to consist of multiple devices using popular networking technologies. In consumer applications, popular technology choices are IEEE1394, Ethernet, and WiFi.

This document addresses the connection of 1394 devices that implement the “Cable/CE Plug ‘n Play”¹ agreement (1394 C/CE devices) to Digital Living Network Alliance Devices (DLNA Devices) that adhere to the DLNA Home Networked Device Interoperability Guidelines v1.0 on Ethernet/WiFi networks. These DLNA Devices are based on the UPnP[™] Device Architecture v1.0 and implement the UPnP AV Device Control Protocols.

It is anticipated that 1394 C/CE devices will exist due to the Cable/CE Plug ‘n Play agreement and resulting FCC regulation. While all of the requirements of the Cable/CE Plug ‘n Play agreement and FCC regulation do not apply directly to the Adapter, many of their provisions do apply in order for the adapter to proxy those devices to the Ethernet home network.

1.1 Scope of This Document

The Adapter is intended to provide seamless connectivity between 1394 C/CE devices and DLNA devices. The Adapter will act as a Proxy between the two interfaces, exposing the devices on the opposite network as if they were on the same network.

A full-featured Adapter implementation is complex, and therefore, a subset of functionality is envisioned for the first version of the Adapter. Future versions of the Adapter specification will add more features.

2 References

2.1 Normative References

The following standards contain provisions that, through reference in this text, constitute normative 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 editions of the standards listed in Section 2.1.1.

¹ The term “Plug ‘n Play” has been used by various other initiatives and carries different meanings for each. Its use in this standard is specific to an agreement between the Cable and CE industries which resulted in the FCC Regulation cited in the informative references of this standard.

2.1.1 Normative Reference List

- [1] AV/C Panel Subunit Specification 1.21, TA Document 2002009, 1394 Trade Association
- [2] AV/C Digital Interface Command Set General Specification, Version 4.1, TA Document 2001012, 1394 Trade Association, December 11, 2001
- [3] CEA-775-A, DTV 1394 Interface Specification, April 2000, Consumer Electronics Association (CEA)
- [4] CEA-931-A, Remote Control Command Pass-through Standard for Home Networking, February 2003, Consumer Electronics Association (CEA)
- [5] DTCP Specification Volume 1 Revision 1.3 (Informational Version), Digital Transmission Content Protection (DTCP)
- [6] DLNA Home Networked Device Interoperability Guidelines v1.0, Digital Living Network Alliance (DLNA)
- [7] DTCP Volume 1 Supplement D DTCP use of IEEE1394 Similar Transports, Version 1.0 (Informational Version), Digital Transmission Content Protection (DTCP)
- [8] IEC 61883-1, Digital Interface for Consumer Audio/Video Equipment—Part 1: General
- [9] IEC 61883-4, Digital Interface for Consumer Audio/Video Equipment—Part 4:
- [10] IEEE 802.3-2002, Standard for information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specification, March 8, 2002
- [11] IEEE 1394a-2000, Standard for a High Performance Serial Bus- Amendment 1
- [12] ISO/IEC 13818-1:2000(E) Information Technology - Generic Coding of Moving Pictures and Associated Audio Information: systems

2.2 Informative References

FCC Rules, Section 76.640(b)(4)(iii); Title 47 of the Code of Federal Regulations, Part 76, Section 76.640(b)(4)(iii), October 1, 2005.

UPnP Device Architecture V1.0, June 8, 2000.

2.3 Reference Acquisition

1394 Trade Association Documents:

1394 Trade Association, 1560 East Southlake Blvd., Suite 242, Southlake, TX, USA 76092; Phone: 817-416-2200; Fax: 817-416-2256; Internet <http://www.1394ta.org>.

CEA Standards:

Global Engineering Documents, World Headquarters, 15 Inverness Way East, Englewood, CO USA 80112-5776; Phone: 800-854-7179; Fax: 303-397-2740; Internet: <http://global.ihs.com>; E-mail: global@ihs.com.

DLNA Documents:

DLNA Administration, C/O VTM, Attn: Membership Services. 3855 SW 153rd Drive
Beaverton, Oregon USA 97006; Phone: 503-619-0422; Fax: 503-644-6708; Internet:
<http://www.dlna.org/>; Email: admin@dlna.org.

DTCP Standards:

Digital Transmission Licensing Administrator, c/o License Management International,
LLC 225 B Cochrane Circle, Morgan Hill CA 95037; Internet: <http://www.dtcp.com>;
Email: info-request99@dtcp.com

FCC Documents:

Federal Communications Commission, 445 12th Street, SW Washington, DC 20554;
Phone: 888-225-5322; Fax: 866-418-0232; Internet: <http://www.fcc.gov>; Email:
fccinfo@fcc.gov, <http://www.gpoaccess.gov/cfr/index.html>

IEC Standards:

Global Engineering Documents, World Headquarters, 15 Inverness Way East,
Englewood, CO. USA 80112-5776; Phone 800-854-7179; Fax 303-397-2740; Internet
<http://global.ihs.com>; Email global@ihs.com.

IEEE Standards:

Global Engineering Documents, World Headquarters, 15 Inverness Way East,
Englewood, CO USA 80112-5776; Phone: 800-854-7179; Fax: 303-397-2740; Internet:
<http://global.ihs.com>; E-mail: global@ihs.com.

UPnP Documents:

UPnP™ Forum, 2400 Camino Ramon, Suite 375, San Ramon, CA 94583;
Phone 925-275-6645; Internet: <http://www.upnp.org>.

3 Definitions**3.1 Key Concepts**

Key terms and their interpretation for the purposes of this standard are presented below.
Some terms are borrowed from other disciplines but have slightly different meanings
based on the context of their use.

These concepts are presented in an order of logical flow. They are not intended to be
used as an alphabetical glossary of terms.

Terms defined in Key Concepts will be capitalized when used.

3.1.1 Adapter

The Adapter is a term created for use in this document. The Adapter serves as a Proxy to
represent a device on one network as a compliant device on a different network. In