IEEE -1394 & HANA: The Future of our Living Rooms

Zeph Freeman
Business Development Mgr.
Texas Instruments
z-freeman@ti.com

DJ Johnson
Applications Mgr
Texas Instruments
dj-johnson@ti.com

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Today’s Home Theater

- **Difficult to Install**
  - Too many interface types
  - Too many cables
  - Not enough connections

- **Difficult to Use**
  - Multiple remotes
  - No communication between equipments

- **Costly**
  - Duplication of equipment
  - No sharing
What is HANA?

H - High Definition
A - Audio-visual
N - Network
A - Alliance

- Cross industry alliance of 40+ companies
- Mission: Enhance the consumer HD entertainment experience thru existing standards
Membership Levels

Board of Directors, Promoters

Contributors

Adopters

Liaison

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The Next Generation...

- Leverage Existing Technology and Infrastructure
- Single Interface Capable of Multiple Streams of HD Content
  - Audio
  - Video
  - Control Commands
- Simplified User Interface
- Networked Architecture with Zero Configuration
Leveraging What’s There

- **Reuse of existing wiring**
  - Coax, CAT5, POF, Power Line
- **Using existing standards**
  - IEEE-1394
  - CEA-2027, CEA-931
Why 1394?

- Time to market – it’s available today
- FCC mandate ensures 1394 as part of the CE cluster for HD digital cable
- Open cable specification requires 1394
- **MPAA approved 1394 with encrypted content transfer in digital cable STB**
  - Current TI 1394 silicon supports DTCP Content protection
- **DVDCCA (copy control assoc.) approved DVD transmit over 1394**
  - Provides path for future addition of DVD and HDDVD to CE cluster
- **DVD Forum approved DTCP-IP for AV transfer**
  - 1394 technology can support DTCP-IP
- **1394 based CE products (STB, DVDR, DVC and DTV) are available today**
Single Interface

- Simplifies Installation
- Eliminates Cable Confusion
- Lowers Costs
- Reduces Clutter
Simplified User Interface

Ease of Use

- Control all AV devices with a single remote per room
- Access Contents via a rich TV GUI and EPG

Old

New
Networked Architecture
*Supports any topology

STB

DVD-R

STB

DVD-R

DVR
Shared Content

Room 1

Room 2

Room 3
Cost Benefits of Networked Architecture

AV Lines

NIU* / Light STB

HD PVR / AV HDD

Cable Tuner

Decoder

ATSC Tuner

HDTV

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Benefits Summary

- **Consumers:**
  - Simplified setup and control
  - Share content throughout the home
  - Bridge between IT and CE networks

- **Service Providers:**
  - Reduced capital expenditures
  - New services and easier access to premium services
  - Built in content protection

- **CE Manufacturers:**
  - New products and features
  - Standardized Interoperability requirements
  - Compatibility with newer equipment

- **Content Providers:**
  - Proven content protection
  - Users have easier access to premium content
IEEE -1394 & HANA: Why Now?
HDTV Revolution

Millions of Households with wide-screen HDTVs

[ In-Stat, Nov.’05 ]

[ TI Developer Conference ]

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HANA & DLNA
Complements not Competitors

- Entertainment centric
- HD focus
- Streaming real-time entertainment

- PC centric
- No HD in sight
- Time-shifted entertainment
Network Segmentation

- **Segment AV from IT or Home Appliance Networks**
  - Commercial contents stay within a “Trust Network”.
  - AV Network is a Trust Network. IT Network is not a Trust Network.
  - Personal contents from IT Network flow into AV Network via A/V Gateway

> Return Channel

**Digital Broadcast**

- HHP
- Internet
- Service Portal

**AV Network**
- NIU
- IEEE 1394
- Built-In DTV
- HTS
- IEEE 1394
- AV HDD

**IT Network**
- DSL / Cable Modem
- Ethernet
- A/V Gateway
- Desk-Top PC
- Printer

**HA Network**
- PLC
- Air-conditioner
- Heating
- Security

※ NIU : Network Interface Unit
IEEE -1394 & HANA: New Applications:
Addressing Today’s A/V Lip-Sync Problem with 1394

Today’s CE Cluster

- Lip-Sync issue when audio decoded in separate box from video

1394 CE Cluster

- Network nature of 1394 allows boxes to adjust out decoder delays
- No more lip-sync……
1394 Connection Between STB and Audio Receiver

STB
- TI JEDI Device
- PHY
- MPEG SOC
- PCI
- MPEG TS Stream

HANA Audio Receiver
- ARM
- TI IceLynx Device
- MPEG Audio Demux
- McASP
- TI Audio DSP
- Memory Interface
- RAM
- Host Infc
- AC3 Audio
- I2S
- TI 8 channel Digital AMP
- Audio

MPEG Stream
1394

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Low Cost 1394 CE Cluster for HD recording and solving lip-sync issues

- It is not required that STB decodes surround sound audio.

- MPEG stays compressed for recording and storage.
- Eliminates need for decoder in DVDR and DVR-HDD.
- Audio can either be decoded with video and provided to AVR as 8 discrete channels or 1394 chip within AVR can demux audio from video and provide to audio decoder.
Low Cost 1394 CE Cluster for HD recording and solving lip-sync issues

- Audio decode and 6 or 8 channel audio DAC/amplification in subwoofer
- Sub serves up GUI to TV via CES2027 specification
- A/V source switching and audio control performed via TV remote
External HDD recording with 1394

DVD CCA announcement on download to burn solution

http://www.dvdcca.org/data/css/DVDCCArecurr1sFINAL.pdf

1394 CE Cluster

- Reduce Capex due to internal HDD removal
- Can daisy chain multiple AVHDDs
- AVHDD can be securely locked to STB
Call to Actions

◆ Come by the demo
◆ www.hanaalliance.org
◆ www.1394ta.org
◆ Expect HANA based products at the end of the year
HD Networking Simplified: One Cable. One Remote. No new Cables

Where others only promise…

HANA Delivers
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