

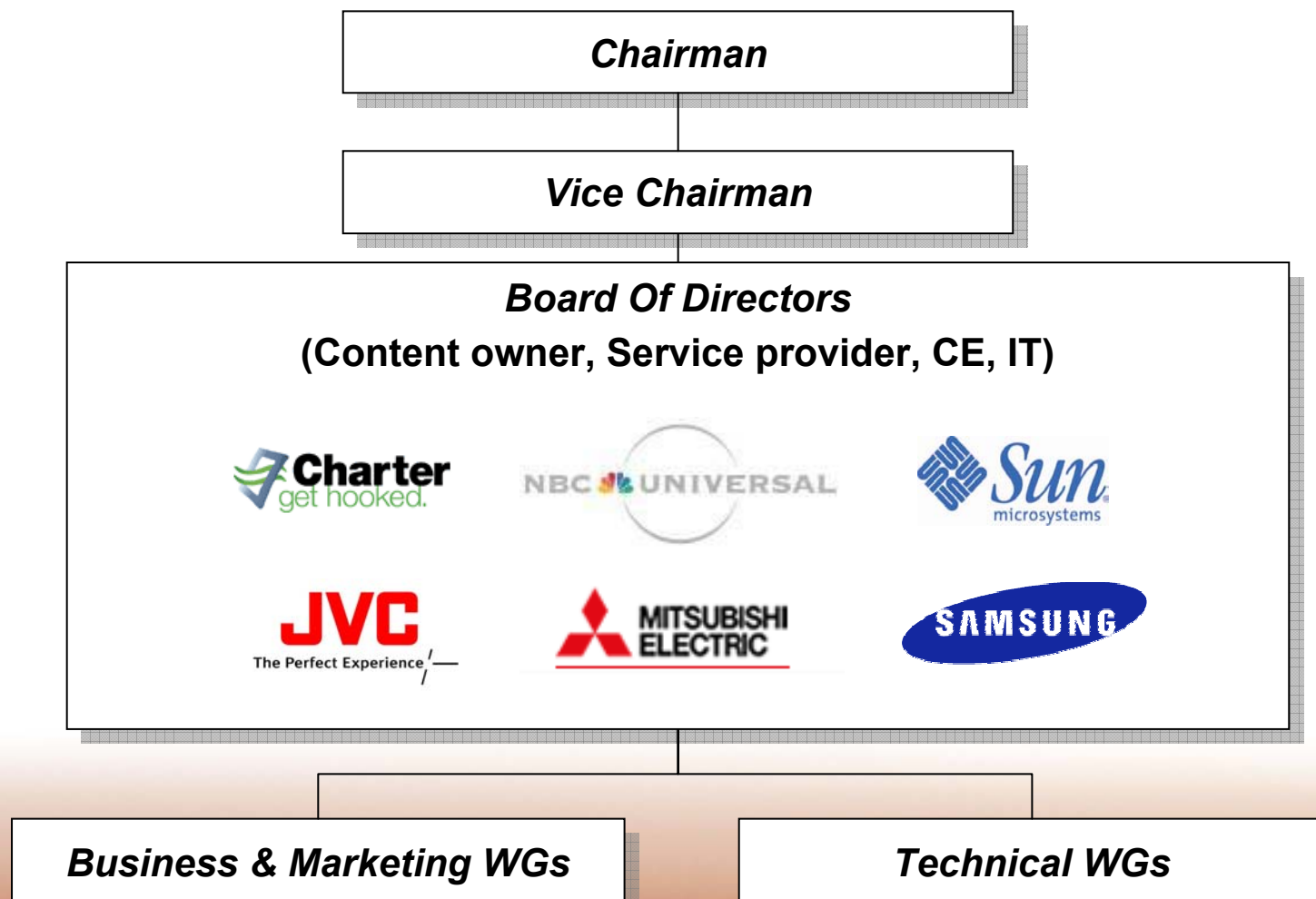
## ***Introduction to***

# **HANA**

HIGH-DEFINITION AUDIO-VIDEO NETWORK ALLIANCE

Bill Rose: President, WJR Consulting, Inc.

Chairman: CEA R7 Home Networking Committee  
CEA Technology and Standards Council



## Promoter Members\*



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## Contributor Members\*



\* Membership Prior to CES 2006

# History of TV

**Commercial Terrestrial : 1941**



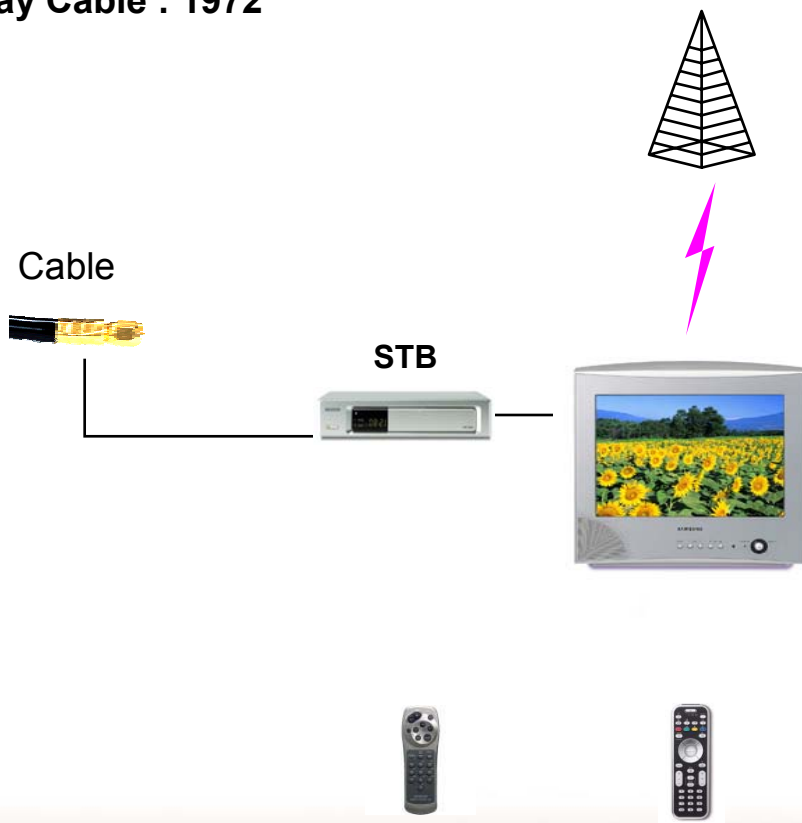
# History of TV

## Commercial Terrestrial : 1960's



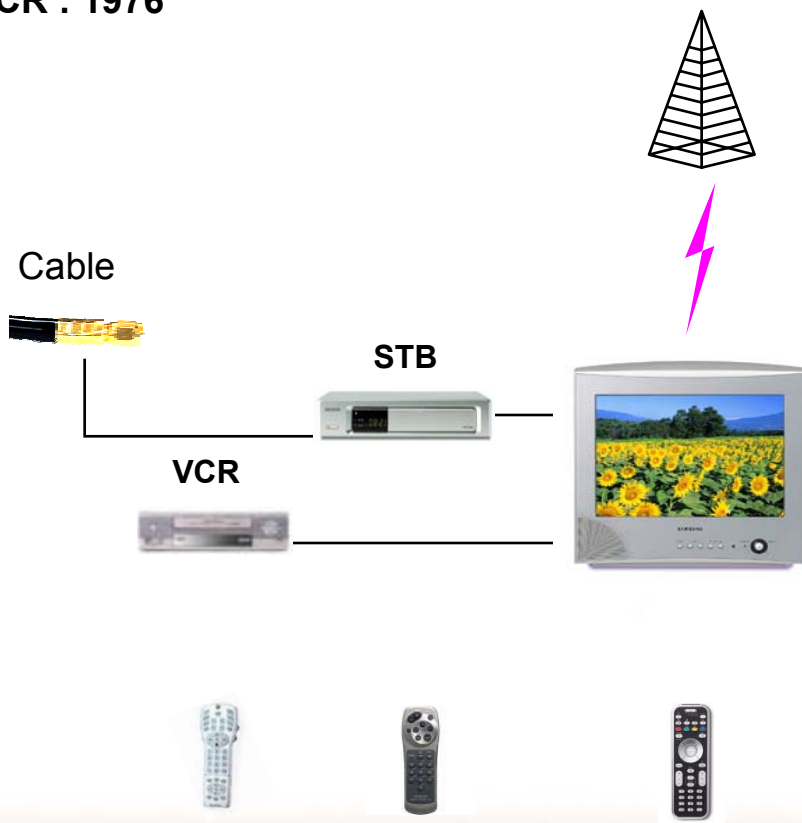
# History of TV

**Pay Cable : 1972**



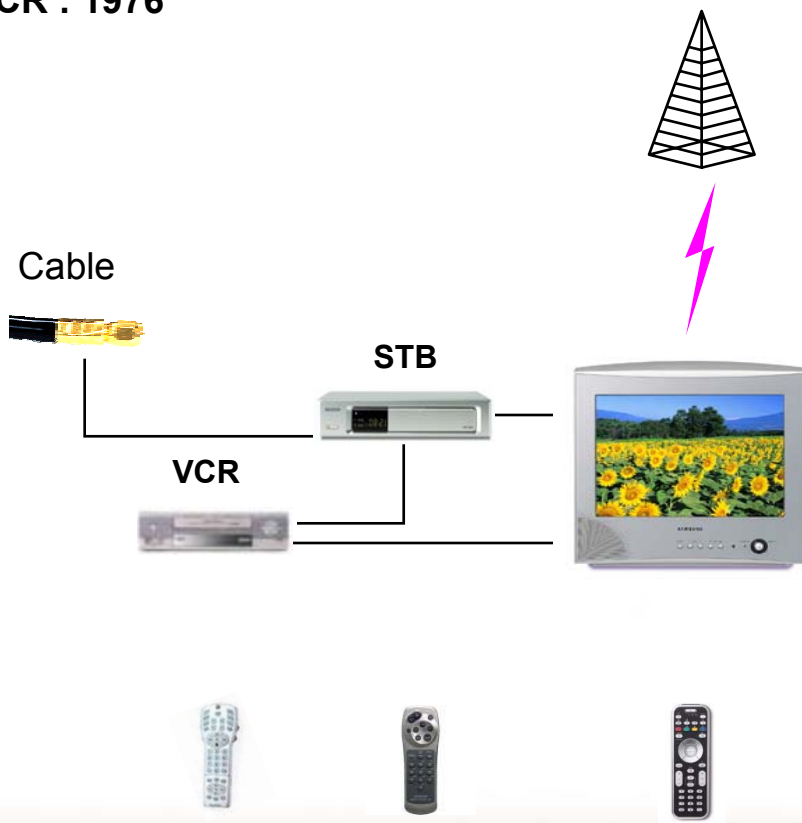
# History of TV

**VCR : 1976**



# History of TV

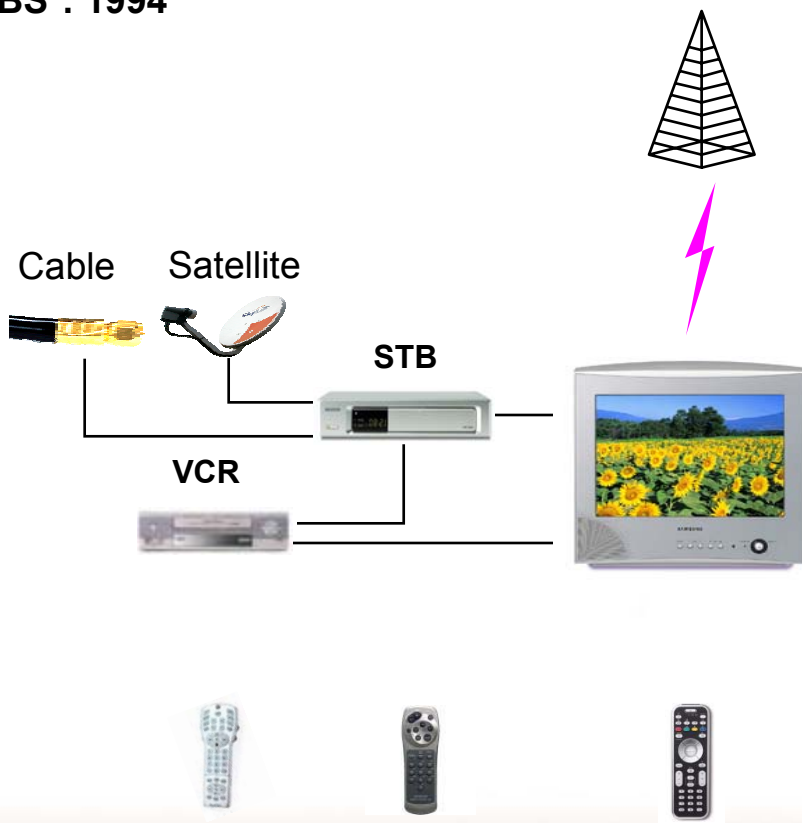
**VCR : 1976**





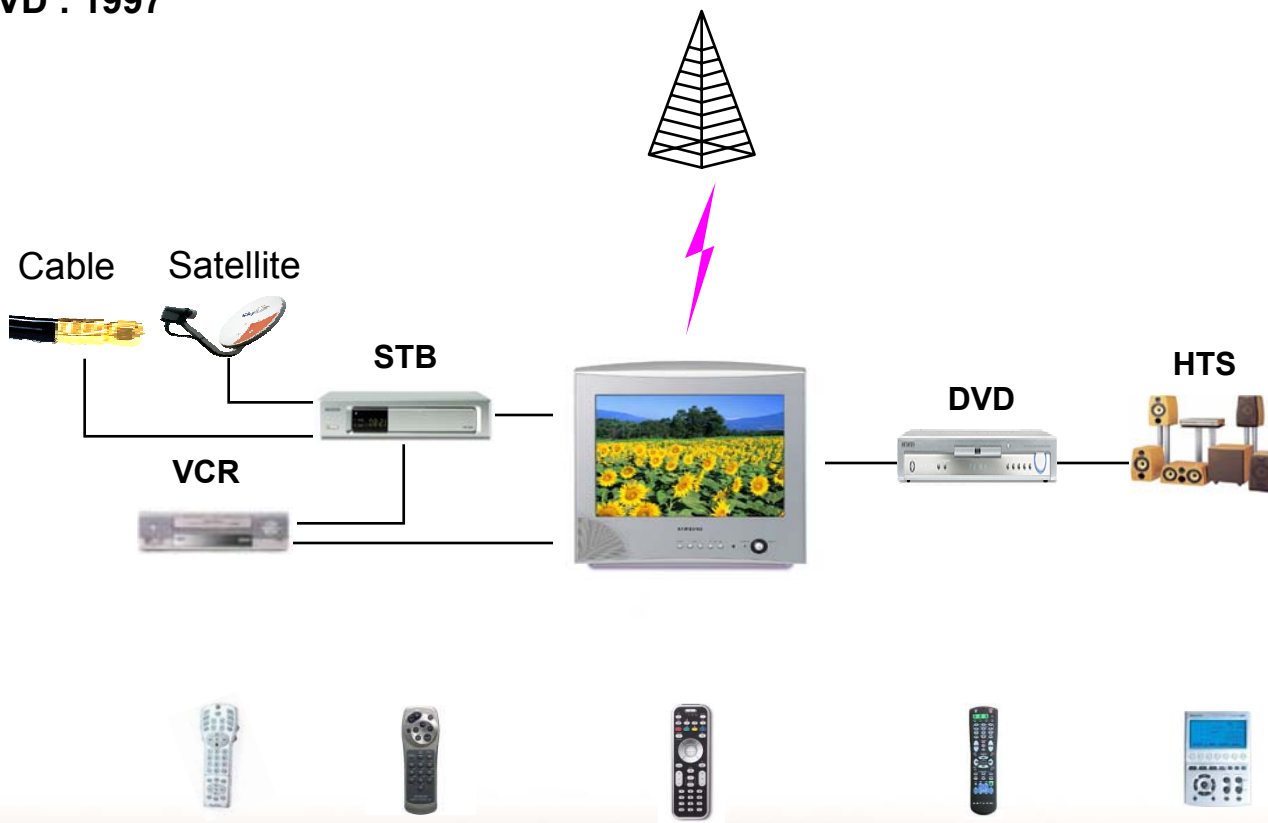
# History of TV

**DBS : 1994**



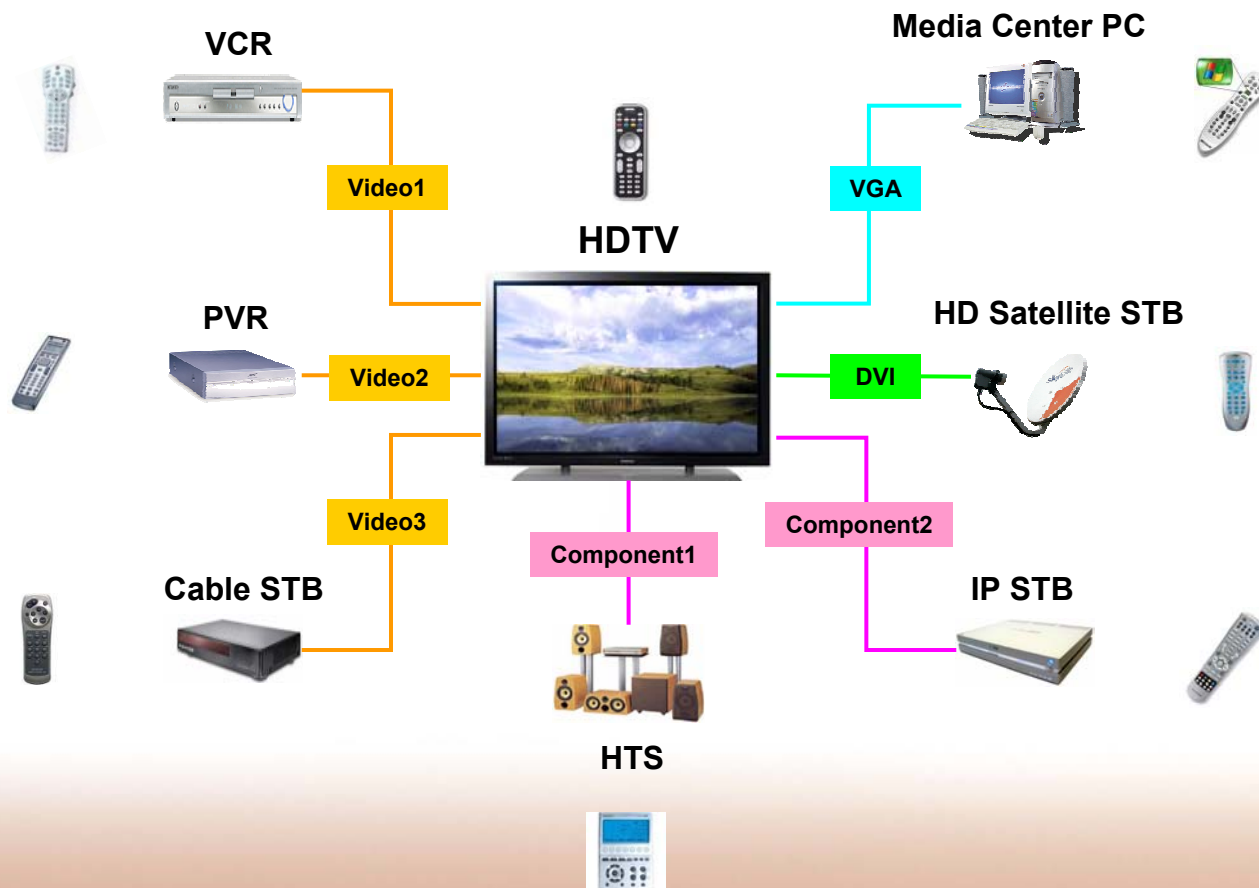
# History of TV

**DVD : 1997**



# History of TV

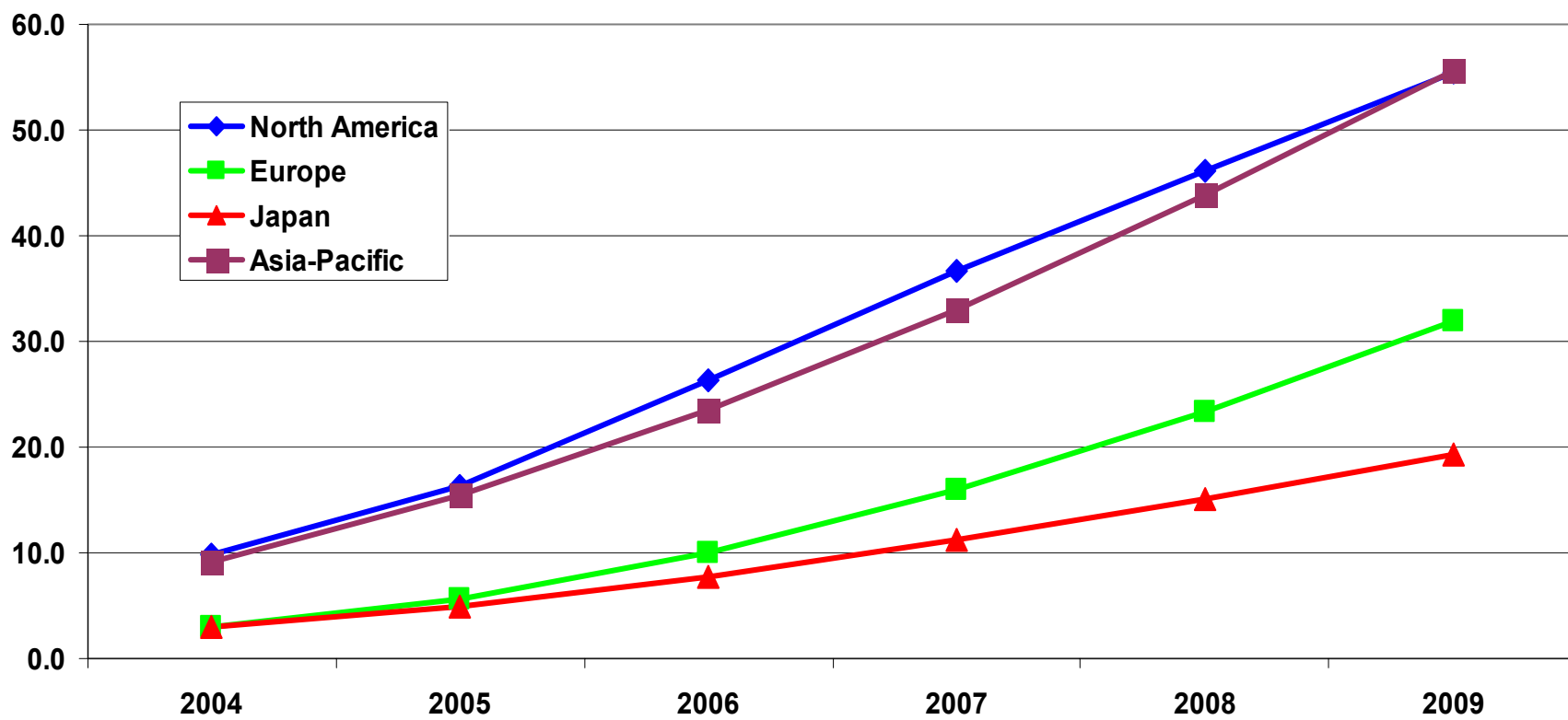
2005



# Industry Trend



Millions of Households with wide-screen HDTVs



[ In-Stat, Nov.'05 ]

## Why 1394?

- Designed for Streaming applications
  - 1394 is an Isochronous network
    - Guaranteed QoS using BW reservation
    - Synchronous (network clock)
  - Bandwidth
    - 1394a: 400 Mbps/4.5 m
    - 1394b: 100 Mbps/100m over UTP
    - 1394b: Several vendors developing 400-800 Mbps over UTP
    - 1394b: 1600 Mbps/1000 meters for GOF
  - Reduces system cost

## Why 1394 NOW?

- Cable STB Mandate
  - FCC now mandates 1394 in all HD STBs (procurement mandate)
- All DTVs must include an ATSC Tuner
  - Requires MPEG decoder
  - Adding 1394 exposes decode

## **1394 Provides Cost Benefits**

- Consumers
  - Fewer devices / components needed
    - Decoders
    - Eliminate buffers and associated delays
    - Share devices
- Manufacturers
  - Device resources
  - Development/Time to Market

## **1394 Shortens Time To Market**

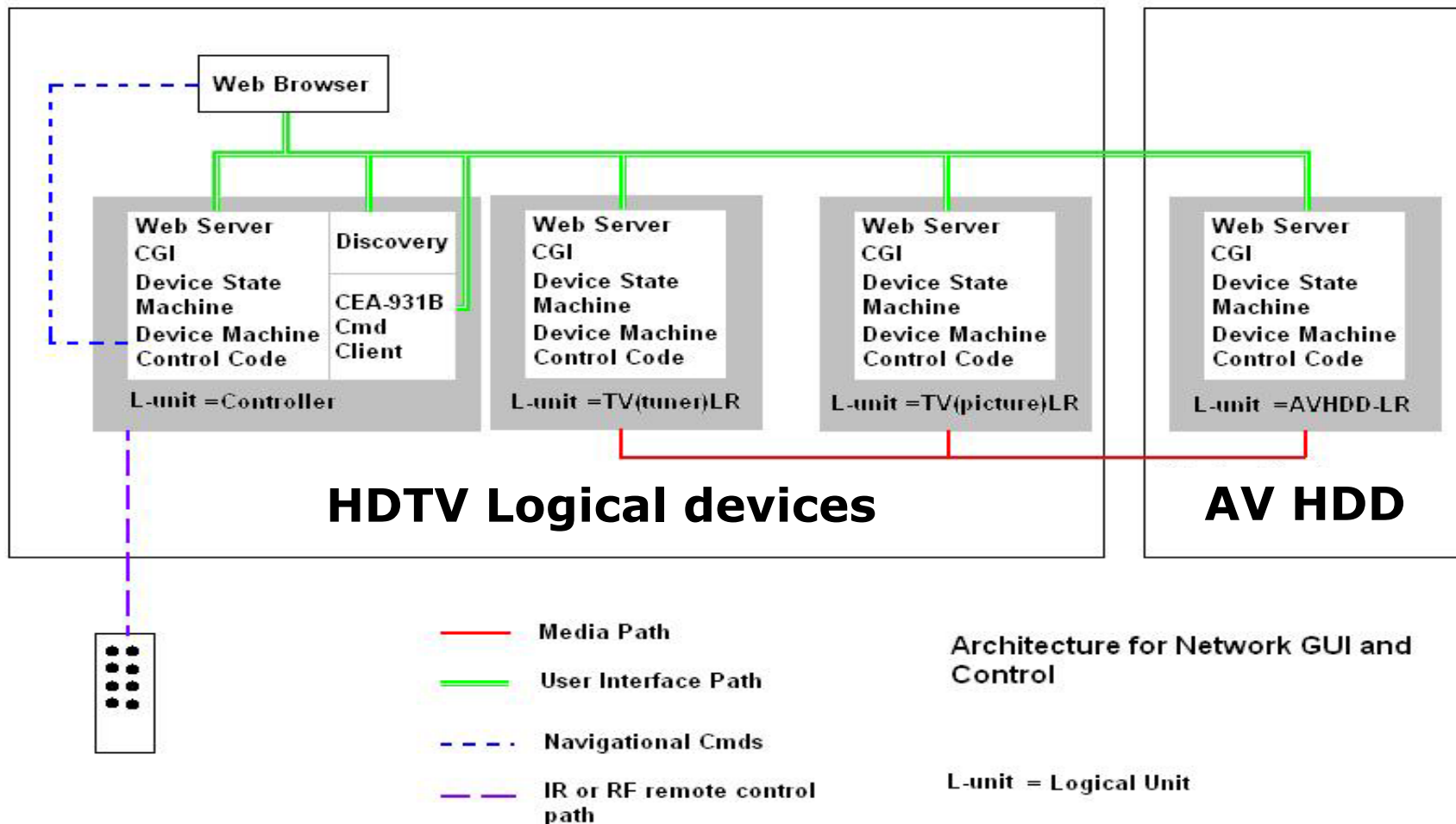
- Off-the-shelf software
  - Web Browser / Web Server
- No complex middleware
  - Reduces development, testing, compatibility issues
- Hot Plug and Play
  - Auto discovery, power management
  - No complex QoS solutions required



## **Web Browser / Server Model**

- Command/Control/UI using IP over Asynch channel
  - DTV supports thin browser
  - Connected devices support thin server
  - AV/C commands over IP (CEA 931B)
  - xHTML
  - CSS

# CEA-2027 Architecture



## HANA HDTV Display - Browser Stack

**Web Browser Display from XHTML, DOM1, CSS1, JPEG, GIF, PNG, JavaScript**

**Web Server ( virtual server for 2027 GUI controller and other 2027 logical unit services )**

**CGI interface to Web Server and State Machine (also funnels incoming 931B remote control commands)**

**CEA-2027 Proxies (In HDTV) for DTVLink, HAVi, and AV/C Legacy devices**

**HDTV state machine for dynamic HDTV logical unit control, network controller, and XHTML GUI services**

**HTTP**

**CCM over AV/C and IEC 61883**

## HANA HDTV IR receiver Stack

<b>NAVi Web Browser navigational input (Up, Down, Left, Right, Select, Exit, Back)</b>	<b>Local IR input queue ( if local menus are on screen )</b>	<b>CEA-931-B HTTP command dispatcher (part of HDTV and Network controller code)</b>
<b>IR receiver driver</b>		<b>HTTP/TCP/IP/1394</b>

# CEA 2027 Stack - Service Side Devices

## HANA NIU for { Satellite | ATSC Broadcast | Digital Cable } A/V services

**Web Server ( virtual server for 2027 GUI controller and other 2027 logical unit services )**

**CGI interface to Web Server and State Machine (also funnels incoming 931B remote control commands)**

**HTTP**

**CCM over AV/C and IEC 61883**

**TCP/IP**

**AV/C**

**NIU state machine for dynamic NIU control and XHTML GUI services.**

**1394 (IEEE 1394TA-2000 )**



# HANA GUI components





# HANA GUI components



**Select AVHDD**



# XHT GUI Components





# User Benefits

## ❑ Simple Connection

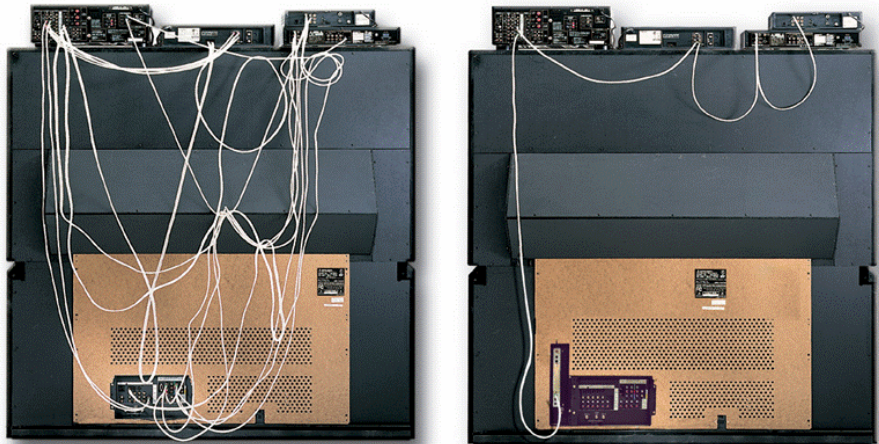
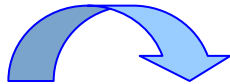
- Single 1394 Cable
- Hot 'Plug & Play'

## ❑ Ease of Use

- Single Remote Control

## ❑ Secure Network

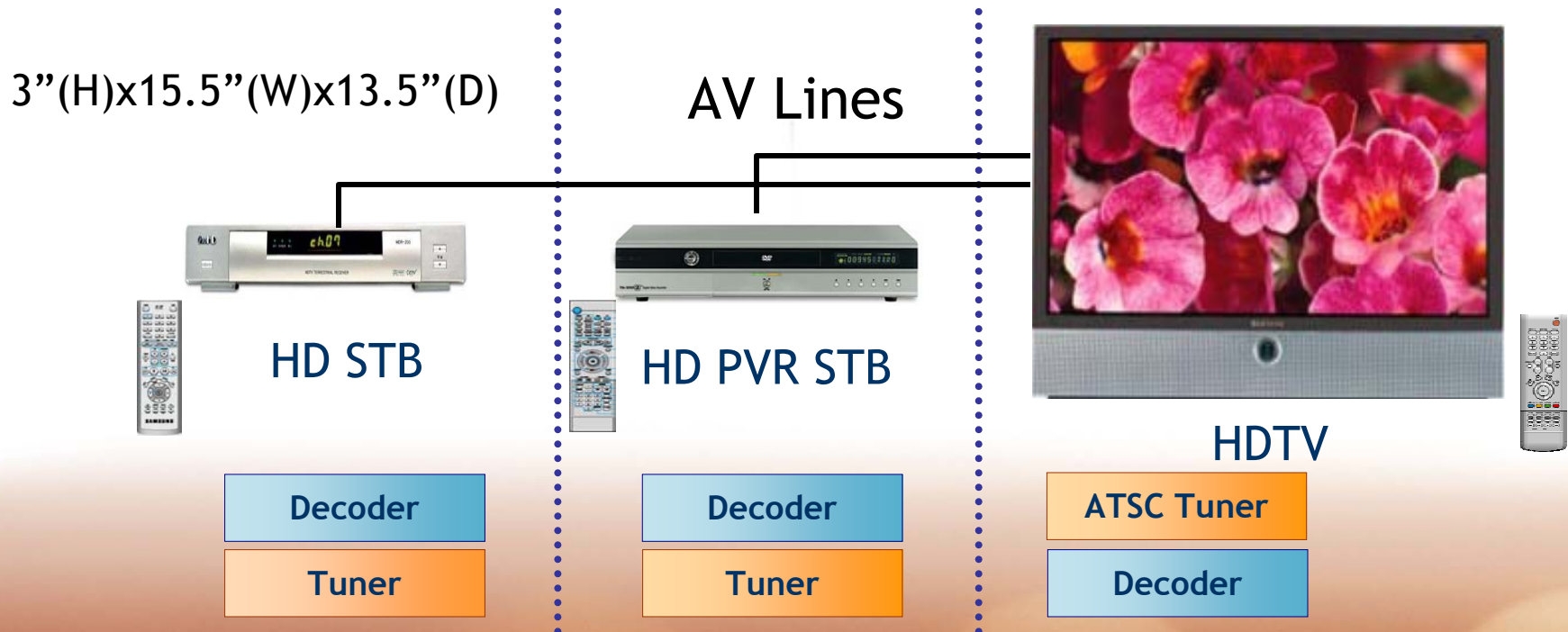
*With 1394*



# Today – No A/V Network

## Complicated setup *No HD AV Network is available*

- Multiple Wires, Multiple Remote
- Redundant Devices and Components



# HANA A/V Network

## Competitive Cost

- Eliminate duplicate components in an HD AV Network
- Utilize existing standards and infrastructure (e.g., COAX)

1.6"(H)x8.2"(W)x10"(D)



Light  
Module

Cable Tuner



HD PVR



HDTV

ATSC Tuner

Decoder

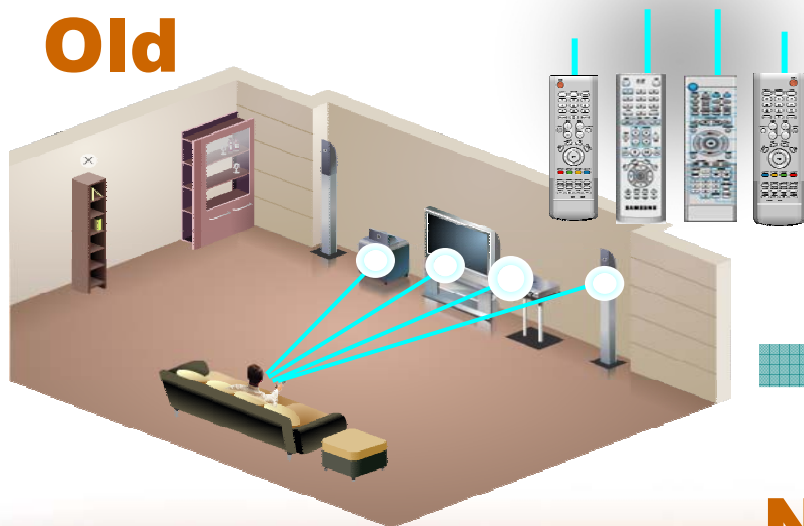


# Usage Scenarios

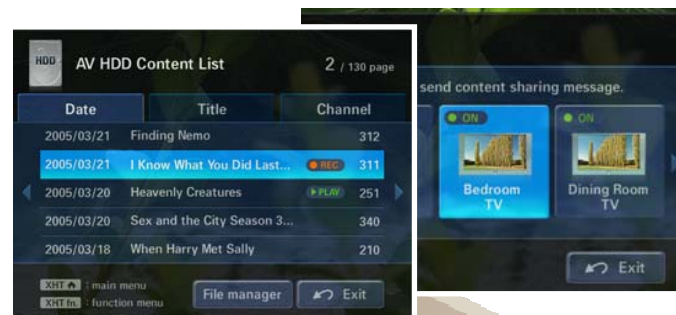
## Ease of Use

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

**Old**



**New**



# Usage Scenarios

## HD Multi-Channel

- View, Pause and Record 5+ HD channels simultaneously with QoS



# Usage Scenarios

## Room to Room

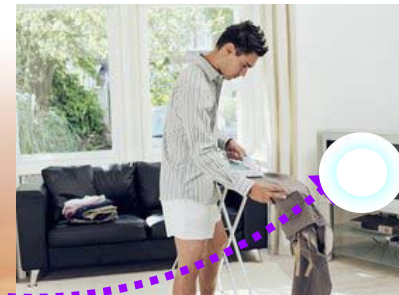
View, Pause and Record HD anywhere in home with just one STB



Room 1



Room 2

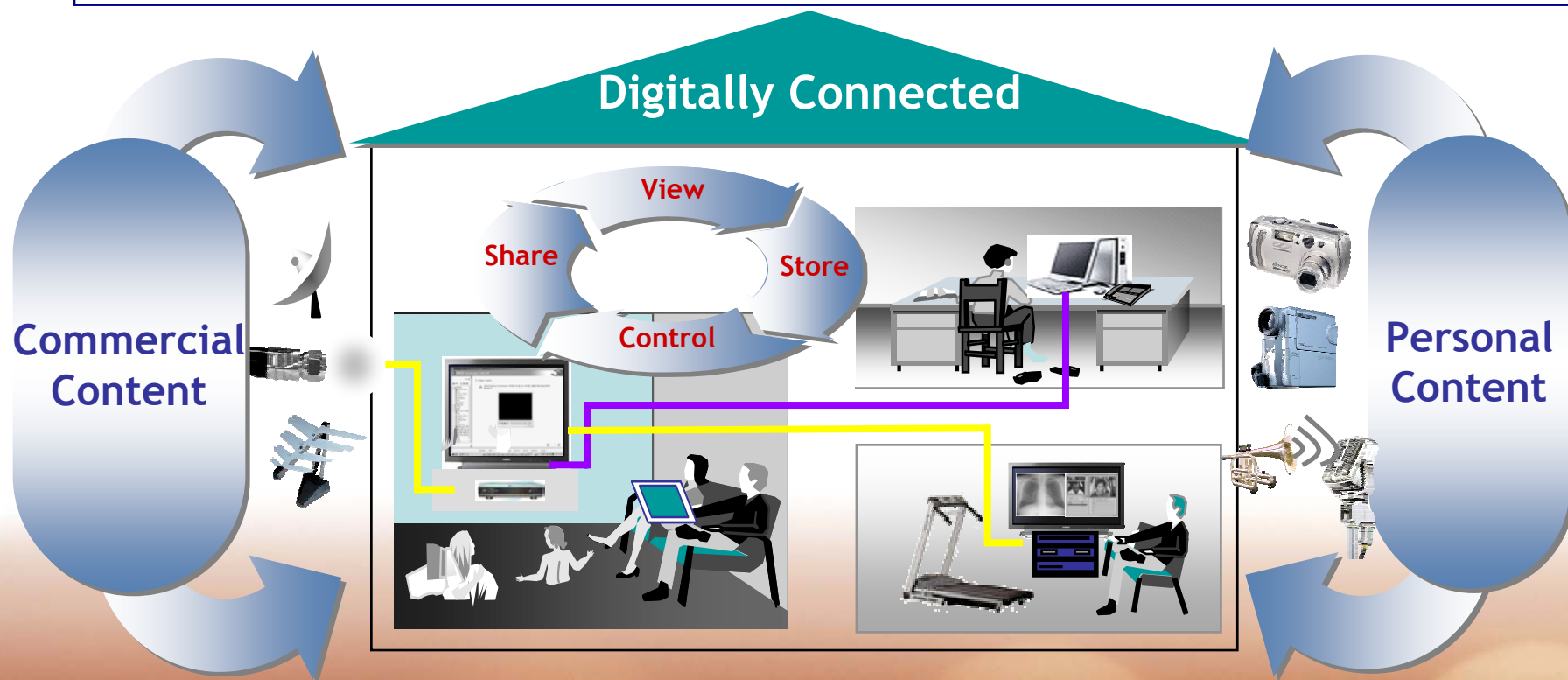


Room 3

# Usage Scenarios

## Contents Sharing

- Allow *Personal* Content to flow between the IT and AV networks but restrict *Commercial* Content to within the AV network



# Service Provider Issues (Solved)

- No UI over 1394
  - Solved with Browser/Server solution
    - Charter Cable using MOXi UI
  - Future OCAP compatibility
- No in-home wiring
  - CAT5/5e/6 (S100, S200, S400, S800)
  - Coax (at least 4 companies: up to S400 demonstrated)
  - UWB (S800)



- Reduced CAPEX
  - Lower CAPEX = Higher Share Price
  - No decoder required
  - PVR becomes a retail buy
- Fewer Truck-Rolls
- Lower Customer Service costs
- Lower Customer Acquisition costs
  - Bundle DTV + NIU + Service at retail
- Reduced churn

# Design Guidelines

- The first HANA reference implementation will incorporate existing specifications and technology:
  - CEA 2027A
  - CEA 931B
  - CEA 851A
  - IEEE 1394
  - 1394 Localization

- Initial HANA reference implementations will enable:
  - QoS for HD content (+5 simultaneous, isochronous HD video streams)
  - Content protection for HD DVD and Blu-ray
  - Hot 'Plug & Play' with auto device discovery and configuration
  - Personal content (not part of trusted network)
  - Standard IP protocols
  - 1 Cable / 1 Remote

- HANA will address compliance and certification testing:
  - HANA Third Party Interoperability Testing
  - HANA Interoperability Guide
  - HANA Developer's Conference
  - CEA and 1394TA Interoperability Events
  - SDK (Software Developers Kit)

# Product Introductions

- HANA-ready product introductions at CES 2007
  - HDTVs
  - High Definition DVD
  - Personal video recorders / HD hard disk drives
  - NIU with downloadable code and video on demand
  - 1394 over CAT-5, coax
  - Digital home theater audio

- Continue to work with standards organization as needed (CEA, 1394TA, CableLabs)
  - CEA 931C
  - CEA 2027-x
  - 1394 over coax
  - OCAP harmonization and interfaces
- UPnP Bridging through VHN / CEA-851A
- Enhanced content protection and trust models
- Enhanced compliance and certification testing
- Enhanced bridging to AV/C world

# Summary

## ☐ **Content Owners**

- Time to market solution for HD with Trusted network environment

## ☐ **Service Providers**

- Easy installation
- Save CapEx (Capital Expenditure)

## ☐ **CE Manufacturers and IT Companies**

- New business opportunities with HANA devices

## ☐ **Consumers**

- Easy to connect (Single Wire)
- Easy to control (Single Remote Control)

**For More Information on HANA**

**[www.hanaalliance.org](http://www.hanaalliance.org)**

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