

**AACS**

advanced access content system

# Advanced Access Content System (AACS)

**AACS Overview  
Presentation to CPTWG**

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# AACS Final Licensing - Agenda

- AACS LA presented its Interim specifications and licenses to CPTWG in February 2006 – AACS LA remained consistent with our original plan
- Current Status
- Features of the Final Specifications
- Licensing Considerations

# AACS LA Structure

**Founders - drawn from 3 key industry sectors: content providers, consumer electronics and IT industry**

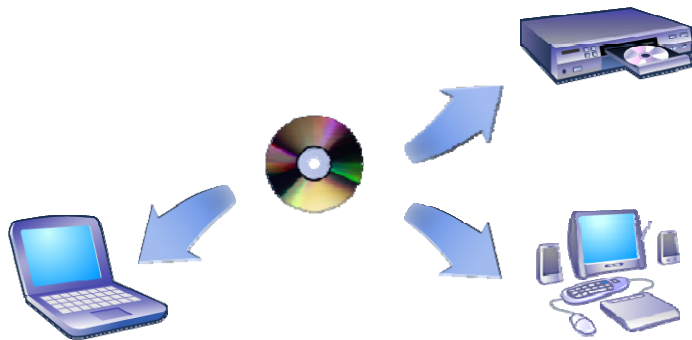
- IBM
- Intel
- Microsoft
- Panasonic
- Sony
- The Walt Disney Company
- Toshiba
- Warner Bros.
- **Contributors**
  - Input and collaboration with 15 additional companies across principal industries
- **Licensees**
  - Manufacturers, Content Companies, Resellers, Online Service Providers
- Cost Recovery; No paid staff; Outsourced services

# AACS Technology Objectives

- **Create a seamless, robust and interoperable environment for the distribution and use of next-generation digital content**
  - Develop, promote and license technologies designed to enhance digital entertainment experiences for consumers
  - Exciting, flexible new entertainment options for consumers in stand alone, networked home and portable environments
  - Solution is format-neutral and designed for the next-generation optical media formats, Blu-ray and HD DVD, for use with PCs and other consumer electronics devices
- **Create opportunities for new business models for content providers, distributors, content aggregators and device manufacturers**
  - Enables e-commerce enhanced content while accelerating the legitimate flow of next generation content, including high definition (HD) content
  - Gives content providers new distribution management options for consumer-friendly authorized use
- **Provide a core entity to license the technology**
  - Strong partnership among the IT, Entertainment, and CE industries

# Extended Business Opportunities

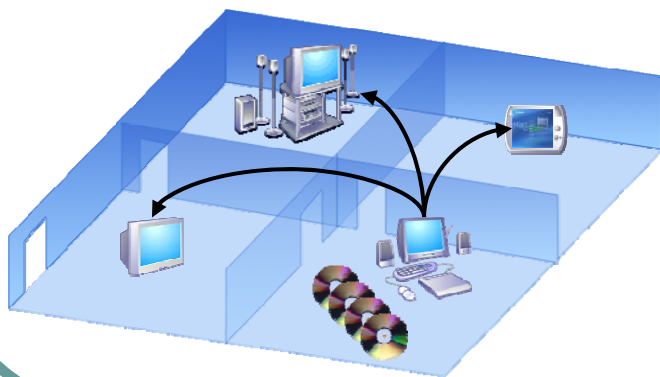
Local Playback



Electronic Distribution with Secure Copy



Home Media Server

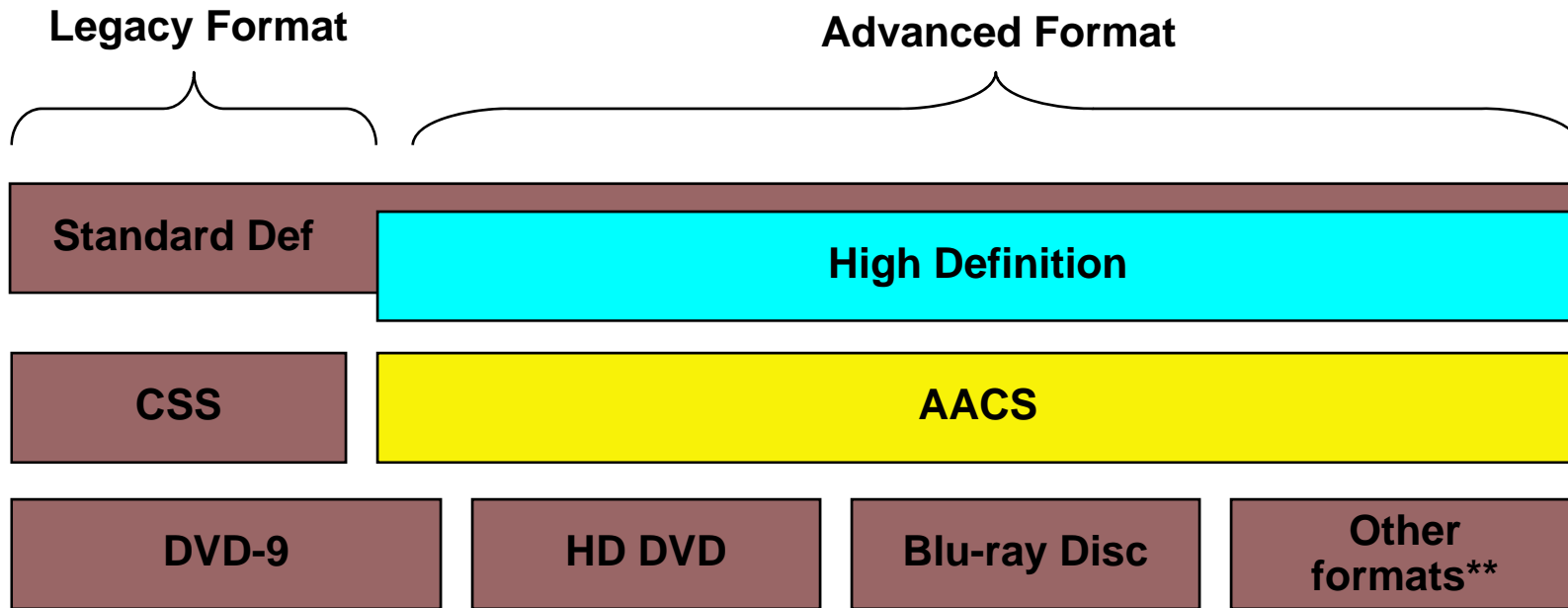


Portable Device



# AACS Framework

**AACS: Advanced, format-neutral protection for next generation audiovisual content for a variety of underlying formats\***



\*Prerecorded and Recordable

\*\* CBHD added

# AACS Technology Review

- **Strong cryptography**
  - Advanced Encryption Standard with 128-bit keys
  - Next-generation media key block
- **Revocation of compromised devices**
  - Precise – affects only compromised key
  - Efficient tree-based, broadcast encryption
- **Enhanced drive authentication**
- **Support for advanced operations such as “move”**
- **Use of network connectivity to enable enhanced uses**
- **New approaches to enhance robustness of implementations**
  - Combination of proactive software renewal with revocation
- **Audio Watermark**

# AACS – Current Status

- Hundreds of interim licenses in force
- Encryption system is robust
- Key renewal and revocation processes work and are routinely used
- Key generation processes have been improved and key order delivery times have dropped
- Key order fees have been reduced as costs have been lowered
- Development of the Final specifications and licenses was more complicated than expected, but are now posted on [www.AACSLA.com](http://www.AACSLA.com)



# AACS Licensing Status

- Interim Licensing began on Feb. 17, 2006
- Final Adopter & Content Participant Agreements published June 5, 2009
  - Final Content Provider & Reseller Agrmts. published June 19, 2009
  - Online Service Provider Agreement being prepared
  - Transition period – Interim Agreements expire Dec. 4, 2009
- Format Rollout:
  - Blu-ray – All provisions of the Final Licenses
  - HD DVD – Final, except MC and WM; Market Monitoring to be done by AACS
  - CBHD – Interim until December 2010

# Outcomes of the Review Steps

- Founders and Contributors provided input on the Specs, Licenses and Compliance Rules
- Besides new features, the review process yielded improved documents and processes
- The improved process areas include:

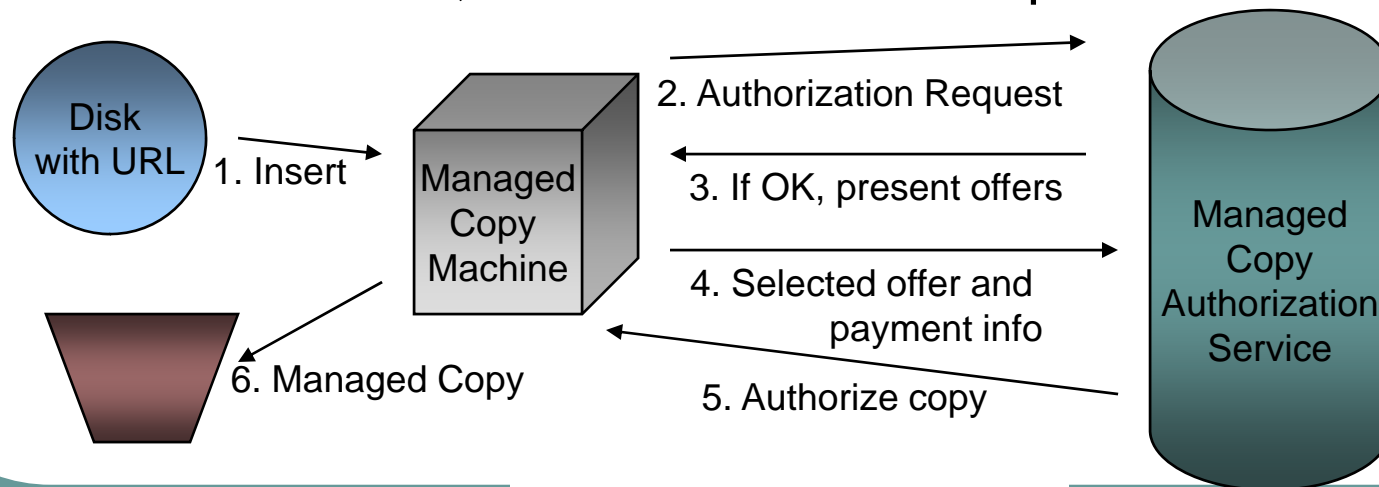
Re-pressing of existing titles	Obligations re. Managed Copy
Transfer rules for CMF's	Use of Content Certificates
Fee Structure	Production Reporting
Volume CP notification	ICT/DOT responsibilities
BD Live data transfer procedures	AACS KGF service levels

# Final Licenses – New Features

- Managed Copy
- Watermark embedding and detection
- Digital Only Token enabled
- Prepared Video
- Class II MKB's
- Bus Encryption
- Analog Sunset Dates
- Slightly modified key expiration terms
- Third-Party Product Certification
- Signed CSS
  - Watermark
  - Content certificate
- Revised Fee Structure

# Managed Copy

- Enables authorized copies and movement of content onto home network and portable devices
- Specifications allow first generation (Interim) AACCS-protected discs to be Managed Copy-ready
- Current authorized Managed Copy output technologies include CPRM, VCPS, WMDRM/PlayReady, MagicGate, AACCS for Recordable Media, as well as AACCS Prepared Video



# Prepared Video

- New AACCS writable format
  - Supports preservation of all features of a pre-recorded disc (navigation, etc.)
    - Disc is enabled through cryptographic token created by a Content Owner server
  - Enables Electronic Sell Through and Manufacturing On Demand models
  - Can be used as an input and/or output technology for Managed Copies
  - AACCS for Prepared Video supports bit-for-bit HD copies, and AACCS LA looks forward to BDA support for this functionality

# Audio Watermark

- Selected watermark technology is from Verance Corporation – referred to as the Cinavia™ Watermark
- Embedded at the discretion of content providers
- Final license obligation is on device manufacturers to screen for the watermark
- Inaudible signal that a content provider may choose to insert into the audio track of their content
- Invisible and inaudible to consumers
- Two uses of the watermark
  - No Home Use – embedded in theatrical releases only
  - Trusted Source – embedded in AACS-protected optical discs and other trusted content delivery methods to consumers
- Licenses and specifications available from Verance Corporation
  - [www.verance.com](http://www.verance.com)

# Digital Only Token

- Digital Only Token will be utilized **only** to enable new business models for content offerings
  - e.g., “Day and date” release of disc and theatrical versions
  - e.g., HD preview of content before generally available
  - e.g., screeners and other non-consumer uses
- When used, restricts content to digital outputs
- If employed, disc required to be clearly labeled to avoid consumer confusion
- Encourages industry use of protected digital interconnections and enhanced security

# Image Constraint Token

- Applicable to analog outputs
- Provides better than current Standard Definition DVD experience for legacy analog devices
  - Resolution superior to current DVDs, twice the resolution of standard definition
- Encourages adoption of protected digital interconnections
- Provides flexible business options for content owners
- Obligation to notify consumer when ICT used on disc
- Employed at the option of the content owner



# Drive-Host Bus Encryption

- Adds a dynamic encryption layer for PC-based players
  - See Specification Common Book – Chapter 4
  - Prevents decryption of content extracted from drive-host interface, even if certain AACCS keys are known
  - Adds second layer of encryption between software host and PC-based drive
  - Uses dynamic keys
  - Forces attackers to have a revocable host private key and certificate in their client, making identification (and revocation) easier

# Class II Media Key Blocks (MKBs)

- Also known as “Unified MKBs”
  - See Specification Common Book – Chapter 3
  - Strengthens ability to respond to clone and anonymous attacks (discovering source of the attack)
  - Combines benefits of Sequence Keys with modified MKB structure
  - Offers lower implementation cost over Class I MKBs/SKBs
    - Class II devices no longer need process SKBs
  - Backward-compatible with the SKB system

# Analog Sunset

- Addresses balance between content protection needs & realistic timeframe for digital output adoption
- December 31, 2010 – analog output limited to SD Interlace Modes only (*i.e.*, Composite, S-Video, 480i component)
- December 31, 2013 – sunset for all analog output
- No impact on Licensed Products manufactured prior to sunsets

# Signed CSS

- New Signed CSS book defines format for CSS certificates for use with DVD
  - Allows Content Owners to place AACCS Watermarks on content which is only protected with CSS
  - If an AACCS player sees the Trusted Source watermark on an optical disc which does not include the certificate, the player will mute the audio

# Fees

- Order process fee reduced for all key order types
  - Now \$500 (50% reduction)
  - Extensive competitive bid process resulted in movement of key generation facility to a new hosting vendor
- Lower fees for content companies
  - On average at least 25% reduction
- New provisions for small content companies
  - New Content Provider annual fee option for small production consortia
- More streamlined payment and accounting process for both content owners and content producers.
  - Content Participants and Content Providers responsible for reporting and fee payment
  - AACCS LA retains audit rights

# AACS Fee Reduction

- Annual Administration Fee for Basic Content Provider
  - Interim Agreement:
    - US\$3,000 (for the life of the Agreement)
  - Final Agreement:
    - US\$3,000 (for the life of the Agreement) or
    - US\$500/year with the cap of US\$5,000
- Optical Media Fee (Per Disc)
  - No Change from Interim to Final: US\$0.04/disc
- Optical Media Fee (Annual Volume Plan) – See the Tables in the Following Page
  - Create new tiers to cover lower production volumes
  - Reduction is applied throughout the tiers
- Content Certificate
  - Interim Agreement: Originally US\$2,500/title, reduced to US\$1,300/title
  - Final Agreement: US\$500/title (80% reduction over 3-year span)

## Interim Agreement

Tier	Minimum Annual Fee
0 - 500K	US\$12,000
0 - 2M	US\$40,000
0 - 5M	US\$80,000
0 - 15M	US\$200,000
0 - 70M	US\$600,000
0 - 120M	US\$1,400,000
0 - 170M	US\$1,900,000
0 - 250M	US\$2,300,000
250M -	US\$2,500,000

## Final Agreement

Tier	Minimum Annual Fee	Additional Per Disc Rate
0 to 200k	US\$ 7,200.00	US\$ 0.036
0 to 500k	US\$ 12,000.00	US\$ 0.0240
0 to 1M	US\$ 20,160.00	US\$ 0.0202
0 to 2M	US\$ 34,474.00	US\$ 0.0172
0 to 5M	US\$ 70,671.00	US\$ 0.0141
0 to 10M	US\$ 121,554.00	US\$ 0.0122
0 to 20M	US\$ 211,504.00	US\$ 0.0106
0 to 30M	US\$ 291,875.00	US\$ 0.0097
0 to 45M	US\$ 405,707.00	US\$ 0.0090
0 to 60M	US\$ 513,895.00	US\$ 0.0086
0 to 80M	US\$ 654,360.00	US\$ 0.0082
0 to 110M	US\$ 860,483.00	US\$ 0.0078
0 to 150M	US\$ 1,129,579.00	US\$ 0.0075
0 to 200M	US\$ 1,460,923.00	US\$ 0.0073
0 to 250M	US\$ 1,793,283.00	US\$ 0.0072
250M -	US\$ 1,800,000.00	N/A

# AACS Fee Reduction

- **Scenario 1** Content Participant releases 20 titles/4 Million discs annually.
- **Fee Schedule under Interim Agreement**
  - Admin Fee: \$40,000.00/year \$40,000.00
  - MKB fees: 20 MKBs @ \$10/MKB \$200.00
  - MKB usage @ Volume plan: \$80,000.00
  - Content Certs: 40 Certs @ \$500.00 \$20,000.00  
(assuming 2 Certs per title, to account for “do overs”)
  - 40 Order Fulfill Fees: @ \$800.00 (2 Certs per title, for “do overs”) \$32,000.00
  - TOTAL: \$172,200.00
- **Fee Schedule under Final Agreement**
  - Admin Fee: \$40,000.00/year \$40,000.00
  - MKB fees: 20 MKBs @ \$5/MKB \$100.00
  - MKB usage: N/A
  - Content Certs: Cert usage @ Volume plan \$68,874.00  
(“do overs” not relevant here)
  - 40 Order Fulfill Fees: @ \$500.00 (2 certs per title, for “do overs”) \$20,000.00
  - TOTAL: \$128,974.00
- **Savings of 25.1% over Interim Fee Schedule**



# AACS Fee Reduction

- **Scenario 2** Volume Content Provider releases 5 titles/1.5 Million discs annually.

- **Fee Schedule under Interim Agreement**

● Admin Fee:	\$15,000.00/year	\$15,000.00
● MKB fees:	5 MKBs @ \$10/MKB	\$50.00
● MKB usage @ Volume plan:		\$40,000.00
● Content Certs:	10 Certs @ \$500.00 (assuming 2 Certs per title, to account for “do overs”)	\$5,000.00
● <u>10 Order Fulfill Fees:</u>	<u>@ \$800.00 (2 Certs per title, for “do overs”)</u>	<u>\$8,000.00</u>
● TOTAL:		\$68,050.00

- **Fee Schedule under Final Agreement**

● Admin Fee:	\$15,000.00/year	\$15,000.00
● MKB fees:	5 MKBs @ \$5/MKB	\$25.00
● MKB usage:		N/A
● Content Certs:	Cert usage @ Volume plan (“do overs” not relevant here)	\$30,260.00
● <u>10 Order Fulfill Fees:</u>	<u>@ \$500.00 (2 certs per title, for “do overs”)</u>	<u>\$5,000.00</u>
● TOTAL:		\$50,285.00

- **Savings of 26.1% over Interim Fee Schedule**

# AACS Fee Reduction

- **Scenario 3** Basic Content Provider releases 1 title/25,000 discs annually.
- **Fee Schedule under Interim Agreement**

	1 <sup>st</sup> year	2 <sup>nd</sup> year and later
● Admin Fee: \$3,000.00 (for the life of the Agreement)	\$3,000.00	N/A
● MKB fees: 1 MKB @ \$10/MKB	\$10.00	\$10.00
● MKB usage: @ \$0.04/disc	\$1,000.00	\$1,000.00
● Content Certs: 2 Certs @ \$500.00 (assuming 2 Certs per title, to account for “do overs”)	\$1,000.00	\$1,000.00
● <u>2 Order Fulfill Fees: @ \$800.00 (2 Certs per title, for “do overs”)</u>	<u>\$1,600.00</u>	<u>\$1,600.00</u>
● <b>TOTAL:</b>	<b>\$6,610.00</b>	<b>\$3,610.00</b>
- **Fee Schedule under Final Agreement**

● Admin Fee: \$3,000.00 (for the life of the Agreement)	\$3,000.00	N/A
● MKB fees: 1 MKB @ \$5/MKB	\$5.00	\$5.00
● MKB usage:	N/A	N/A
● Content Certs: @ \$0.04/disc (“do overs” not relevant here)	\$1,000.00	\$1,000.00
● <u>2 Order Fulfill Fees: @ \$500.00 (2 certs per title, for “do overs”)</u>	<u>\$1,000.00</u>	<u>\$1,000.00</u>
● <b>TOTAL:</b>	<b>\$5,005.00</b>	<b>\$2,050.00</b>
- **Savings of 24.3% over Interim Fee Schedule for the 1<sup>st</sup> year and 43.2% for the 2<sup>nd</sup> year and later.**

# AACS Fee Reduction

- **Scenario 4** Basic Content Provider releases 1 title/1,000 discs only once.
- **Fee Schedule under Interim Agreement**
  - Admin Fee: \$3,000.00 (for the life of the Agreement) \$3,000.00
  - MKB fees: 1 MKB @ \$10/MKB \$10.00
  - MKB usage: @ \$0.04/disc \$40.00
  - Content Certs: 2 Certs @ \$500.00 \$1,000.00  
(assuming 2 Certs per title, to account for “do overs”)
  - 2 Order Fulfill Fees: @ \$800.00 (2 Certs per title, for “do overs”) \$1,600.00
  - TOTAL: \$5,650.00
- **Fee Schedule under Final Agreement**
  - Admin Fee: \$500.00/year \$500.00
  - MKB fees: 1 MKB @ \$5/MKB \$5.00
  - MKB usage: N/A
  - Content Certs: @ \$0.04/disc \$40.00  
(“do overs” not relevant here)
  - 2 Order Fulfill Fees: @ \$500.00 (2 certs per title, for “do overs”) \$1,000.00
  - TOTAL: \$1,545.00
- **Savings of 72.7% over Interim Fee Schedule.**

# Final License Elements

- Similar in structure to other content protection technology licenses and the AACCS Interim Agreements
  - Patent IP license from each Founder
    - Necessary Claims
  - Non-assert from each Licensee to every other Licensee, as well as to Founders and AACCS LA, LLC
    - Provides “litigation-free zone” for all licensees
    - Non-assert limited to Necessary Claims within scope of Specifications
  - Non-patent IP license from AACCS LA, LLC
    - Copyright in Specs
    - Trade secrets

# Final License Elements (cont.)

- License election
  - Evaluation License for evaluation of AACCS Technology & product development
  - Production License for production of devices/components for sale
- Authoring/Mastering using AACCS Technology is licensed for “Licensed Content Producer” under Adopter Agreement
  - Stamping is accomodated under Content Participant Agreement/Content Provider Agreement
  - AACCS Online Service (including development and operation of AACCS Managed Copy Servers) will be licensed under Online Service Provider Agreement
- Provision for “Have Made” Parties
  - Facilitates licensee use of subcontractors

# Third-Party Certification

- Third-party review of pre-shipping Licensed Products
  - Sections 3.1 to 3.4 of the Adopter Agreement;
  - A check of Licensed Products for compliance and robustness prior to shipping, providing opportunity to identify problems before they show up in the field;
  - RFP for development of testing regimen provided to twelve candidates;
  - Structured as a two-phase implementation to get initial process in place as early as possible;
  - Current timeline calls for first phase of the program to be in place in early Q2 2010;
  - Comprehensive Robustness Review document produced, undergoing internal finalization.

# Final License Elements (cont.)

- Change Management
  - Limited ability of AACCS LA to make changes to Compliance Rules or Specifications
  - Some licensees have change management role
  - Licensee may terminate license in response to proposed change, freezing survival of non-assert at state of AACCS Technology immediately prior to introduction of such change

# Final License Elements (cont.)

- Term/Termination of Interim Agreement
  - 6 months after Final Agreement available – June 5, 2009
  - Effective Date of Final Agreement entered into by Adopter
- Key Expiration/Renewal
  - Keys can be Expired if cloned, lost, extracted or used in unauthorized distribution of Keys
  - Shared Keys must be proactively renewed
  - Expiration procedure can be initiated by AACCS LA, Adopters or Content Participants
  - Adopter has right to object to Expiration
  - Final License has terms to make it more efficient to Expire keys under certain conditions



# Summary

- AACS has been licensed by hundreds of licensees during the Interim licensing period
- The Final Specifications and Agreements bring new function to consumers and additional content security for content owners
- License process yielded process improvements for Content Producers
- New, streamlined fee structure and reduced fees
- AACS website is [www.aacsla.com](http://www.aacsla.com)
- Verance (Cinavia™) website is [www.verance.com](http://www.verance.com)