DRM & Interoperability

Marlin, Coral & DECE
Marlin Functionality

• Device Bound Model
  – Still Useful for Rental
• Domain Bound Model
  – Current Wave, useful for ecosystems, subscriptions
• Ad Supported Model
  – Add Flexibility to the most common business model
  – Constrain ad skipping
  – Anonymous yet accurate reporting
Marlin Developer Community (MDC)

- The Marlin specifications were developed by the Marlin Developer Community (MDC).
- The MDC was created in 2005 by Intertrust, Panasonic, Philips, Samsung, and Sony.
Marlin Partner Program

• The Marlin Partner Program (MPP) is a forum for solutions providers

• Today, over 35 partner companies provide expertise across the value chain
  – Includes Technology Solutions Providers and System Integrator’s who provide solutions for adopters, including Set Top Box and mobile phone solutions

• MPP membership includes non-commercial access to SDKs.
Marlin Partner Network

Technology Solutions Providers

System Integrators

Content Aggregator/Solutions Providers

Device Maker

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Marlin Trust Management

- The Marlin Trust Management Organization (MTMO), which is an entity distinct from the MDC
- The MTMO has a single trust authority to ensure maximum interoperability
- The MTMO uses a “delegated trust” model to give adopters maximum flexibility
- MTMO allows multiple entities to provide keys if they meet certain criteria; Intertrust operates, Seacert, one such trust service provider
- MTMO publishes compliance and robustness rules
• Provides infrastructure services (i.e., keys and secure digital certificates) to device makers and service providers who want to deploy domain-based media content distribution systems, including for Marlin and OMA DRM
• Easy-to-use, cost-effective comprehensive services
• Supports a variety of cryptographic standards and protocols and uses its expertise and experience to offer a customized and reliable implementation
• Over 30 global customers
Seacert Customers
Market Adoption

• Marlin is used for content distribution and protection in:
  – Japanese national IPTV deployment (IPTV-ES specification)
  – Sony PlayStation Network, PS3, PSP, TVs, and other devices
  – SyncTV catch up TV service
  – Philips NetTV

• Marlin’s simple licensing program
  – Minimizes market hurdles
Standards Adoption

The Marlin specifications have been adopted by other standards development organizations.

- Marlin is the content protection technology selected by the Open IPTV
- DECE Approved DRM
- Bluewhale and Sushi have passed the ChinaDRM Forum conformance test suite
Studio Support

All major studios support Marlin to protect their content for rental, subscription and electronic sell through of their digital assets.
Japanese IPTV Device/Component Adopters

ACCESS™  BUFFALO™  CyberLink  DigioN®

FUJITSU  FUNAI  HITACHI  INSPIRE THE NEXT  I-O DATA

i-TEC  JVC KENWOOD HOLDINGS  MOTOROLA  MITSUBISHI ELECTRIC

NEC  Panasonic  SANYO  Soliton

SHARP  SONY  SUMITOMO ELECTRIC NETWORKS, INC.  TOSHIBA

USEN
Japanese IPTV Service Adopters
## Wasabi/Sushi SoC Ports

<table>
<thead>
<tr>
<th>Vendor Models</th>
<th>Broadcom 7405</th>
<th>Intel CE4100 (Sodaville)</th>
<th>Sigma 8634 8654</th>
<th>STI 7105</th>
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</thead>
<tbody>
<tr>
<td>Presentation Framework</td>
<td>Flash Lite</td>
<td>Flash Lite</td>
<td>Flash Lite, Webkit</td>
<td>Opera</td>
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<tr>
<td>Streaming Video</td>
<td>Adaptive MP4,MP2TS</td>
<td>pre-alpha</td>
<td>pre-alpha</td>
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<tr>
<td>Progressive Download</td>
<td>MP4/PDCF</td>
<td>pre-alpha</td>
<td>MP4/PDCF</td>
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</table>
# Wasabi/Sushi PC Ports

<table>
<thead>
<tr>
<th></th>
<th>Apple</th>
<th>Linux</th>
<th>Windows</th>
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<tbody>
<tr>
<td><strong>Browser Playback</strong></td>
<td>HTML5 pre-alpha</td>
<td>HTML5 pre-alpha</td>
<td>DirectX Plugin</td>
</tr>
<tr>
<td><strong>Media Framework</strong></td>
<td>Sample Player, GStreamer Plugin</td>
<td>Sample Player, GStreamer Plugin</td>
<td>Sample Player, WMP Plugin, GStreamer Plugin</td>
</tr>
<tr>
<td><strong>Streaming Video</strong></td>
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</tr>
</tbody>
</table>
## Wasabi/Sushi Handset Ports

<table>
<thead>
<tr>
<th>Media Framework</th>
<th>iPhone</th>
<th>Android</th>
<th>symbian</th>
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<tr>
<td>Wasabi w/Native Codecs alpha</td>
<td>Wasabi w/Native Codecs</td>
<td>Sushi Only</td>
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</table>

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<td>Adaptive MP2TS pre-alpha</td>
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</thead>
</table>
OMArlin

- Common File Format
  - DCF, PDCF

- Multiple Licenses for the Same File
  - Distributed with the file
  - Delivered later
Introduction to Coral

April 2010
Problem: How can we obtain ‘equivalent’ DRM licenses for two systems A and B?

- Constraints
  - DRMs have different, incompatible license formats
  - DRM licenses may not be accessible
  - Automated license translation difficult in general
Coral Architectural Approach

- DRM licenses are derived from Rights Tokens
- Rights Tokens encode usage models
- Licenses issued to enforce models
Coral Architectural Approach

- Allow DRM systems to work as designed
- Do not interfere with DRM protocols
- Require no changes from DRM systems
Anatomy of a Rights Token

- Rights Tokens
  - Provide a standard syntax for rights interchange
  - Adopters or groups of adopters specify semantics
  - Used only for derivation of DRM Licenses
  - No enforcement mechanism specified
Coral DRM Integration Model

• Coral works through integration
• Native DRM functions are wrapped with standardized Coral interfaces
• Design of Coral architecture reflects ‘typical’ DRM system architectures
• DRM systems have fundamental similarities:
  – WM-DRM
  – OMA DRM v2
  – Adobe
  – Marlin
  – Fairplay
Coral DRM Integration Model

- **Licenses**
  - *Encode usage rules and conditions for content*
- **License Servers**
  - *Provide DRM licenses to clients*
- **Clients**
  - *Evaluate licenses and render content*
- **Domains**
  - *Authorization for a set of clients*
- **Domain Managers**
  - *Provide domain membership membership tokens to Clients*
- **Triggers**
  - *Cause clients to seek licenses, domain tokens*
Joining a Domain

- DRM #1 License Server
- Rights Locker
- Domain Manager
- DRM #2 License Server
- Retailer /SP #1
- Retailer /SP #2
- Device #1
- Device #2

User Domain of Devices
Coral Specifications – Three Layers

**Ecosystems**
Combinations of Core Architecture Components
Layer Semantics over Core Architecture
Specify a set of consensus Usage Models and mappings

**Core Architecture**
Basic Interfaces and Data Structures
Focus on standardize syntax
Authentication and Authorization specifics

**NEMO**
Secure Trusted Messaging Architecture
Service-oriented Design
Specifications for authentication and authorization
THE FUTURE
OF ENTERTAINMENT STARTS HERE.

Digital Entertainment Content Ecosystem
Who is DECE

- Digital Entertainment Content Ecosystem, LLC -

• U.S. limited liability company (legal entity), with first members in June 2008
• Open for international participation by any company/trade association engaged in business related to digital entertainment content (over 40 member companies as of today)
• Organized to develop and license specifications for ecosystem of distributing digital entertainment content
DECE Goals

• Create the best consumer experience for digital content distribution:
  – progressive download, burn, stream (remote access)
  – an open market -- choice of interoperable devices, online retailers
  – value-added services

• Develop and license specifications

• Establish a consumer brand and deliver on its promise to consumers

• Enable efficiencies for DECE adopters and infrastructure providers

• Build on existing industry standards
DECE Participants (partial list)
Electronic Sell-Through Today

- Silo services limit consumers into a single device platform and a single retailer for purchasing content
- Every additional service silo further fragments the market
- It is another format war, but with online services
- Content delivered from a single network service to a single device platform lowers the consumer’s perceived value of ecosystem
# Standards Format Roadmap

<table>
<thead>
<tr>
<th>Product/Format</th>
<th>Resolution</th>
<th>Distribution Channel</th>
<th>Business Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVD</td>
<td>STANDARD-DEF</td>
<td>PHYSICAL</td>
<td>• SELL-THROUGH</td>
</tr>
<tr>
<td></td>
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<td>• RENTAL</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• SUBSCRIPTION</td>
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<tr>
<td>Blu-ray Disc</td>
<td>HIGH-DEF</td>
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</tr>
</tbody>
</table>
The Open Marketplace for DVD

- Defined Standard with a choice of storefronts and devices
  - Approved format
  - Single usage model providing consistent experience
The Open Marketplace for Digital

- Domain usage model
- Rights locker
- Cross-platform

- Remote access
- Sharing within a family
- Export to DVD / Flash Memory
A retail service in an open marketplace is not limited to a single device platform and can reach a mass market of devices.
A device in an open marketplace is not limited to a single service silo and can receive content from a mass market of retail services.
DECE Will Deliver...

- **Digital product definition (akin to DVD)**
  - common media format accessed by multiple devices
  - uniform usage model

- **Centralized cloud service platform**
  - cloud-based functionality helps retailers reduce costs, gain efficiencies
  - coordinates essential data between online retailers and devices
  - provides virtual content rights locker
  - standardized web services for device and user management, identity management and federation

- **Brand and Conformance System**
  - drives affinity through a great customer experience
  - promotes “DECE” brand awareness to improve consumer confidence

- **Supply chain optimization** and efficiencies to lower operating costs
DECE Ecosystem Roles

- **Content Providers**: Licenses content into the Ecosystem
- **DECE Coordinator**: Manages DECE Locker Accounts/Device Domains, Facilitates cross-service and device compatibility
- **Online Retailers**: Customer-facing storefront service, Sells DECE content
- **Locker Access Service Providers**: Consumer-facing streaming service, Sells DECE content-access service
- **Digital Service Providers**: Interfaces to DECE Coordinator, Provides content fulfillment services
- **Device Makers**: Manufacturer of compliant devices, Plays ecosystem content
DECE Ecosystem Architecture

DECE Coordinator

Digital Service Provider A / CDN
- Retailer A
- LASP A

Digital Service Provider B / CDN
- Retailer B
- LASP B

DECE Domain/Account
- Domain Device A
- Domain Device B
- Domain Device C

Streaming Device
# What We All Gain

## Content Owners
- Enhanced value of content
- Supply chain optimization
- Competitive marketplace
- Solution to interoperability
- Mass market for digital content

## Online Retailers / Service Providers
- Enhanced value of service
- Content has higher value
- Robust marketplace
- Increased device reach
- Solution to interoperability
- Mass market for digital content

## CE/IT Companies
- Enhanced value of devices
- Lower barrier to entry
- Competitive marketplace
- Greater access to content
- Solution to interoperability
- Mass market for devices

## Consumer
- Purchasing an experience, not a format
- New ways to acquire and access content
- Authorized sharing within household
- Greater choice of interoperable devices
- Choice of digital retailers
Progress

• Coordinator has been selected
  – Neustar

• DRMs have been selected
  – Marlin
  – OMA
  – PlayReady
  – Adobe
  – Widevine

• Format
  – Nearly Complete
  – Common File supported
Summary

• Entertainment 1.0 = physical (DVD) distribution

• Entertainment 2.0 = ubiquitous content availability through cloud services
  – More ways to acquire and use content
  – Seamless integration between digital and physical media (Flash, DVD, BD)

• DECE:
  – Developing ecosystem to enable an interoperable Entertainment 2.0 platform and value-added services
  – Goal: wide implementation in global market