The Digital Kitchen Sink
DCPs, KDMs, and Accessibility

Michael Karagosian
MKPE Consulting LLC
July 2014
It Starts With The Composition
Encrypted Composition

Composition Playlist (CPL)
DCP: Digital Cinema Package

Every Version of an Encrypted Composition Requires a Unique Set of Content Keys
Security Key Management
In Distribution

Composition

KDM (Key Delivery Message)

Public Key

Content Key

Exhibitor (Media Block)

Distributor (Mastering)

Media Block

Public Key

Private Key

Key Pair

Public Key

Private Key

Key Pair
Security Key Management
In Exhibition

Exhibitor
(Media Block)

Media Block

Key Pair

KDM
(Key Delivery Message)

Private Key

Composition

Content Key

Exhibitor
(Media Block)
How Does The Distributor Learn The Public Key?

Distributor

KDM (Key Delivery Message)

Exhibitor

Public Key

Media Block

Key Pair

Public Key

Private Key

?
How Does the Distributor Send the KDM?

KDM (Key Delivery Message)

Distributor

Exhibitor

Media Block

Key Pair

KDM (Key Delivery Message)
Accessibility
Visually-Impaired Narrative aka Descriptive Narration (VI-N)

A narrative dialog track for those who have difficulty with sight

Hearing Impaired Audio (HI)

An enhanced sound track for those who have difficulty hearing

Closed Captions (CC)

Visual presentation of caption text for those who cannot hear or hear well
Hearing Impaired (HI) - How It Used To Be

HI Film Signal Was Summed in the Audio Processor
THIS NO LONGER WORKS WITH DIGITAL CINEMA
Visually Impaired Narrative (VI-N)
also known as Descriptive Narration
- How It Used To Be

With Film, VI-N was only possible with DTS
Closed Captions with Film…

Rear Window® Captioning System
Accessibility in Digital Cinema is Based On Open Technology

- Standards-based
- Open distribution
- Open interoperability
- Competitive marketplace
- Lower distribution costs
- Lower installation costs
# HI & VI-N With Interop DCP

<table>
<thead>
<tr>
<th>Container Channel</th>
<th>Configuration</th>
<th>General Loudspeaker Position</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5.1</td>
<td>7.1 SDDS</td>
</tr>
<tr>
<td>1</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>2</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>3</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>4</td>
<td>LFE</td>
<td>LFE</td>
</tr>
<tr>
<td>5</td>
<td>Ls</td>
<td>Ls</td>
</tr>
<tr>
<td>6</td>
<td>Rc</td>
<td>Rs</td>
</tr>
<tr>
<td>7</td>
<td>HI</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>VI-N</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>--</td>
<td>Lc</td>
</tr>
<tr>
<td>10</td>
<td>--</td>
<td>Rc</td>
</tr>
<tr>
<td>11</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>12</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>13</td>
<td>Motion Data</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>15</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>16</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
Closed Captions in the Composition
Interoperability at the Server