

Building End-to-End Video Experiences with Azure Media Services



Video contributes to
57% of internet traffic

Everyone can create videos



Long form content
over IP delivery

2013



Traditional TV
152 million



Connected TV
75 million

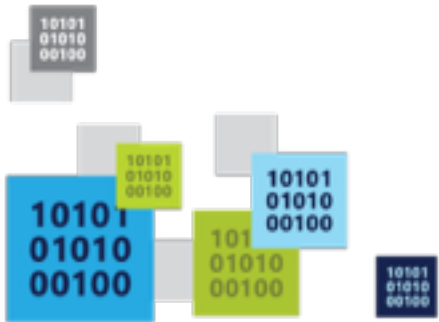


Streaming gadget
30 million



Viewers who consume on 4 devices WATCH 42% MORE television than those who only watch TV only

More Screens = More Viewership



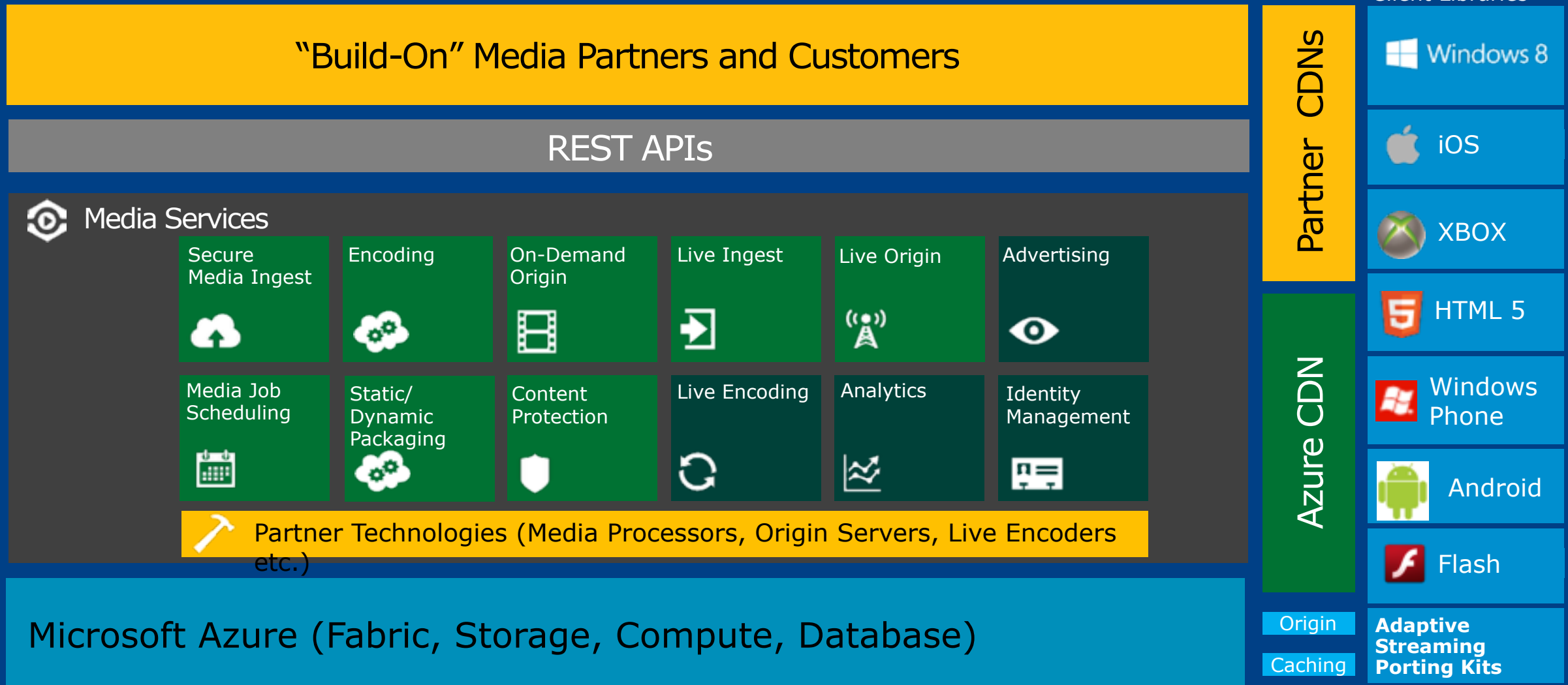
- Infrastructure costs
- Managing costs
- Monetizing contents
- Digital Rights Management
- Security

Challenges



Media Services Architecture

Microsoft Azure



 Released

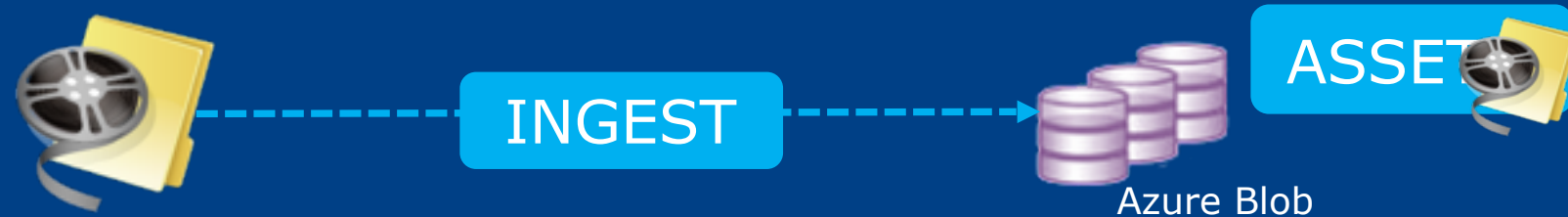
 Coming Soon

 Partners

Video-on-demand Services

-  Ingest
-  Encode
-  Package
-  Encrypt
-  Deliver

Step 1: Ingest Content

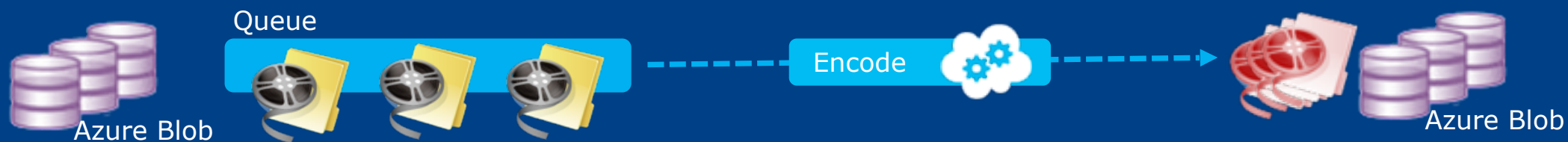


Different options of Ingesting a Mezzanine Asset

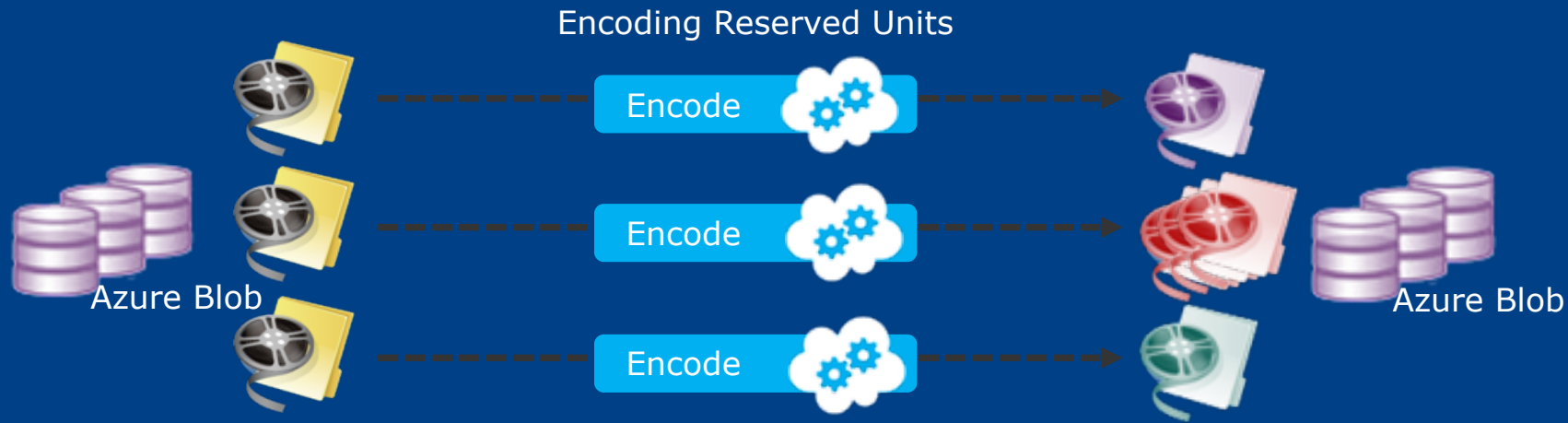
- Pre-encrypt files prior to uploading (AES 256)
- Secure HTTPS upload
- Network level peering for fast HTTP into Azure
- Fast upload using UDP with Aspera
- Storage Import/Export service to ship large amounts of media to DC

Multiple storage accounts enabled to manage your media asset

Step 2: Encode, Package or Encrypt



Step 2: Encode, Package or Encrypt



Microsoft Azure Media Encoder

- Supports encoding to H.264 or VC-1 video
- Encodes audio to AAC-LC, HE-AAC, Dolby DD+, WMA
- Packages to MP4, Smooth Streaming, Http-Live-Streaming
- Encrypts with PlayReady, Common Encryption, AES

Encoding with third-parties

- Partner SDK for enabling 'build-in' encoders

Step 3: Deliver Content



Managed streaming service... it just works!

- Guaranteed bandwidth
- Auto recovery, redundancy and failover
- Multiple origins support and scale independently

Azure and 3rd party CDN support

IP Whitelisting



REST API for all platforms

Reference: <http://msdn.microsoft.com/en-us/library/windowsazure/hh973617.aspx>

.NET library

Nuget package: <https://nuget.org/packages/windowsazure.mediaservices>

GitHub: <https://github.com/Azure/azure-sdk-for-media-services>

Extensions for .NET SDK: <https://github.com/sazure/azure-sdk-for-media-services-extensions>

PHP Library

GitHub: <https://github.com/windowsazure/azure-sdk-for-php>

Open Tech blog with demo: <http://msopentech.com/blog/2014/01/23/ms-open-technologies-enhances-open-source-php-sdk-windows-azure/>





JAVA library

Windows / Mac / Linux: <http://www.windowsazure.com/en-us/develop/java/java-home>

GitHub: <https://github.com/windowsazure/azure-sdk-for-java/>

PowerShell cmdlets

How to use: <http://www.gtrifonov.com/2013/08/24/how-to-use-windows-azure-powershell-for-media-services/>

Node.js library

GitHub: <https://github.com/fritzy/node-azure-media>

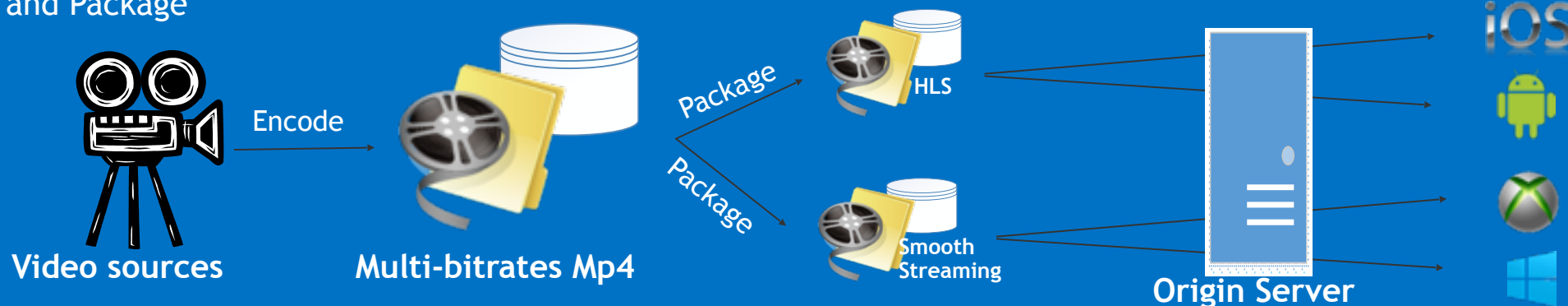


Dynamic Packaging

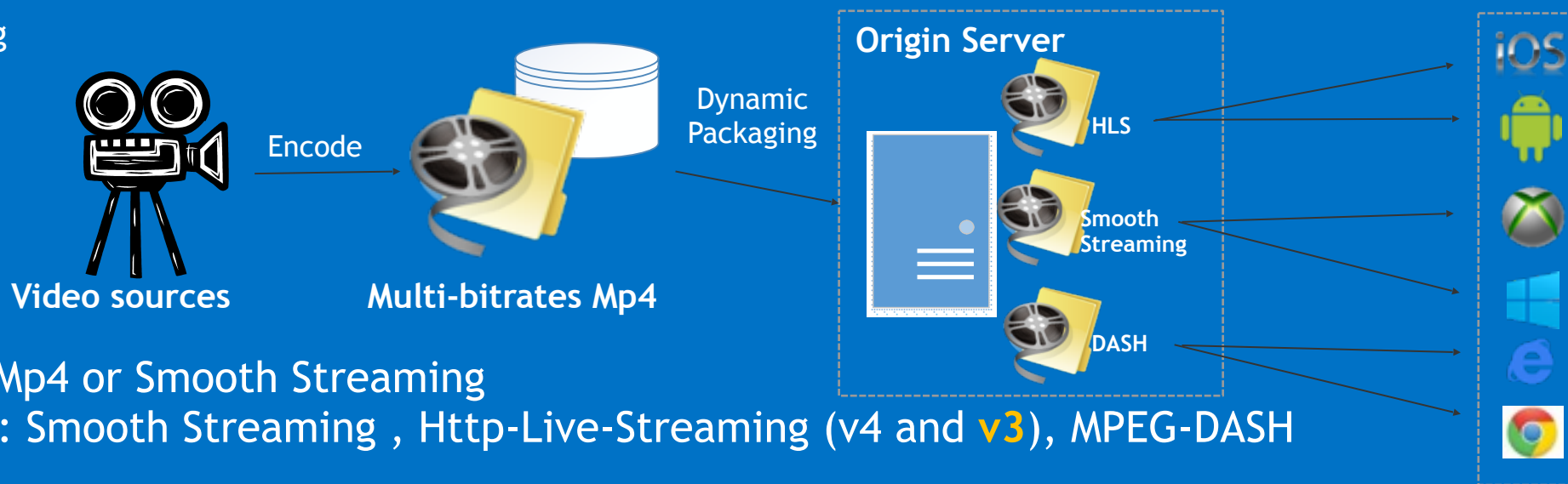
Dynamic packaging

Allows you to re-use your encoded content and bring it to various streaming formats without repackaging the content.

Traditional Encode and Package



Dynamic Packaging



Input format: Mp4 or Smooth Streaming

Output format: Smooth Streaming , Http-Live-Streaming (v4 and **v3**), MPEG-DASH



You need to have at least 1 reserved streaming unit to enable dynamic packaging!

Useful information - Dynamic Packaging

Microsoft Azure

- Full demo code at:
 - [Introducing Extensions for Microsoft Azure Media Services .NET SDK](#)
 - [Demo – how to create HLS and Smooth Streaming assets using dynamic packaging](#)

By Mingfei Yan

- Other readings:
 - [Dynamic packaging and Encoding and Reserved units](#)

By Nick Drouin

Securing your media with Azure Media Services

Why do you need to secure your content

Microsoft Azure



Subscription Fee
(User Authentication)



Ad-funded
(Player Authentication)

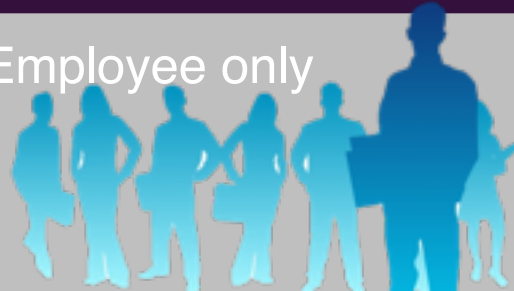


High-premium content provider:

- Prevent piracy
- Prevent Man-in-the-middle



Employee only



Enterprise or Time-sensitive event:

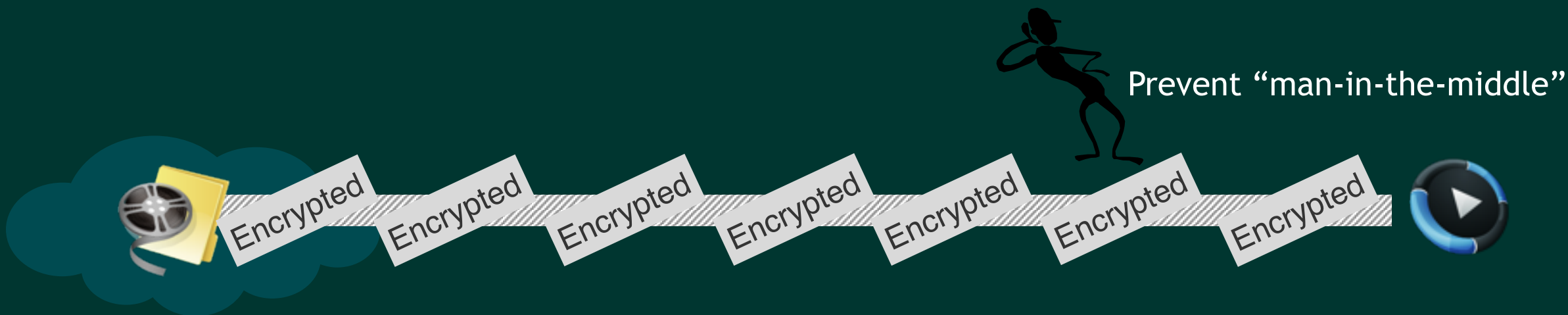
- Piracy is not a major issue
- Prevent Man-in-the-middle



Ad-funded
(Player Authentication)



Options with Media Services



AES clear key
dynamic encryption



DRM technology



+ licensing agreement

Options with Media Services

AES Clear Key dynamic encryption

- Encrypt on-the-wire communication using the widely-known symmetric AES encryption algorithm.
- An authentication service for key is provided.

Who should use this feature:

- “Trust your client”: Key is stored in clear format so it requires you to trust your client not to pass key around
- “Light” encryption: prevent “man-in-the-middle” attack
- Lower cost compared to DRM solution

DRM technology (PlayReady)

- Encrypt Smooth Streaming content with PlayReady protection via common encryption scheme (CENC), and the option of packaging it into HLS or DASH.
- DRM technology allows you to define restrictive licensing agreement to manage user access rights to your media.

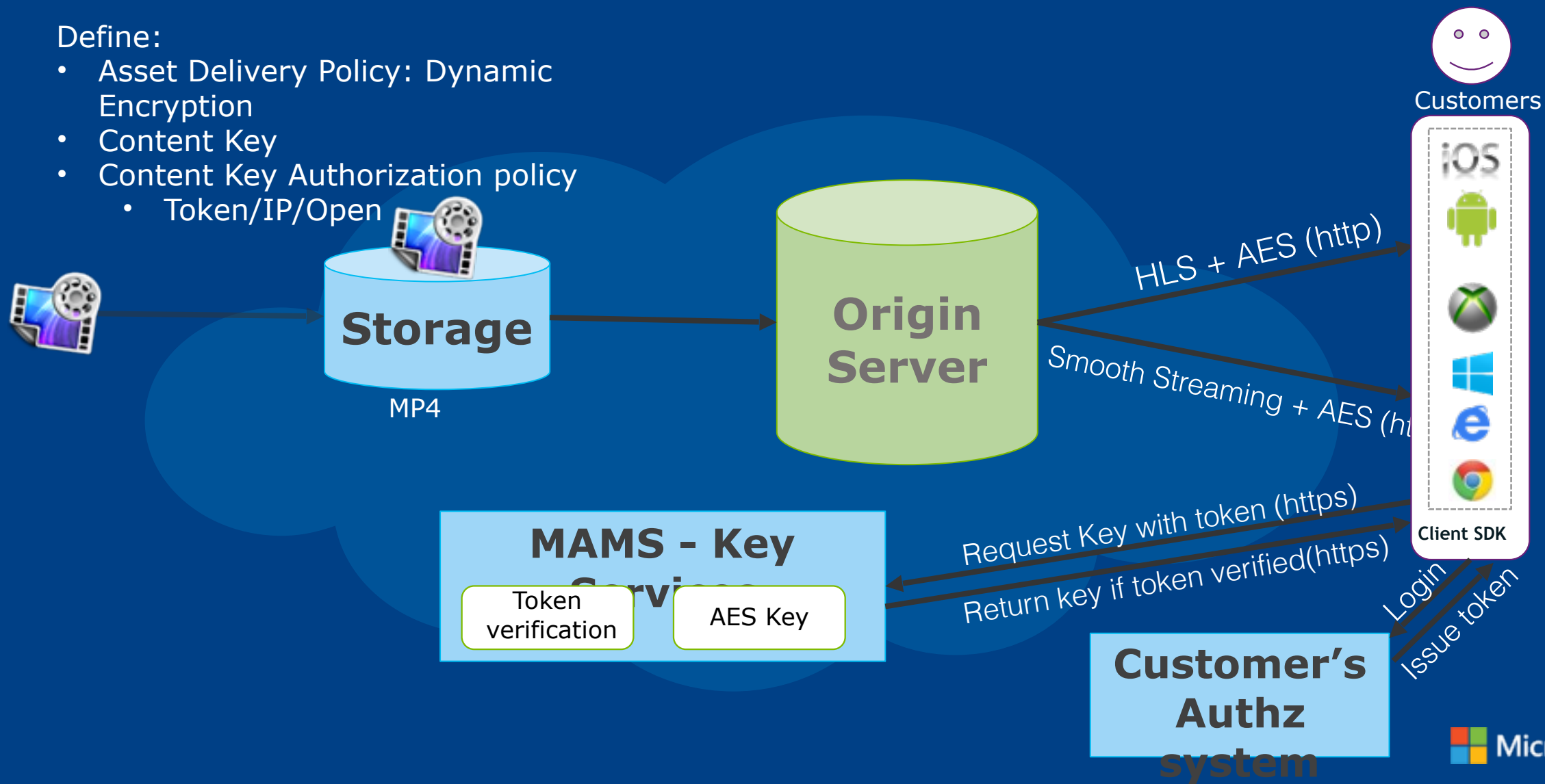
Who should use this feature:

- Premium content or high business impact content: decoding happens in a secure DRM decoder environment
- Prevent piracy and “man-in-the-middle” attack
- More business models enabled

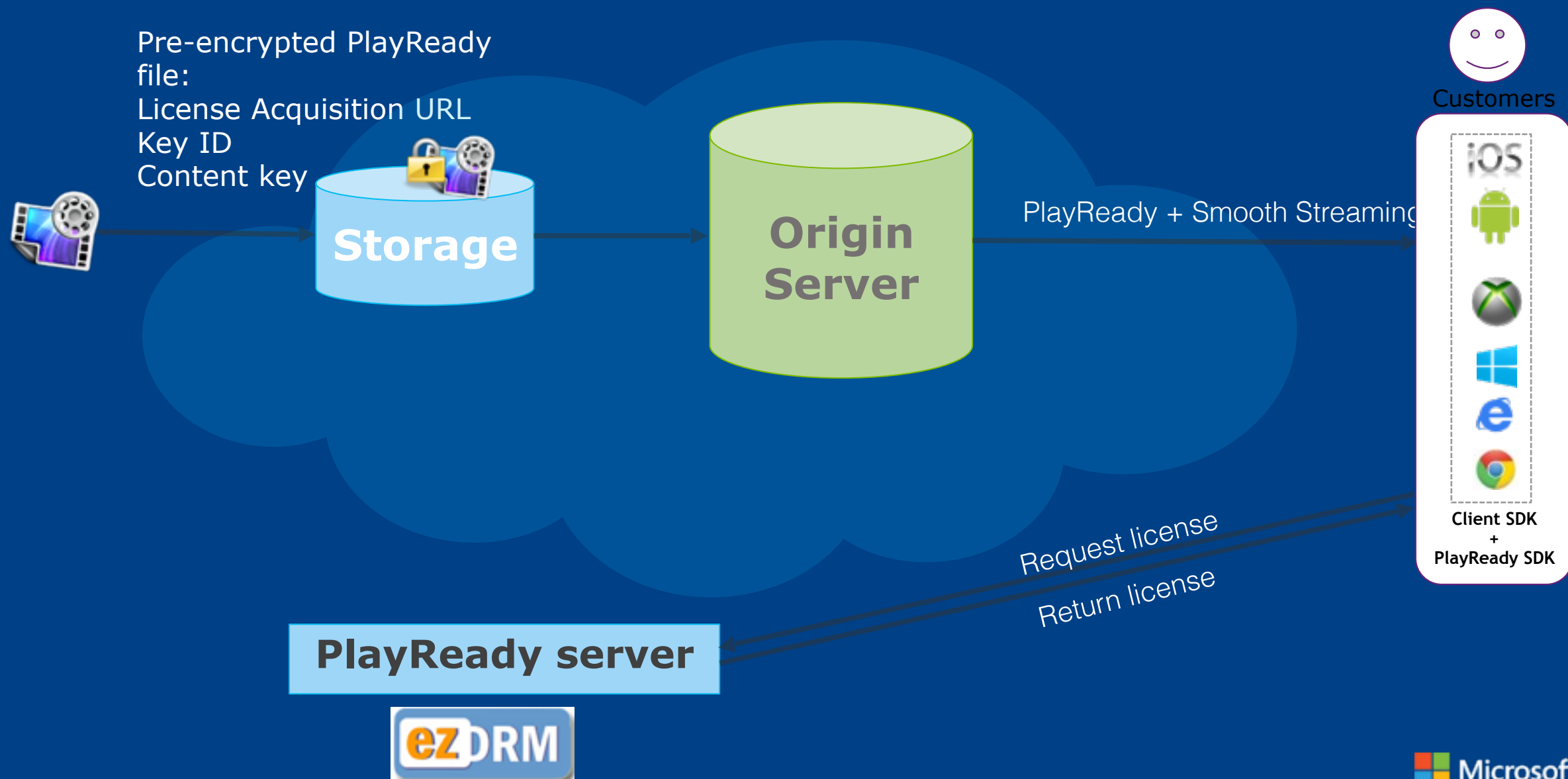
Architecture: AES Dynamic Encryption

Define:

- Asset Delivery Policy: Dynamic Encryption
- Content Key
- Content Key Authorization policy
 - Token/IP/Open



Architecture: PlayReady DRM solution



Useful information Secure delivery

- Overview:
 - [Secure your media with Azure Media Services](#) via MSDN
 - [Protecting Smooth Streaming and MPEG DASH with PlayReady](#) via MSDN
 - [How to Protect an asset with PlayReady protection](#) via MSDN
- Session video:
 - [Introducing the New Office 365 Video Experience](#)



Why do you need to secure your content



Subscription Fee
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High-premium content provider:

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DRM



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AES



Ad-funded
(Player Authentication)



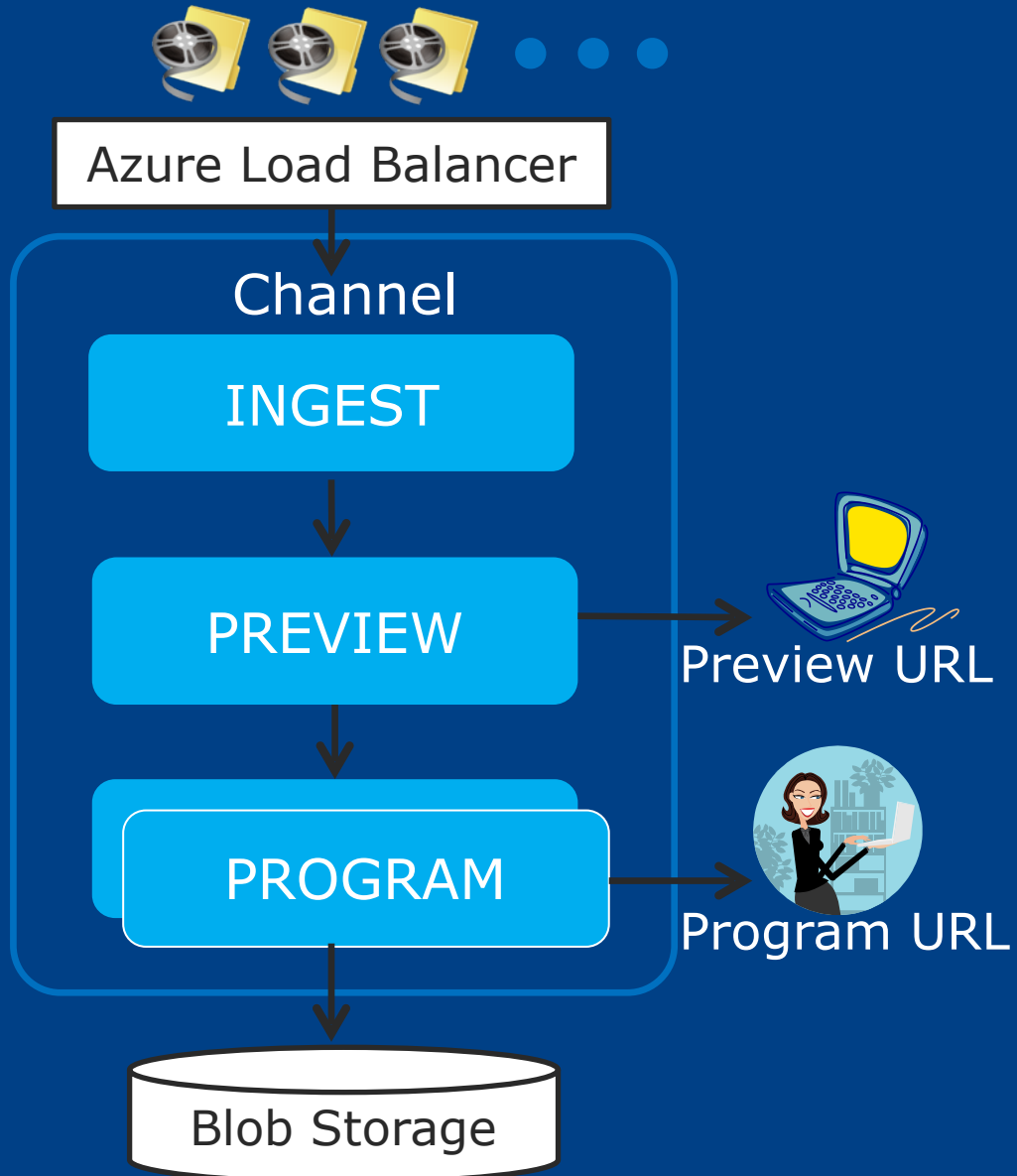
Live Streaming

Media Services Live

- Stream live content directly through public cloud
- Multi-format output (Smooth Streaming, HLS and DASH)
- Global reach – deploy anywhere quickly
- Cloud elasticity
- No capital expenses
- Ramp quickly to global scale
- Tear down immediately



How does live streaming work?



Ingest:

Ingest URL to accept Live streams with different bitrates (smooth streaming) through load balancer

Forwards the stream to all preview end-points

Preview:

Receives stream from Ingest

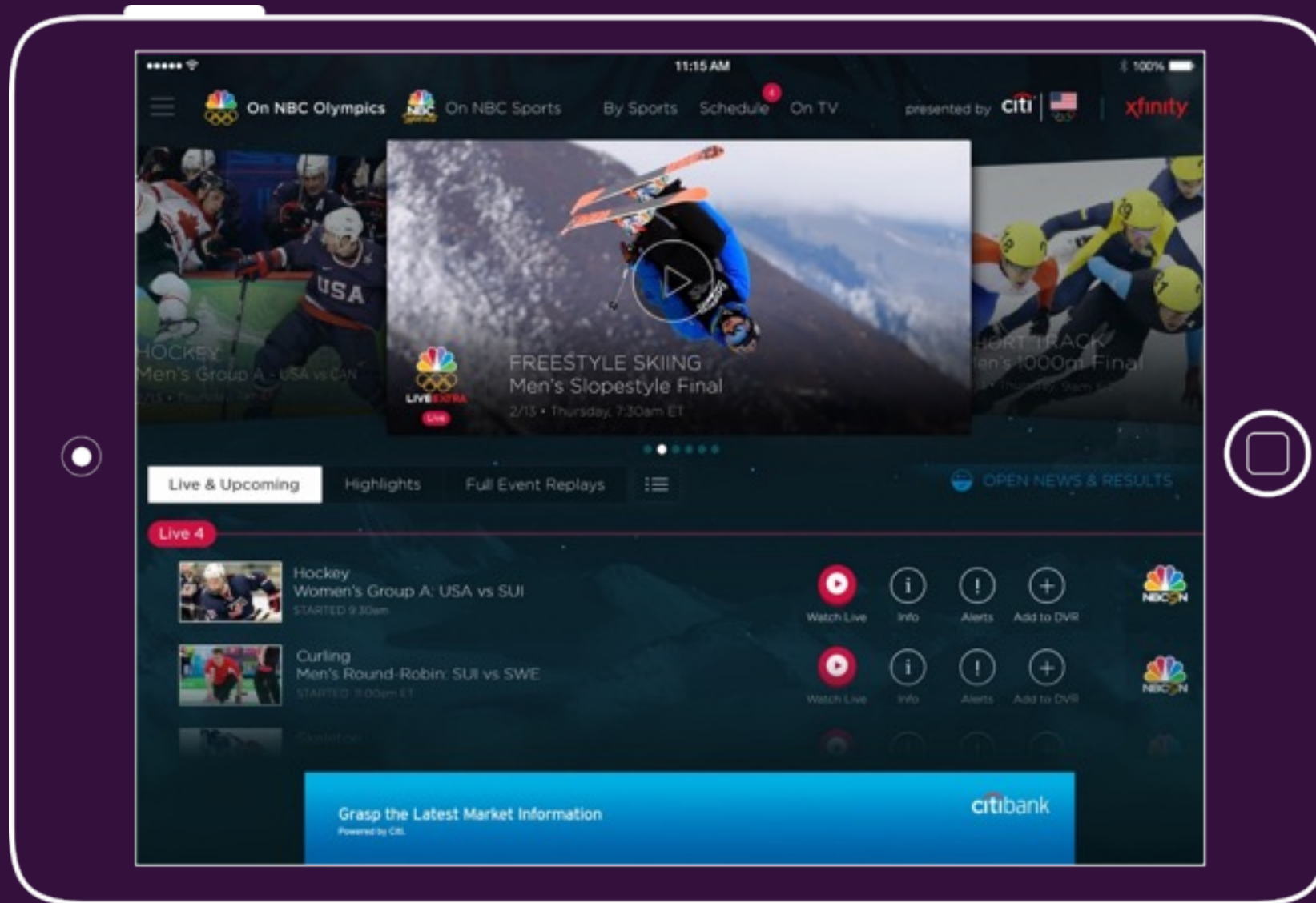
Forwards to Program

Exposes Preview URL (for monitoring and voice-over)

Program:

Writes it to Blob Storage for Live DVR and Archive

Dynamic package into HLS, Smooth and DASH



NBC Olympic Sports

Live video encoding and streaming

Web + Mobile

100 million viewers

2.1 million concurrent HD viewers during the USA vs. Canada hockey match

Azure Media Player

Old Player World



Flash Player



Silverlight
Player



Windows SDK



Android SDK

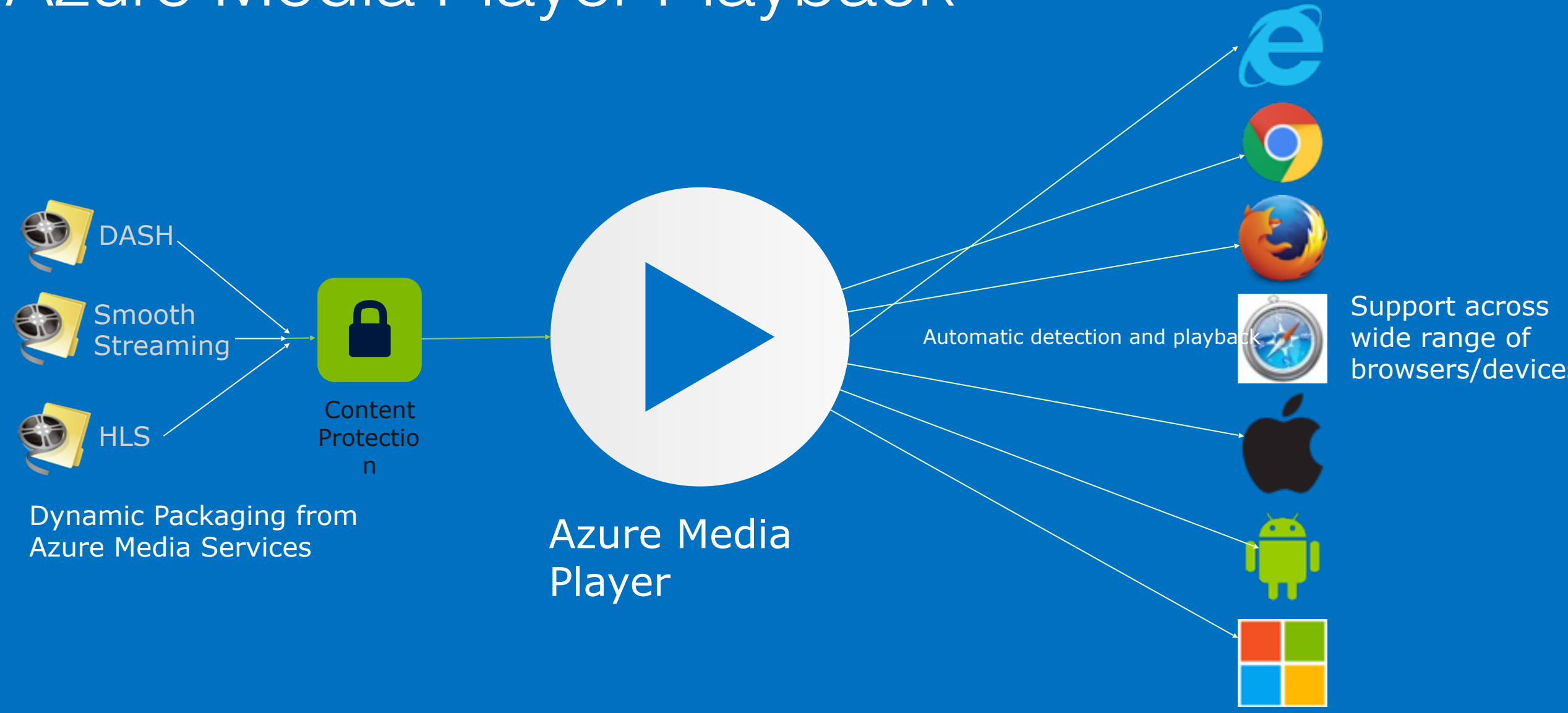


iOS SDK



HTML5

Azure Media Player Playback



Azure Media Player Features

























Implemented Features

- Playback of Content from Azure Media Services
 - Clear On Demand
 - Clear Live
 - AES-128 Encrypted content
 - PlayReady Encrypted content
- Playback across a wide range of devices
- Simple setup with <video> or via JS
- Unified JavaScript APIs
- Basic Heuristics
- Unified Player UI

Coming Soon

- Full Subtitles/Captions support
- Discontinuities
- Trick-Play
- Audio Only
- Ads support
- Analytics
- Audio Track Selection
- Bitrate Selection
- Heuristics APIs
- Specific error messaging and across-tech error unification
- Multi-period presentations
- Multiple camera angles

Azure Media Player Reach

Browser	Clear Content		AES Content		PlayReady Content	
IE 11		DASH		DASH		DASH
Chrome 37		DASH		DASH		Smooth
iOS Safari		HLS		HLS		n/a
Android 4.4 Chrome		DASH		DASH		n/a
Firefox		Smooth		Smooth		Smooth
IE 10-		Smooth		Smooth		Smooth
WP IE 11		DASH		DASH		n/a
Safari 8 on OSX Yosemite		Smooth		Smooth		Smooth
Safari on OSX Lion		Smooth		Smooth		Smooth