SIMULTANEOUS MIGRATION OF CODECS, FORMATS AND DRM

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BACKGROUND
OVERVIEW OF XFINITY TV

- **LIVE TV**
- **VIDEO ON DEMAND**
- **CLOUD DVR**

Available both in and out of home

- **Over 14,000 live streams**
- **Over 900,000 on demand assets**
- **Over 800 million hours of video streamed thus far**
AUDIO & VIDEO CODECS

VIDEO
MPEG-4 (H.264)
MAIN & HIGH PROFILES

AUDIO
HE-AAC
- STEREO ONLY
DOLBY DIGITAL PLUS
- STEREO
- SURROUND SOUND
DELIVERY FORMATS

HTTP LIVE STREAMING (HLS)
- ORIGINALLY APPLE SPECIFICATION
- NOW IETF RFC 8216
CURRENTLY SUPPORT V4 OF THE SPECIFICATION
DIGITAL RIGHTS MANAGEMENT

PROVIDES ASSURANCE TO CONTENT PROVIDERS
ENCRIPTS CONTENT WITH UNIQUE KEYS PER ASSET/STREAM
VENDOR PROVIDED SYSTEMS
MUST HAVE CLIENT SUPPORT

CURRENTLY UTILIZING ADOBE ACCESS DRM
- AES-128/CBC WITH WHOLE SEGMENT ENCRYPTION
CH-CH-CH-CH-CHANGES
AUDIO & VIDEO CODEC CHANGES

BEFORE

VIDEO
MPEG-4 (H.264) MAIN & HIGH PROFILES

AUDIO
HE-AAC
- STEREO ONLY
DOLBY DIGITAL PLUS
- STEREO
- SURROUND SOUND

AFTER

VIDEO
MPEG-4 (H.264) MAIN & HIGH PROFILES
HEVC MAIN10 PROFILE

AUDIO
HE-AAC
- STEREO ONLY
DOLBY DIGITAL PLUS
- STEREO
- SURROUND SOUND
DOLBY ATMOS
DELIVERY FORMAT CHANGES

BEFORE
HLS V4

AFTER
DYNAMIC ADAPTIVE STREAMING
HTTP (DASH)
HLS V7
DRM CHANGES

BEFORE

ADOBE ACCESS
- AES-128/CBC WHOLE SEGMENT

AFTER

WIDEVINE (DASH)
PLAYREADY (DASH)
FAIRPLAY (HLS V7)

AES-128 COMMON ENCRYPTION
- DASH USES CTR
- HLS USES CBCS
THE PROCEDURE
COMPONENT IDENTIFICATION

- Linear Transcoder
- Linear Packager
- Cloud Recording System
- Just-In-Time Packager
- OnDemand Transcoder
- OnDemand Packager
- OnDemand Storage
- Content Delivery Network
- License Server
- Emergency Alert System
- Ad Decision System
- Player Platform
- Emergency Alert ENDEC

Signal Processing System
Provider Delivery Storage

LICENSE TO...

EACH FLAVOR OF DRM REQUIRES A NEW LICENSE SERVER
LICENSE SERVERS TIE INTO OTHER SYSTEMS FOR AUTHORIZATION
DEPLOYING LICENSE SERVERS DOES NOT IMPACT LEGACY
IT’S ALL ABOUT THE TRANSCODE

HEVC REQUIRES TRANSCODER SUPPORT
UHD CONTENT MODELED AS SEPARATE ASSETS & STREAMS
- SIMILAR TO SD VS HD
METADATA TIES UHD TO OTHER VARIANTS
INTERMEDIATES

PACKAGE INTO COMMON INTERMEDIATE FORMAT (CIF)
- BASED ON DASH
- SCTE 214-4

REQUIRED TWEAKS TO RECOGNIZE HEVC AND ATMOS
JITP FTW

UPDATES TO HANDLE NEW DRM METADATA IN MANIFESTS
JITP DESIGNED FOR INTEGRATING NEW FORMATS
DISTINCT URL PATHS FOR EACH FORMAT
SMALL TWEAKS TO EXPRESS HEVC CODEC TO CLIENT
LET THE PLAYER CHOOSE

DETERMINES DEVICE CAPABILITIES
EXCLUDES OPTIONS THAT IT CANNOT PLAY
REQUESTS FORMAT THAT IT SUPPORTS
CHOSES DRM BASED ON DEVICE SUPPORT
COMPLETING THE PUZZLE

DEPLOY SERVER SIDE CHANGES
- LICENSE SERVERS
- JITP
- INTERMEDIATE PACKAGERS
- TRANSCODERS

UPDATE LEGACY RECORDINGS AND ASSETS

RELEASE/DEPLOY APPS WITH UPDATED PLAYERS

DECOMMISSION LEGACY FORMAT/DRM
SIMULTANEOUS MIGRATION OF CODECS, FORMATS AND DRM

PROBLEM DECOMPOSITION IS KEY TO LARGE SCALE CHANGES

CLEAN INTERFACES BETWEEN COMPONENTS FACILITATED A SMOOTH MIGRATION

STRONG MIGRATION STRATEGY ENABLES FUTURE INNOVATION AND RAPID DEPLOYMENT OF NEW CODECS, FORMATS, AND DRM SYSTEMS

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