

IP OTT Service Delivery

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Constraints and Realities

- In non-managed networks (e.g. The Internet), guaranteed delivery bandwidth is not assured.
 - And available transmission bandwidth varies over time.
- Network topology impacts viewer-count scalability.
 - Calling for distributed delivery mechanisms (e.g. CDN)
- Customers are accustomed to quick playback due to experience with other delivery platforms.
- Large numbers of devices and software ecosystems exist in the marketplace.
- Internet video delivery services are a *relatively* new development

Bandwidth Availability

- Buffering
 - Client hardware/software stores a pre-roll of upcoming compressed content.
 - Useful for handling transient bandwidth restrictions (e.g. network congestion)
- Adaptive bitrate delivery – e.g. DASH, Smooth Streaming, HLS
 - Server(s) and Client designed to allow for periodic changes in content-quality and streaming bandwidth requirements.
 - Buffer management (typically client-side) modifies content chunk requests to account for player buffering disposition.

Network Topology and Scaling

- Content Delivery Networks (CDN) – e.g. Akamai, Level 3, CloudFront
 - Encoded content is distributed to servers positioned in topologically diverse logical and physical locations.
 - Typically “dumb” file servers.
 - Enabled with common encodes in DRM environments, typically using device-side trusted environment key decode.
 - Generally required for a scalable video service in multiple geographic (and topological) markets

Quick Playback

- Pre-buffering
 - Partial content may be predictively delivered to client devices at a total bandwidth cost
- Scale-up via adaptive bitrate
 - Content playback is started at reduced quality to reduce initial buffering delay

Hey, you can always download...

- Pros:
 - Provides ideal playback conditions
 - Instant playback due to more stable (ostensibly) network capacity
- Cons:
 - Doesn't work for live content
 - Calls for explicit user intervention or comparatively large local storage capacity

Device and Ecosystem Variability

- Many device types, software platforms, and ecosystems in the marketplace, written against different languages, hardware capabilities, and platform APIs.
- How does one manage content protection and playback systems in a diverse environment?

Device-agnostic DRM protocols allow for separation of server and client implementation details. - e.g. PlayReady, Widevine

Other Common Service Concerns?

- **Catalog Discovery**
 - Typically provided in-client via Search and Browse functions
 - Increasingly integrated with client platforms where available
- **Identity**
 - User sign-on/sign-up is most commonly per-service.
- **Business**
 - Business-model particulars can be handled in client software and/or managed via platform integration.
 - Subscription
 - Purchase
 - Rental
 - Ad integration

Q&A