



# Ad Insertion in Live Content

DVB Webinar – March 2020

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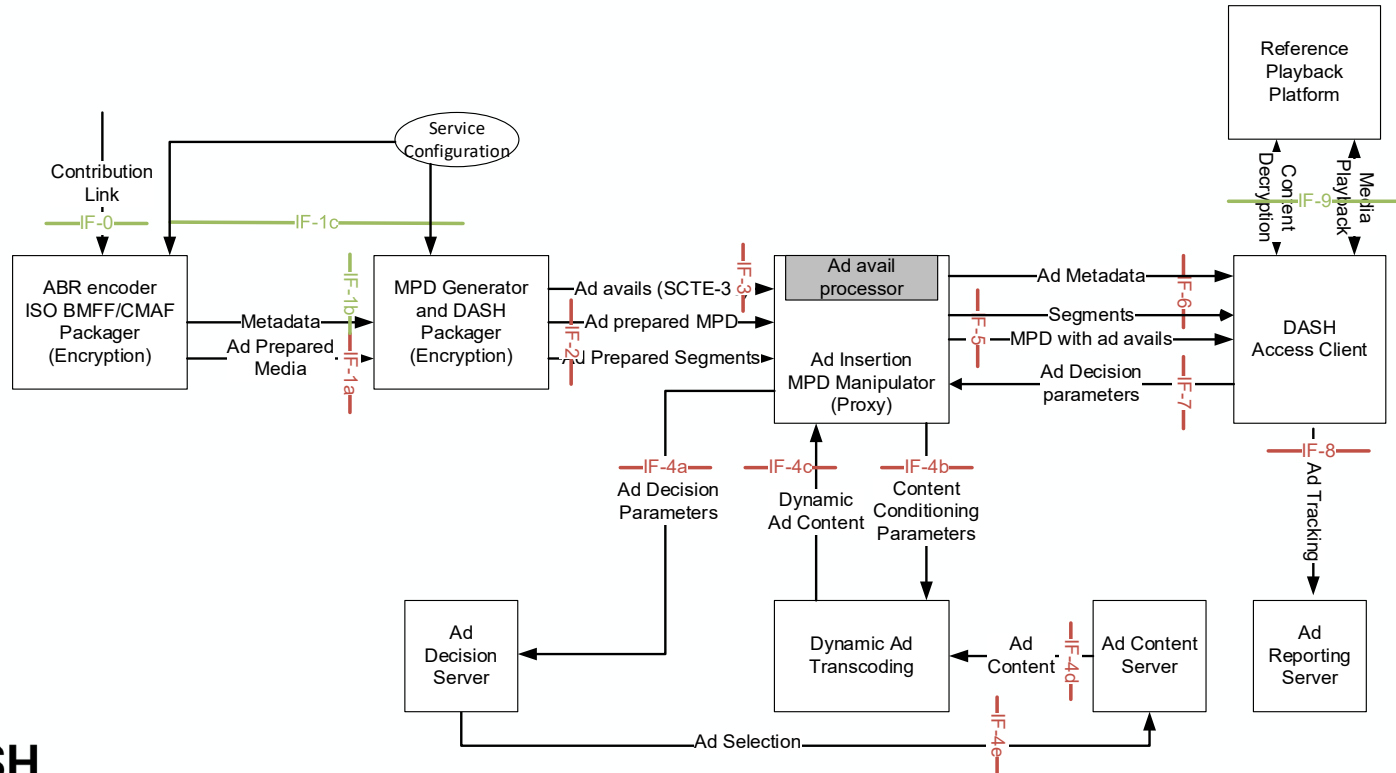
**Zachary Cava**

**Video Platform Architect, Hulu**

# DASH + Ad Insertion

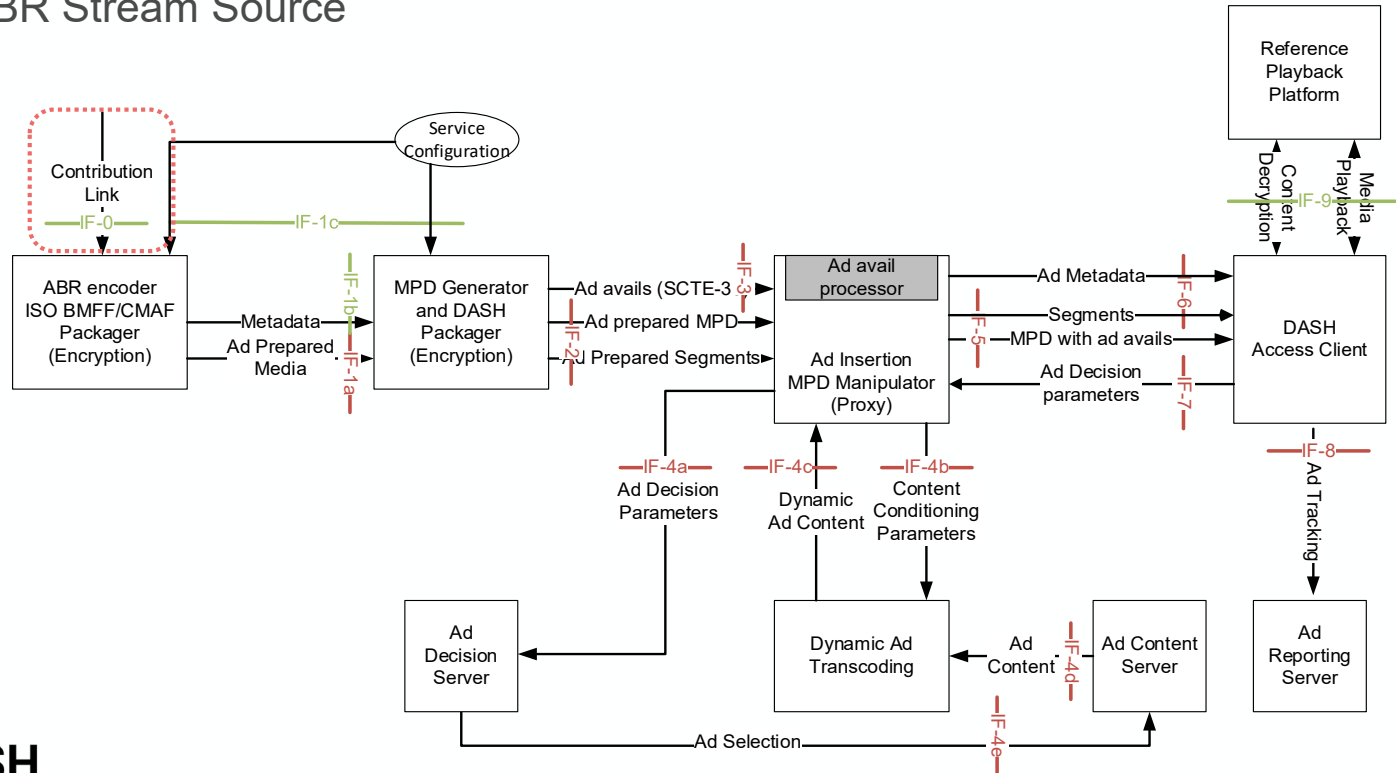
- Ad Insertion is important and complex
  - Revenue for online video
  - Part of a product experience
  - Requires personalization and reporting
- DASH-IF: Advanced Ad Insertion in DASH
  - Defines relevant use cases and architectures
  - Requirements and recommendations for content authoring
  - Carriage and tracking of advertisement data
  - 2<sup>nd</sup> Community Review Available: <https://dashif.org/guidelines/#ad-insertion-in-dash>
- Initial Focus
  - Server-Side Ad Insertion Architecture
  - Live with in-stream opportunities
  - Transition between Main Content and Ads

# DASH-IF Ad Insertion Architecture



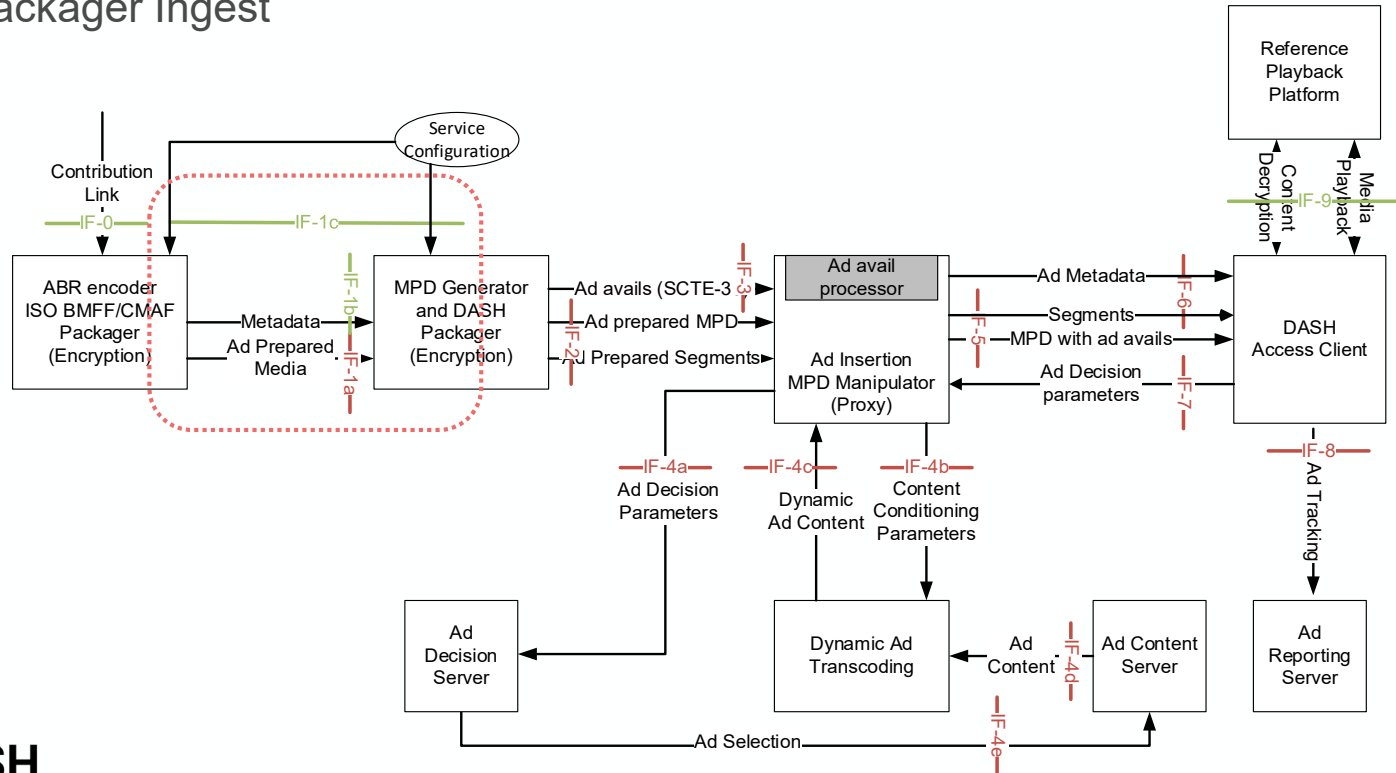
# DASH-IF Ad Insertion Architecture

## IF-0: ABR Stream Source



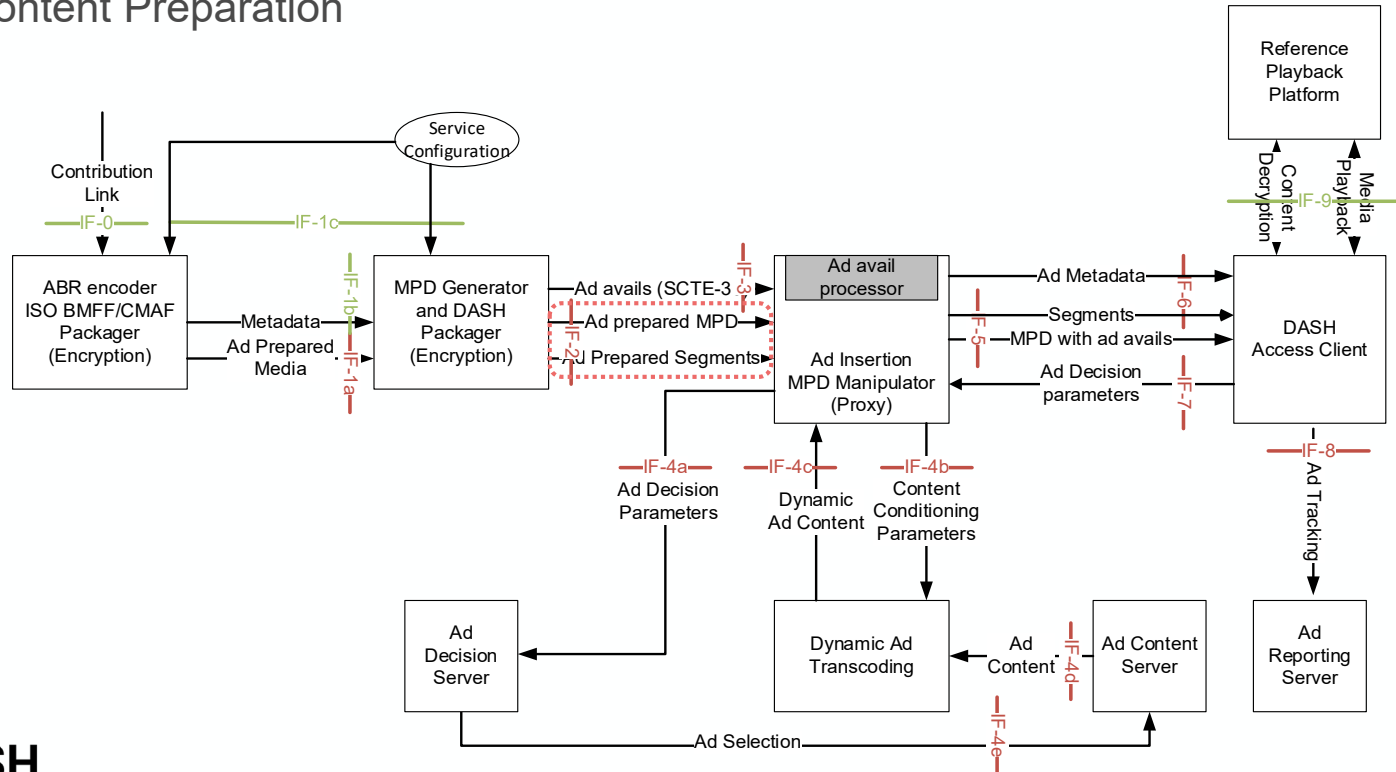
# DASH-IF Ad Insertion Architecture

## IF-1: Packager Ingest



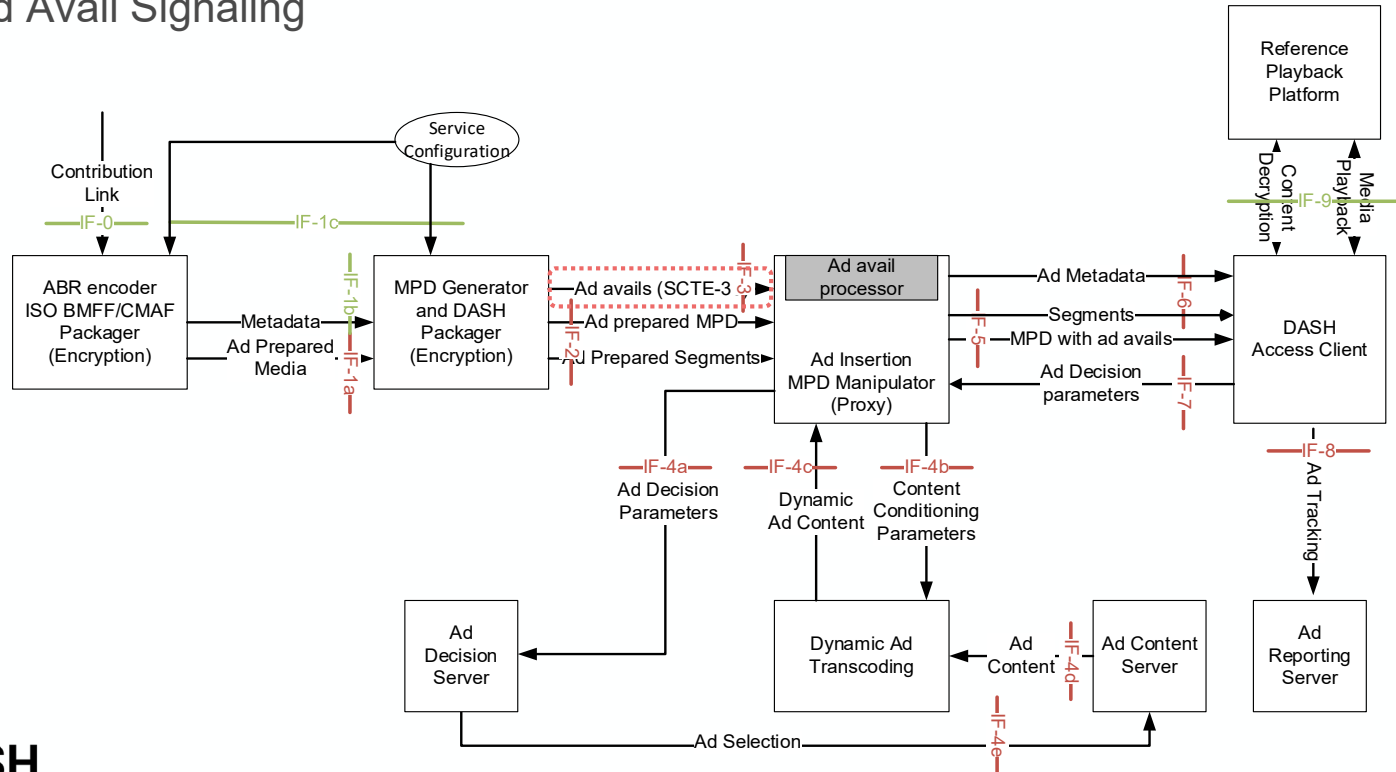
# DASH-IF Ad Insertion Architecture

## IF-2: Content Preparation



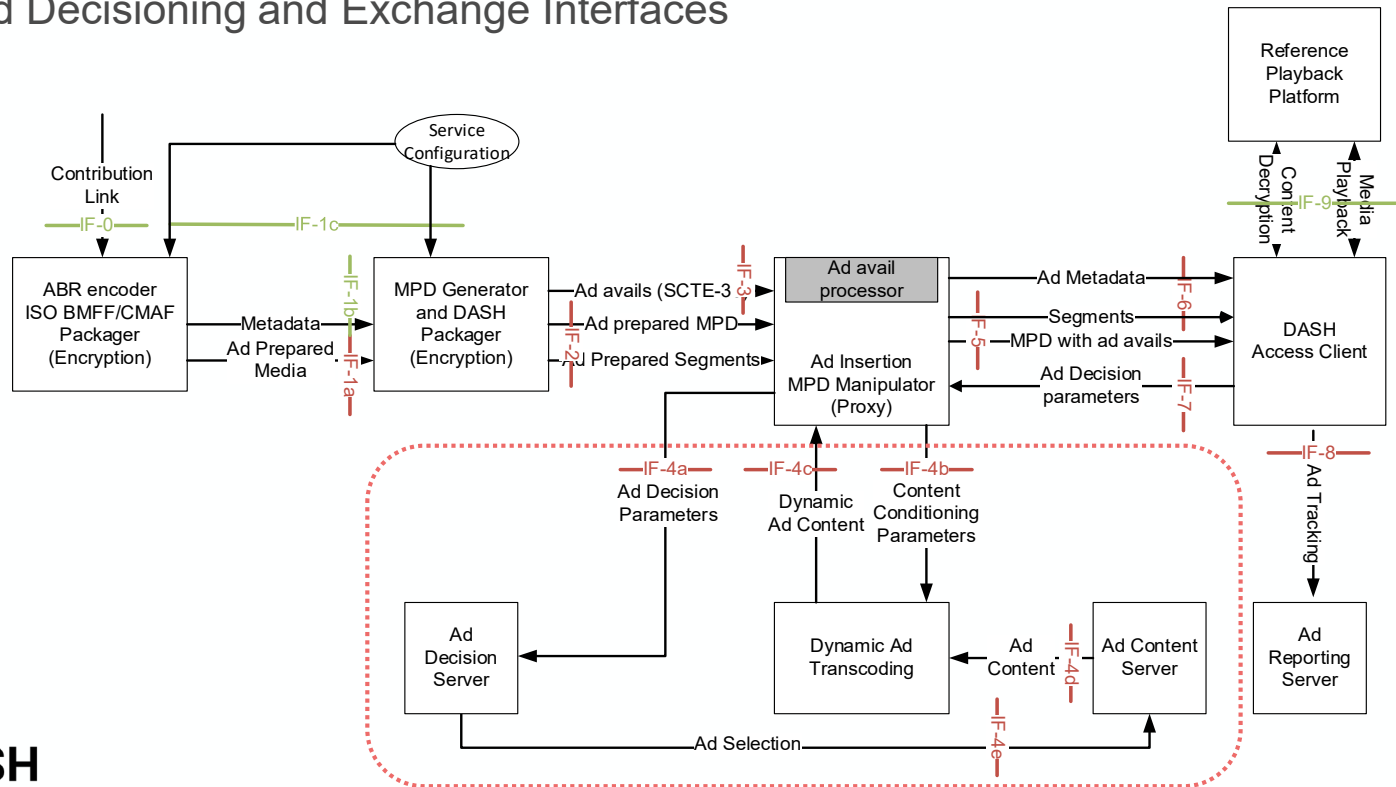
# DASH-IF Ad Insertion Architecture

## IF-3: Ad Avail Signaling



# DASH-IF Ad Insertion Architecture

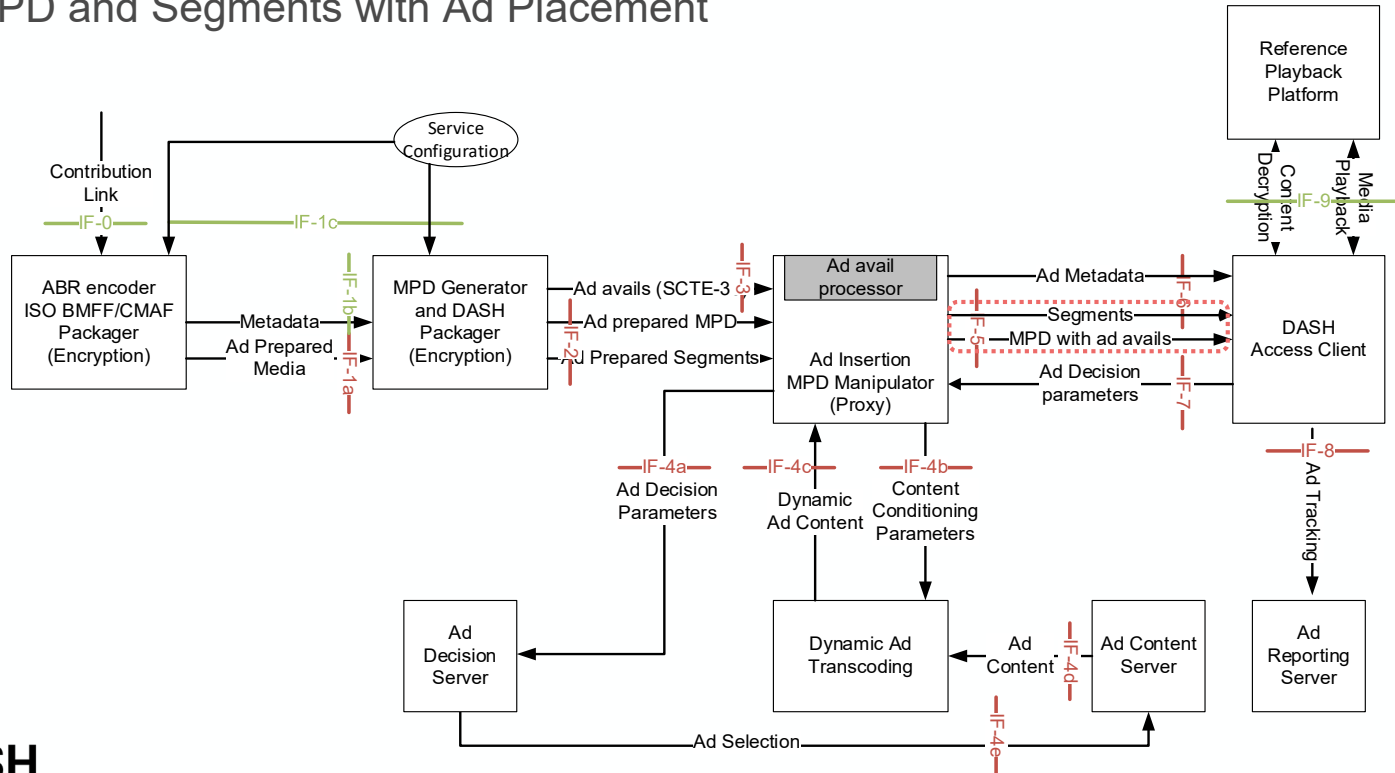
## IF-4: Ad Decisioning and Exchange Interfaces





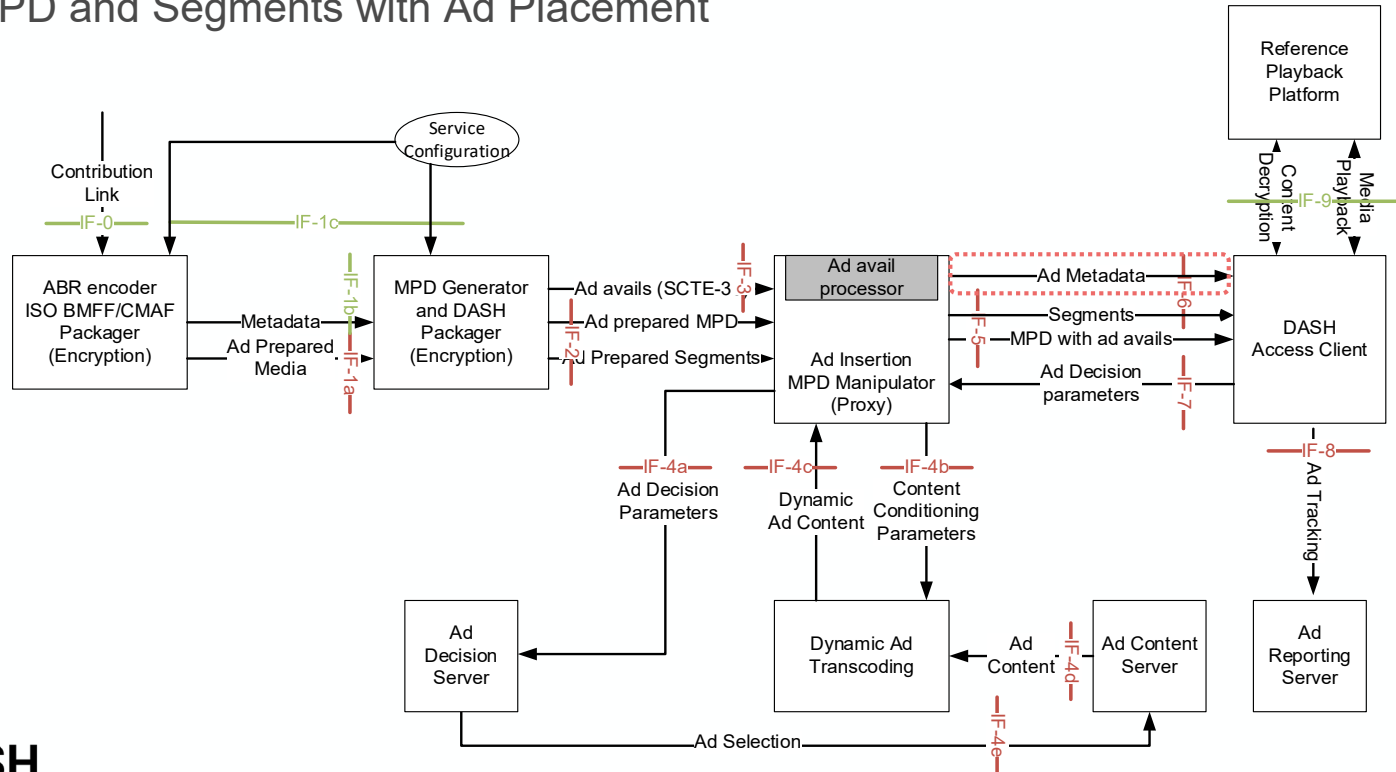
# DASH-IF Ad Insertion Architecture

## IF-5: MPD and Segments with Ad Placement



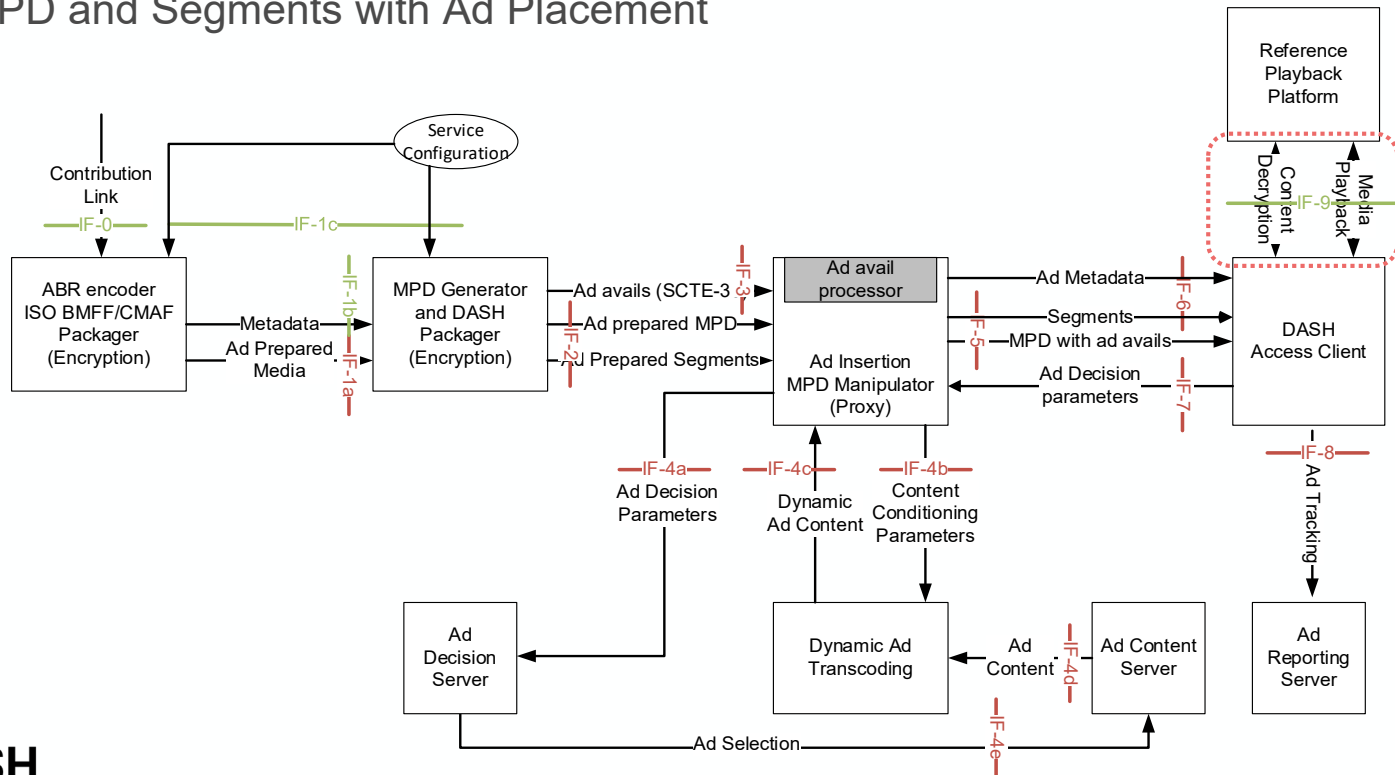
# DASH-IF Ad Insertion Architecture

## IF-6: MPD and Segments with Ad Placement



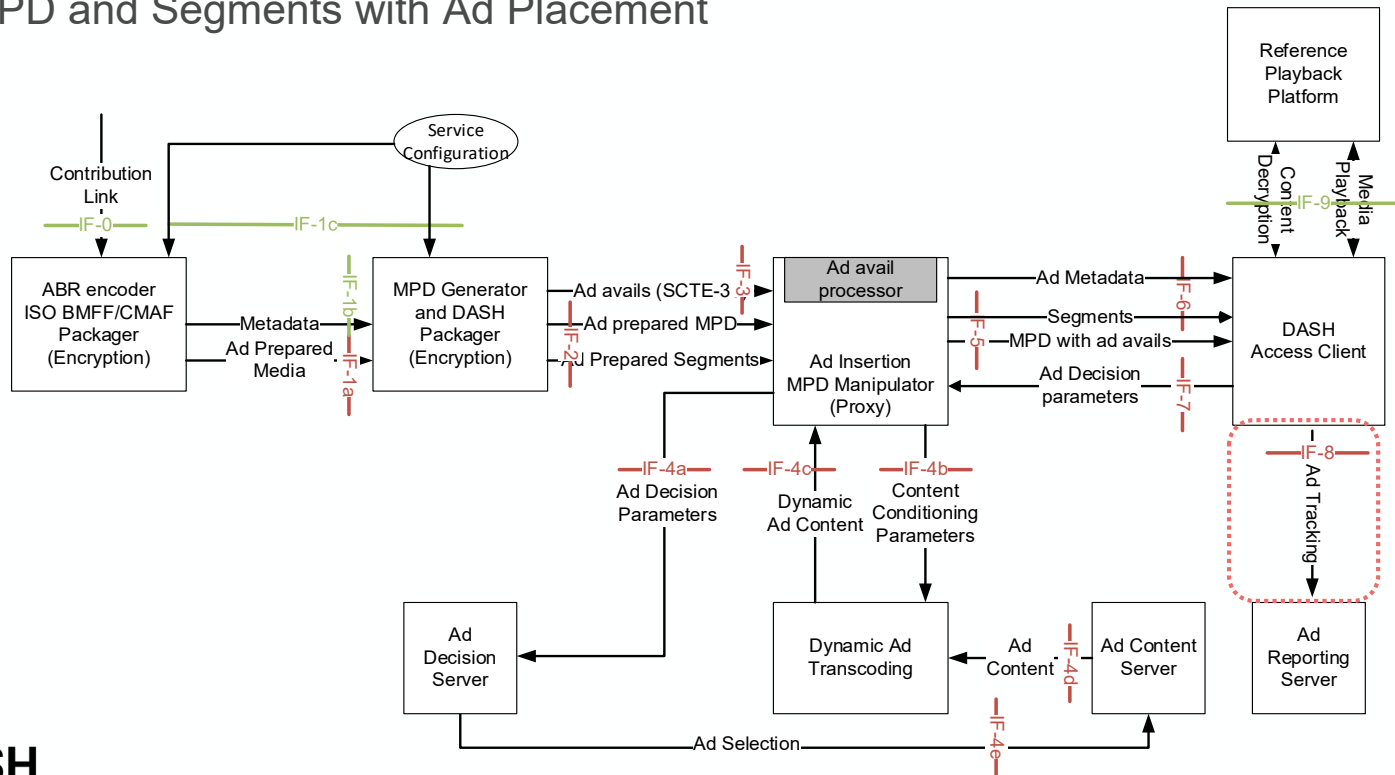
# DASH-IF Ad Insertion Architecture

## IF-9: MPD and Segments with Ad Placement



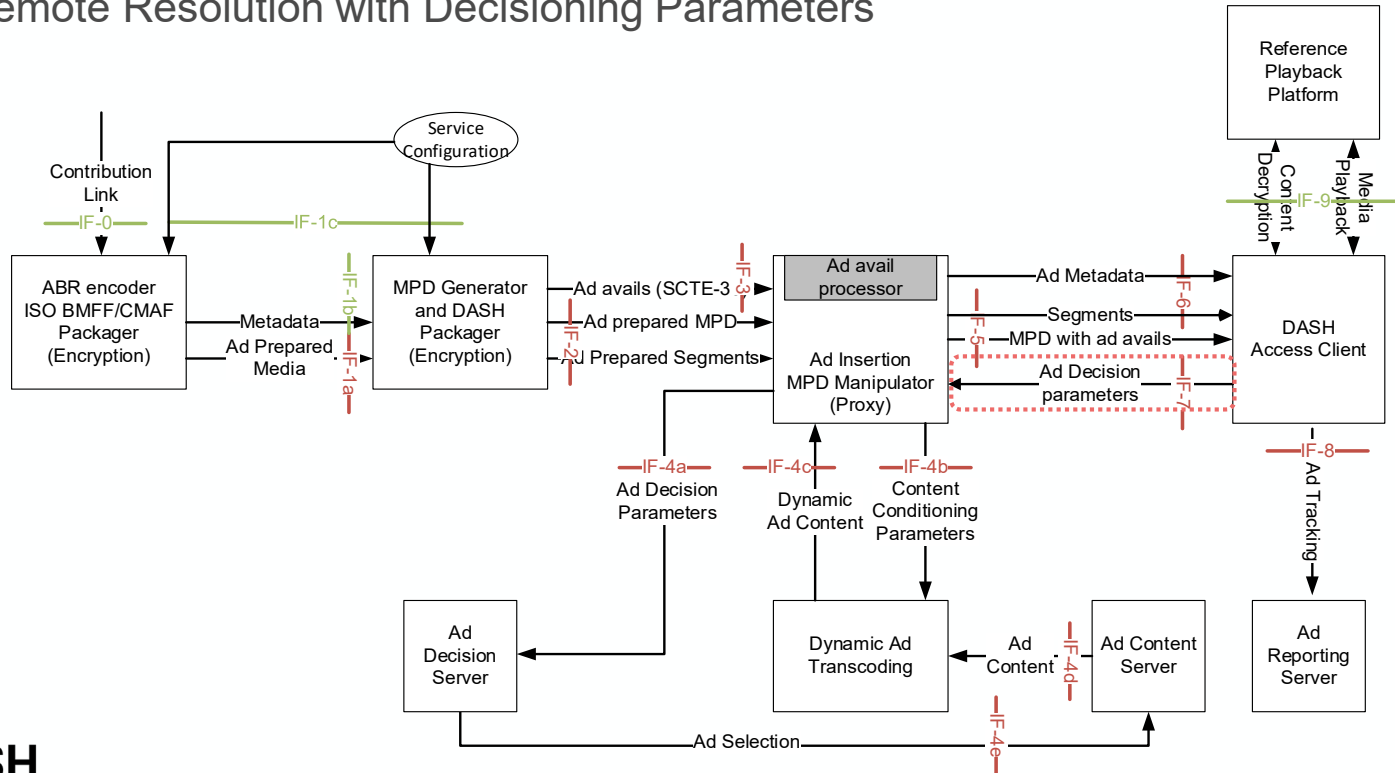
# DASH-IF Ad Insertion Architecture

## IF-8: MPD and Segments with Ad Placement



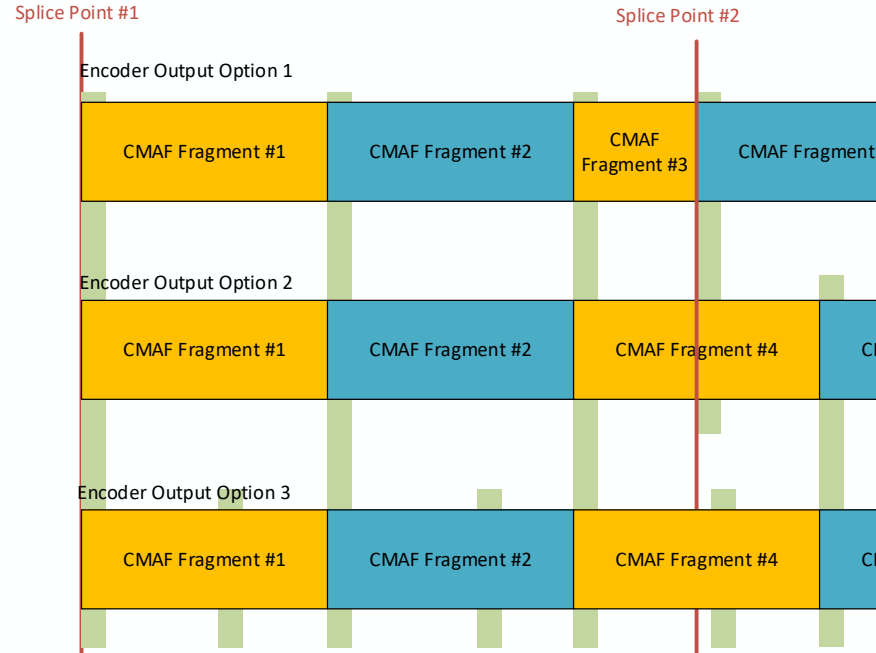
# DASH-IF Ad Insertion Architecture

## IF-7: Remote Resolution with Decisioning Parameters



# Content Splice Conditioning

- Conditioning drives complexity and experience
- Three options identified
  - Splice-Conditioned Packaging
    - CMAF Fragment boundary at splice point
  - Splice-Conditioned Encoding
    - SAP type 1 or 2 at splice point
  - Splice Point Signaling
    - Just signal, no specific encoding or packaging
- Recommended: Splice-Conditioned Packaging
  - Simplified MPD Manipulator
  - Broader seamless player experience



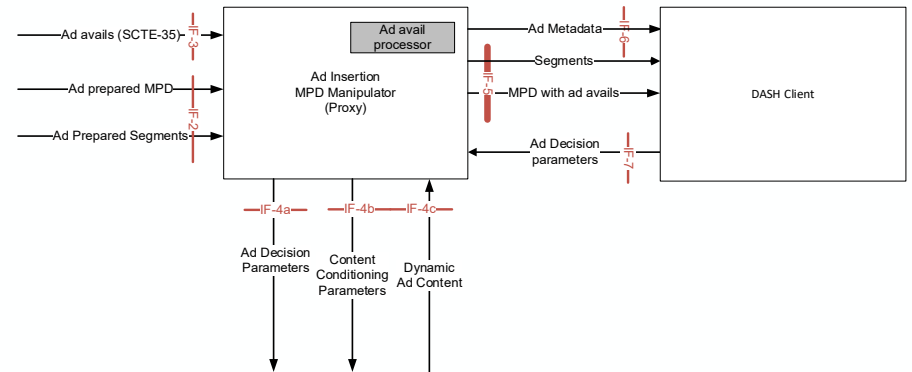
# Prepared Content and Ad Avails

- Recommended: Multi-Period DASH for Content
  - Period boundaries at splice points
  - Period replacement by MPD Manipulator
  - DASH-IF Main Live Content Profile
- Opportunity Metadata Requirements
  - Presentation time of splice point that starts opportunity
  - And either
    - Guaranteed accurate duration
    - Identifier for later event that will declare duration
  - Example: SCTE-35
- Recommended: MPD Events for Opportunity Metadata

```
<EventStream
  schemeIdUri="urn:scte:scte35:2014:xml+bin"
  timescale="1">
  <Event
    presentationTime="1540809120"
    id="1999">
    <Signal
      xmlns="http://www.scte.org/schemas/35/2016"><B
        inary>/DAhAAAAAAAAAAP/wEAUAAAfPf+9/fgAg9YDAAAA
        AAA/APOv</Binary>
    </Signal>
  </Event>
</EventStream>
```

# Ad Metadata and Tracking

- Ad metadata carriage mechanisms
  - DASH MPD Events
  - DASH Inband Event Messages
- Data presentation time aligned to media
  - Direct measurement with DASH Callback
  - Third-party measurement with common data surfacing
- Recommended: DASH MPD Events
  - Avoids ad segment modification





# Conclusions

- DASH + Ad Insertion
  - Ad Insertion is a first-class feature of DASH
  - DASH-IF defined requirements simplify workflows and aim to ensure the highest quality experience
- Advanced Ad Insertion in DASH
  - 2<sup>nd</sup> Community Review Available: <https://dashif.org/guidelines/#ad-insertion-in-dash>
  - Feedback and comments welcome!
- Only the First Step
  - Remaining use case details need work
  - Server-Guided Ad Insertion mechanisms need study
  - Interested in helping? Come join us! <http://dashif.org>

Thank you

