

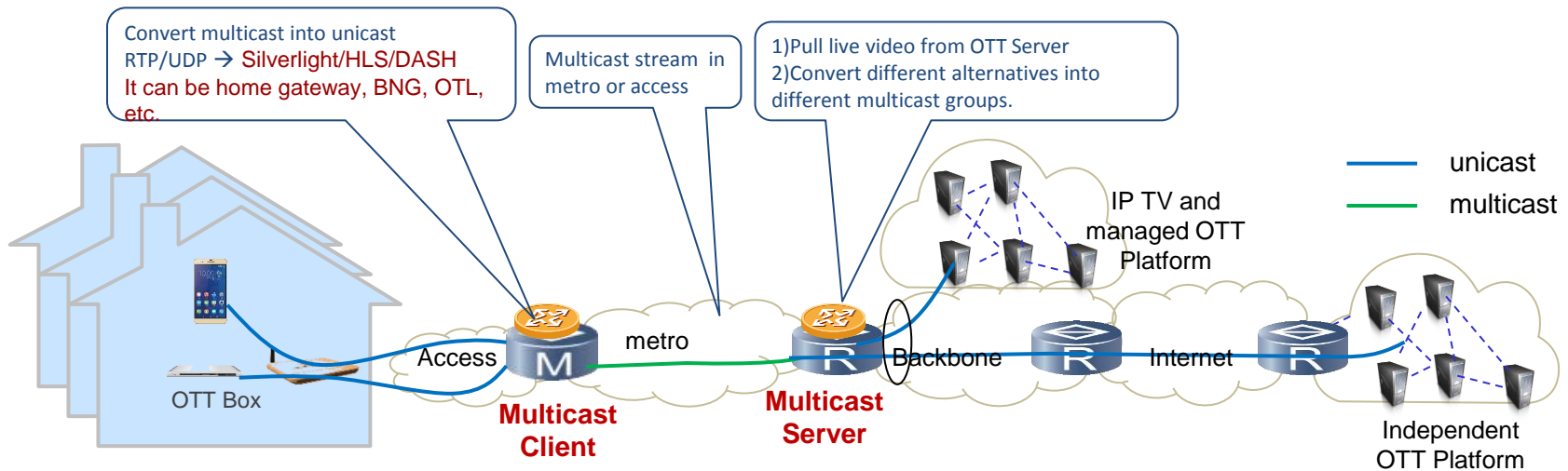
# RTP Payload Format for HTTP Adaptive Streaming

draft-wei-payload-has-over-rtp-00

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# Why Multicast ABR

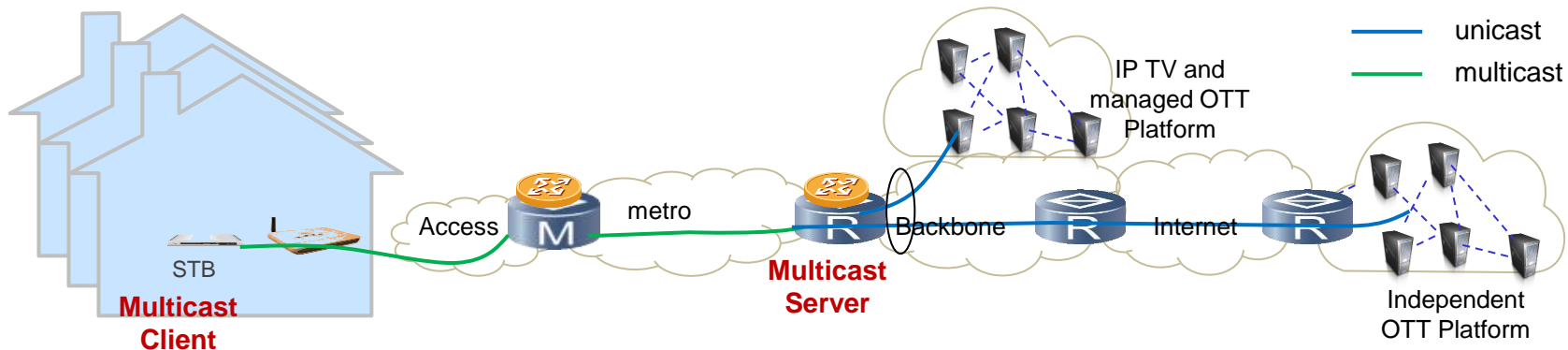
- **Real-time**: Bearing 4K Live video on multicast to avoid delays caused by OTT HLS / DASH mechanism and TCP cumulative mechanism.
- **Reduce network traffic and workload of OTT video server**, decrease traffic of Internet, backbone, metro. Millions of viewer watching same channel only require one multicast stream.
- **Anti-tidal effects , revenue maximization** : Bearing video stream on multicast , do not need reserve bandwidth or server resources for the peak time, users can watch content smoothly anytime. Save operator's inter-network settlement cost;



HAS over RTP is between Multicast Server and Multicast Client.

# Why RTP?

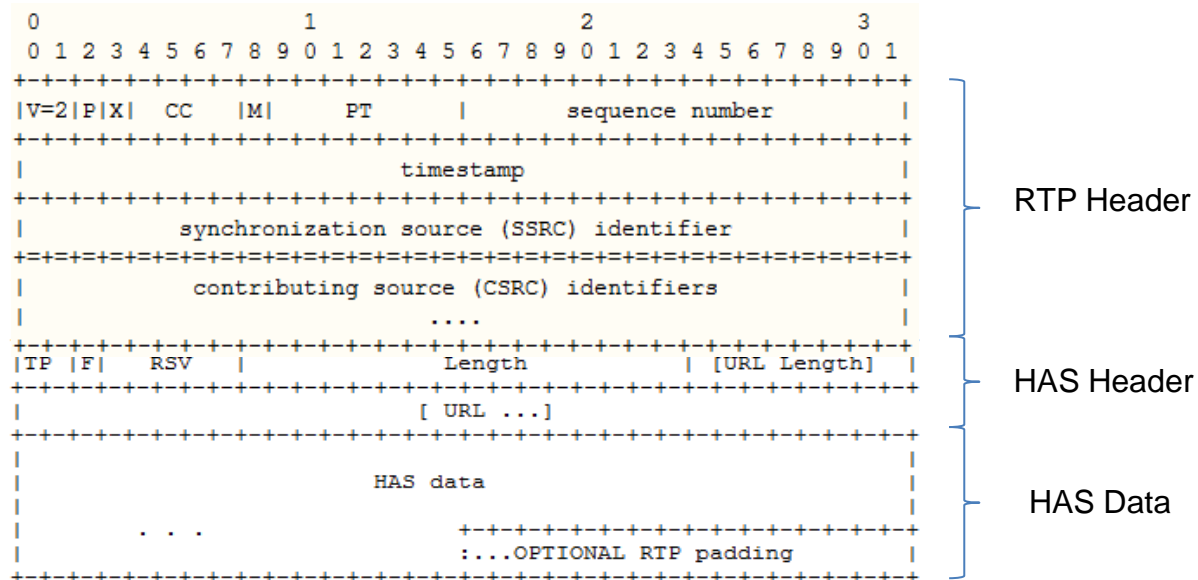
- Multicast ABR (Cablelabs) uses NORM to deliver HTTP adaptive streaming data in multicast.
- Comparing to NORM, RTP has advantages:
  - RTP has fast channel change (FCC) mechanisms [RFC6285], so that the time for changing different video resolutions can be reduced.
  - Some Telecom operators only have IPTV multicast platform, which may not support NORM protocol.
  - NORM is not aware of the media timing while RTP is better designed to handle multimedia.
  - RTP is already supported in some end user devices, like STBs etc, in which case the multicast can go directly to the end users, as shown in the following figure.



# Works to be Considered

- HAS over RTP requires following work to be considered:
  - An RTP payload for HAS
  - How to handle the manifest files
  - Fragmentation considerations
  - Congestion control

# RTP Payload Format



- Type (TP): The content type of this payload.
  - 0 = Manifest; 1= Initial information; 2 = HAS segments
- Fragmentation(F):
  - F=1: indicates the received packet is a part of a decodable fragment and can not be decoded correctly until the whole decodable fragment is received.
  - F=0: A decodable fragment.
- Length: The size of the RTP payload in bytes including HAS header.
- URL Length: The size of the URL field in bytes, including the URL length.
- URL: indicates the URL of the content.

# Other Considerations

- How to transmit manifest files:
  - Out of band way: reliable, but requiring additional bandwidth and round-trip time
  - In band: unreliable, but requiring to handle losses and partial receives
  - Do we really need the manifest files when considering the multicast to the end users?
- Intelligent Fragmentation considerations
  - Split HAS segment into RTP packets enabling decodable RTP packets. Two options:
    1. The multicast server is authorized to access the HAS segment , so that it can split it into decodable pieces.
    2. Use the manifest files to allow the OTT content providers to indicate the fragmentation points where independently decodable application data can be extracted. This option may need the work in MPEG to indicate the fragmentation points.
- Congestion Control
  - Multicast clients will dynamically join a multicast group based on current network conditions.
  - A new congestion control mechanism is needed to coordinate the multicast clients with the same problem, so that they can share the stream to obtain the best quality they can have.