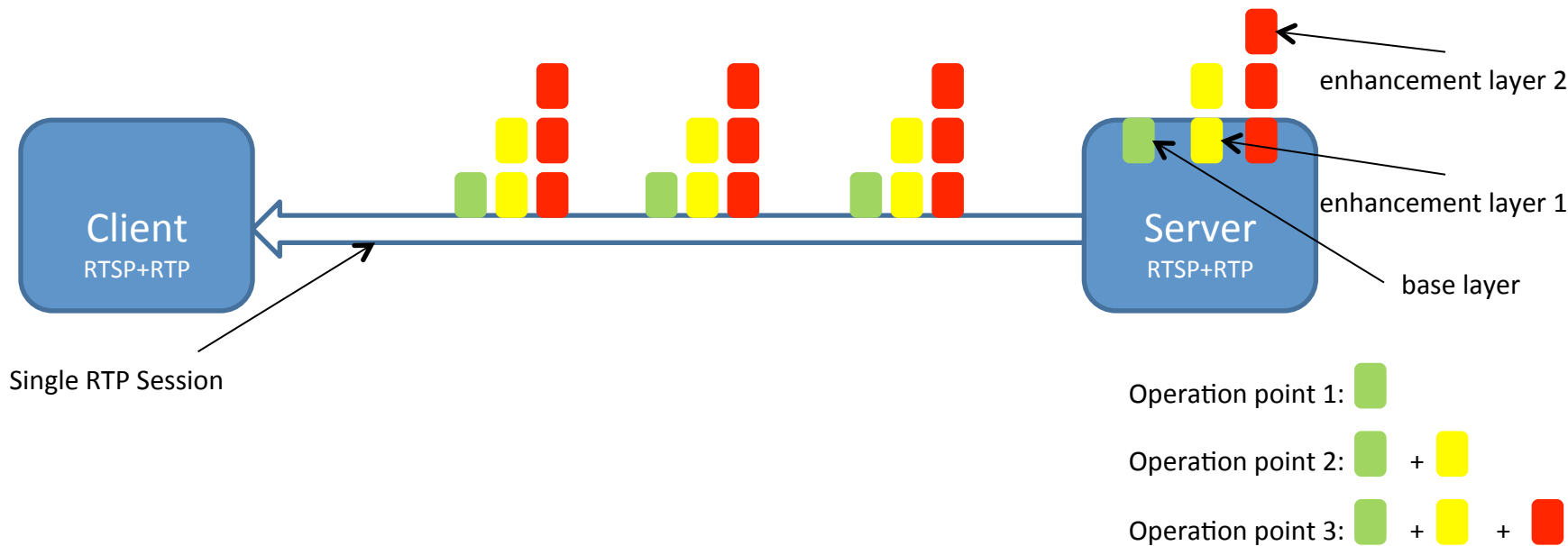# draft-yue-mmusic-rtsp-substream-control-extension

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Scenario: Single Session Transport
--- used for SVC and MVC

Example :SVC content transport to client

enhancement layer 2

enhancement layer 1

base layer

Client
RTSP+RTP

Server
RTSP+RTP

Single RTP Session

Operation point 1:

Operation point 2: +

Operation point 3: + +

Problem identified:
How can the client retrieve part of the content (e.g. Operation point 1, the base layer), or even switch between operation points?
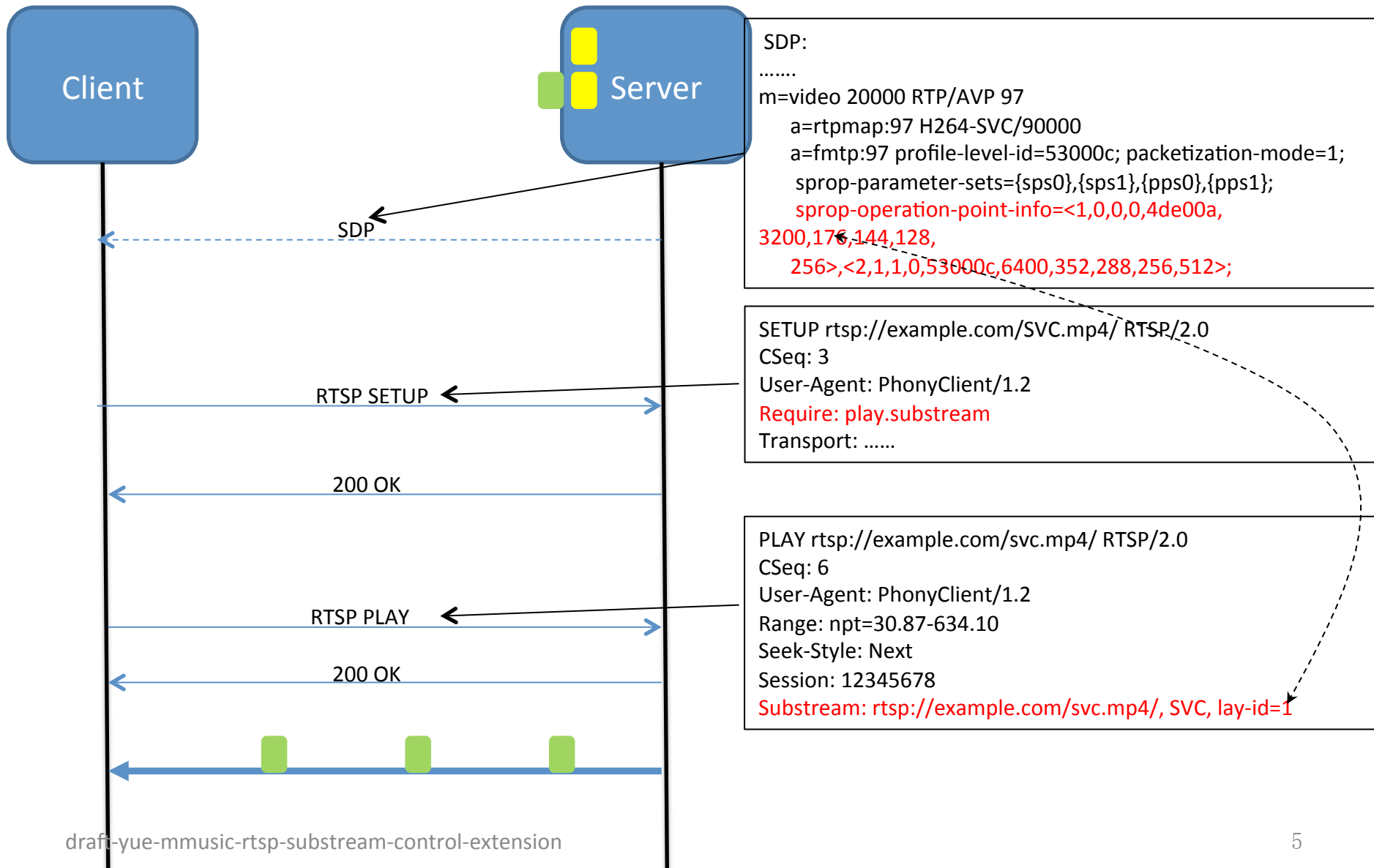
Definition

- Definition

    - Substream: a part of a media stream containing one or more bitstream components, which can be independently decoded.
    Typically a Substream is identified by an operation point.

    - Substream type: the compound mode of the bitstream components in a substream, e.g. SVC, MVC, etc

Substream control solution

- Annotation
  - Signaling the substreams available for control.
  - It is usually done by the SDP specification of the RTP PF specification

- Capability negotiation
  - Based on the RTSP feature tag negotiation mechanism
  - new feature tag defined

- Control operations
  - Define new RTSP header, used in PLAY request.
  - New status code for failure cases

Example

Client   Server

```
 SDP:
 …….
m=video 20000 RTP/AVP 97
    a=rtpmap:97 H264-SVC/90000
    a=fmtp:97 profile-level-id=53000c; packetization-mode=1;
     sprop-parameter-sets={sps0},{sps1},{pps0},{pps1};
     sprop-operation-point-info=<1,0,0,0,4de00a,
3200,176,144,128,
     256>,<2,1,1,0,53000c,6400,352,288,256,512>;
```

SDP

RTSP SETUP

```
SETUP rtsp://example.com/SVC.mp4/ RTSP/2.0
CSeq: 3
User-Agent: PhonyClient/1.2
Require: play.substream
Transport: ……
```

200 OK

RTSP PLAY

```
PLAY rtsp://example.com/svc.mp4/ RTSP/2.0
CSeq: 6
User-Agent: PhonyClient/1.2
Range: npt=30.87-634.10
Seek-Style: Next
Session: 12345678
Substream: rtsp://example.com/svc.mp4/, SVC, lay-id=1
```

200 OK

Summary of extensions

- Extension to RTSP
  - Header extension:
    - Substream, contains the Request-URI, substream type and substream id triples.

  - Feature Tag extension
    - Play.substream, indicating the support of substream control defined here.

  - Status Code Extension
    - 552 Substream Type Not Recognized
    - 553 Substream Control Not Allowed
    - 554 Substream Id Not Valid

Next step

- Complete the MVC part with the ongoing discussion of I-D.ietf-payload-rtp-mvc
  - MVC substream annotation
  - MVC substream id

- Discuss on the need of in-band signaling of substream annotation.
  - e.g. when the client request to play a non-exist substream, 554 error will be responded. In this response message, the substream annotation may be further contained. Does this make sense?

- Security considerations?