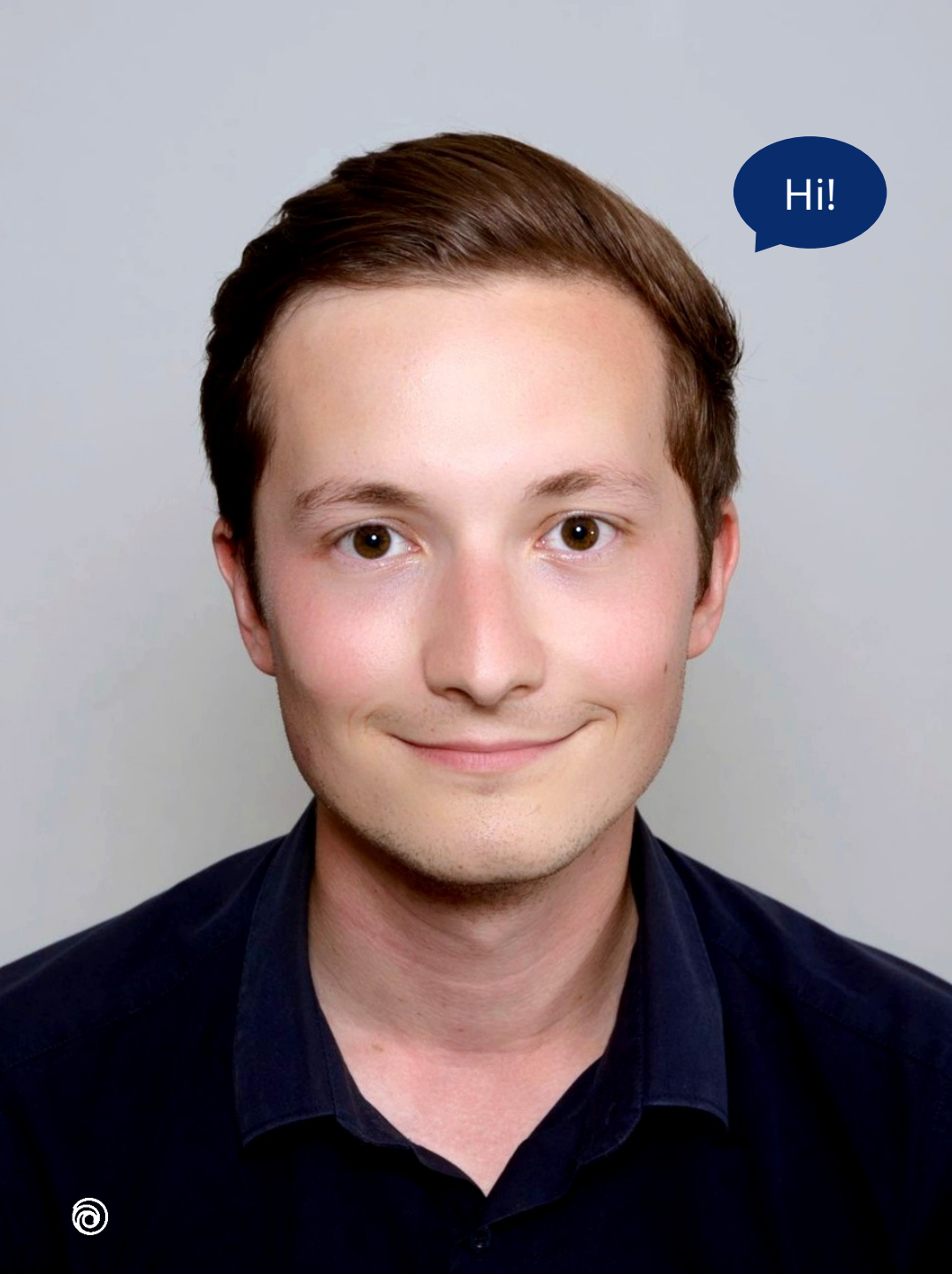




OTT STREAMING OVERVIEW

GENERAL INTRODUCTION

28 SEPTEMBER 2022

A portrait of Simon Da Silva, a man with short brown hair and a slight smile, wearing a dark blue polo shirt. A blue speech bubble with the text "Hi!" is positioned above his head.

Hi!

SIMON DA SILVA

Software Engineer
Ubisoft Bordeaux

Telecommunications Engineer
Bordeaux INP: ENSEIRB-MATMECA
Software Engineering

PhD “High-QoE Privacy-Preserving Video Streaming”

LaBRI, CNRS, France
Multi-source OTT streaming
Dynamic content provisioning
Secure private streaming

R&D Engineer
Quanteec, France
Live OTT streaming platform
Encrypted WebRTC streaming
Scalable visio-conferencing solution

Technical Project Manager
Witbe, Calgary, AB, Canada
OTT streaming consulting & trainings
Automated monitoring solutions

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PART 5

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PART 6

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PART 7

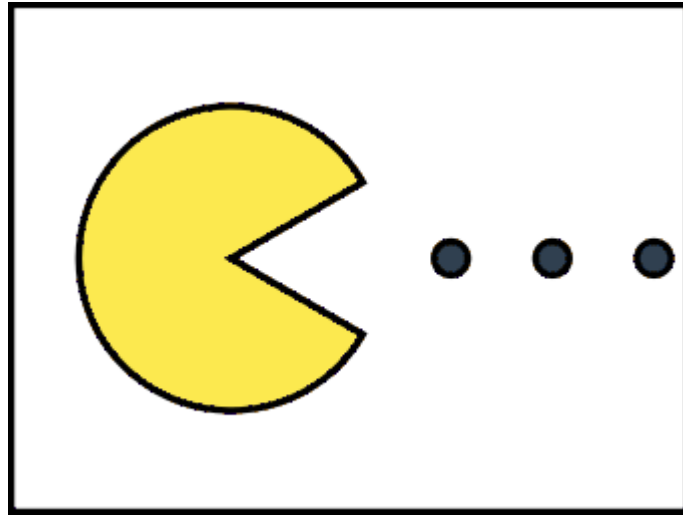
WEBRTC

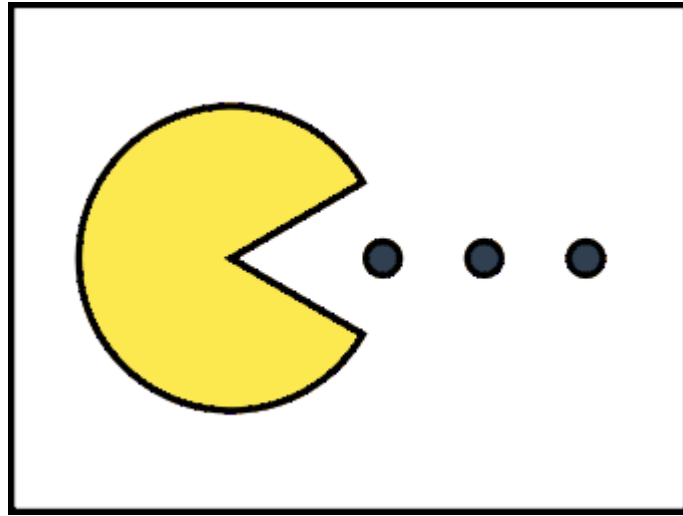


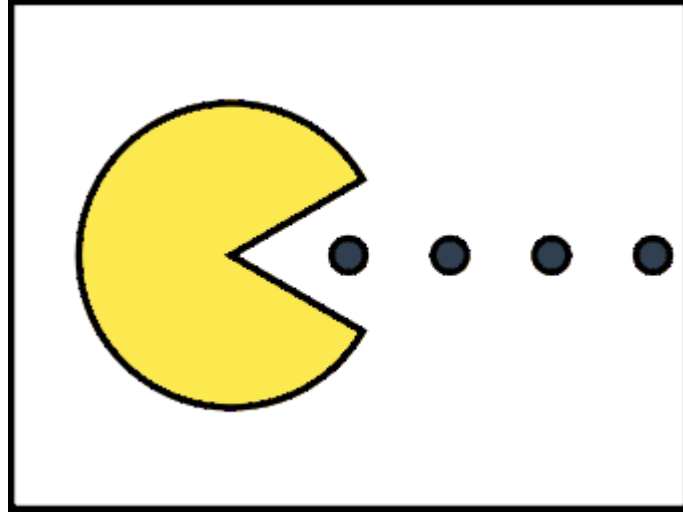


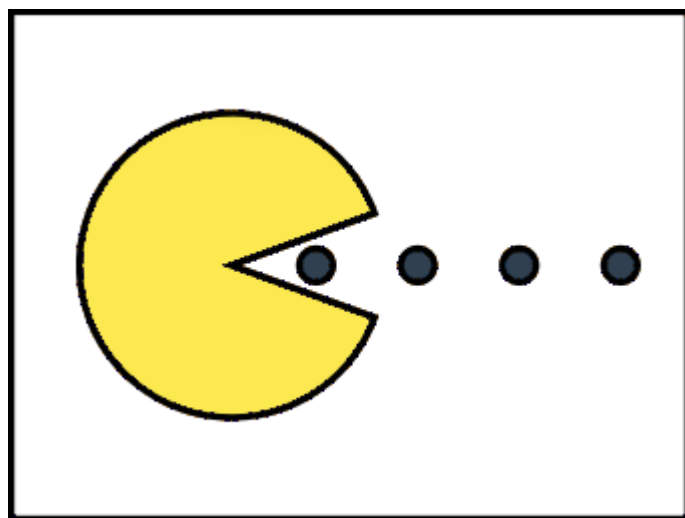
PART 1

VIDEO ENCODING

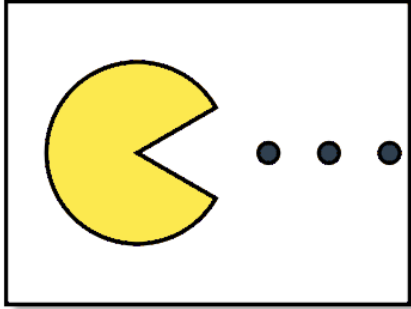




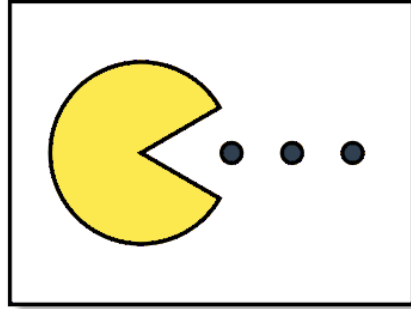




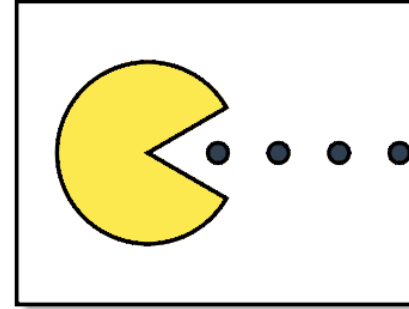
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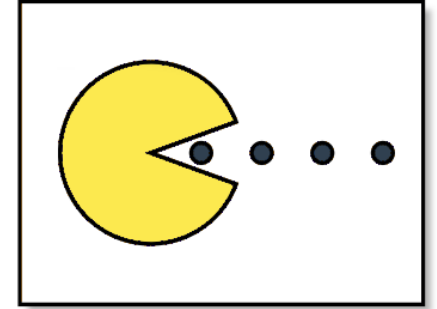
Frame #1



Frame #2

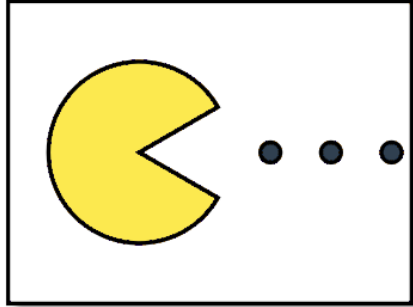


Frame #3

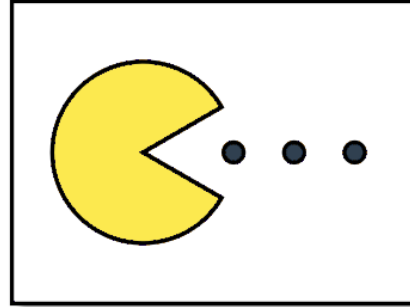


Frame #4

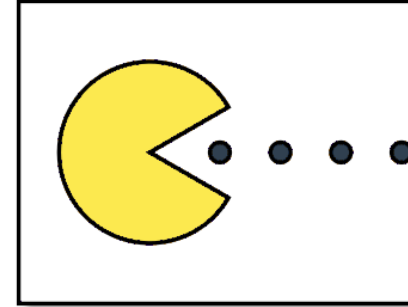
Displayed content:



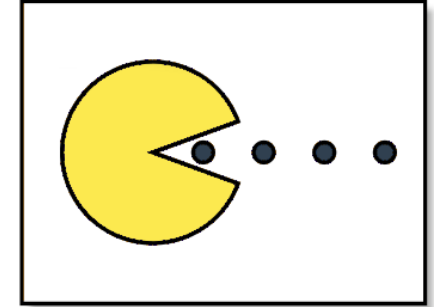
Frame #1



Frame #2

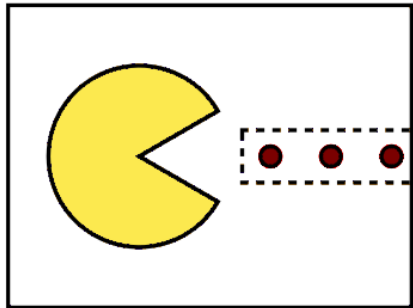


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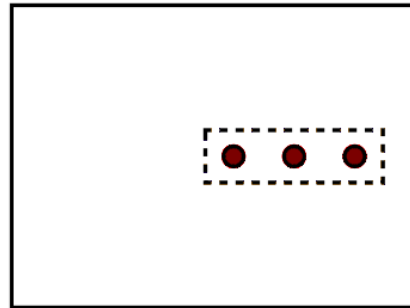


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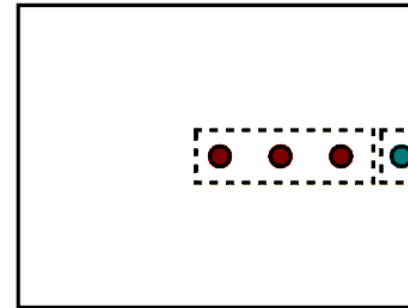
Encoded content:



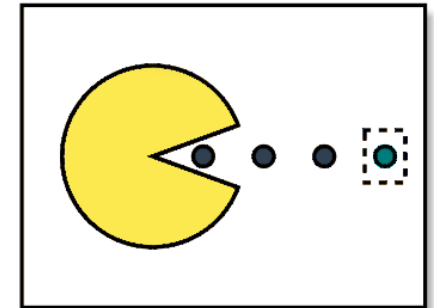
I-frame



P-frame



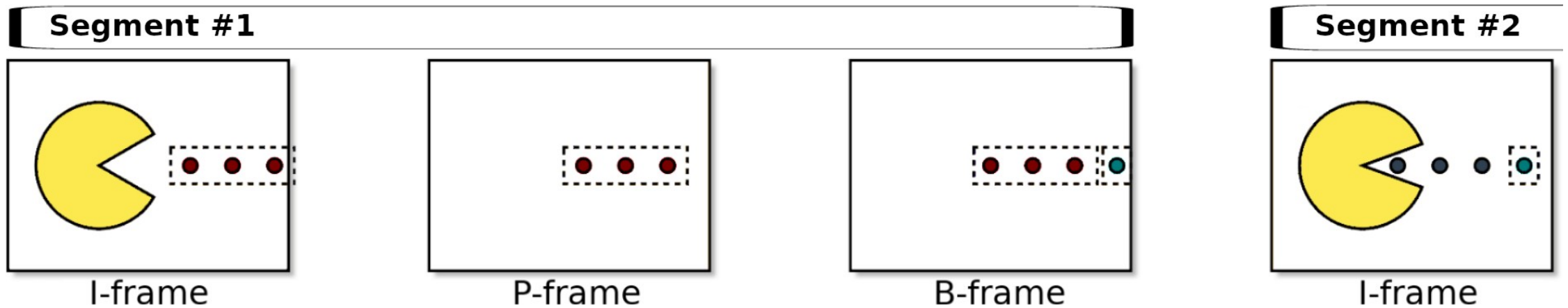
B-frame



I-frame

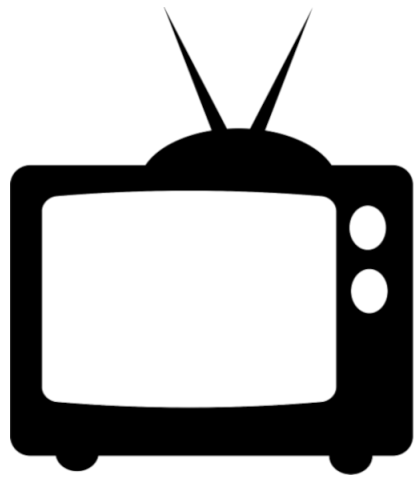
Also known as "Group of Pictures"
(apologies for technical incorrectness)

Also known as "chunk"

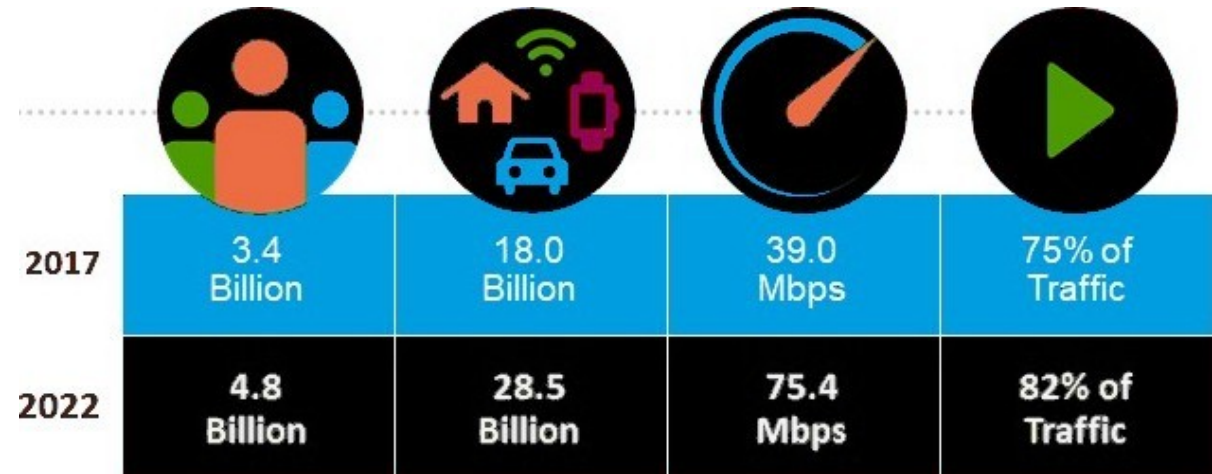


PART 2

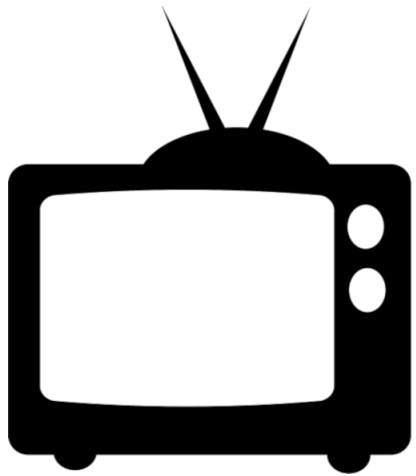
CONTENT CONSUMPTION CHALLENGES



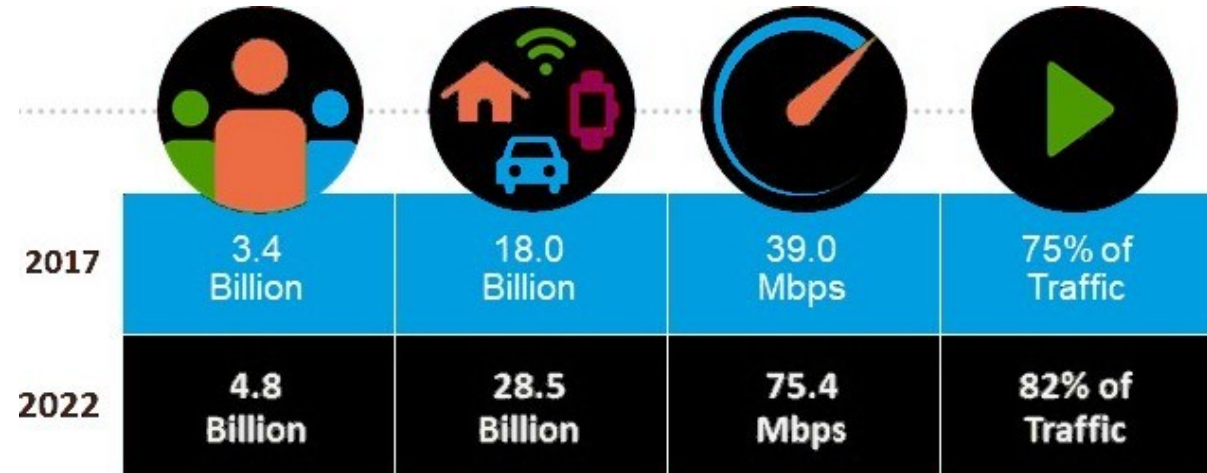
NETFLIX
You Tube
twitch



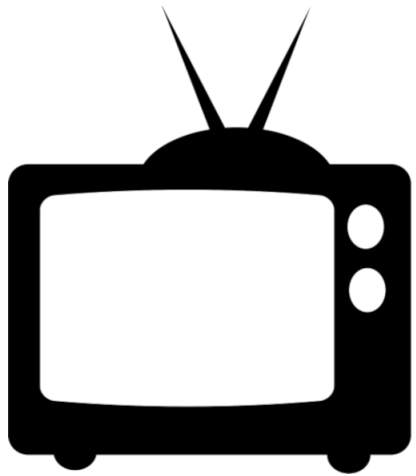
Cisco VNI 2017-2022



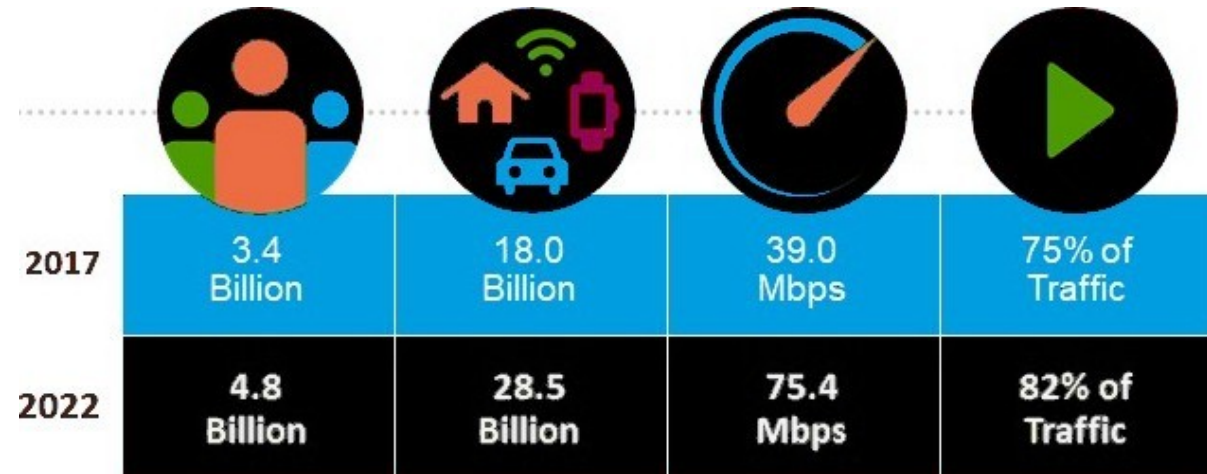
NETFLIX
You Tube
twitch



- ▶ High QoE
- ▶ Reliability
- ▶ Low cost



NETFLIX
YouTube
twitch



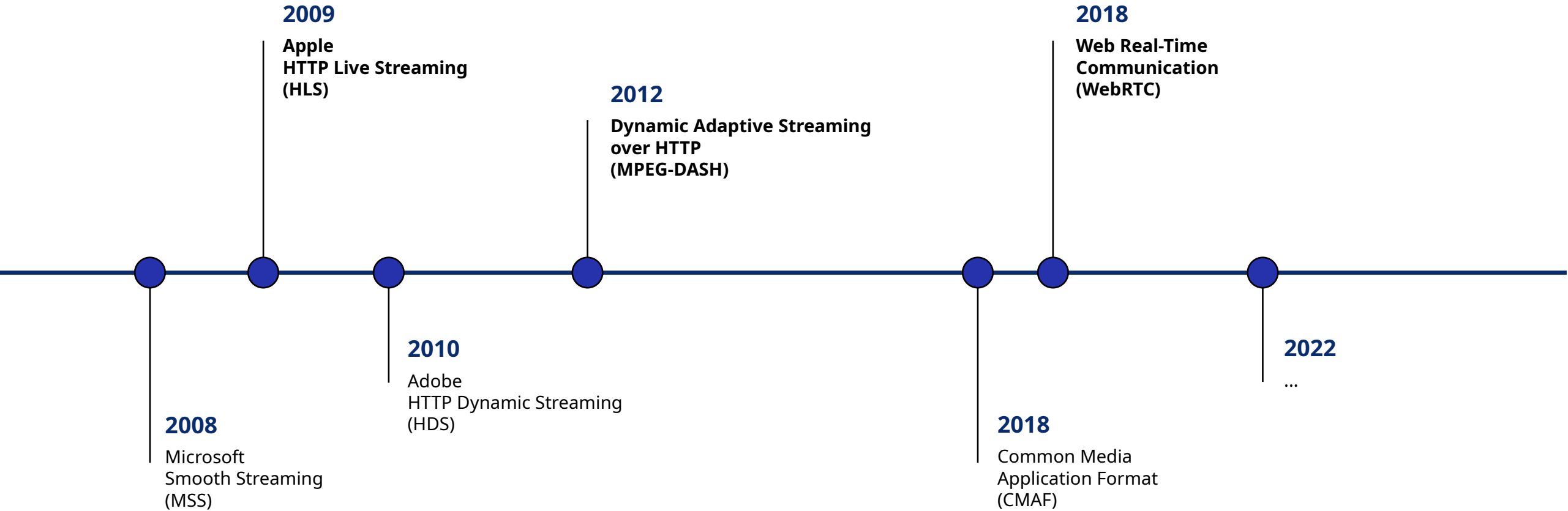
- ▶ High QoE
- ▶ Reliability
- ▶ Low scalability cost

PART 3

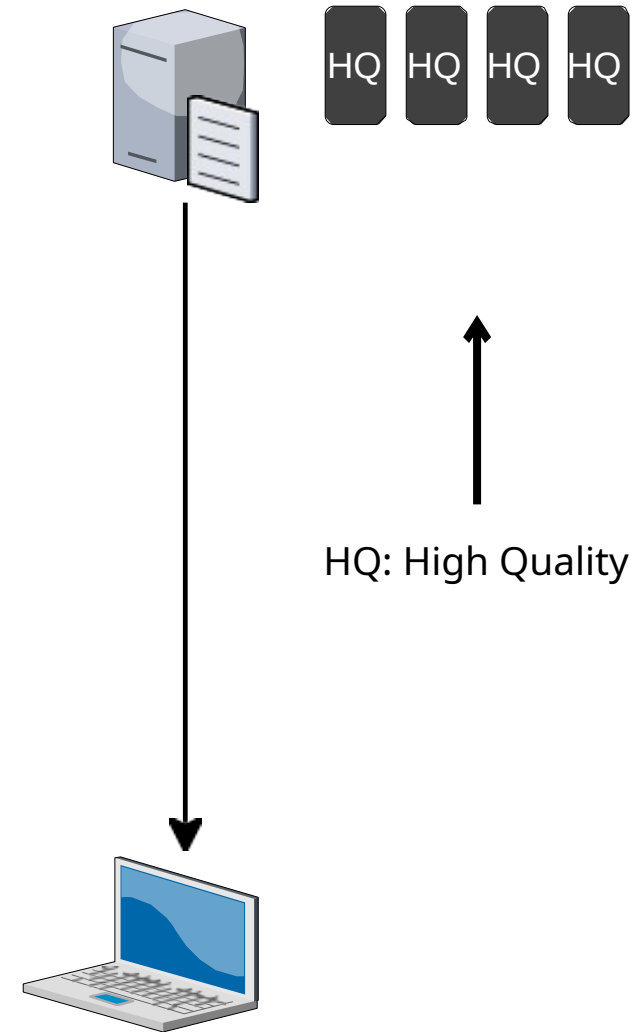
ADAPTIVE STREAMING



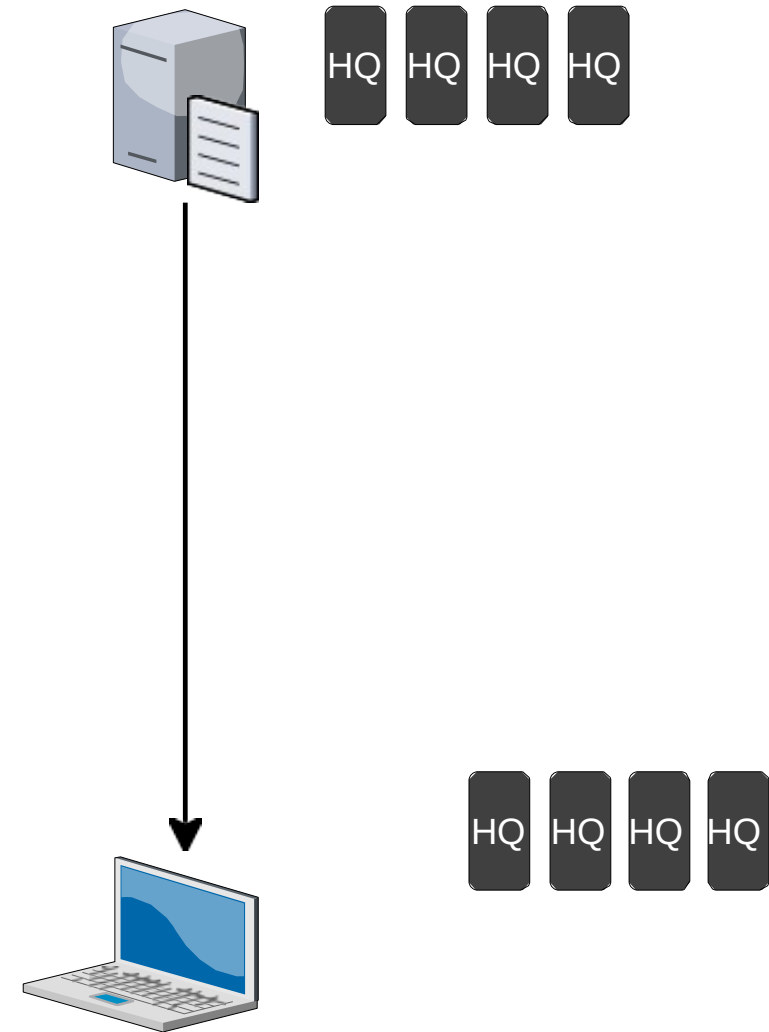
ADAPTIVE STREAMING TIMELINE



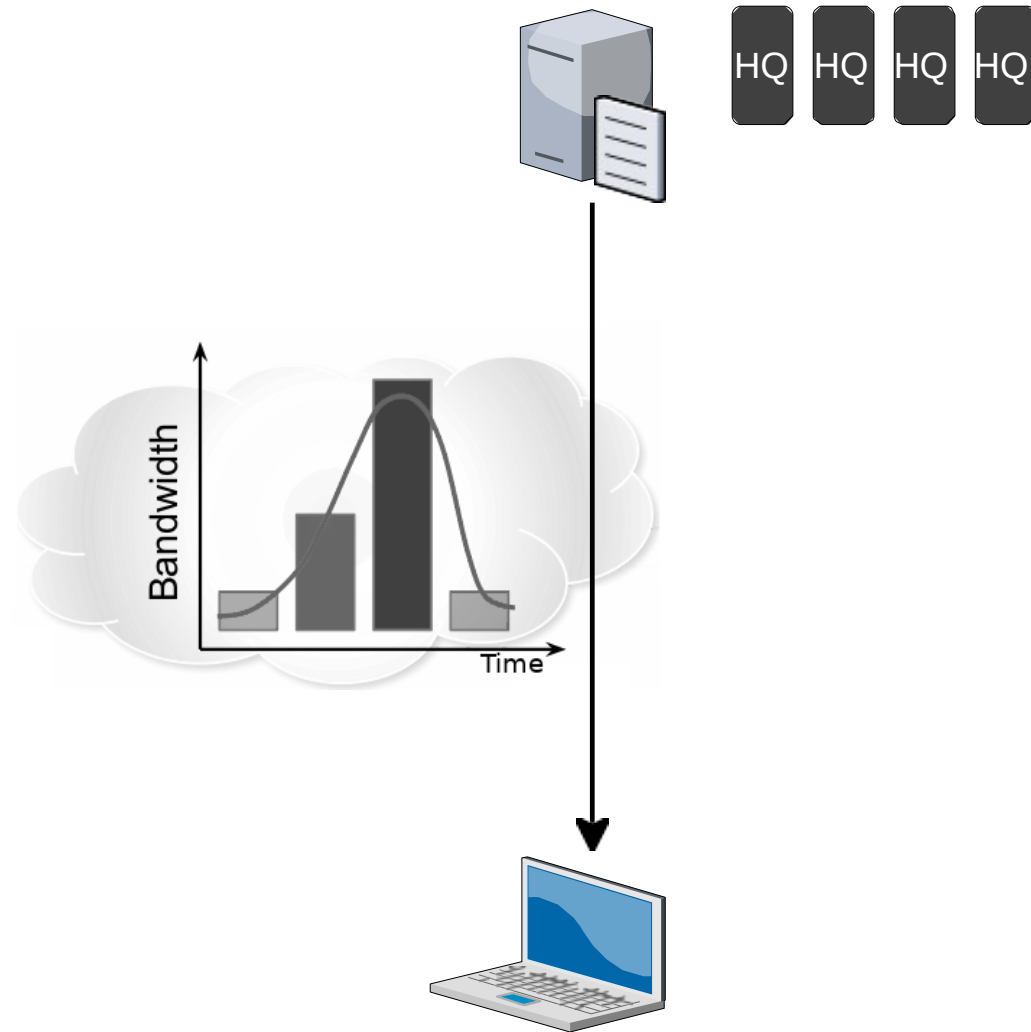
- ▶ High QoE
- ▶ Reliability
- ▶ Low scalability cost



- ▶ High QoE
- ▶ Reliability
- ▶ Low scalability cost



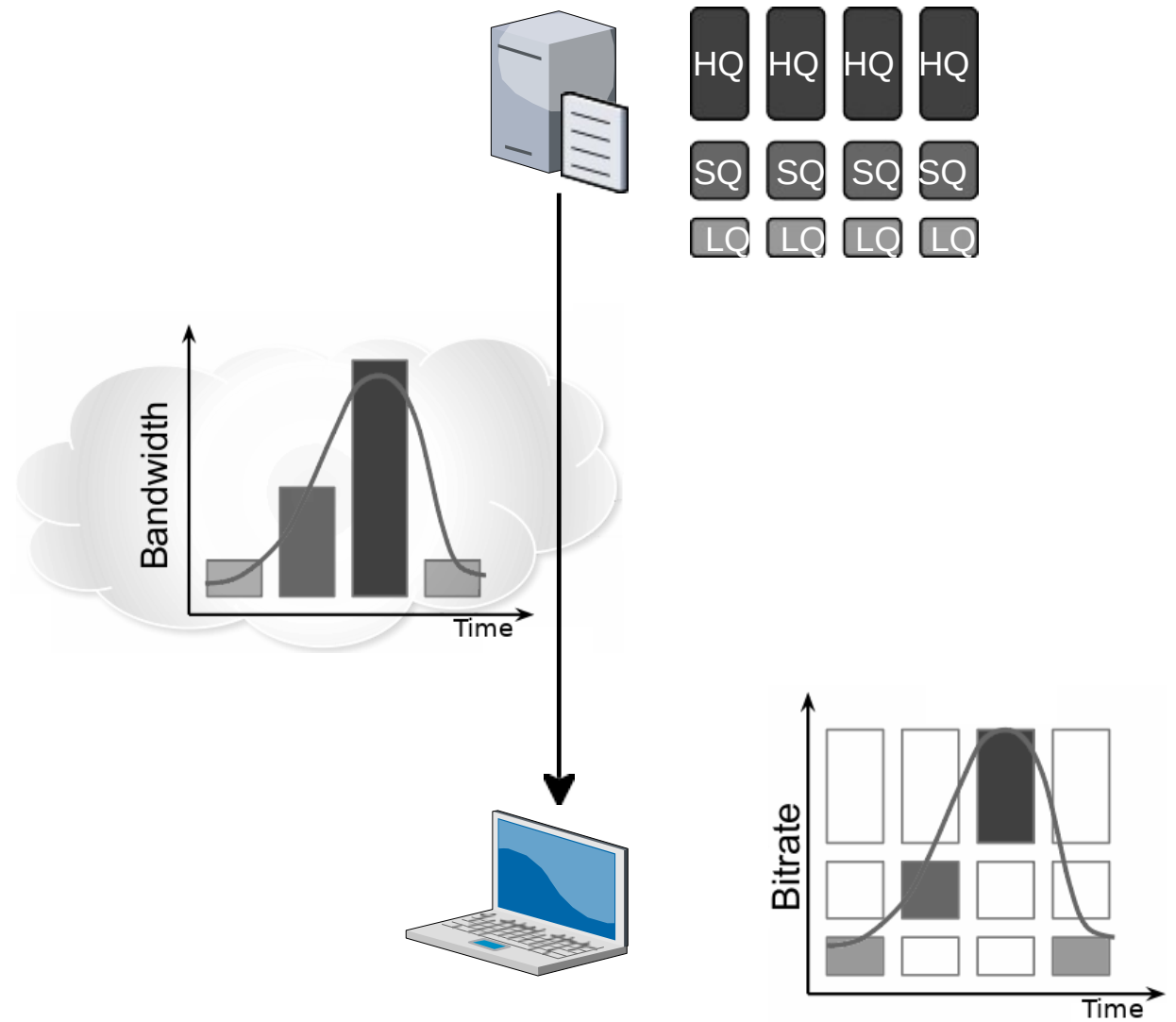
- ▶ High QoE
- ▶ Reliability
- ▶ Low scalability cost



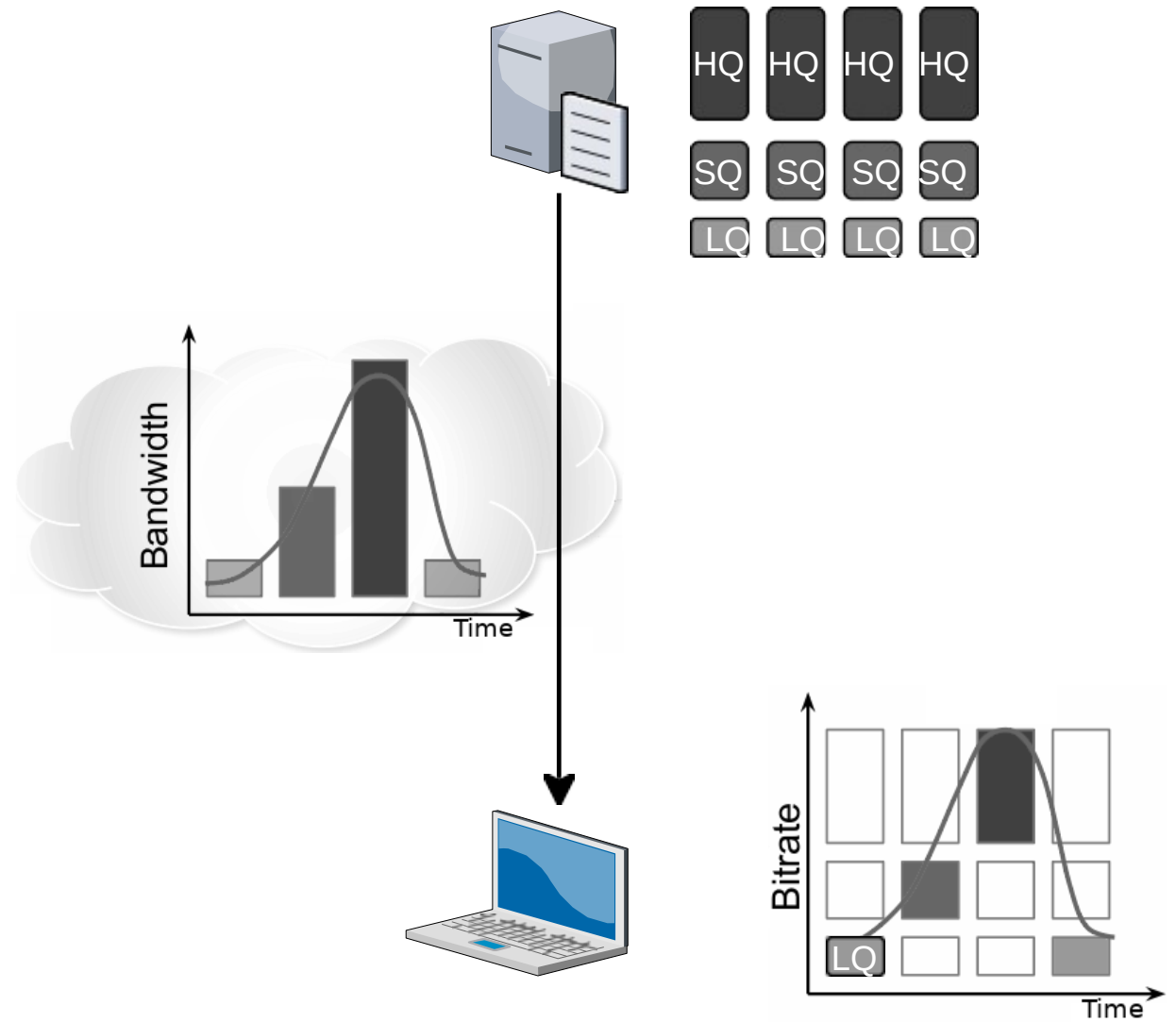
- ▶ High QoE
- ▶ Reliability
- ▶ Low scalability cost



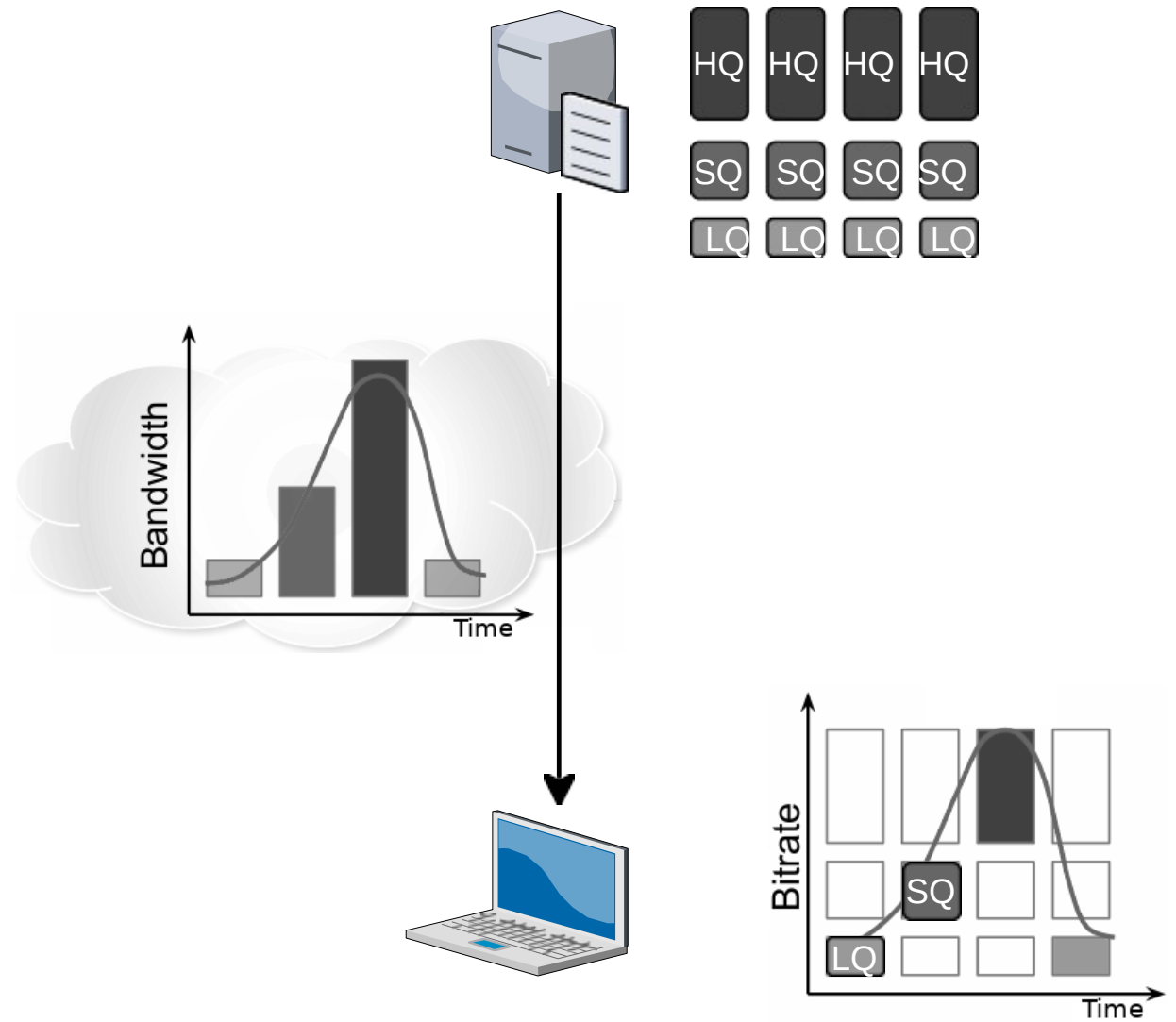
- High QoE
- Reliability
- Low scalability cost



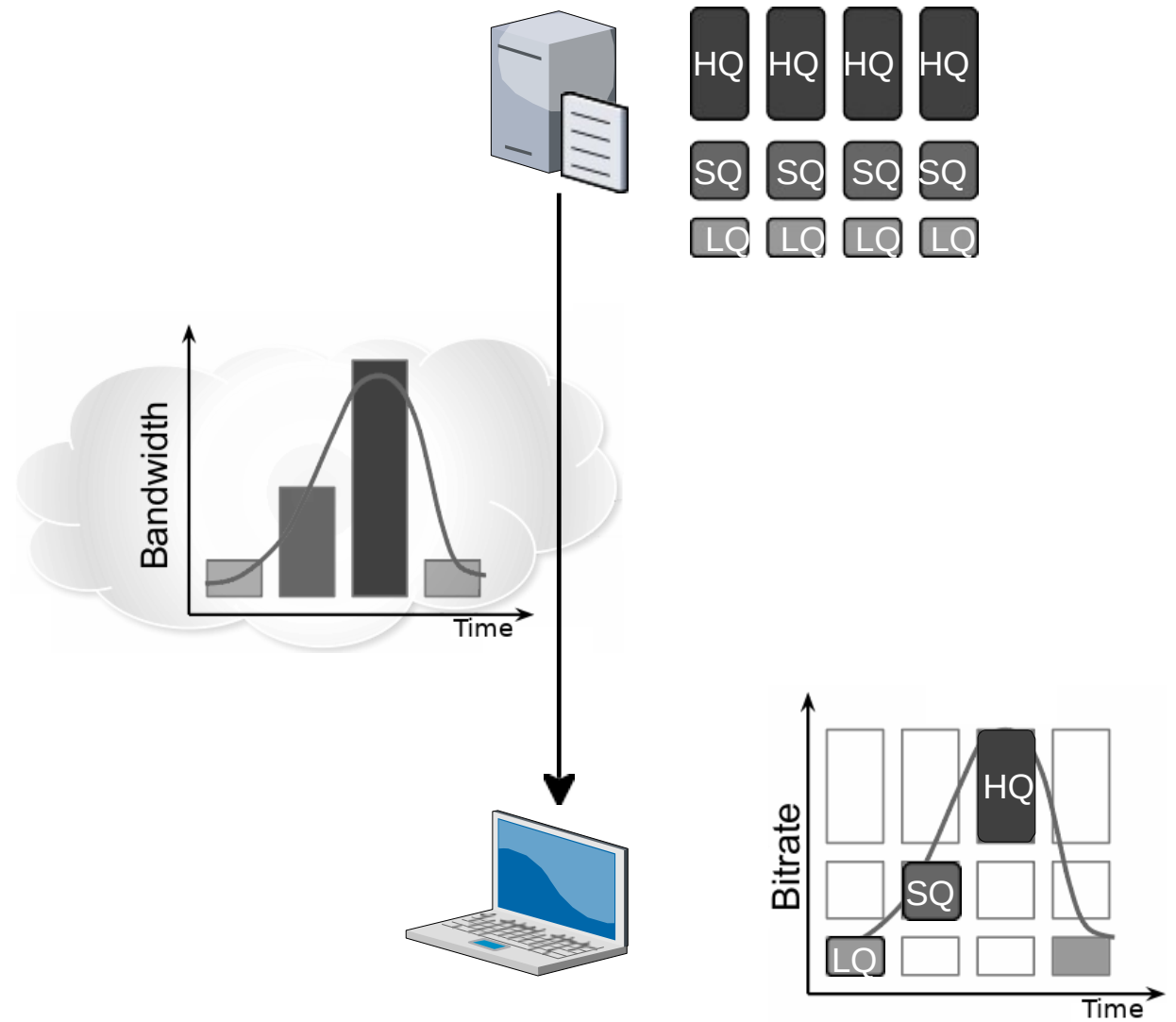
- High QoE
- Reliability
- Low scalability cost



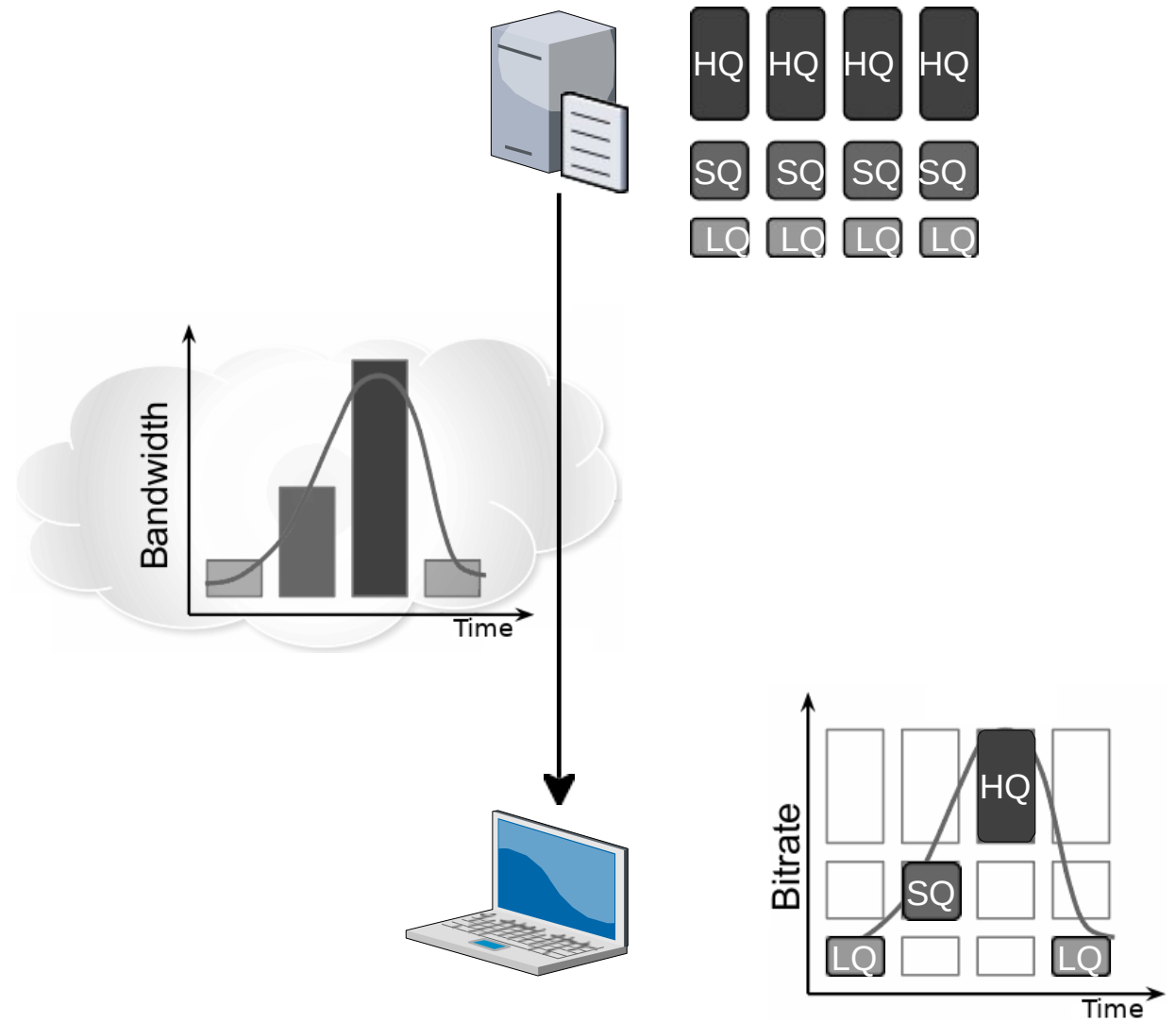
- High QoE
- Reliability
- Low scalability cost



- High QoE
- Reliability
- Low scalability cost



- High QoE
- Reliability
- Low scalability cost

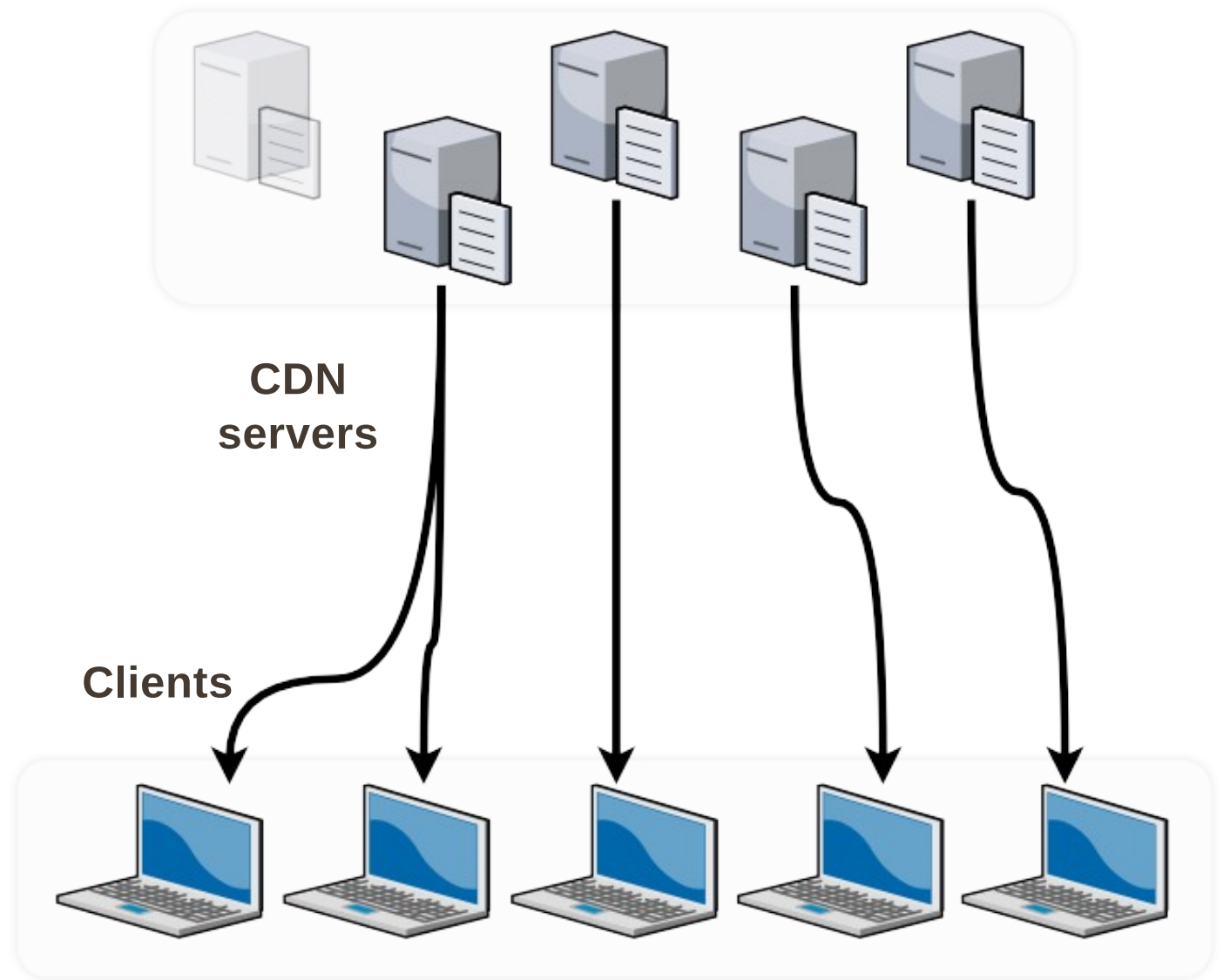




PART 4

CONTENT DELIVERY NETWORKS

- High QoE
- Reliability
- Low scalability cost



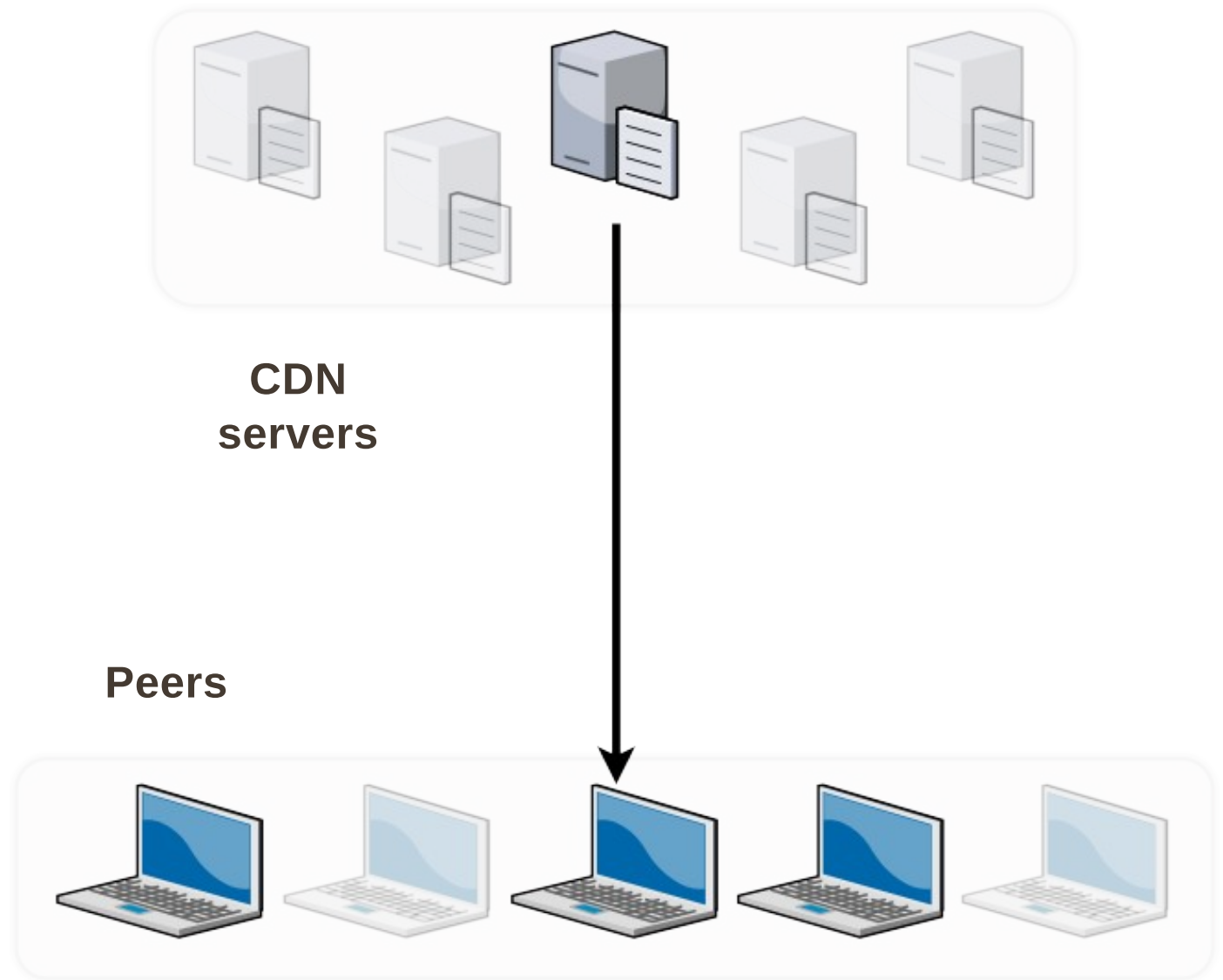
- 
- A world map with white outlines of continents and countries on a dark blue background. Numerous small white symbols are scattered across the map, representing data points. The symbols include solid triangles, open triangles, and small squares. The symbols are distributed across all major landmasses, with a higher concentration in North America, Europe, and Asia.
- ▶ High QoE
 - ▶ Reliability
 - ▶ Low scalability cost

PART 5

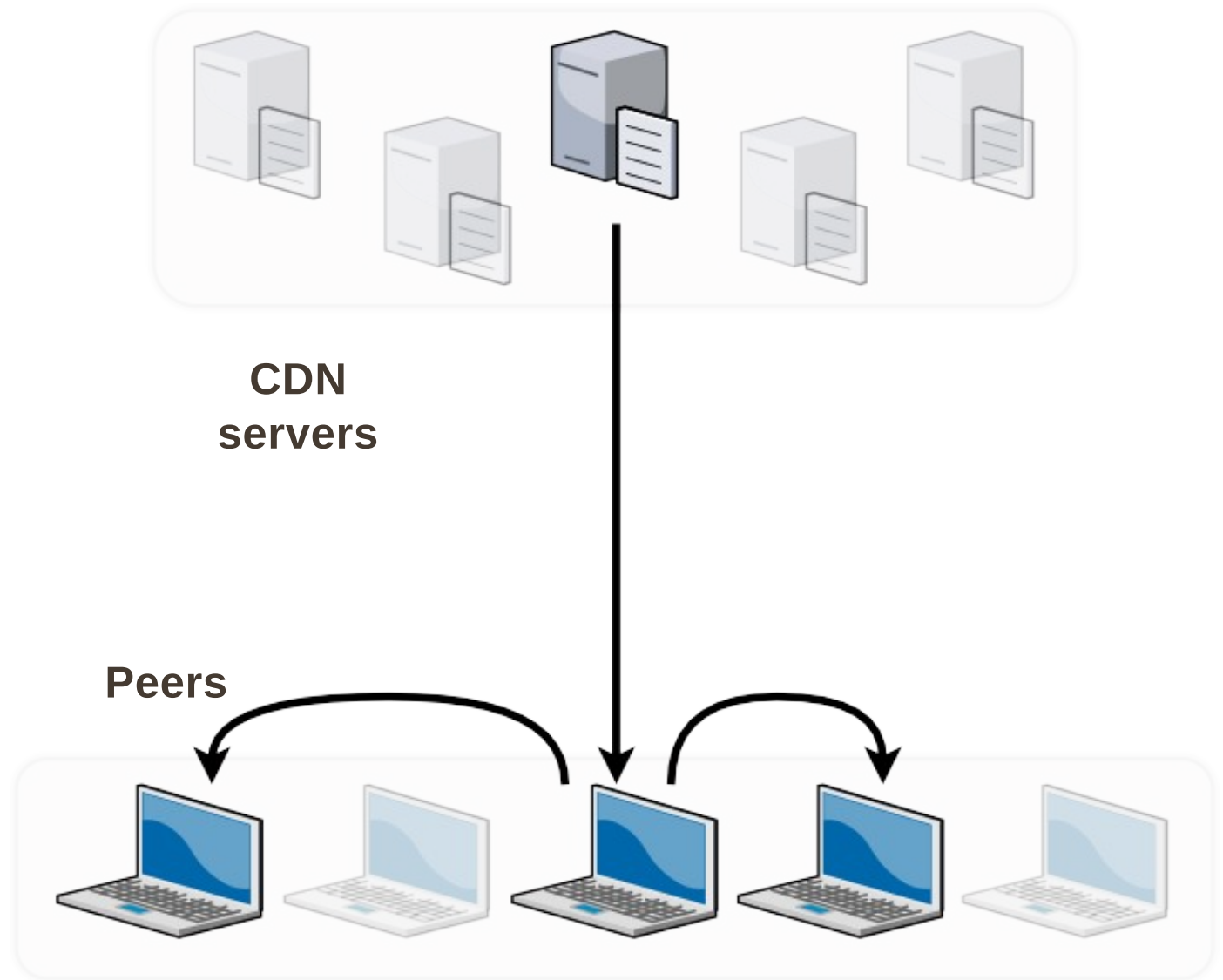
PEER-TO-PEER / EDGE-ASSISTED STREAMING



- ▶ High QoE
- ▶ Reliability
- ▶ Low scalability cost



- ▶ High QoE
- ▶ Reliability
- ▶ Low scalability cost



PART 6

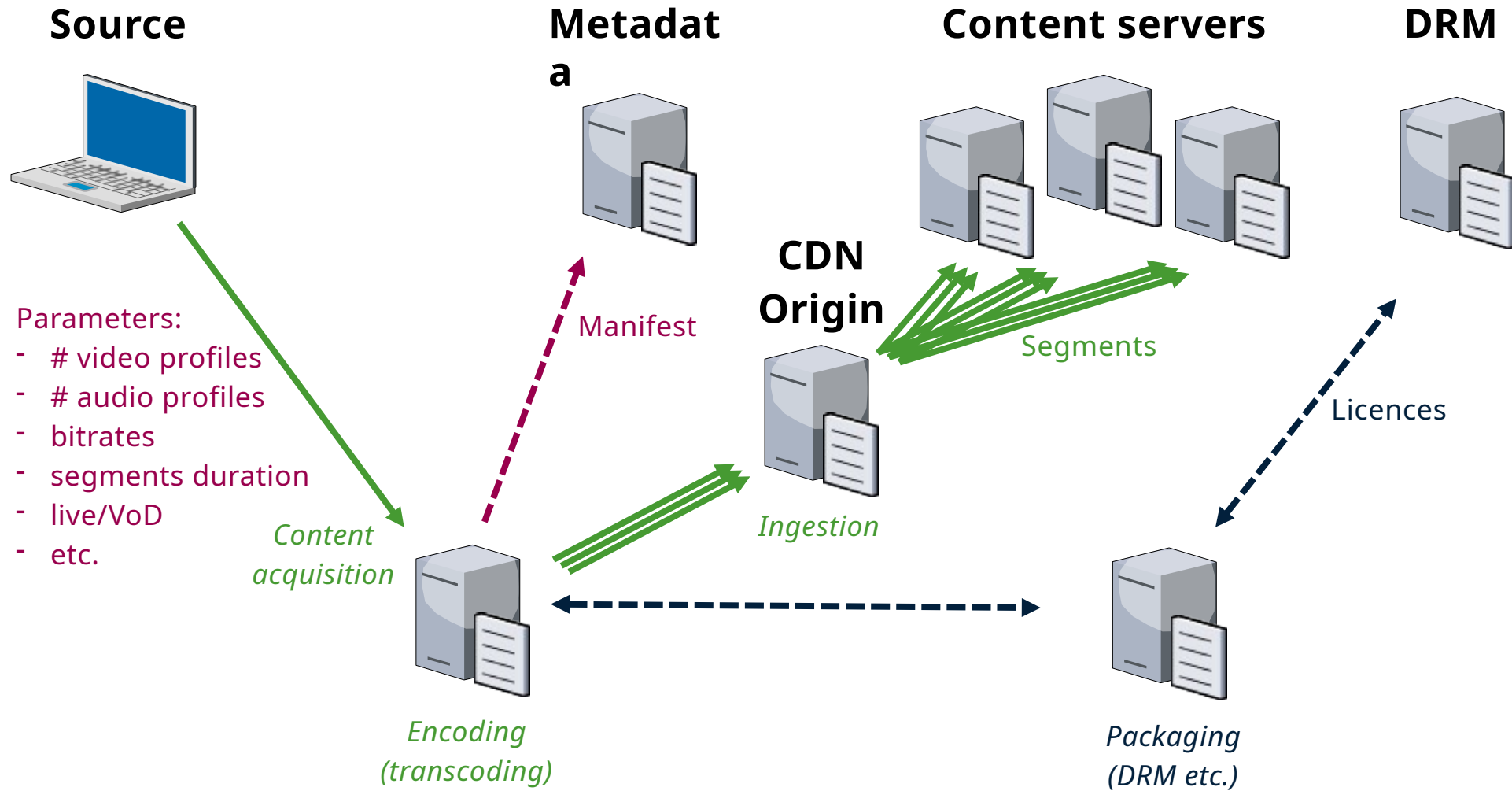
OTT DELIVERY OVERVIEW



The background is a detailed, painterly illustration of a landscape. On the left, a large, leafy green tree stands prominently. A waterfall cascades down a rocky ledge into a pool of water. A river flows through the center of the image, surrounded by dark, rocky terrain. The right side of the image is dominated by a large, billowing cloud or smoke that fills the upper right corner. The overall color palette is dark and moody, with deep blues, greens, and browns, accented by the white text.

OTT DELIVERY OVERVIEW

Back Front



The background is a detailed, painterly illustration of a landscape. On the left, a large, leafy green tree stands prominently. A waterfall cascades down a rocky ledge in the upper left. A river flows through the center, its water a vibrant turquoise color. The river is bordered by dark, craggy rocks. In the upper right, there are soft, billowing clouds in shades of white and light brown. The overall style is reminiscent of a video game or a high-quality digital painting.

OTT DELIVERY OVERVIEW

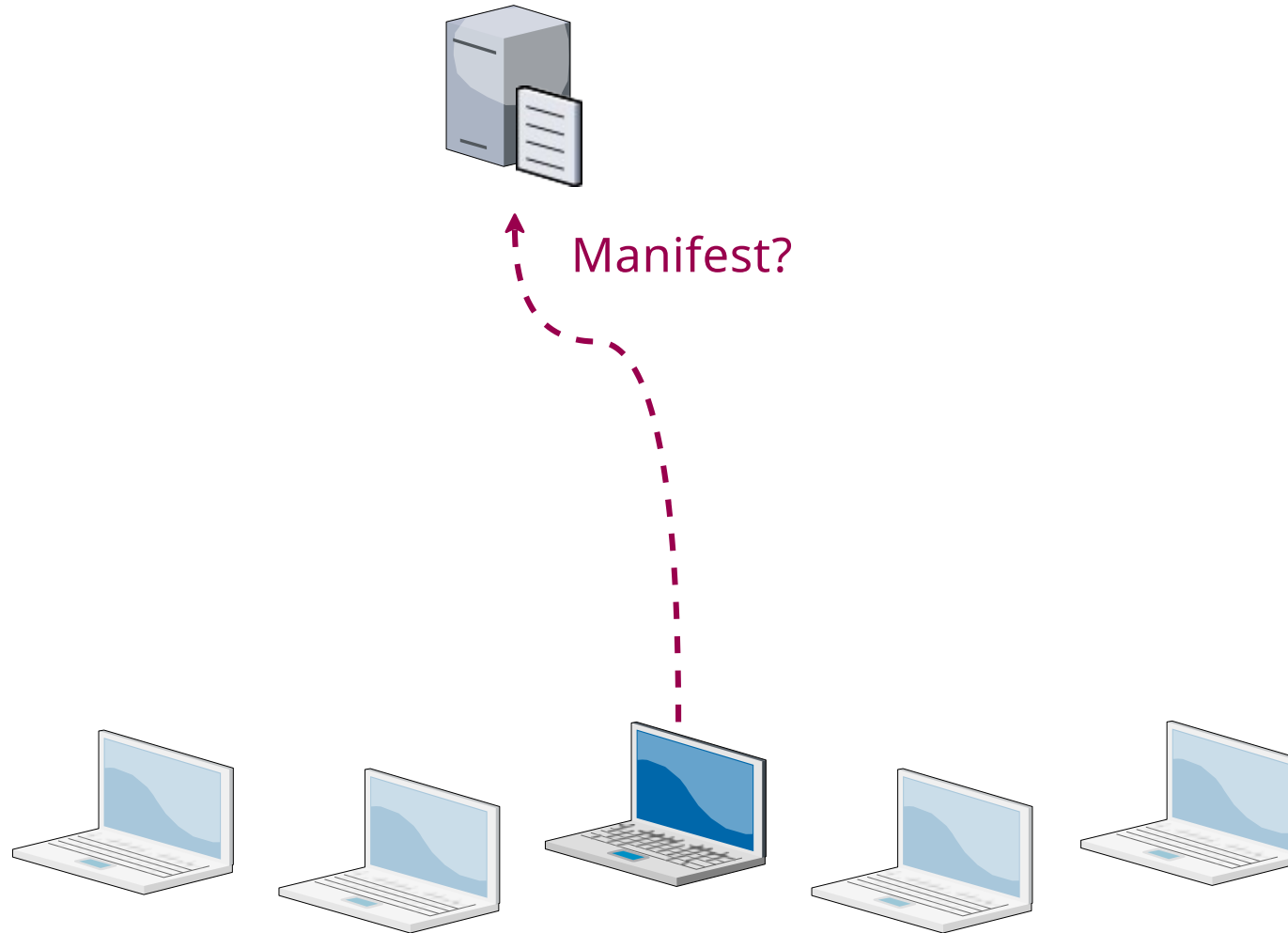
Back Front



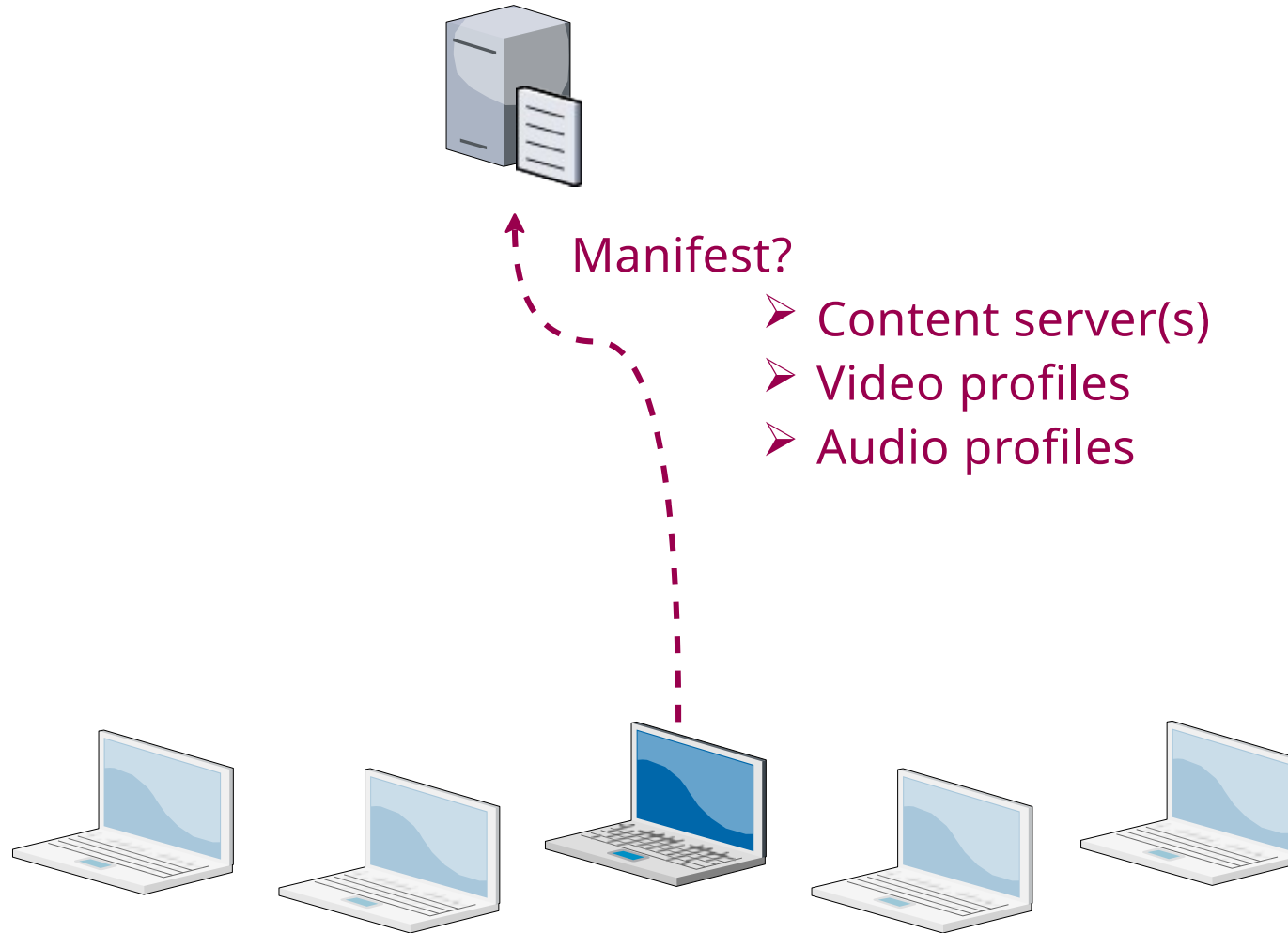
Metadat a



Metadata

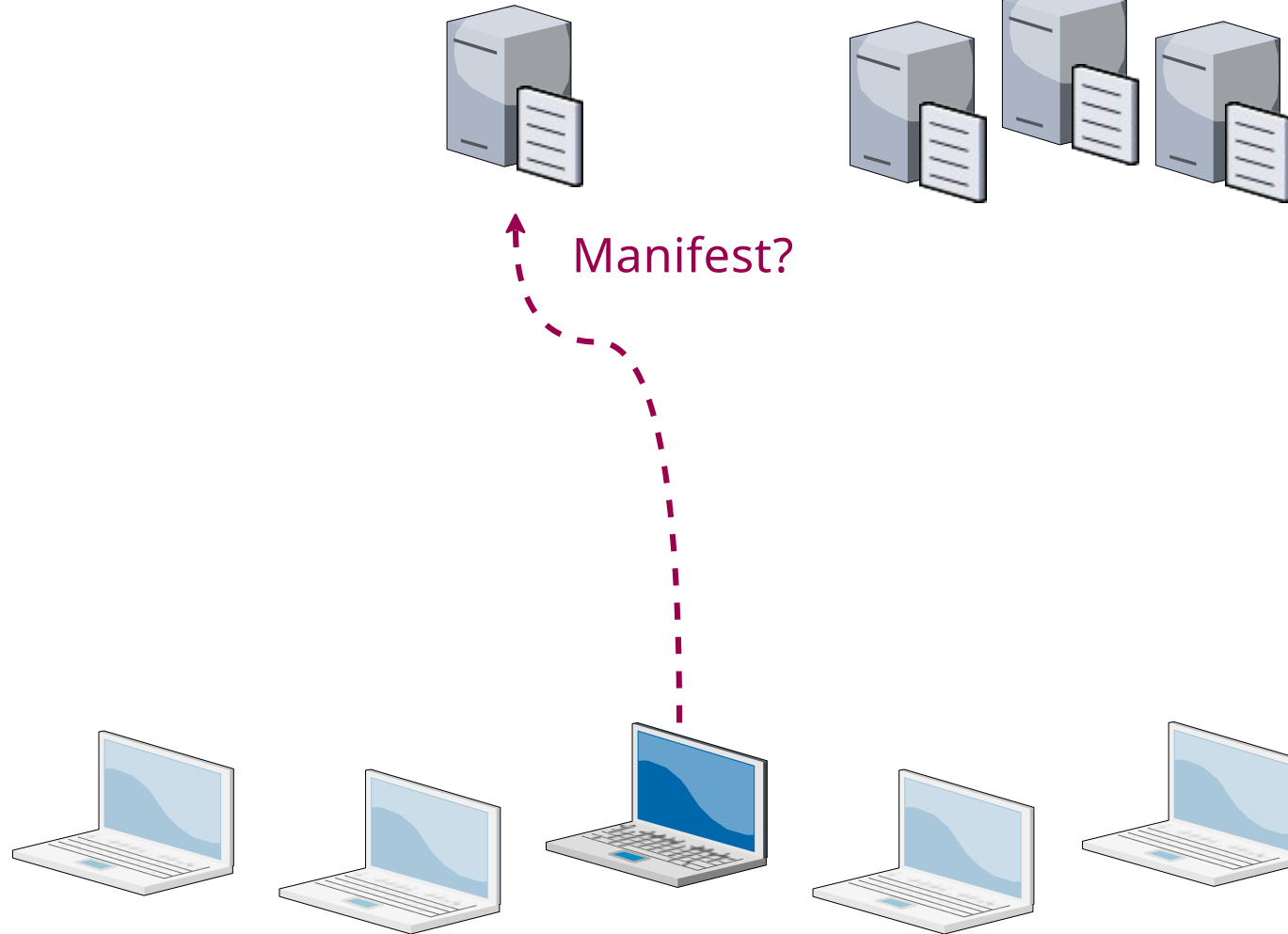


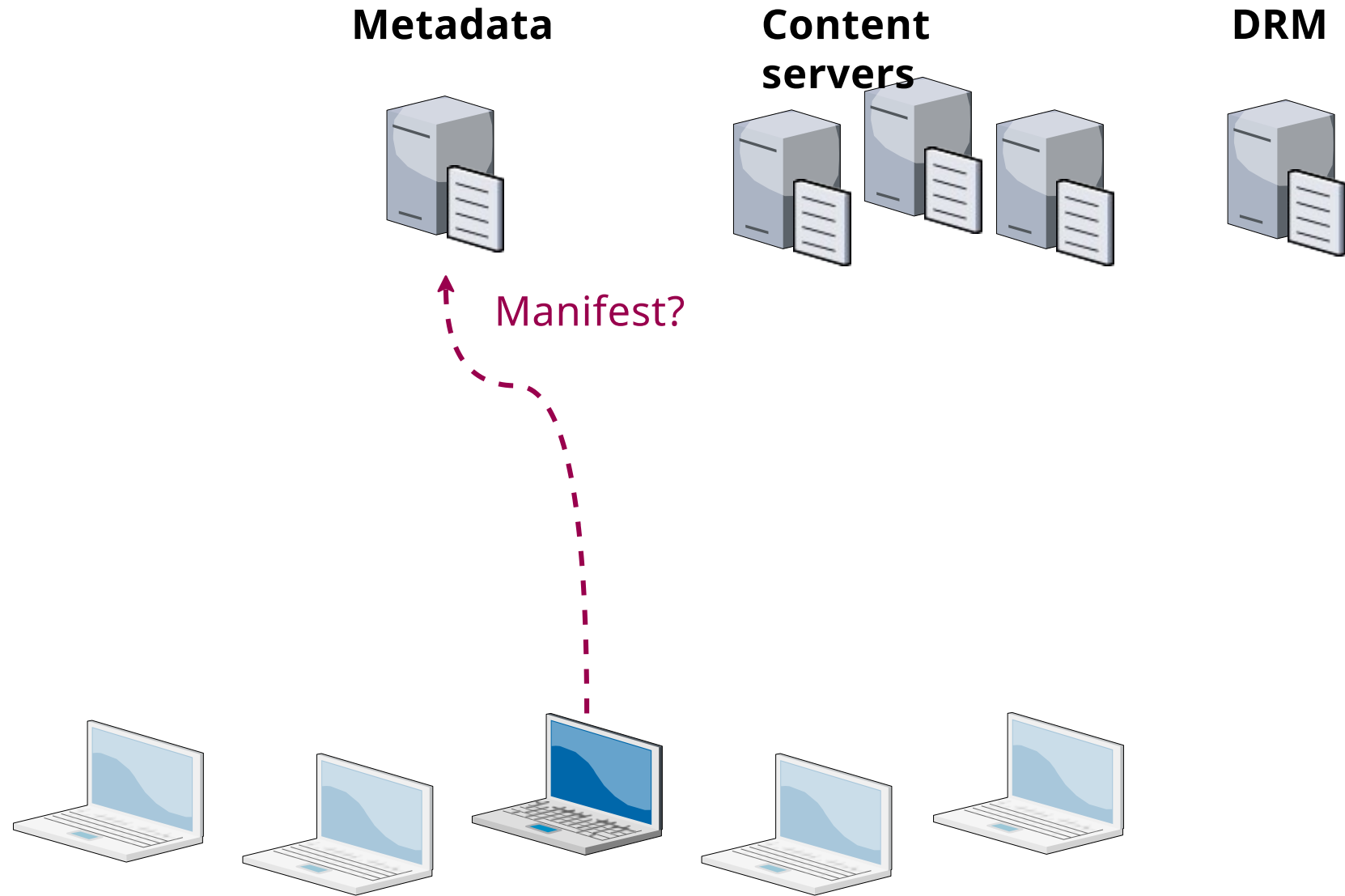
Metadata

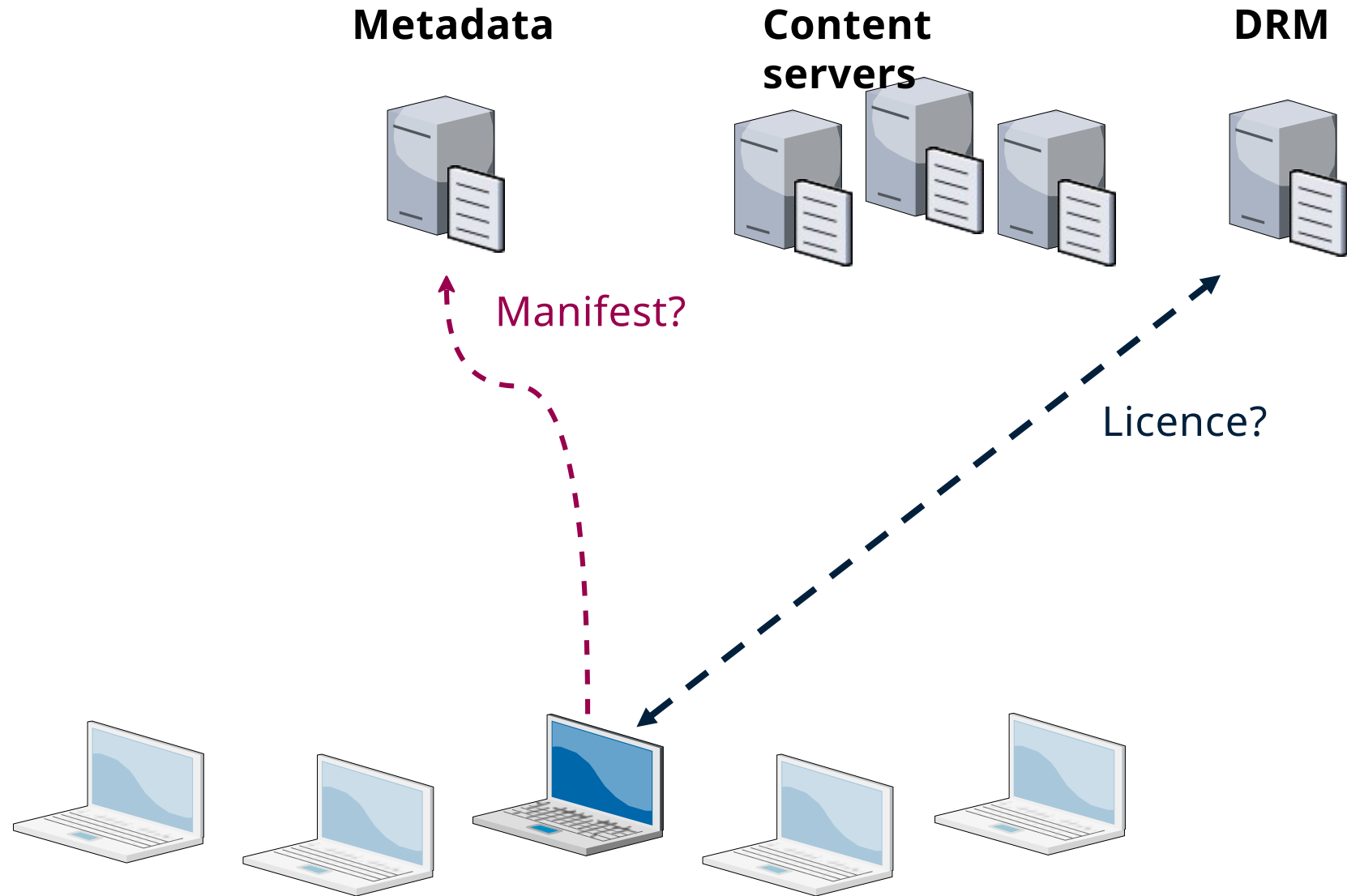


Metadata

**Content
servers**







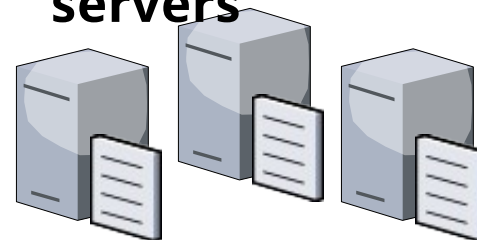
Tracker



Metadata



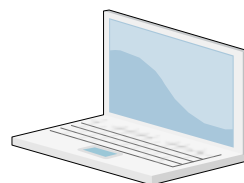
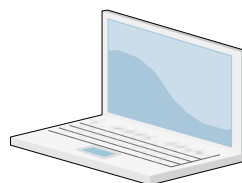
**Content
servers**

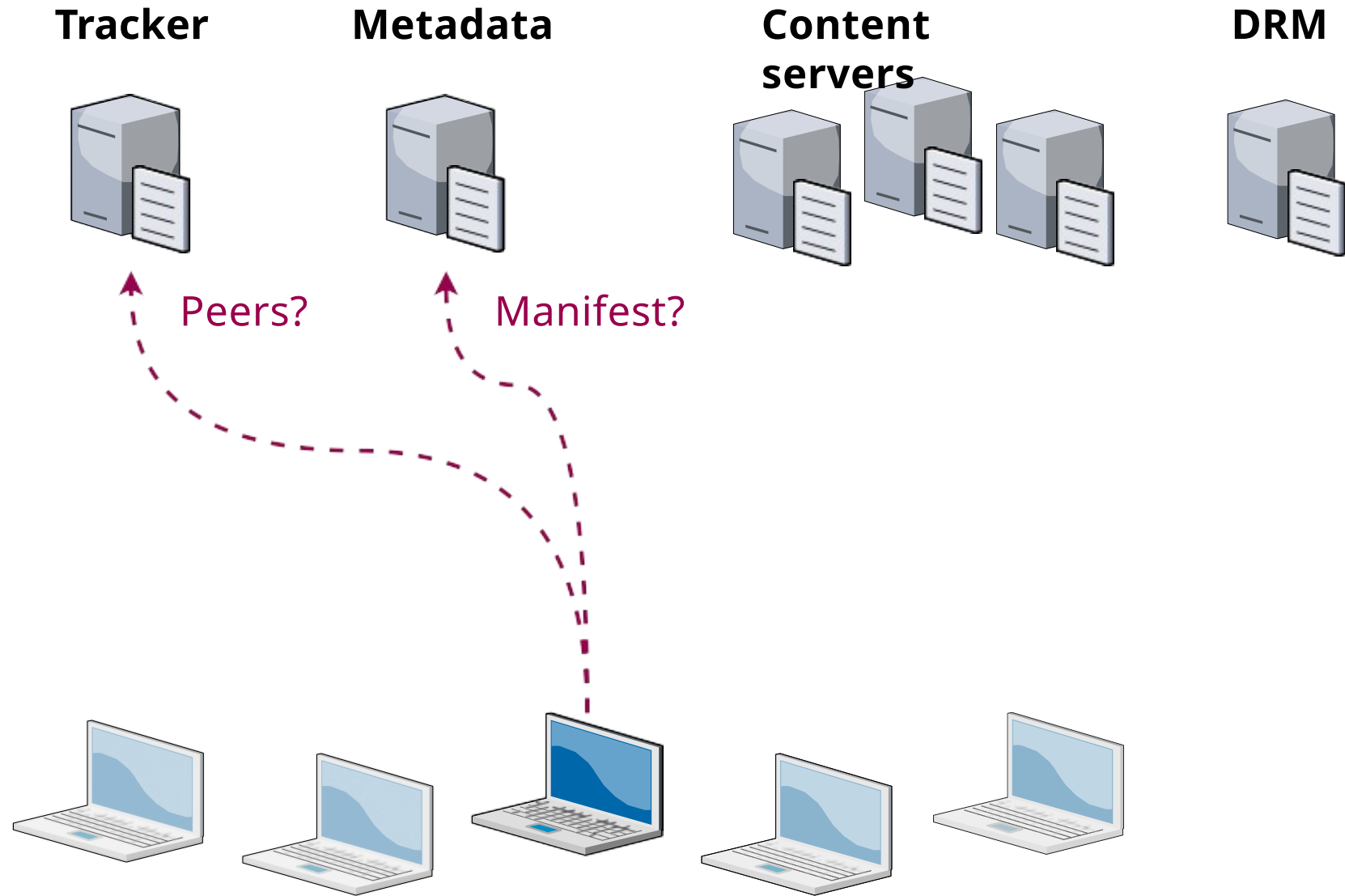


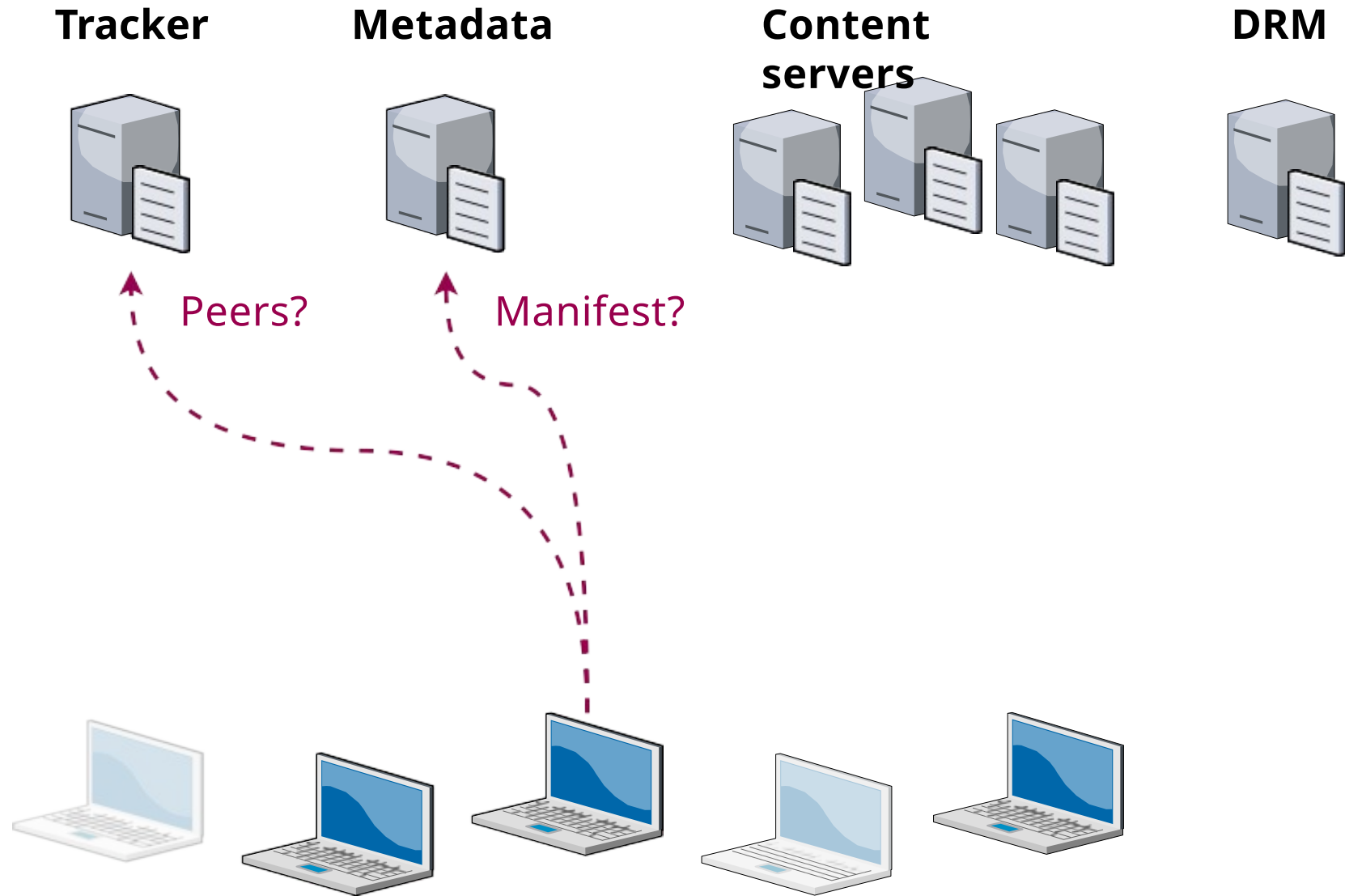
DRM

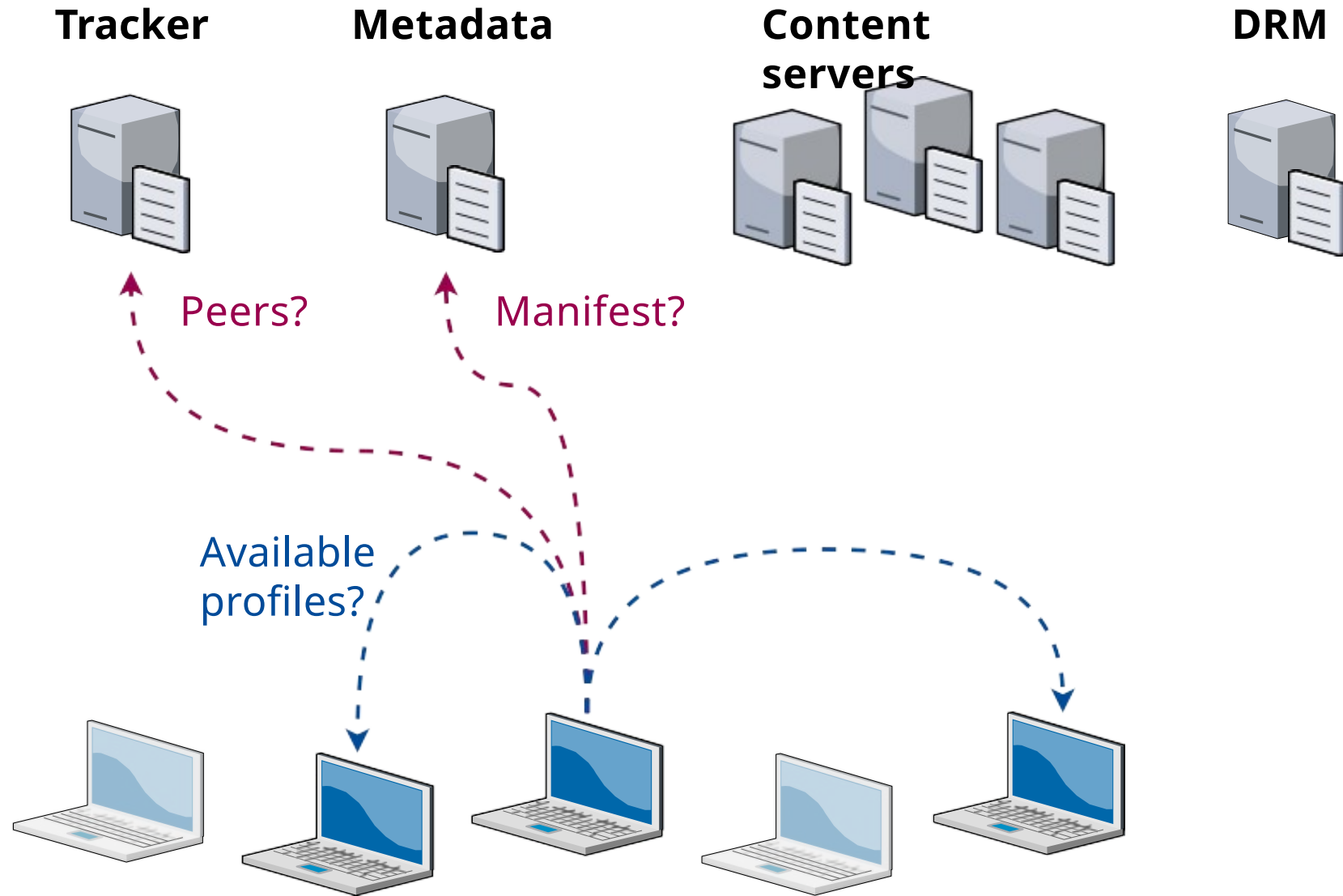


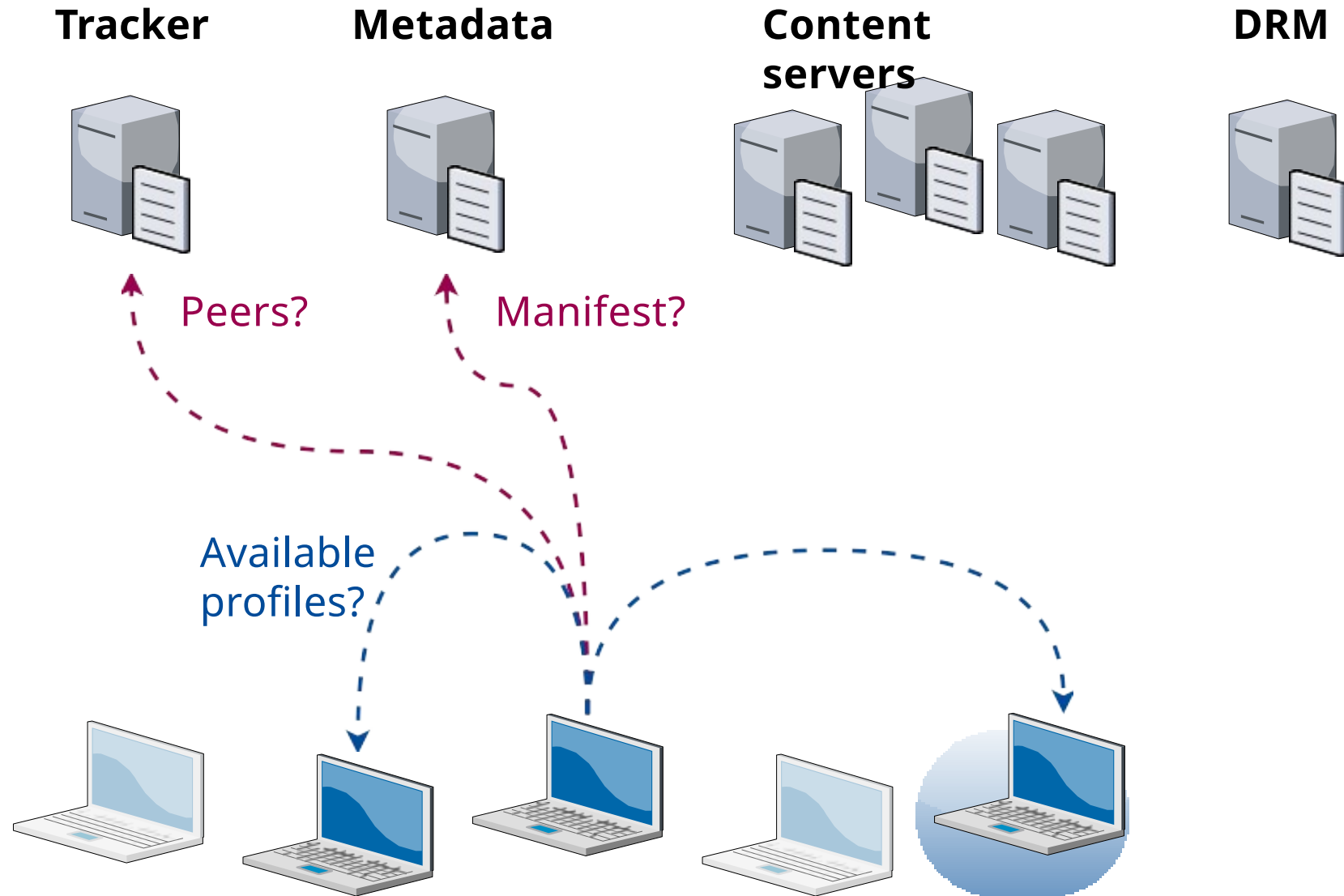
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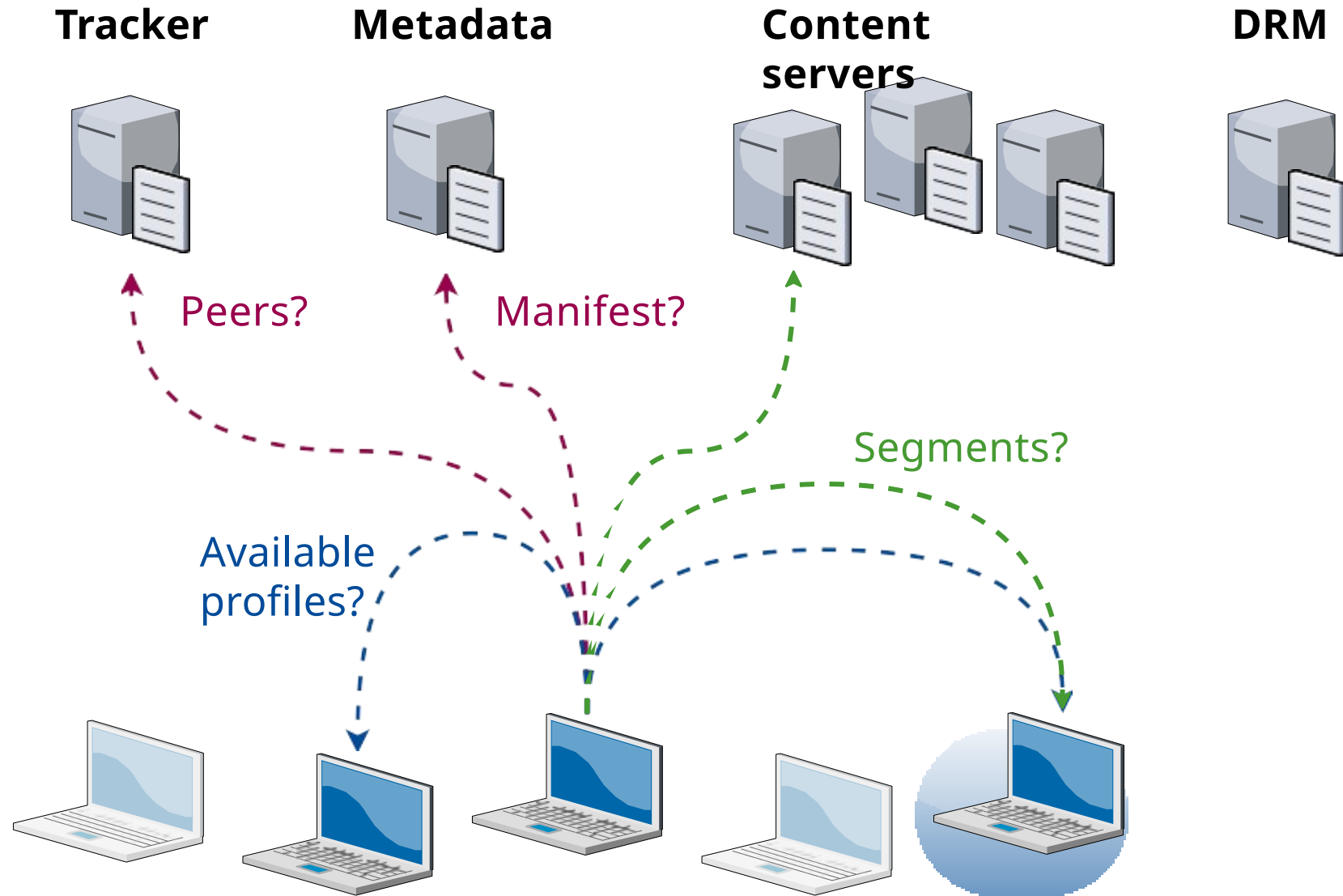


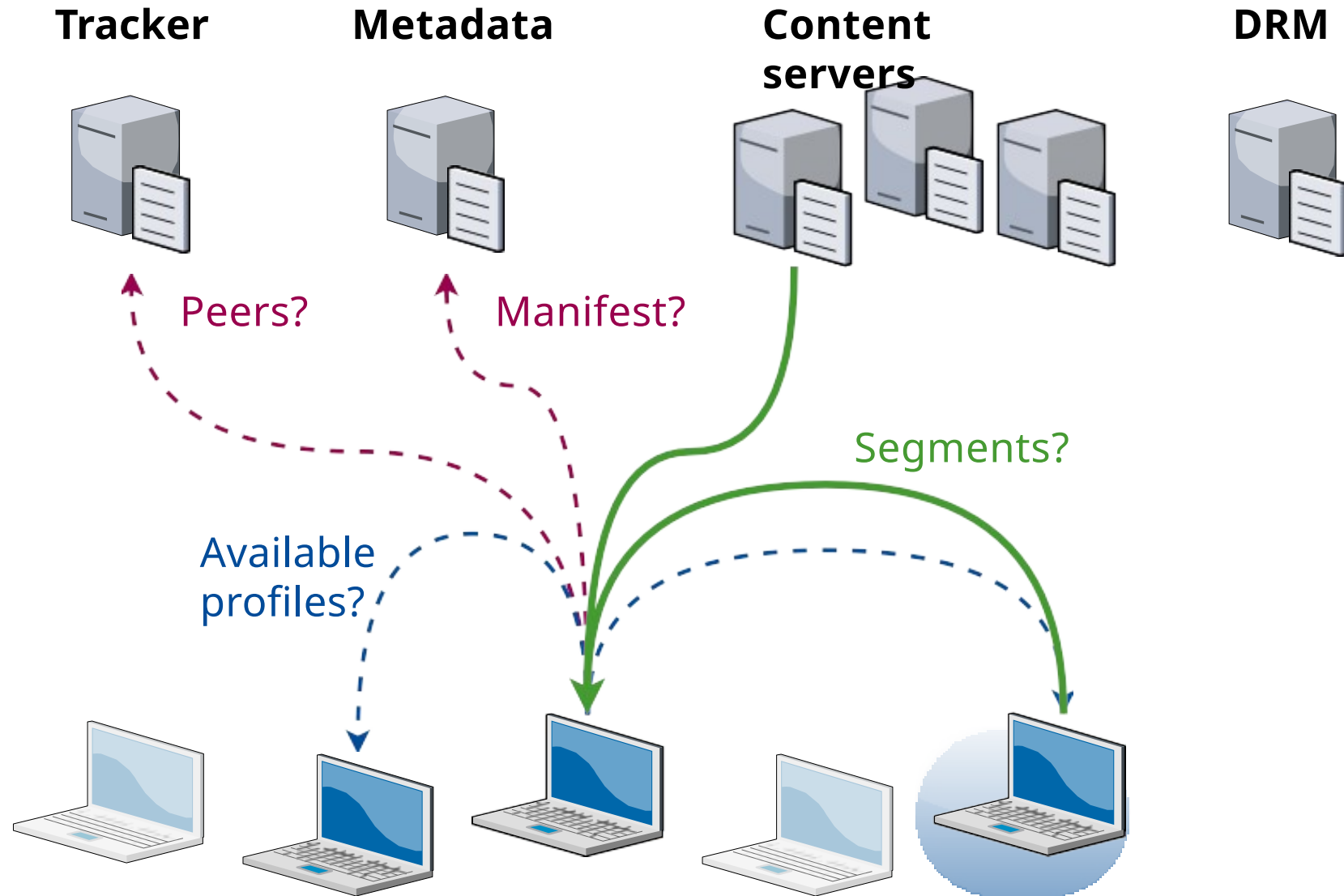










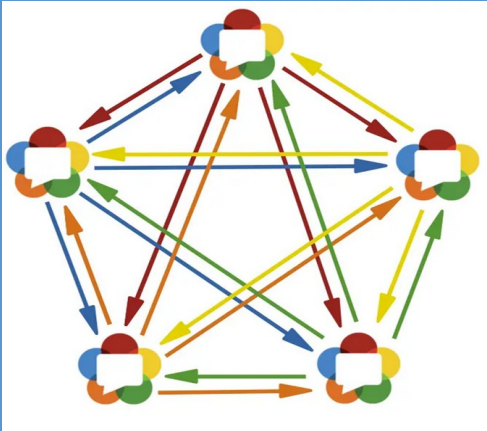


PART 7

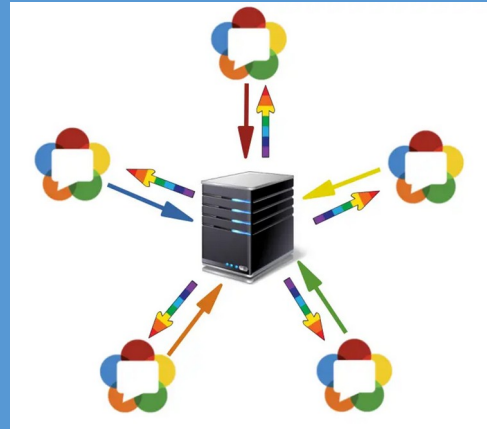
WEBRTC



TOPOLOGIES AND MEDIA SERVERS



P2P MESH



MCU



SFU

Reach out to me

Unity building – 1st floor mezzanine
simon.da-silva@ubisoft.com



Simon Da Silva

Software Engineer
BDX

Teams