UNIVERSITÉ CÔTE D'AZUR

ÉCOLE UNIVERSITAIRE DE RECHERCHE
SYSTÈMES NUMÉRIQUES POUR L'HUMAIN

Module:
Multimedia Networking

Ubinet master 2024-25

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E316 Templiers

https://lms.univ-cotedazur.fr/2024/course/view.php?id=14867

Plan of the module

1. Content Distribution Networks (CDNs)
    a.   Motivation
    b.   How a CDN works
2. Video Streaming
    a.   Overview of HTTP-based video streaming
    b.   Quality of Experience
    c.   Streaming strategies
    d.   HTTP Adaptive Streaming (HAS)

DISCLAIMER: Small changes are still possible

Evaluation

- 1 exam, 2-hours (50%)
  - Only one A4 sheet with personal notes on ONE side for the exam plus one calculator are allowed.
  - Other course documents (slides, student notes) are NOT allowed.
  - Mobile phones, tablets and laptops must be <u>turned off</u> and put away.
  - Start to answer in the space provided at the end of the questions. Don't forget to indicate the question number you reply.

Evaluation

- 2 Evaluated Labs (50%)
  - Two-people groups
    - Give names before Lab 1
    - No changes allowed after Lab 1
  - Lab1 about Content Distribution Networks (CDNs)
  - *Lab2 about HTTP Adaptive Streaming (HAS)* *(subject to confirmation)*

Calendar *(tentative)*

- Session 1: Content Distribution Networks Unit
  - Motivation, CDN basics, Server Selection
- Session 2: Content Distribution Networks Unit
  - Content storage *(with exercises session)*
  - Overlay Routing, Akamai example
- Session 3: Content Distribution Networks Unit
  - *Lab 1: Finding the content in CDNs*
- Session 4: Video Streaming Unit
  - Video Streaming: Overview, Quality of Experience

Calendar *(tentative)*

- Session 5: Video Streaming Unit
  - HTTP based Adaptive Streaming (HAS)
- Session 6: Video Streaming Unit
  - *Lab 2: HTTP Adaptive Streaming*
- Session 7: Video Streaming Unit
  - *Lab 2: HTTP Adaptive Streaming (continued)*
- **Session 8: EXAM**

Sources

- G. Urvoy-Keller and L. Sassatelli, *Video streaming*, lecture M2 Ubinet, UNS, 2014
- M. Siekkinen, *Video streaming*, lecture Aalto Univ., 2014
- H. Riiser, *Adaptive Bitrate Video Streaming over HTTP in Mobile Wireless Networks*, PhD thesis, Univ. of Oslo, 2013
- Z. Morley Mao, *Multimedia Networking*, lecture, lecture Univ. of Michigan
- *Video Communications and Video Streaming Over Internet: Issues and Solutions*, lecture Sharif Univ. of Technology
- A. C. Begen and T. Stockhammer, *HTTP Adaptive Streaming: Principles, Ongoing Research and Standards*, ICME 2013
- S. Akhshabi, S. Narayanaswamy, A. C. Begen, C. Dovrolis, *An experimental evaluation of rate-adaptive video players over HTTP*, Elsevier SP, Oct. 2011
- *Computer Networking: A Top-Down Approach* (7th Edition) by James Kurose
- C. Wilson, CS 4700 / CS 5700, *Lecture 15: Content Delivery Networks*
- Mike Freedman, COS 461: *Computer Networks, Content Distribution Networks (CDNs)*
- And others along the way…