

CASE STUDY 5

Delivering Social Multimedia Content with Scalability

CS Summary – 4th Grant Period

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Motivation

Multimedia content delivery technologies: essential for a wide range of innovative services-multimedia social networks

P2P video streaming / IPTV / interactive online games /cloud multimedia content delivery / content-centric networks

Network infrastructures: Content Delivery Networks (CDNs)

- proliferation of smartphones/ cheap broadband connections
- free short clip and streaming platforms (*100 hours of video content uploaded in YouTube per minute*)
- multiplication over popular **Online Social Networks (OSNs)** (*500 million tweets per day, of which more than 400 tweets per minute include a YouTube link*)
- video stalling events

CDNs need to cope with the cost-efficient prefetching of voluminous bandwidth-demanding content.

Topics & Main problems

- Content Delivery
- Edge /Fog Computing
- Points of Presence
- User Generated Content Delivery Optimization
- Reduce Environmental Impact (Server Location)
- Data Scalability (Time Threshold)
- Data Localization
- Energy Efficiency / Consumption
- Data/ System Redundancy
- Time Critical / Self-adaptive system (high-level configurations should address low-level needs)

TOPICS

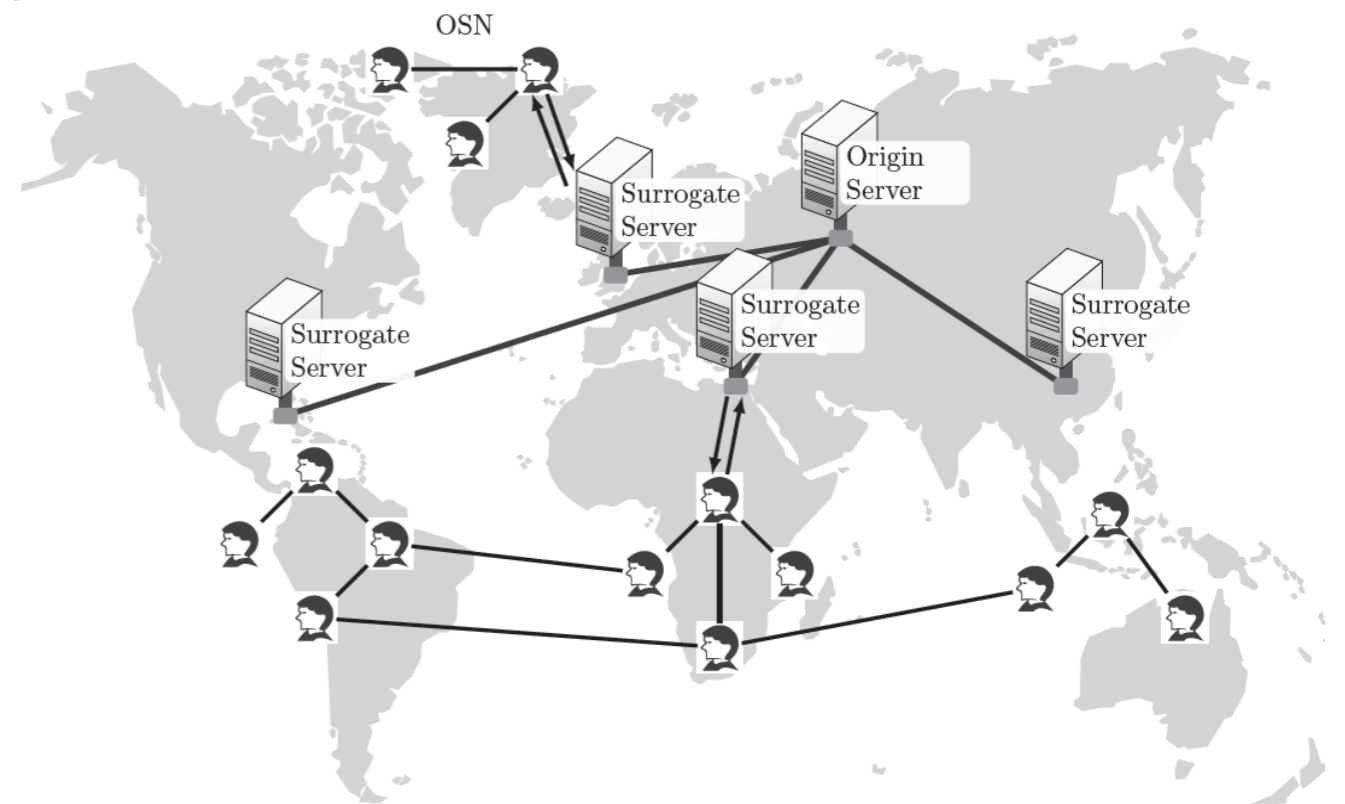
MAIN PROBLEMS

Existing solutions

- Network Caching algorithms
- Holistic (software / infrastructure) approach in optimizing energy consumption
- SWITCH approach for time critical and self-adaptive cloud applications
- Data kept in memory instead of hard drives

Proposed solutions

- Design an holistic approach combining application and infrastructure
- Applications of heuristics to build prefetching decisions
- Use of a realistic industrial application as a testbed for the developed framework



Work results according to Workplan till end of February 2018

- Survey of the SotA on Challenges for future content-delivery data centers (published) ✓
- Identify journal special issues on topic related to the CS ✓

Publications (cHiPSet):

1. I. Kilanioti, A. Fernández-Montes, D. Fernández-Cerero, C. Mettouris, V. Nejkovic, R. Bashroush, G. A. Papadopoulos, A Survey on Cost-effective Context-aware Distribution of Social Data Streams over Energy-efficient Data Centers, ELSEVIER SIMPAT Special Issue on Modeling and Simulation of Cloud Computing and Big Data, In press, DOI: 10.1016/j.simpat.2018.11.004.
2. I. Kilanioti and G.A. Papadopoulos, Content Delivery Simulations supported by Social Network awareness, Simulation Modelling Practice and Theory Journal - SIMPAT Elsevier, Volume 71, February 2017, Pages 114-133, Elsevier.
3. I. Kilanioti and G. A. Papadopoulos, Delivering social multimedia content with scalability, in Resource Management for Big Data Platforms: Algorithms, Modelling and High Performance Computing Techniques, Springer Computer Communications and Networks Series, Eds. J. Kolodziej, Florin Pop and B. di Martino, Springer, 2016, ch. 18.
4. I. Kilanioti and G. A. Papadopoulos, Predicting video virality on Twitter, in Resource Management for Big Data Platforms: Algorithms, Modelling and High-Performance Computing Techniques, Springer Computer Communications and Networks Series, Eds. J. Kolodziej, Florin Pop and B. di Martino, Springer, 2016, ch. 20.

Areas of expertise - Collaborations



- Network routing
- Security issues
- Energy efficiency
- Digital Interaction Intelligence
- Social Network Analysis
- Multimedia content