

# Fighting packet storms in mobile networks with information-centrism

Vaggelis G. Douros, Nikos Fotiou,  
George C. Polyzos

Mobile Multimedia Laboratory  
Athens University of Economics and Business

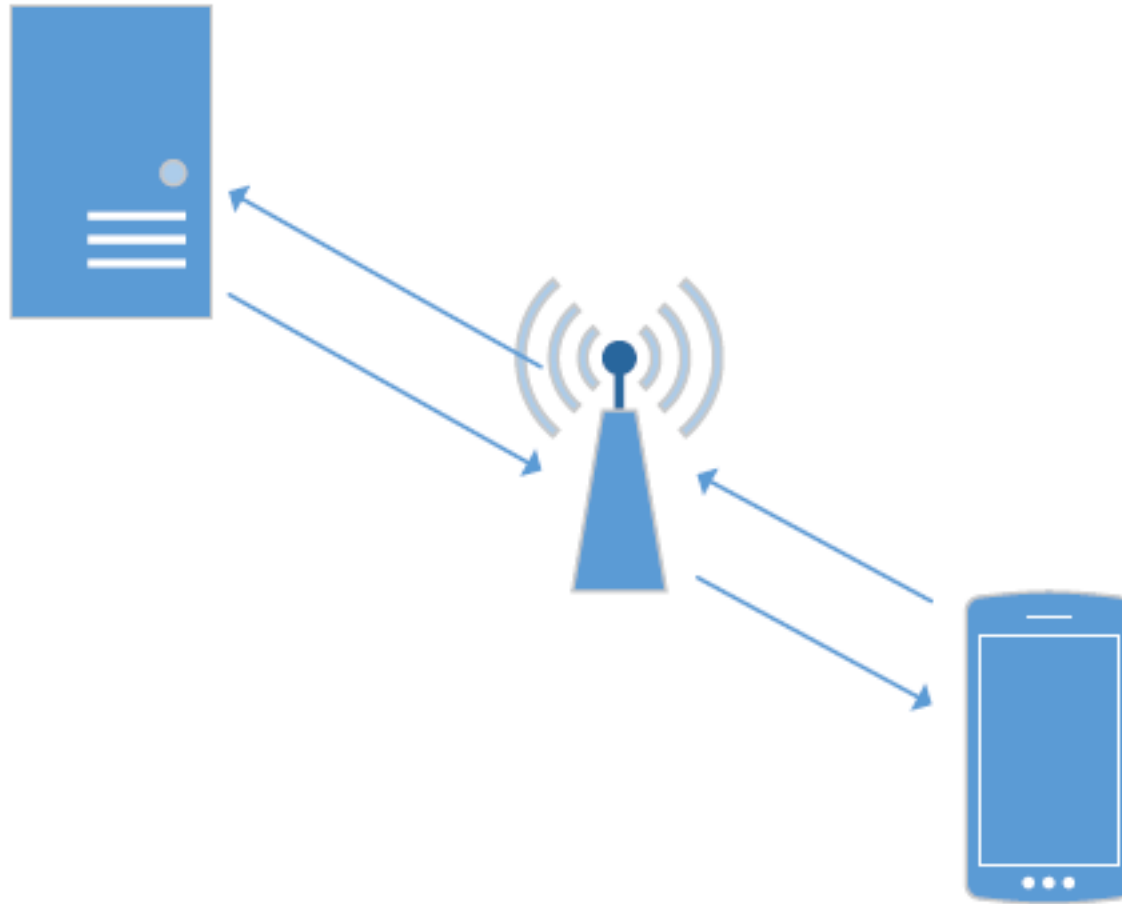
# The problem

- More than one third of the Internet users connect mostly through a smartphone
  - ... but smartphone applications are not mobile network-friendly
- Smartphones generate significant signaling traffic
  - “Signaling traffic consists of the small background messages exchanged between a handset and a network to set up or end a data connection”
- Signaling load is increased up to 20 times when services are “down”

# Is it serious?

- 2012: DoCoMo outage due to android, 2.5m subscribers affected
- Verizon Wireless suffered from similar problems

# An example



# Signaling

- Each polling period:
  - MN->BS
  - BS->Server
  - Server->BS
  - BS->MN

# Signaling with ICN v1

- Initially:
  - MN->BS
- Every polling period
  - BS->Server
  - Server->BS
- If there is an update
  - BS->MN
  - MN->BS
  - BS->Server
  - Server->BS
  - BS->MN

# Signaling with ICN v2

- Initially:
  - MN->BS
- Every polling period
  - BS->Server
  - Server->BS
- If there is an update
  - BS->MN

# Some analytical results

- Let  $N$  be the number of polling periods
- Let  $M$  be the times there is an update
- Number of messages in the access network
  - Usual case:  $2N$
  - ICN v1:  $3M$
  - ICN v2:  $M$
- If  $M = 0.4N$ 
  - ICNv1 40% improvement
  - ICNv2 80% improvement



# Future Steps

- Modifications of applications
- Mobile access network becomes aware of the application layer
- Security concerns

Thank you