QoE in Wireless Pricing

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What affects my QoE?

• (Arguably) three important factors
  – What I’m viewing
  – What the network is doing
  – What I’m paying
End User Pricing QoE

• Bad revenue
  – Paying $100 to send an email after landing in Europe

• Good revenue
  – Paying extra so I can fly a drone with my phone
Three Research Directions From White Paper

• Quota Dynamics

• Content Provider QoE

• Unified framework for pricing optimization
Quota Dynamics

• Call duration as function of remaining pre-paid balance (voice)
Quota Dynamics

- Possible types of data users

= “conservative”

= “reckless”

= “oblivious”

= “sporadic”
Content Provider QoE
Is Sponsoring Beneficial to Content Provider?

Fraction of revenue that Content Provider should pay for sponsoring

Fractional increase in traffic due to sponsoring
Case Study for Buzzfeed

- If sponsoring cost is $15 per GB:
  - Only worthwhile if traffic increase is 375%
- If sponsoring cost is $5 per GB:
  - Worthwhile if traffic increase is 33%
Unified Pricing Model

• Most pricing models studied in isolation
  – Shared-data plans
  – Quota trading
  – Sponsored content

• Can we put them in common framework to compare the QoE they offer to end users and Content Providers?
Unified Pricing Model

• Idealized pricing scheme
  – For each transaction, charge end user and Content Provider according to their utility

• How close can we come with practical schemes?

$$\max_{Q} \sum_{q_{ik} \in Q} (U_i(q_{ik}) + \max_j V_j(q_{ik}) - C(Q))$$