Paris Metro Pricing

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Motivation

- Agreed goal: differentiated services in the future Internet

  ⇒ Several QoS mechanisms developed

  – Most mechanisms involve complicated and costly implementations

  ⇒ Usage sensitive pricing needed

  – Differentation achieved by allocating limited resources

Paris Metro Pricing (PMP)

- Former pricing scheme in the Paris Metro:
  - First and second class cars identical, only ticket prices different
    - » First class cars attracted fewer people and were on average less crowded

⇒ Paris Metro Pricing proposal [Odlyzko]:

- Partition current Internet into several parallel best-effort subchannels with different usage prices
  - ⇒ Service differentiation through price differentiation
  - ⇒ Sacrifices some utilization efficiency of the network

Technical issues

- Setting the parameters
  - Number of channels
  - Capacities and prices of channels
- Implementation
  - Major change: charging infrastructure
  - Additional changes:
    - Router software
    - Application software
  - Open issues: ISP interoperability, revenue division

Business issues

- Consumer response
  - Willingness to pay for best-effort service?
  - Usage-based pricing vs. consumer preferences
  - Fairness
- Feasibility of PMP: game theoretical studies
  - [Gibbens et al.]: Social planner and monopolist will wish to provide several classes, but duopolists won't
  - [Cao & Shen]: Leader-follower game leads to optimal solution with identical prices in PMP!

Conclusion

- Paris Metro Pricing is the simplest differentiated services solution
  - Simplicity achieved at the cost of utilization efficiency of the network
  - Motivation: consumers prefer simplicity; networking is already seen to be too complicated
- Results of game theoretical studies on PMP depend on the chosen model