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
    – Differentiation 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

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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!

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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

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