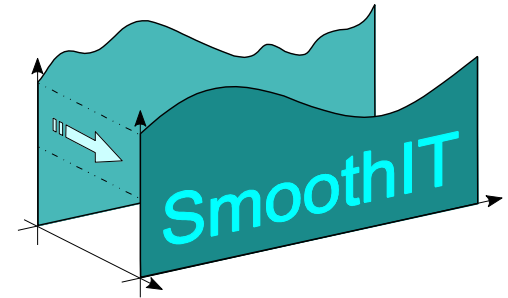


*Simple Economic Management Approaches of
Overlay Traffic in Heterogeneous Internet Topologies*
European Seventh Framework STREP FP7-2007-ICT-216259
<http://www.smoothit.org>



Design Principles for Future Internet

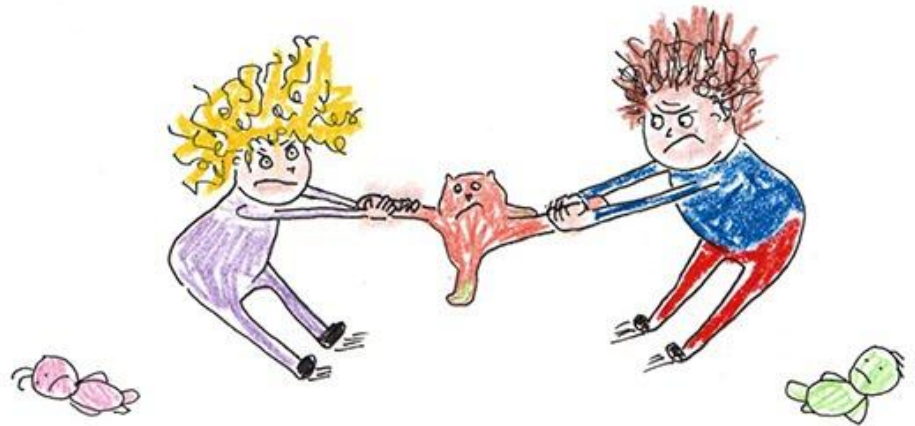
Ioanna Papafili, AUEB
Sergios Soursos, ICOM
Krzysztof Wajda, AGH
George D. Stamoulis, AUEB
Burkhard Stiller, UZH

FISE Workshop on
FI Design Principles
Brussels, Belgium
May **23**, 2011



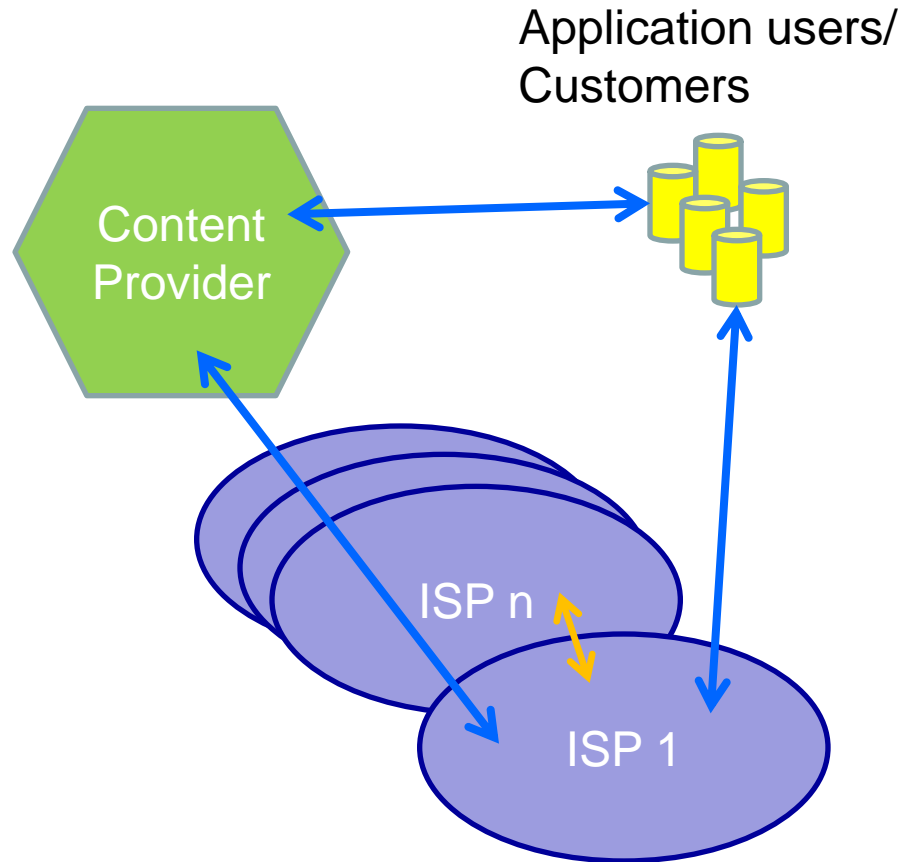
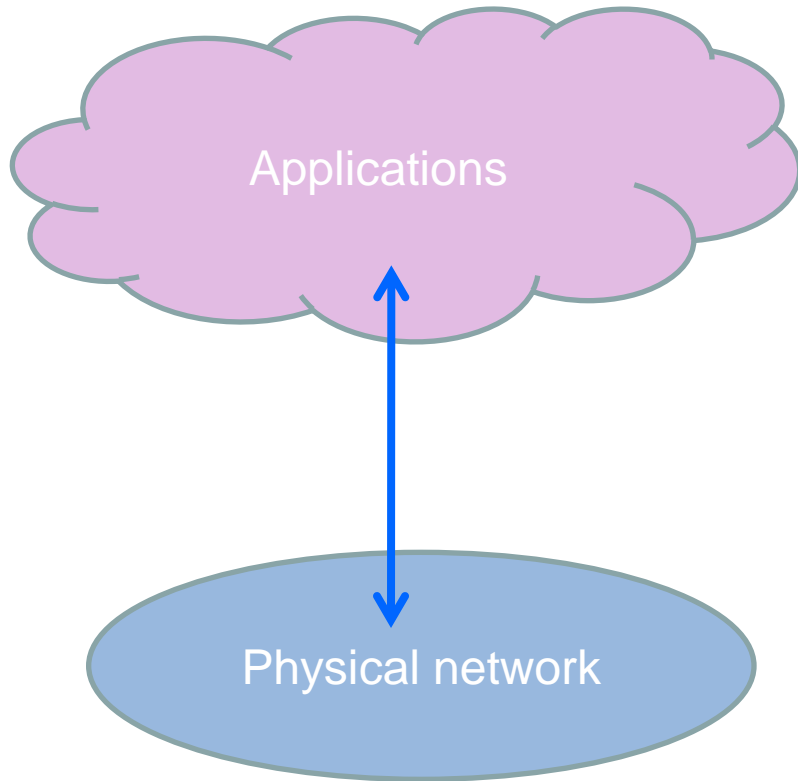
The Internet Ecosystem: Current and Future

- Many players acting simultaneously ...
 - Customers/Users
 - Providers
 - ISPs
 - Application providers
 - Over-the-top providers
 - Content providers
 - ...



- ... with conflicting interests → leading to **tussles**

Cross-layer & Cross-player



Information Asymmetry

- ❑ ISPs make routing decisions ignoring application requirements
- ❑ Applications (e.g. overlays) manage traffic do not take into account underlay characteristics
- ❑ What is needed?

FI Design Objectives

- ❑ **Cross-layer optimization**
 - Underlay-overlay

- ❑ **Cross-player optimization**
 - ISPs, Content Providers, End-Users

- ❑ **Promotion of mutually beneficial cooperation**
 - Among layers
 - Among players

FI Design Principles

- ❑ Allow the exchange of information among different players and layers
 - Reveal only **sufficient** information, no critical details
- ❑ If feasible, enable “All-Win”
 - Provide incentives to affect stakeholders’ behavior
- ❑ *Clark et al.*: **Do not dictate** the outcome, ...
permit players to express their preferences

Economic Traffic Management

- Employs **economic concepts** and **incentive-based mechanisms** to promote collaboration across layers and between players
- Target: “All (stakeholders)-Win” situation
- ETM Focused on P2P traffic, but...
applies also to CDN traffic, cloud etc.

Conclusion

- SmoothIT ETM mechanisms implemented as **complements** to current Internet architecture

- New design principles would allow:
 - Broader applicability
 - Richer intelligence
 - Higher efficiency in
 - performance
 - implementation
 - scalability
 - Lower costs

Thank you for your attention!