"Socializing SwarmTella: building social community networks for content distribution"

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Benchmarking of Future Content Distribution
Exploring the Limits of Selforganization?

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This talk is about "towards social aware content distribution networks"

the vast majority of network content is pull/interest-based

economics* argues for making the "long tail" of content available

at low transaction/network costs

to large numbers of small groups of only the most interested recipients.

* Anderson, C. *The Long Tail: How Endless Choice Is Creating Unlimited Demand. Random House, New York, 2006.*

**the Internet is already dominated by swarms
of network-coded content**

no longer e2e approach

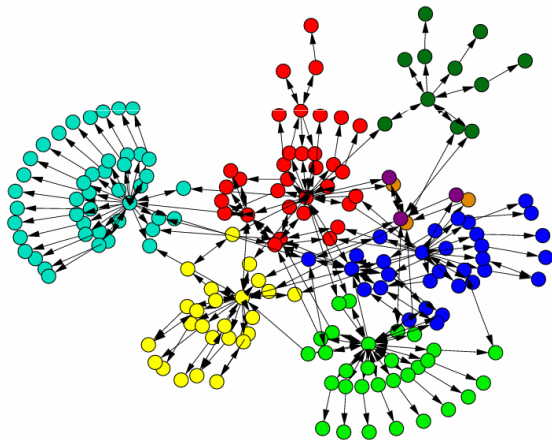**emanating from multiple sources**

Micro, community networks

the dynamics of social networks
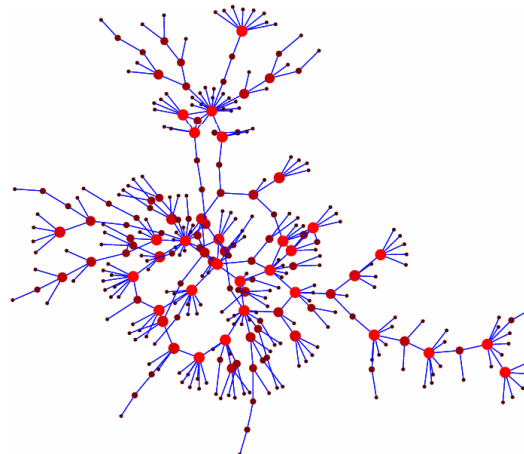
Macro, economics of swarms

how to incentivize ISPs, content providers, users
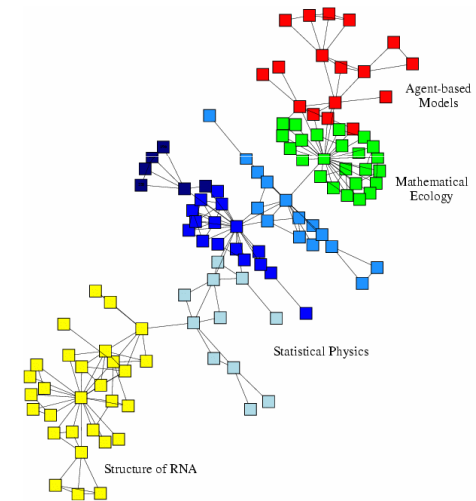
Micro, community networks

the dynamics of social networks

The Web Site
Newman and Girvan
Finding and evaluating community structure in networks
Physical Review E **69**, 026113 (2004).

Sexual contacts
Newman
The structure and function of complex networks
SIAM Review **45**, 167-256 (2003).

Interdisciplinary collaborations
Girvan and Newman
Community structure in social and biological networks
Proc. Natl. Acad. Sci. USA **99**, 8271-8276 (2002).

The dynamic of networks

◆ **Networks -> Topology + Function**

◆ **Topology (Physics, "scale free", "small worlds"…)**

◆ **Availability of large scale data -> topology**

◆ **Can we learn function from topology?**

◆ **Still missing -> connection between topology and function**

Community Networks

◆ **Many networks of interest in the sciences (social and biological networks) are found to divide naturally into communities or modules**

◆ **The problem of detecting and characterizing this community structure!**

◆ **Practical application**

   ❖ **Content distribution in DTN**

   ❖ **Exploiting social interaction in mobile systems**

   ❖ **Optimizing social aware overlays**

   ❖ **Next steps in CDN: metadata,pub/sub/interests.**

Socializing SwarmTella

◆ **CONTENT NoE Joint Research: UC3M and TUD**

◆ **Distributed mechanism for building communities based on end-users common interests on content**

◆ **Next steps:**

  ❖ **Building communities based on a mobile scenario**

  ❖ **Extending the interest on content to the interest on a service/node/resource**
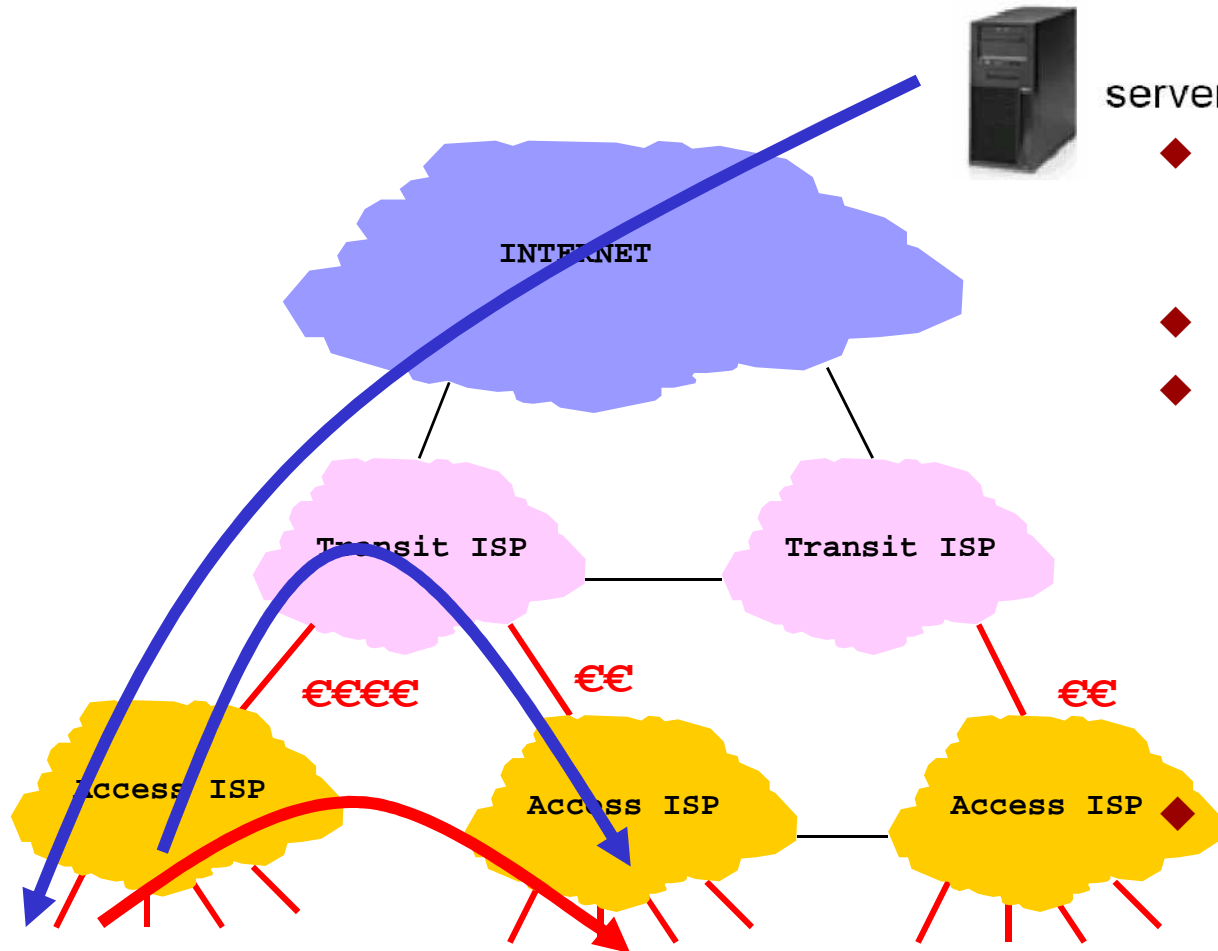
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server

INTERNET

Transit ISP

Transit ISP

€€€€

€€

€€

Access ISP

Access ISP

Access ISP

◆ **Filtering out P2P traffic**

  ❖ **But P2P increases access demands (€€€)**

◆ **Add caches**

◆ **Enrich connectivity**

  ❖ **Peering between access ISPs**

  ❖ **Difficulties on dimension networks and TE**

  ❖ **P2P is about cost shifting**

◆ **New techniques for peer selection**

  ❖ **Network-aided peer selection**

  ❖ **Prioritize local peers**

Conclusions

◆ **Exploiting the mobility and dynamis of social networks for optimizing the function of content distribution**

◆ **Micro perspective, building social community networks**

◆ **Macro perspective, taming the torrent, p4p, ietf/alto/tana**