

# Methodology issues and how to experiment

Stockholm, January 15, 2010



**THOMSON**

**TECHNICOLOR** 

**PPP**

# What does experimentation mean?

---

- Implement and test – validation
- Converged architecture
  - Partners agree to a common basis for their developments
- Facing reality
- Include (end) users

But also:

- Experimental platform is not a product!
- More work than expected
- More failures
  - always plan for multiple experiments



**THOMSON**

**TECHNICOLOR** 

**PPP**

# Why do we need experimentation?

---

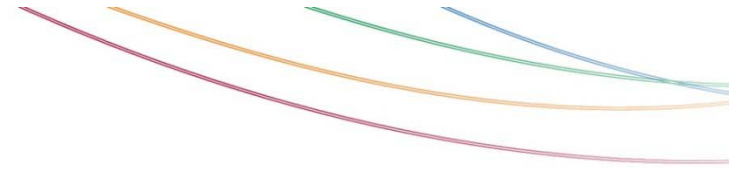
- **Beyond theoretical results**
- **Enforces collaboration between partners**
  - See Didier's presentation
- **Experimentation enforces usable project results**
  - Sustainability
  - Allows for global collaboration between projects – even though, this is very difficult!
- **For industry:**
  - Reduce time to market
  - But: IPR issues to be solved



**THOMSON**

**TECHNICOLOR** 

**PPP**



# Experience from NaDa, HAGGLE, and ANA



**THOMSON**

**TECHNICOLOR** 

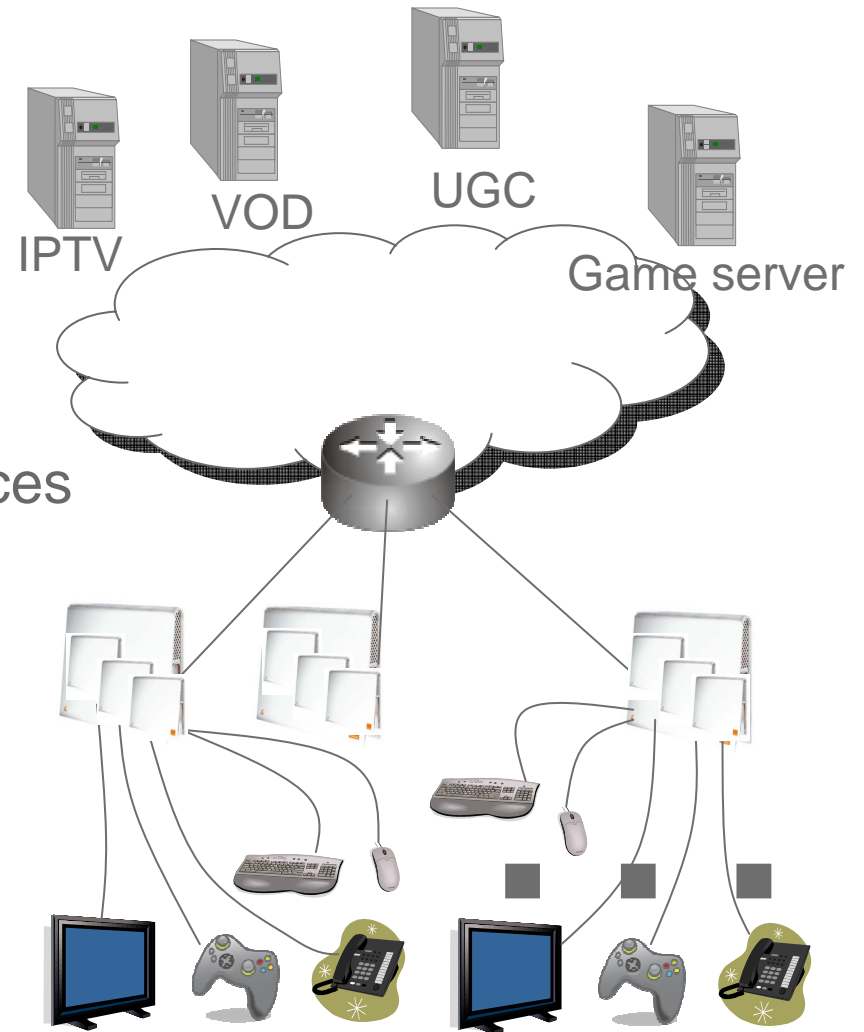
**PPP**

# Nano Datacenters

Virtualize box resources  
(memory, CPU, storage, b/w)

Benefits:

- Fast deployment of new services
- Isolation guarantees
- Enables new businesses:  
“Virtual ISP”



**THOMSON**


**TECHNICOLOR**

**PPP**

# Haggle

- Mobile social networking
- Asynchronous messaging
- Epidemic newsgroups
- Ad hoc voting

**MobiClique**



**Name: Alice**  
Status: Going to Barcelona  
Location: Paris, France

**MobiClique | Interest Groups**

- MobiClique Test & Feedback
- SIGCOMM 2009: Barcelona Res...
- SIGCOMM 2009: Visit Barcelona

**MobiClique | Vote**

- 13/08/2009
  - 09:00-18:10 MobiHeld
  - 09:00-18:00 VISA
  - 09:00-17:30 WOSN
  - 12:30-14:30 Lunch +2/-1
  - 19:30-23:59 Welcome Reception
- 14/08/2009
- 15/08/2009

Vote Menu

- Contacts (2/2 nearby)
- Interest groups (3/3 nearby)
- Inbox (1 unread messages)
- Vote (4 active votes)

Edit Profile

**MobiClique | Contacts**

- Bob
- ? Charlie

Send Message Menu

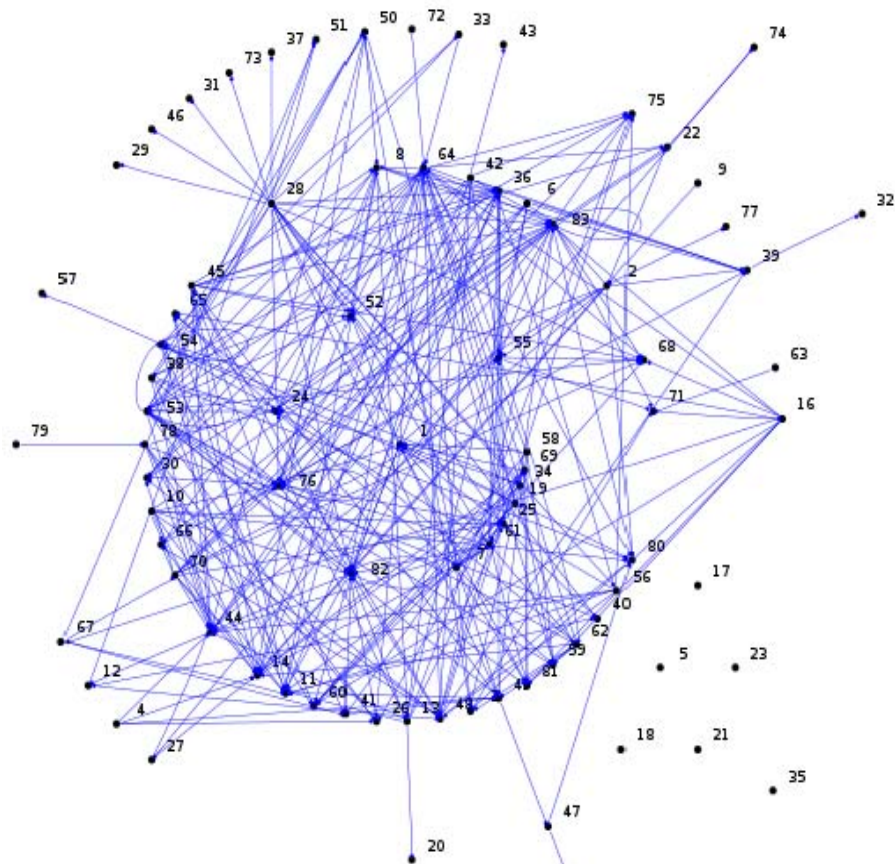
**MobiClique | Inbox**

- [14:47] Bob: Re: hey
  - [14:47] Bob: Re: hey
  - [14:44] Me: hey
- [14:43] MobiClique Test & Feedback
  - [14:43] Charlie: hello world

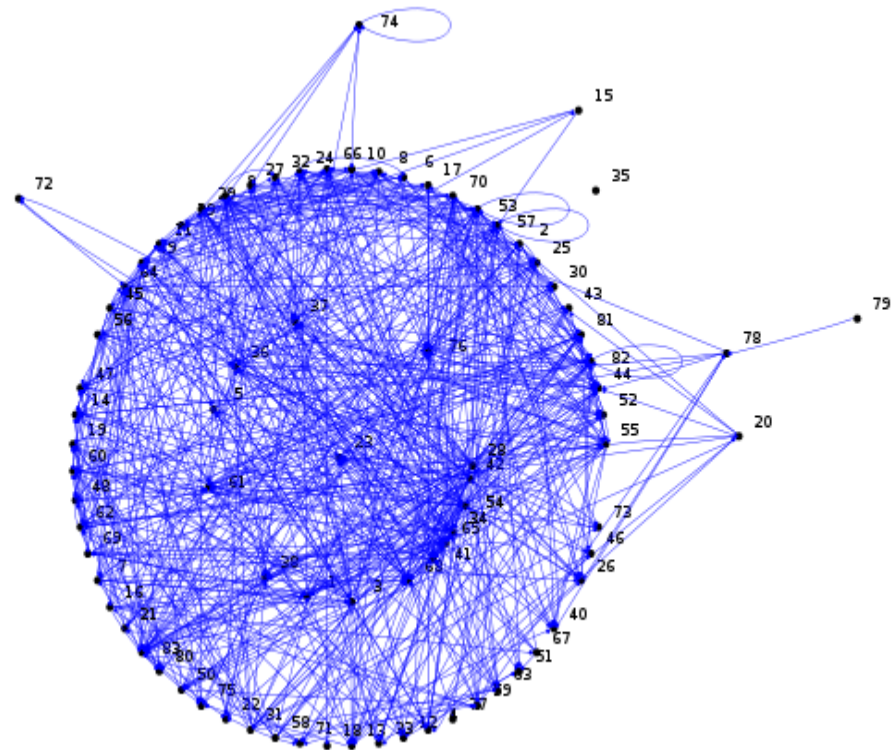
Show Menu



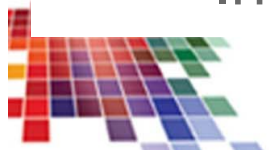
# Social Network Evolution (SIGCOMM 09)



Initial Friendship Graph



Final Friendship Graph

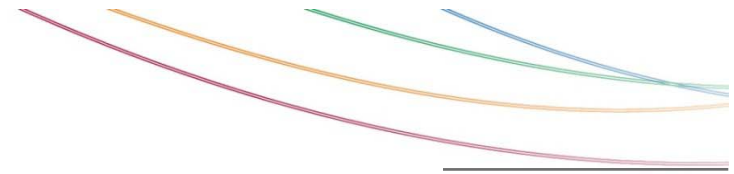


**THOMSON**

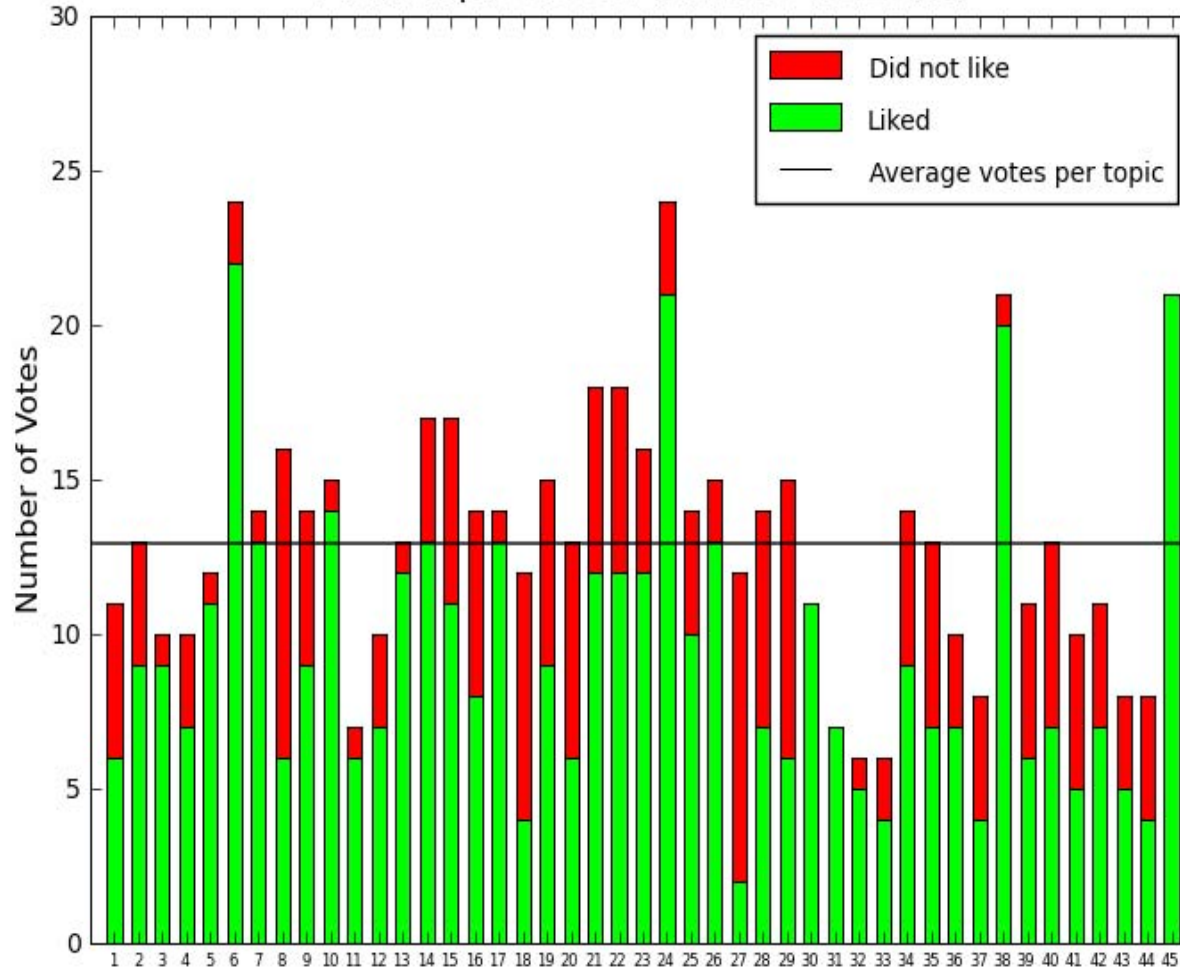
**TECHNICOLOR**

**PPP**

# Votes (SIGCOMM 09)



MobiClique SIGCOMM 2009 Vote Final



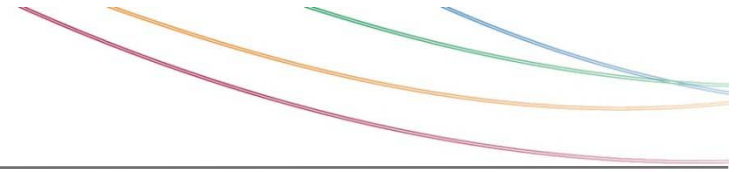
**THOMSON**

**TECHNICOLOR**

**PPP**

# ANA

---



- 3 implementation iterations
- Successful development of framework
- Many protocols and apps available
- Major challenge:
  - Development environment is key for success
  - Focus changed from autonomic to architecture
  - Platform for wide use of ideas (from Linux router to iPhone)



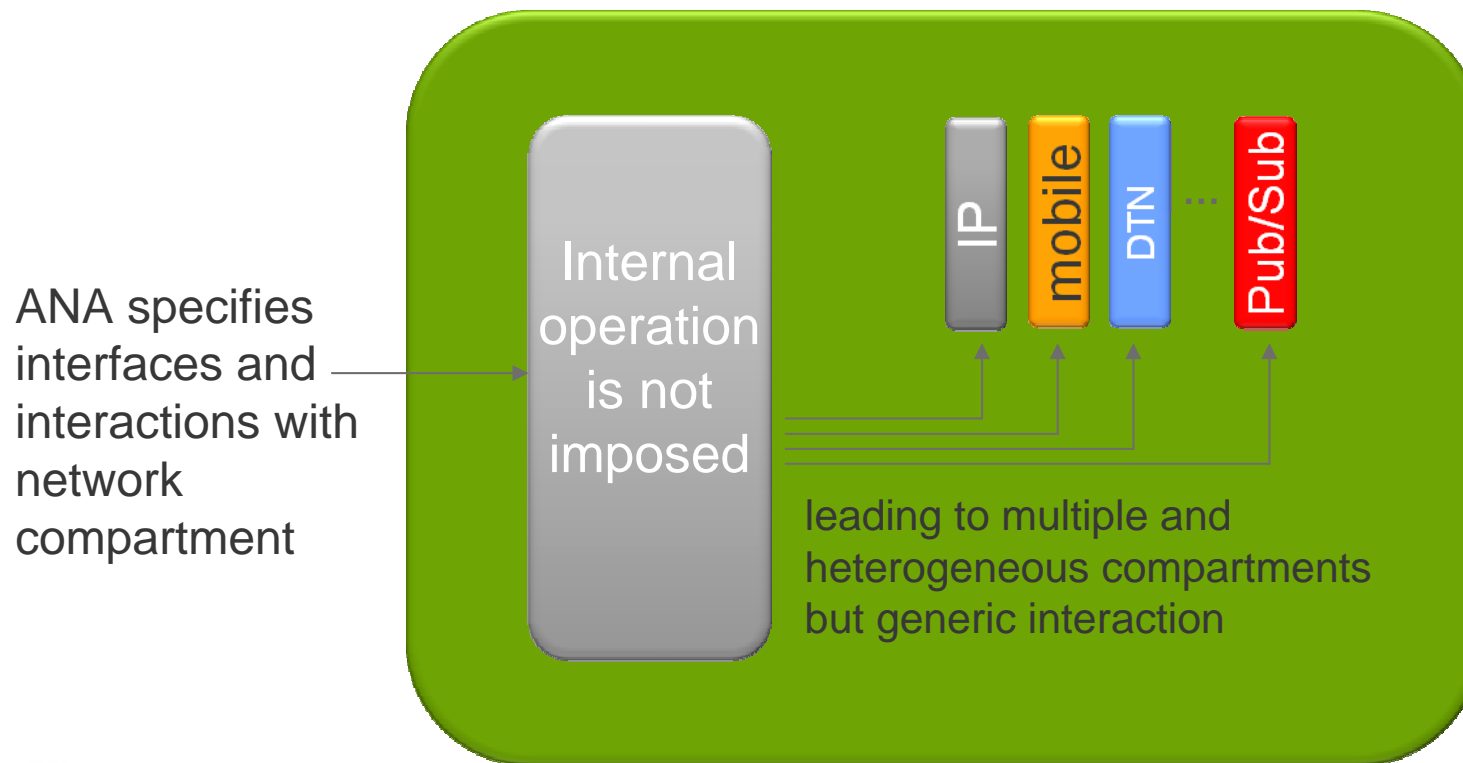
**THOMSON**

**TECHNICOLOR** 

**PPP**

# ANA: a meta-architecture

- ANA framework specifies how networks interact
- Stacks available for core IP networking, clean slate, mobile environments, DTNs,...



# Lessons learned...

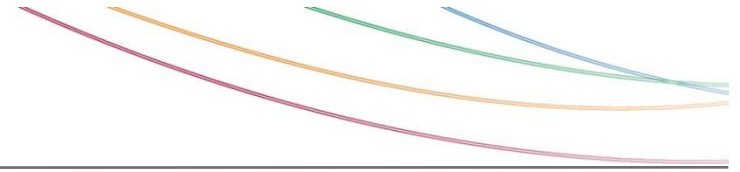
---

- **The devil is in the detail**
- **Choose the right platform**
  - (and don't stick to the wrong one for too long)
- **Be aware of difficulties in publishing results**
- **Make results available**
  - Haggie and ANA are part of OneLab2
  - Experimental facilities will be available through OneLab2 infrastructure
  - Publish traces if collected (of course after a grace period)
- **Always plan for multiple trials**
  - Haggie performed 2 experiments per year – 2003 to now
- **Allocate more time for experiment preparation**



# Questions?

---



## ■ References:

- NaDa – [www.nanodatacenters.eu](http://www.nanodatacenters.eu)
- Hagggle – [www.hagggleproject.org](http://www.hagggleproject.org)
- ANA – [www.ana-project.org](http://www.ana-project.org)

## ■ Or check out our lab web site:

- [www.thlab.net](http://www.thlab.net)



**THOMSON**

**TECHNICOLOR** 

**PPP**