

Migration...

...the ultimate goal whether
you like it or not

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- ❖ *„Migration, like reproduction and other phases (as molting in birds), is part of the life cycle and depends on a complex internal rhythm that affects the whole organism...“ [Britannica, Physiological stimulus of migration]*
- ❖ It's part of life → It is inevitable
- ❖ Affects a whole lot → It is expensive
- ❖ Complex → It is difficult

Migration examples

- ❖ 2G, 3G, LTE
 - Strategy: Build new, operate old till you most people switched to new, switch off old

- ❖ Floppy disk, CD, DVD, Blue-ray & HD DVD
 - Strategy: Build new, continue with old till nobody needs it anymore, stop producing old

- ❖ Playstation I, Playstation II, Playstation III
 - Strategy: Build new (partially compatible for a while), continue with to support old till nobody wants it any more, stop support

- ❖ DOS, Windows 9x, Windows XP, Vista
 - Strategy: Build new (some backwards compatibility), continue to support old, stop support old



Migration to the next Internet

- ❖ Has not happened (yet), but remember
 - It affects a whole lot
 - It is complex
 - It is part of life

- ❖ Why has it not happened yet?
 - Our fault
 - Their fault
 - Nobody's fault

- ❖ Things have changed, but below and above IP



Our fault

- ❖ We do not find the right 2.0 solution
 - Many solutions out there: Triad, IPNL, HLP...
- ❖ We do not identify the right problems
 - QoS, multi-path routing, multi-cast...
- ❖ We do not care about migration
 - Migration is not a research topic?
- ❖ We are not the right people
 - Migration is an engineering task
 - It's a different department, we don't talk to these people



Their fault

- ❖ They do not see the problem
 - The Internet does work. Never change a running system.
- ❖ They do not pay for the solution
 - The Internet does work. Why pay for something that in the end might also “just work”.
- ❖ They have a different horizon
 - The Internet does work for 6 more months at least. The current budget plan might not cover anything beyond that.
- ❖ They are not the right people
 - Researchers don't really talk to them (enough)
 - They find/pay for other solutions (IPv6 vs. NAT)
- ❖ They don't care about migration
 - Does it make money?
 - Does anybody force them to do it?



Nobody's fault

- ❖ Migrating from CD to DVD was relatively easy
 - No need for compatibility
 - Single problem to solve: make it bigger
- ❖ What is the Internet's "problem":
 - Scalability (state, churn etc.)
 - Mobility (Signalling, seamlessness, etc.)
 - Security (DoS, authentication, Spam, SpIT, accountability etc.)
 - Resource control (QoS, Congestion control, access control etc.)
 - Business models
 - Many more...
 - BUT: which one(s) do we **really** need to solve
- ❖ Politics vs. Business vs. Religion
 - Government ↔ ISPs & Operators ↔ Net Neutrality

Future Internet (v2.0)

- ❖ Migration often is a de facto replacement
 - 2G → 3G (running in parallel, GSM & UMTS)
 - IPv6 (incompatible on the wire → dual stack)
 - What will happen with the Internet (2 parallel ones?)
- ❖ There is always money involved
 - Sell HD DVDs & recorders, Playstations, OSes, mobile data service
 - What will be the selling point of the future Internet (note that more bandwidth is happening without I2.0)?
- ❖ “Migration” will only happen below IP?
 - Faster layer 1 technology
- ❖ “Migration” will only happen above IP?
 - Vista, eXXX, IPTV, VoIP, P2P, whatever Google does...



For our workshop discussions

- ❖ Is there such a thing as “migration friendly”?
- ❖ Is “migration friendly” a good thing (does it imply worse solution in the end)?
- ❖ Can our Internet evolve without real migration (is it really part of life)?
- ❖ Who should migrate and why (end hosts, core, both)?
- ❖ How do we get there?

