A Battleplan to Deploy “Something Autonomic”

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Disclaimer

• these may or may not be my own opinions (hey, it’s a panel)

• these are definitely not Nokia positions
Autonomic & Opportunistic Success Story

• **autonomic** adj
  used to describe functions not under the voluntary control of the individual

• **opportunistic** adj
  resourcefully taking advantage of all opportunities or situations, especially in a devious, unscrupulous, or unprincipled way

• we already have a great success story with an application that uses autonomic & opportunistic communication!

**spambots**
We Were Done 20 Years Ago

- **opportunistic**
  - use any means for communication available

- **autonomic**
  - do it in a way that isn’t managed by humans

- both were arguably goals of the original Internet
  - incorporate heterogeneous local networks
  - self-organizing, resilient routing
  - intelligence at the edge

- if we were done then, why are we not done now?
The Enemy

• massive growth drove the system to the point where the autonomic mechanisms failed

• (and some things were never autonomic to begin with)

• handholding by ISPs allowed continued growth but firmly entrenched them in a position of control

• *i.e.*, control of the core, but that is leverage – all the interesting content currently hangs off the core
The Solution? A Solution?

• autonomic & opportunistic networking is about wresting some of that control away

• or at least creating areas of the network with less ISP control and more device control

• so what’s needed to make this happen?

• where “this happen” means “successfully roll out something autonomic”, not “pull in grant money and generate PhDs”

• (but yeah, grant money and PhDs are nice, too)
Pre-Flight Checklist (1)

• show that you aren’t killed by success
  • don’t want to repeat what happened to the Internet
  • architecture = \( O(\text{billions of nodes}) \)
  • what happens if Nokia puts your stuff on all our phones?

• show partial benefit from incremental deployment
  • is anyone in the room running their autonomic stuff on their laptop right now?
  • can’t have a flag day for something autonomic
  • need even stronger incentives than with vendor/ISPs – every node is independent
Pre-Flight Checklist (2)

• show that it’s OK to let it loose
  • BGP is arguably autonomic
  • we’re still debugging it today – can’t run unsupervised
  • how about your stuff – convergence? stability? attack resistance? future-proof?

• show strong utility
  • how close is the utility to a scenario with central control?
  • can ISPs spend X dollars and kill you?
  • are you a one trick pony? or an architecture for many apps?
Last Slide, *i.e.*, Not a Conclusion

- research is busy demonstrating the feasibility and achievable benefits of autonomic and opportunistic stuff
- that’s necessary to generate interest for any sort of deployment, but it’s by no means sufficient
- to get this stuff from academia to practical use, we need something more
- *how* do we get this?
  *who* will do the work?
- (or will this all remain yet another academic exercise?)