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 <u>not</u> Nokia positions

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Autonomic & Opportunistic Success Story

- **au·to·nom·ic** *adj*

  used to describe functions not under the voluntary control of the individual

- **op·por·tun·is·tic** *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

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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?

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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

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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)

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Pre-Flight Checklist (1)

- **show that you aren't killed by success**
  - don't want to repeat what happened to the Internet
  - architecture = O(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

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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?

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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

- <u>how</u> do we get this?
  <u>who</u> will do the work?

- (or will this all remain yet another academic exercise?)

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