

2nd Workshop on Autonomic
Communication

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Panel I :

Autonomicity vs complexity

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Where does complexity come from?

- Complexity is not introduced by Autonomicity
- Complexity is **inherent** to Mobile Ad hoc Nets
 - Many parameters to setup at several layers.
 - We don't know optimal setup for a given scenario, much less varying ones.
 - We are hoping system's self-tuning will magically "take care of it"
- Autonomicity adds the "control stability" complexity in exchange for simplifying the parameter tuning complexity.

Why accept “stability” complexity?

- Feedback loop: many “conflicting” concerns:
 - Forwarding
 - Reliable delivery
 - Resource sharing
 - Channel access/exploit
 - Security/trust management, etc.
- Different control knobs interact with each other at maybe different time scales.
- Then, why will we go through all the trouble?

A very good reason: adapting to the environment can give us a 10x improvement in performance!

How to handle complexity

- KISS: Keep It Simple Stupid!.
- Decouple system's "intelligence" from "interaction monitoring".
 - Decoupling similar to human nervous system: one part reasons, other monitors sensory information and reacts.
 - Boundary prevents control loops and instability.
- Allow different levels of "smart" in the nodes:
 - Allow simple instantiations
 - Dumb individuals may result in smart group behavior: e.g. ants
 - Open to extensions.
 - Simple users can still adapt/mutate and be excellent for a particular goal. Analogy: FPGAs – as fast as specialized DSP but with the versatility of "multipurpose" microprocessors.
 - As nodes (as well as designers) evolve and learn with time, more sophistication will be added