# ResiliNets: Survivable and Resilient Networking

James P.G. Sterbenz and David Hutchison – www.ittc.ku.edu/resilinets

Survivable Resilient Nets

- Maintain service in the face of:
  - design, configuration, & operational errors
  - large-scale natural disasters
  - attacks (crackers, terrorist, war)
  - environmental challenges: mobile wireless
  - unexpected legitimate traffic (flash crowd)
- Strategy and lines of defense
  - resistance: architecture maximises defense
  - detection: problem & attack self-diagnosis
  - remediation: automatically react and repair
  - recovery: self-organising and autonomic

Model
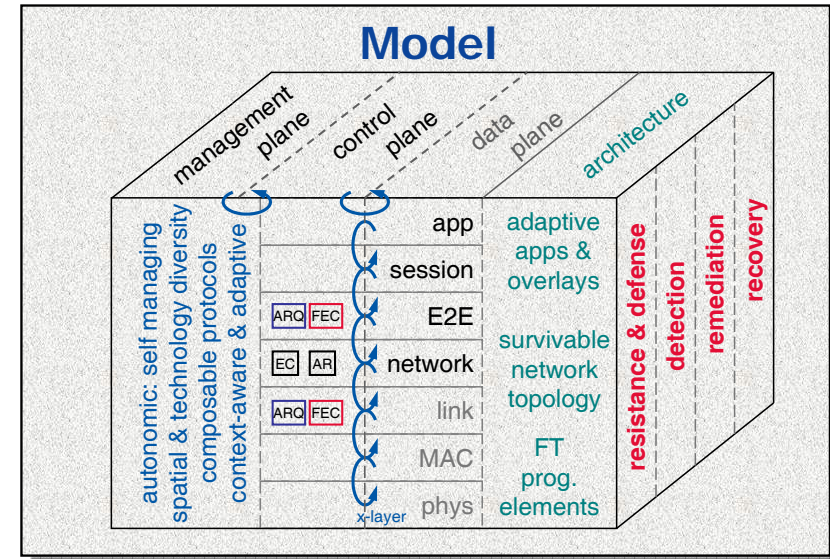
Multilevel

- Do the best possible at every level
  - foundation for the next level up or out
- Bottom-up
  - phys → link → network → transport → app
- All planes
  - data → control → management planes
- Inside-out
  - components → entire network
- Cross-layer knobs and dials
  - knobs instrument up; dials influence down

Research Thrusts

- Architectural diversity
  - technologies, topology, and routing
  - autonomic and dynamically programmable
  - service and communication adaptation
  - infrastructure independence
- New communication paradigms
  - communicate even when no stable E2E path
  - resilience and survivability as a QoS property
- New protocol architectures
  - cross-layer and cross-plane optimisation
  - composable, adaptive, and evolvable