



ResiliNets: Survivable and Resilient Networking

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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

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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