

# ResiliNets: Resilient and Survivable Networking

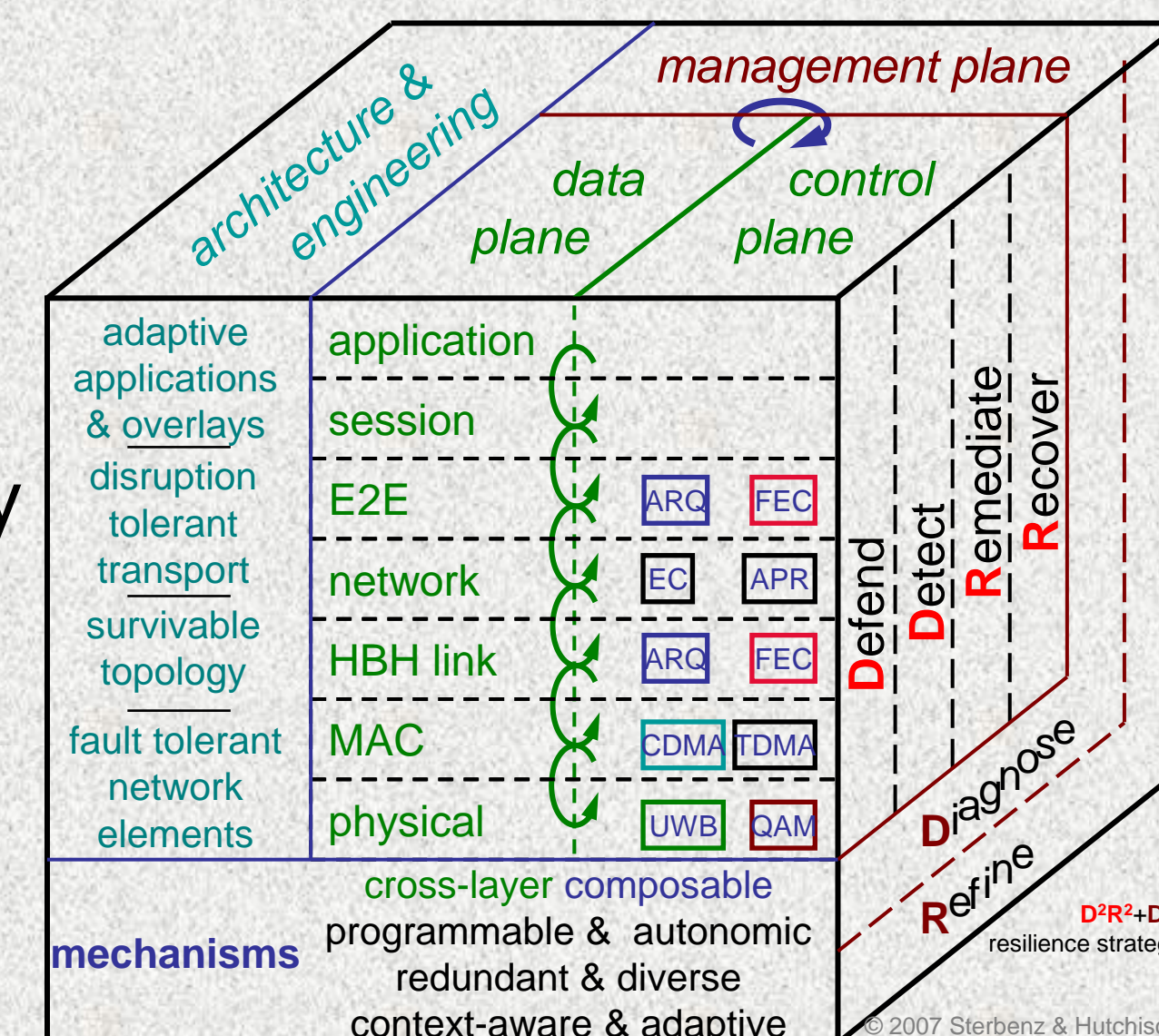
James P.G. Sterbenz, David Hutchison, E. Çetinkaya, D.T. Fokum, A.J. Mohammad, J.P. Rohrer, M. Schöller, P. Smith  
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## Resilience Motivation

- Pervasive network infrastructure with increasing...
  - dependence by individuals, businesses, nations
  - consequences of disruption
  - attractiveness as target from bad guys
- Resilience: maintain service in the face of
  - comm. environment: wireless, mobile, delay
  - large-scale natural disasters
  - non-malicious operational errors, accidents, traffic
  - malicious attacks (including DDoS)
  - lower level failures
- Includes FT, dependability, survivability, security

## Multilevel Model

- ResiliNets Cube
  - multilevel
    - protocol layers
    - planes
    - mechanisms
- D<sup>2</sup>R<sup>2</sup>+DR strategy
  - defend
  - detect
  - remediate
  - recover
  - diagnose
  - refine



## Resilient Network Interaction

- From faults to service failures
  - dormant faults triggered by challenges or operation
  - active faults manifest as errors
  - errors may degrade network operation
  - degraded network operation may lead to service failure
- Network state (at each level)
  - operational space
    - normal, partially degraded, severely degraded
    - determined by network engineering and protocol design
  - service space
    - acceptable, impaired, unacceptable
    - determined by service specification (application at top level)

## Resilient Network Interaction

