

UCL DEPARTMENT OF COMPUTER SCIENCE
NETWORKS RESEARCH GROUP

UNIVERSITY OF ST ANDREWS, SCHOOL OF COMPUTER SCIENCE
NETWORKS AND DISTRIBUTED SYSTEMS RESEARCH GROUP



UCL

Coalition-Based Connectivity for Flexible Communication

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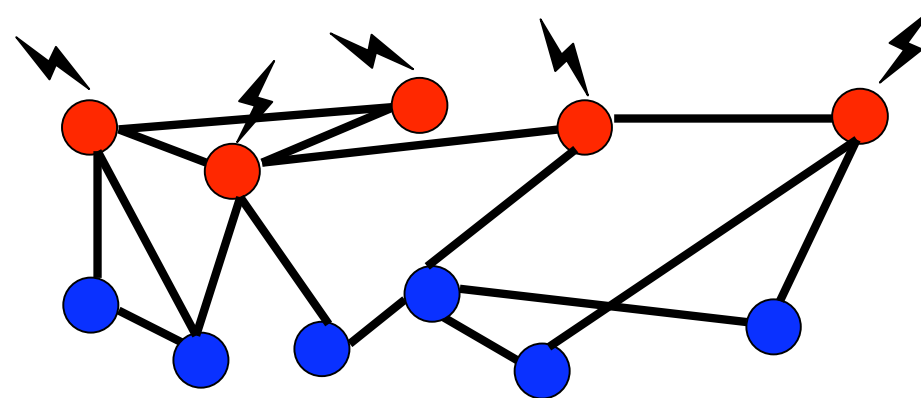
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The Changing Nature of Connectivity

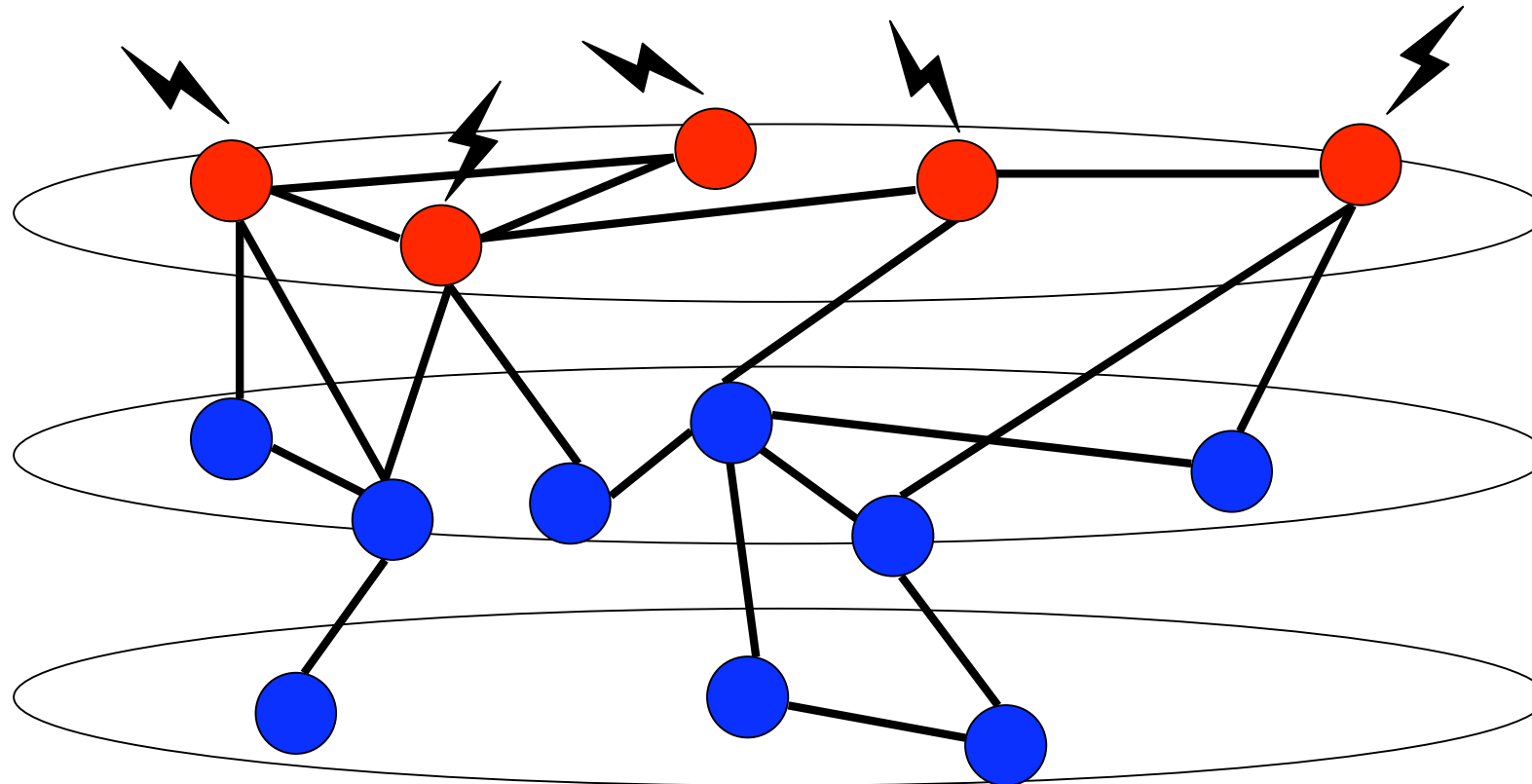
- An Increasingly Visible Class of Community-Area Network:



● Wide-Area Capable Peer
● Local-Area Only Peer

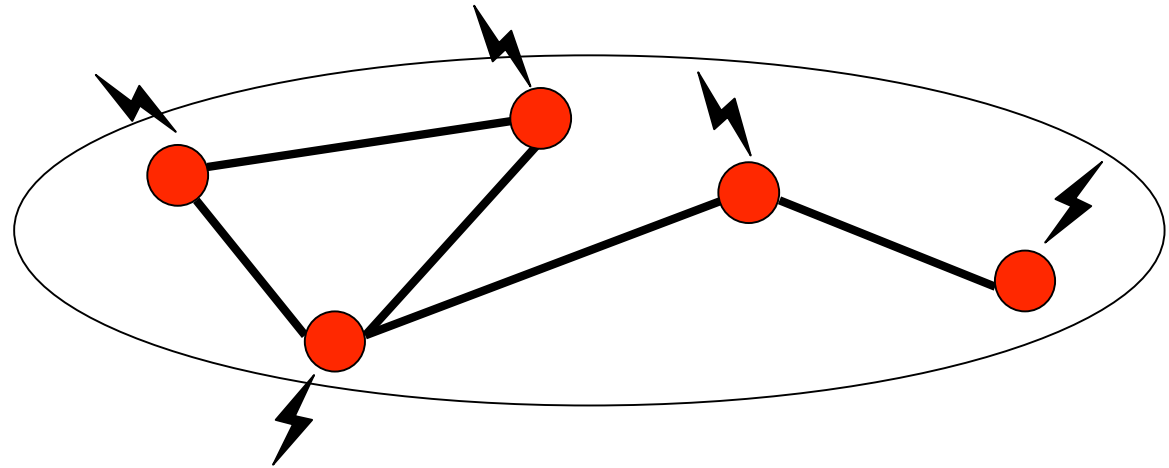
⚡ Wide-Area Connectivity
— Ad Hoc Peering Agreement

Coalition Peering Domain (CPD) Architecture



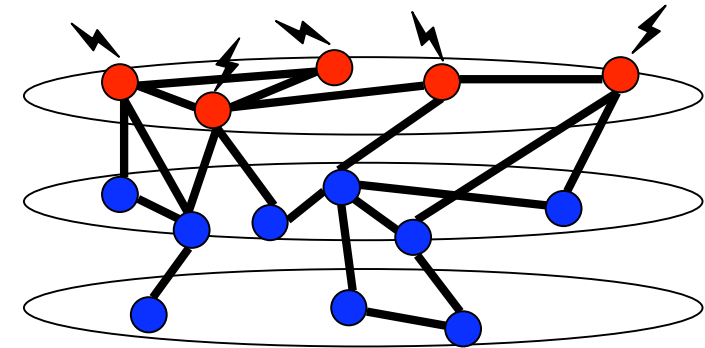
- Coalition-Edge Forwarder (CEF)
- Coalition-Internal Forwarder (CIF)
- Local Peering Agreement

Challenges



- Dynamic Formation
- Addressing
 - Centralised Function – Distributed System
- Routing
 - Multi-Homing, Multi-Path Forwarding
 - Implications for Higher Layer Protocols
 - Reverse Path Aggregation
- Mobility
- Security and Trust

Applications



- Highly Survivable Networks
 - Robustness in Overall Connectivity Through Multi-Homing
- Emergency and Disaster Scenarios
 - Heterogeneity and Resource-Limitation
 - Time-Critical: Disseminate Information Quickly
- Networked Embedded Systems
 - Sensor Networks
 - Personal Area Networks
- Heterogeneous Wide-Area Connectivity

Summary

- Local-Area Peering
 - Missing Opportunities to Better Utilise Connectivity
- The Coalition Peering Domain
 - New Architectural Element
 - Manage Available Resources Dynamically
- Diverse set of Scenarios