Panel II:
Perspectives on Network Routing
- Dan Massey - Colorado State University
- Tim Griffin - University of Cambridge
- Oliver Bonaventure - Universite catholique de Louvain
- Loa Anderson - Acreo AB
- Vijay Gil - AOL
Context For this Panel

- 25 years of routing research and deployment
- Panel focuses on infrastructure routing
  - Provides basic underlying network services
  - Network and routing is managed
  - Must account for commercial interests
  - Massive scale with distributed control
- What can we learn from past results?
- What challenges do we face today?
Security: Problems and Solutions

- Prefix Hijacking
  - AS wrongly claims to be prefix origin
  - Many examples from logs and operational lists

ISP monitors announced new path for 20 minutes to 3 hours

Real Origin
192.26.92.3

Prefix Hijacking
- AS wrongly claims to be prefix origin
- Many examples from logs and operational lists

Originates route to 192.26.92/24
What Might Be Done?

- Cryptographically secure the protocols
  - Prevent hijacking events from occurring.
  - Concept is relatively simple (e.g. apply RSA)
  - But building a complete system is complex

- Fast and reliable detection, ad hoc response
  - Community very effective at reacting to events
  - Detect events and distinguish from valid ops
  - Reliably send report despite routing problems
What Is Being Done?

- Deployed Defenses to False Routes
  - Public venues for communication (eg NANOG)
  - Private venues for communication (NSP Sec)
  - Ad hoc, but fairly effective reactions (filters)

- Larger Concern is Attack by Edge Systems
  - Limited resources (eg CPU) in infrastructure
  - Vast numbers of compromised edge systems
  - RFC 3682: discard packets with TTL < Max -1
What Does This Mean For Research?

- Start From an Informed View
  - 25 years of research innovations and problems
  - 25 years of deployment experience and problems

- Panel Provides Our (Biased) Views
  - Don’t Let Deployment Success/Failure Constrain Ideas
  - Don’t Ignore Lessons and Problems of Current Systems

- Challenge or Enhance This View With Your Questions
Outline of the Panel

• Tim Griffin:
  Abstractions are important

• Oliver Bonaventure:
  Fast convergence

• Loa Anderson:
  MPLS and multi-layer networks

• Vijay Gil:
  Operational practices and backbone design

• Discussion:
  Your questions and comments