Panel II: Perspectives on Network Routing

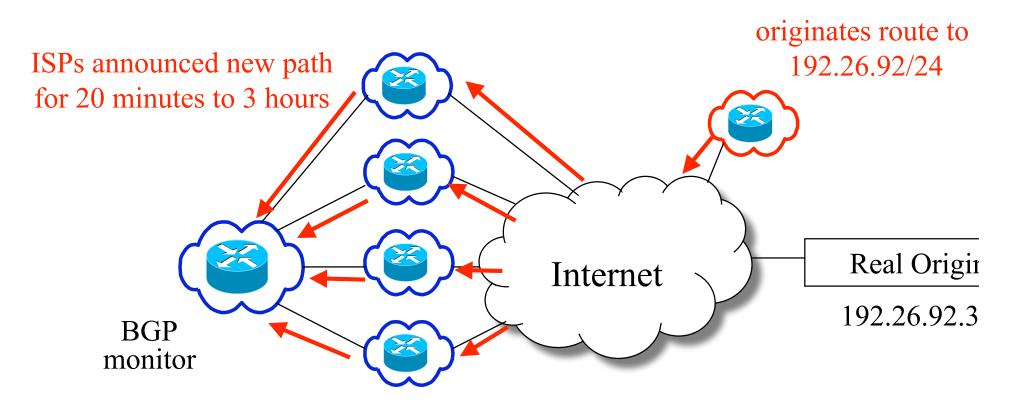
- Dan Massey Colorado State University
- Tim Griffin University of Cambridge
- Oliver Bonaventure Universite catholique de Louvain
- Loa Anderson Acreo AB
- Vijay Gil AOL

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



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