Lecture 6

CS625: Advanced Computer Networks
Fall 2004

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http://www.cse.iitk.ac.in/users/braman/courses/cs625-fall2004/outline.html

Outline for Today
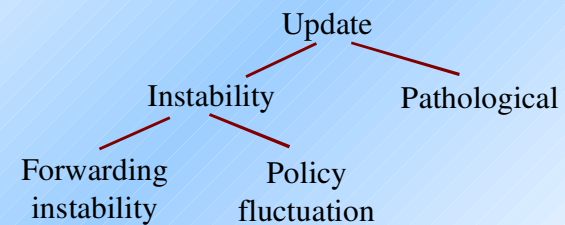
- BGP clarifications (from previous class)
- Routing instability
- *Scribe for today?*

Instability in Routing

- Instability: changing routes
- Why is it bad?
  - Lost packets
  - Load on routers
- Scaling issues
- Instability in IGP?

BGP Updates

- Incremental in nature
- Announcements and withdrawals
- Implicit and explicit withdrawals

Goal and Methodology

- Goal:
  - How many updates?
  - How many valid?
- Methodology:
  - Collect BGP update traces at *large public exchange points*
  - Where the "core" of the Internet exchanges *default-free* routes

BGP Instability

- Why is instability bad?
  - *Route caching* will not be effective
  - "Route flap storm"
  - Large state-dump
- Possible ways to reduce instability:
  - Address aggregation
  - Route servers
  - Route dampening

Classifying Updates

- Success events for (prefix, peer) pair
  - WADiff, AADiff, WADup, AADup, WWDup
- WADiff, AADiff, WADup: Instability
- WWDup: Pathological instability
- AADup: Policy fluctuation, or pathological

Results

- Num. updates: 10x or more of expected
- Dominated by pathological updates
- Periodicity: 30 or 60 seconds
- Correlation between n/w usage and #updates
- Pathological updates dominated by small ISPs, but no such pattern in instability
- Summary: significant level of Internet instability

Next Week

- Queuing and packet scheduling
- Random Early Detect (RED)
- QoS: IntServ and DiffServ