Routing in Congested Networks: [Shaikh00a]

(got to slide 19 on Feb. 2)

CSci551: Computer Networks
SP2006 Thursday Section

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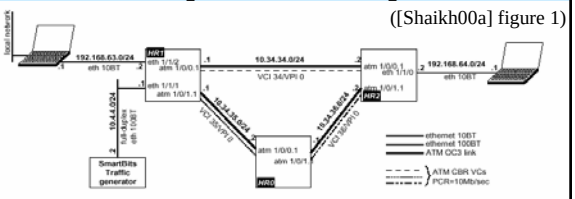
Key Idea

- experiments:
  - set up toy network
  - inject traffic
  - causes congestion and lost routing messages
  - this causes routing to think the link is down
- do some analysis and modeling of protocol behavior
- (possible) conclusion: should isolate routing from data traffic?
  - we consider control traffic more important than data traffic

Experiment Setup

([Shaikh00a] figure 1)



- traffic generator
- loads from 125-500% of capacity

- link buffer 4 or 16MB
- drop-from-front queueing
- packet-aware ATM links

Topologies

2- vs. 3-nodes: how problem resolves differs

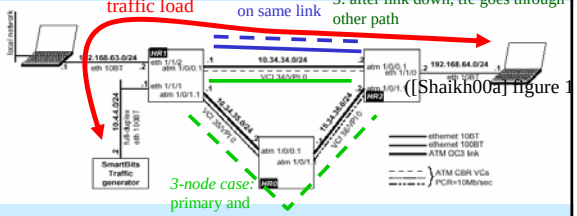
2 node case: stop sending new tfc after link is declared dead

3: after link down, tfc goes through other path

2-node case: primary and backup on same link

traffic load

([Shaikh00a] figure 1)



3-node case: primary and backup on different links

Measure

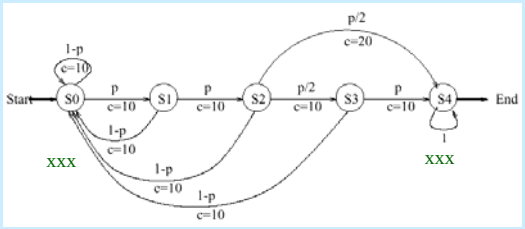
- u2d and d2u
  - route failure and restore times
- for OSPF and BGP
- as load goes from 125-500% of capacity (drop prob *p* from .2-.8)

(and *model* what you expect to check understanding)

Failure Situations

- OSPF
  - HELLO sent every 10s over UDP
  - expect one every 40s or link down
- BGP
  - sends keepalives over its TCP connection every 60s
  - expect at least one every 180s or link down

Markov Model of OSFP Failure



For details about how to solve Markov models see EE465.