Backbone Operator Perspectives
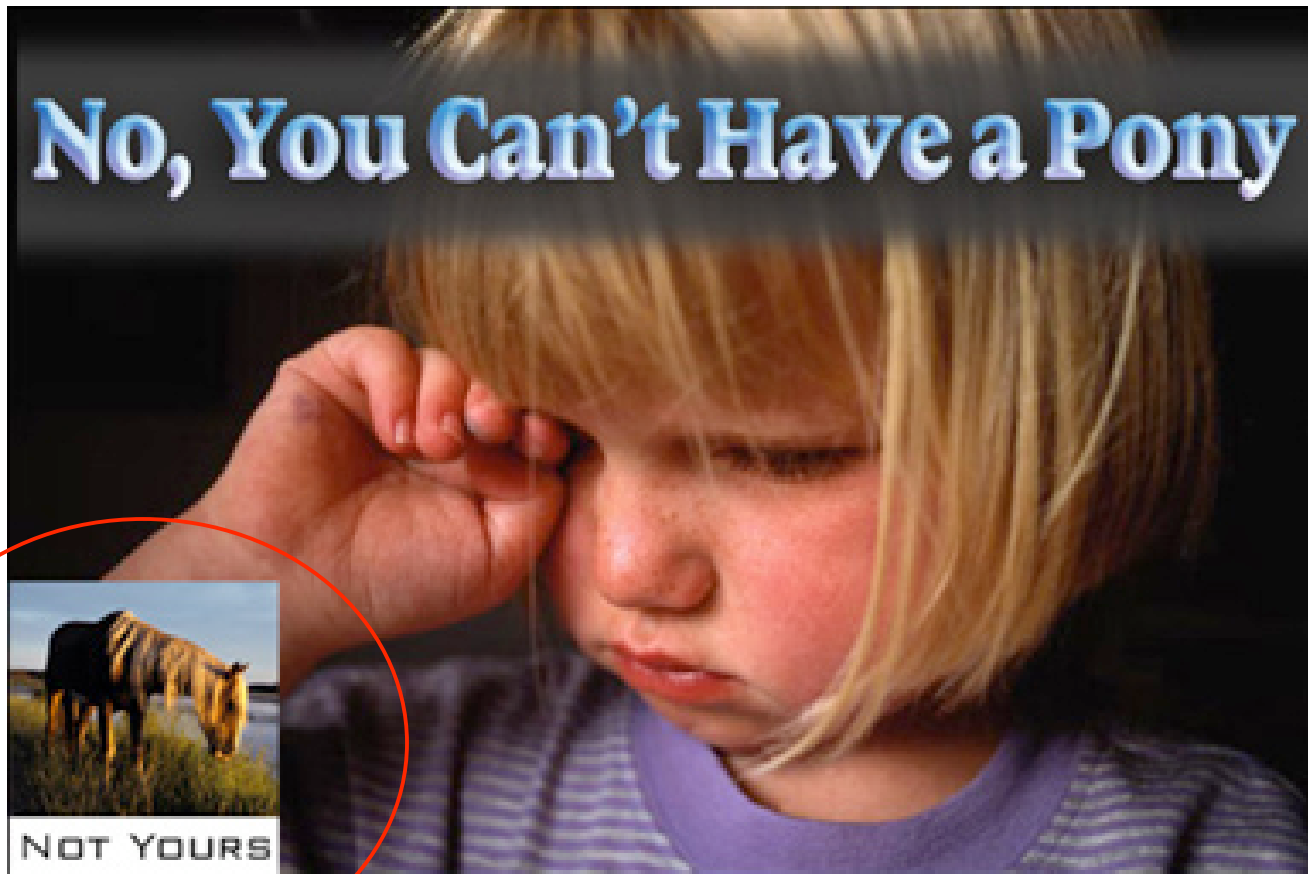
Internet Architecture Board
Bad Traffic Workshop

Marina Del Rey, CA, March 9-10, 2006

Vijay Gill <vijaygill9@aol.com>
Ted Seely <tseely@sprint.net>

If All Our Wishes Could Be Granted

Short Problem Statement

- ## Do More, With Less
  - Primary driver in operational networks is more of everything:
    - Products
    - SLA
    - Customers
    - Bandwidth
  - Less of:
    - Cost (Capital and SG&A)

"I said that before - disruptive pricing was what Jack wanted....
"And now he's getting it (in the shorts)"
"Wah, i built my economies on MY disruption! I cant have that disrupted!"
-Joe Provo

Control Plane Protection

- Control Plane Protection in Protocols
  - Build Control Plane Protection by default into protocols from the get-go
    - When vendors are building hardware, they can do things like quick disambiguation between good and bad as close to the framers as possible. Easier than retrofitting after the fact.
    - GTSM as a reference of a hack after the fact.

"If you think there is a solution, you're part of the problem"
-GC

Multihoming

- Multihoming by the individual enterprises is not going to go away, no matter how much we wish it were so (we == IETF)
- Come up with a workable solution (See notes from shim6-bof DMM hosted at NANOG 35)

NACCIDENT UNIFORM COLOR CODE

Elements affected during a faulty maintenance:

- IGP
- MPLS
- (3) CrossRoads
- VoIP
- Dep(3)(3)ring™
- Cogent
- IPv6
- BGP

CALL BEFORE YOU REDISTRIBUTE!

IGP Safety

1-877-4 L E V E L 3

Levelled (3)
COMMUNICATIONS

"Great ideas, in theory, should not be hampered by pesky reality." -Dys

IP Based FRR

- ## IP Based Fast ReRoute
  - Loop Free Alternatives
  - Dave Ward/Stefano Previdi's work on this topic is our recommendation
- ## MPLS based providers will need this for customers Virtual Networks

"There is a difference between making something foolproof and reducing the number of fools"   -Bill Barns

Protocol Security

- {S,So}BGP (Strawman)
  - Authenticated and trusted reachability announcements
  - We work around this using policy mechanisms based on data that are out of date very quickly *"Just Stop! The IRR is Bankrupt" - Mike O'Dell*
  - Outboard Solutions are not practical for deployment (power/space/mgmt issues)
  - Must fit in network devices

To paraphrase a nameless hardware designers lament: It could be a lot faster, simpler and cheaper if it didn't have to get the right answer.

Verification of Behavior

- ## If All Our Wishes Could Be Granted
  - Auto-verify configuration and protocol behaviors
    - Do what I mean, instead of do what I say

- ## Problems
  - Ones persons redistribute BGP into OSPF is another persons ASAP ™ (proprietary routing snake oil)

"With the apocalyptic wasteland comes a refreshing lack of bureaucracy."
"Yes! No car registration or emissions testing in THUNDERDOME"

Traffic Engineering

- Automated traffic load balancing
  - Very hard to do properly
  - Implementation dependent
- We want it anyway

I would hail our new slacker conquering overlords, but they would insist that the hail "might have implications" that "we'd have to investigate" as a result.

-Rob Rodgers

NAT Traversal

- NATs are a fact of life
- IETF MUST recognize this and where appropriate, make protocol level tradeoffs that allow easy NAT traversals
  - How not to do this: SIP, IPSEC
  - Workarounds - Increased CAPEX in terms of NTMs for SIP, SSL tunneling for IPSEC
- Just accept it, deal with it.

Fin

"But in our enthusiasm, we could not resist a radical overhaul of the system, in which all of its major weaknesses have been exposed, analyzed, and replaced with new weaknesses."

-Bruce Leverett

Try again. Try harder.
-Inox