# Banned at NANOG! Use of Default in the 'DFZ'

2009.07.26 / IEPG / Stockholm

**Randy Bush <randy@psg.com>**

**Olaf Maennel <olaf@maennel.net>**

**Matt Roughan <matthew.roughan@adelaide.edu.au>**

**Steve Uhlig <steve.uhlig@gmail.com>**

<http://archive.psg.com/090726-iepg-default.pdf>

# We Study *Visibility*

- What is the real routing graph of the Internet?

- What is the AS topology of BGP routing?

- How do we debug our network?
  - Are ping and traceroute the best we can do?

- How biased is our methodology?

# Bogon Diagnosis Work

- R&D for ARIN to enable them to diagnose what ASs were filtering newly allocated address space.  See preso from NANOG 40 June 2007.

- Though ARIN never deployed, we continued to measure to see how long it takes to get filters removed.

- Bored, we turned the tool to other use
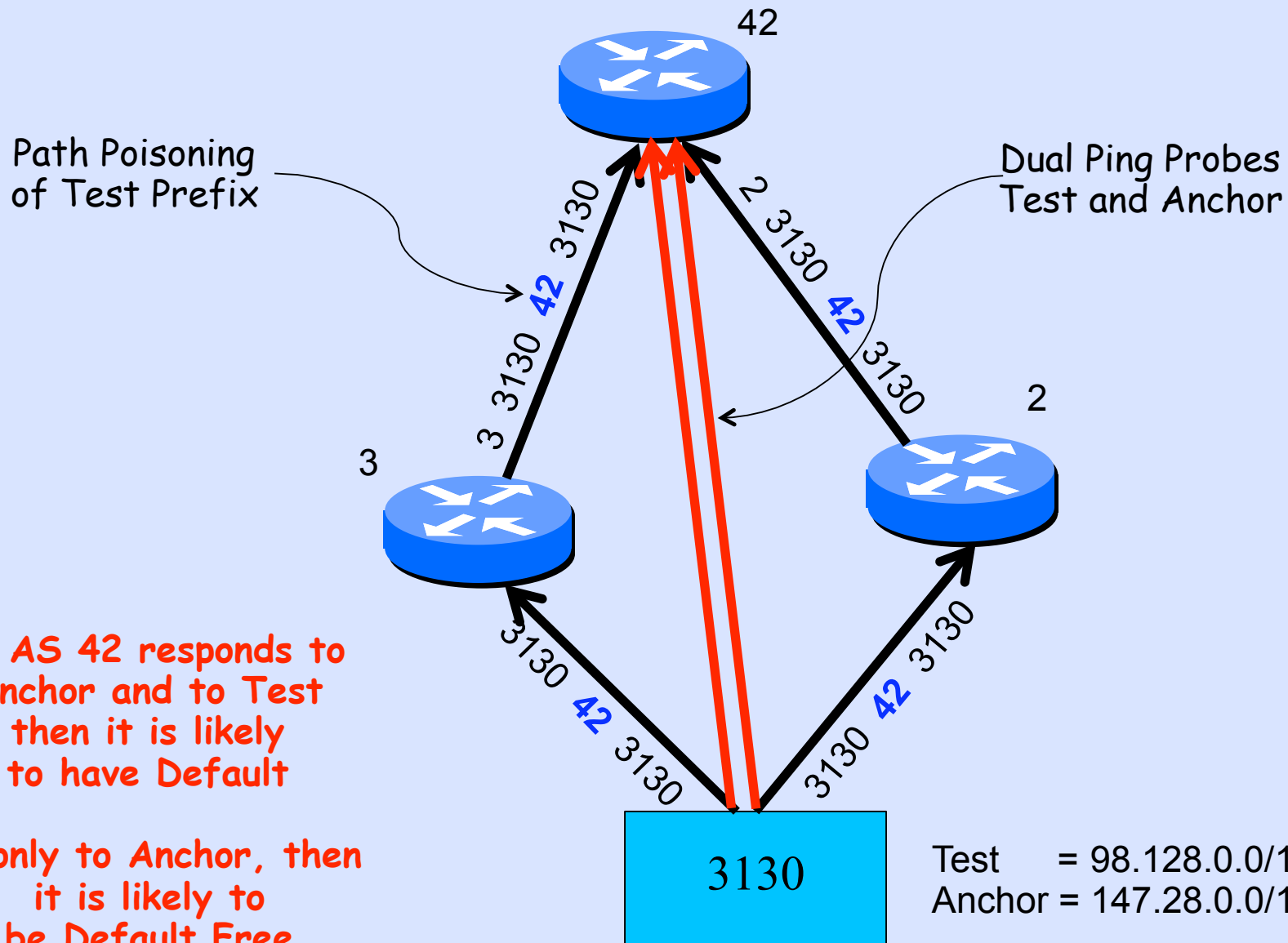
# An Example, a /25

- We announced a /25 to NTT

- They passed it only to customers

- RV/RIS/... showed 15 ASs could see it

# Whoops!

- We used ping from the /25 to 'all' ASs
- 1024 ASs could get packets back to us!
- Do they receive the BGP announcement and not show in Route Views / RIS?
- Do they default to someone who could see us?

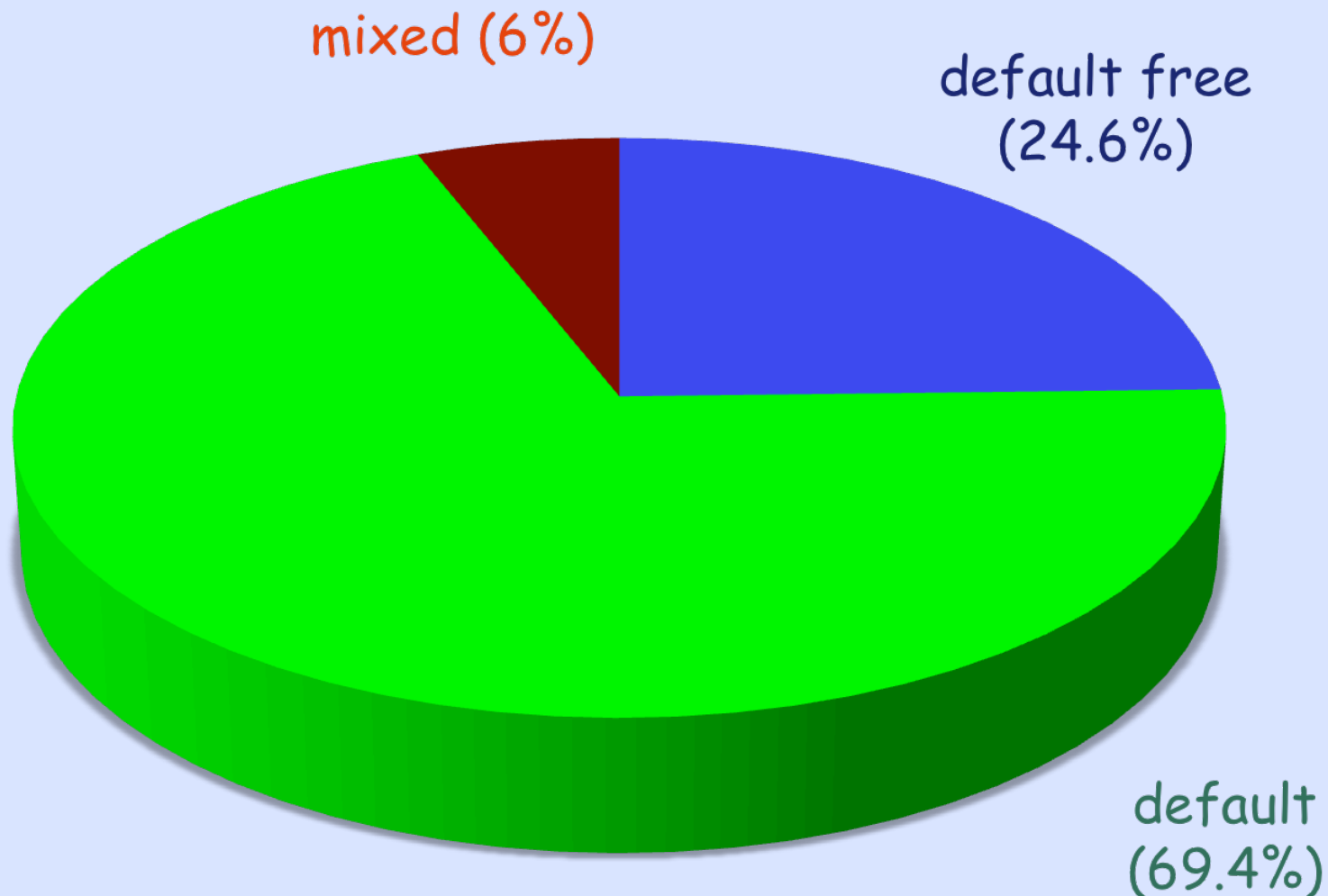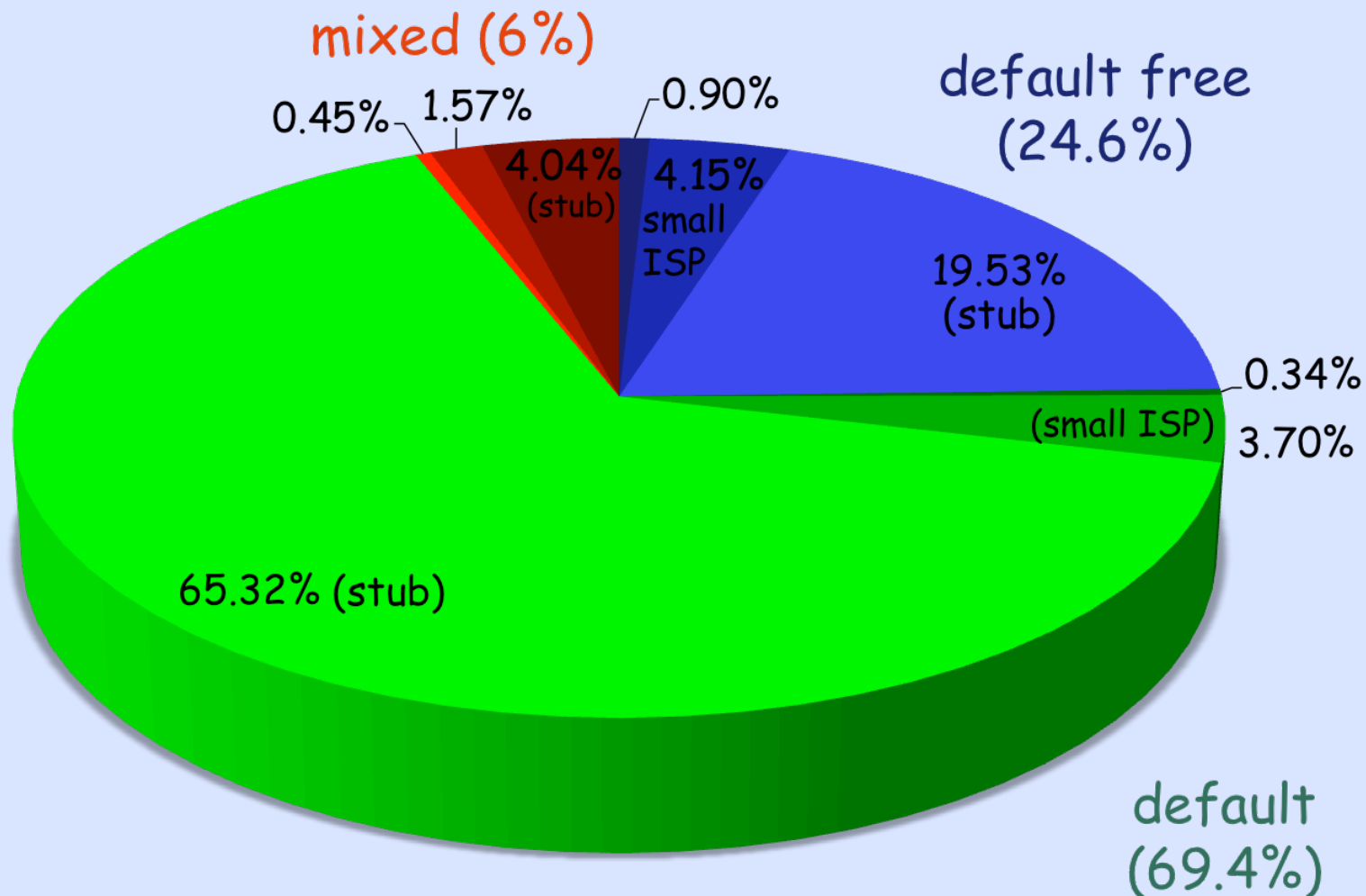# How Much of This was Due to Default as Opposed to Poor BGP Visibility?

# Default Detection

42

Path Poisoning
of Test Prefix

Dual Ping Probes
Test and Anchor

42 3130

2 3130

3 3130  **42** 3130

2 3130  **42** 3130

3 3130

3

2

If AS 42 responds to
Anchor and to Test
then it is likely
to have Default

If only to Anchor, then
it is likely to
be Default Free

3130  **42** 3130

3130  **42** 3130

3130

Test    = 98.128.0.0/16
Anchor = 147.28.0.0/16

# Defaults in /25-Experiment

mixed (6%)

default free
(24.6%)

default
(69.4%)

# Defaults in /25-Experiment



mixed (6%)

0.45%  1.57%  0.90%

4.04% (stub)  4.15% small ISP

default free (24.6%)

19.53% (stub)

0.34% (small ISP)  3.70%

65.32% (stub)

default (69.4%)

# Default Routing

| | tested/total | default | default-free | mixed |
|---|---|---|---|---|
| stub | 24,224/31,517 | 77.1% | 19.3% | 3.6% |
| small ISP | 1,307/1,361 | 44.5% | 42.2% | 13.3% |
| large ISP | 246/255 | 17.1% | 60.6% | 22.3% |
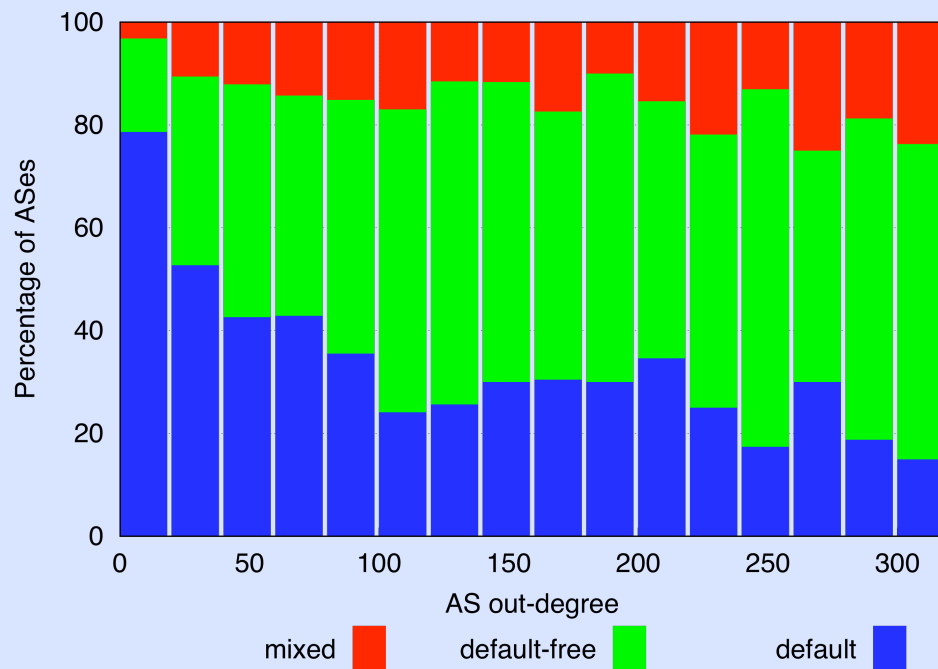


Breakdown of default routing use as a function of AS out-degree

ASes with out-degree ≥ 300 are combined in the last value.

# Default Free Zone

# my

# <bleep>

# Our Glasses are Broken

- Looking in RV/RIS/... does not tell you if they can reach you

- Looking just in RV or RIS is as good (well bad) as hundreds of BGP feeds

- Researchers should be very wary of using RV/RIS data for many classes of analysis, e.g. AS topology, traffic

- Are Renesys-style presos bogus?

# Please Validate!

http://psg.com/default/