

facebook

IPv6 initiatives at Facebook

Donn Lee, Will Lawton, Paul Saab, John Allen
Network Engineering, Software Engineering Teams
February 2011
APRICOT-APAN, Hong Kong

World IPv6 Day: 8 June 2011

- Open to everyone
- Encouraged by ISPs, mobile companies, websites, content providers
- Global awareness for users, ISPs
- First, global test-flight of v6
- Synchronized operations, controlled environment
- Breaks chicken-and-egg situation
- Opportunity to fix hardware/software bugs before June-8

A yellow callout box with a pointer pointing towards the title. It contains the text: "Announced by Facebook, Google, Yahoo!, Akamai, Limelight".

Announced by
Facebook, Google,
Yahoo!, Akamai,
Limelight

W6D initiatives

- Anchor participants & press release
- Gathering user statistics
- External roadshow
- Internal awareness

W6D initiatives (2)

- Backend code changes
- Network capacity
- Self-test, how-to page
- User messaging
- PR

check6 project

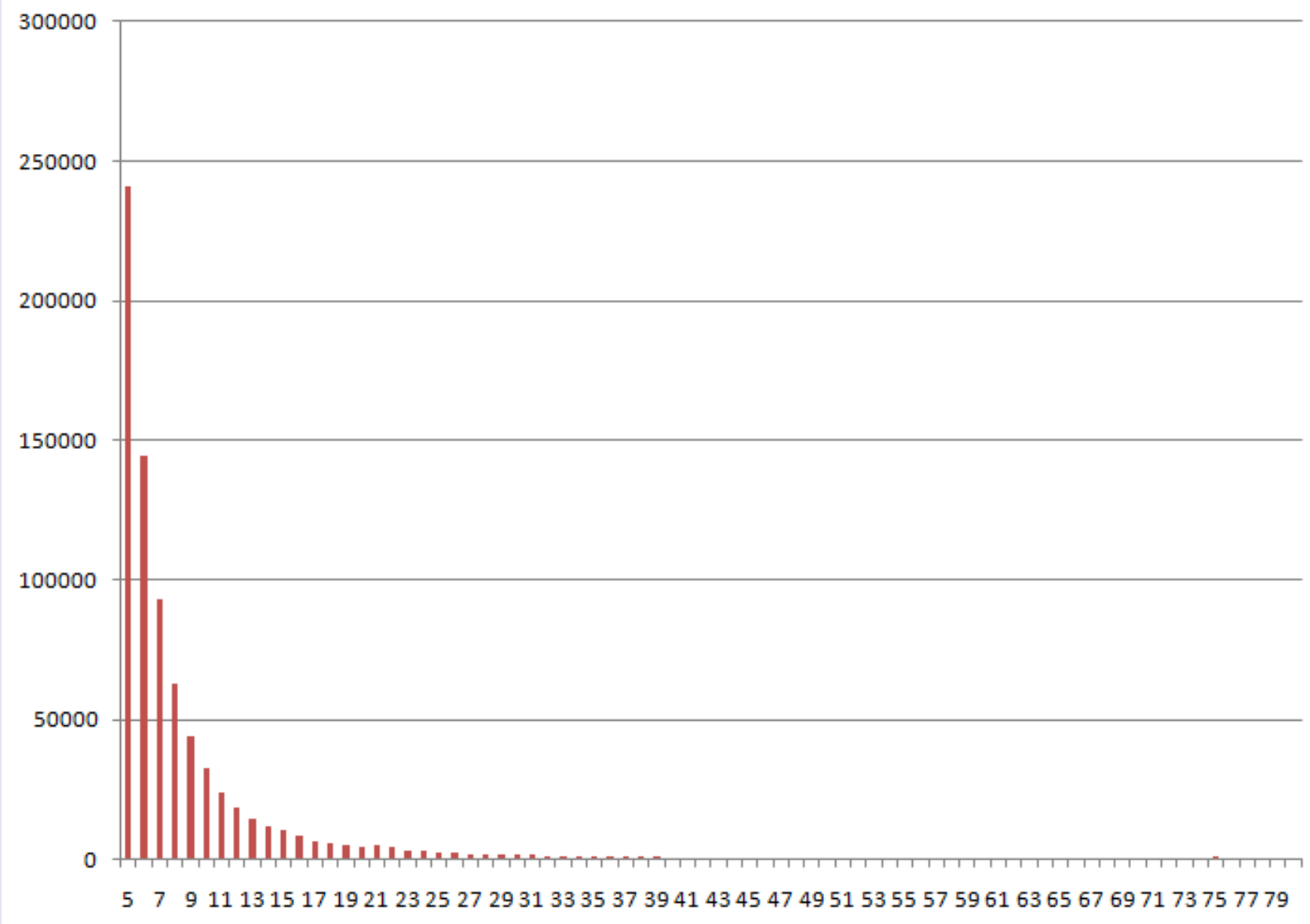
- Measure user brokenness
- Iterative coding & analysis process
- Lots of data, odd client behavior
- Mining tiny numbers from vast dataset
- Will be useful for W6D

check6 construction

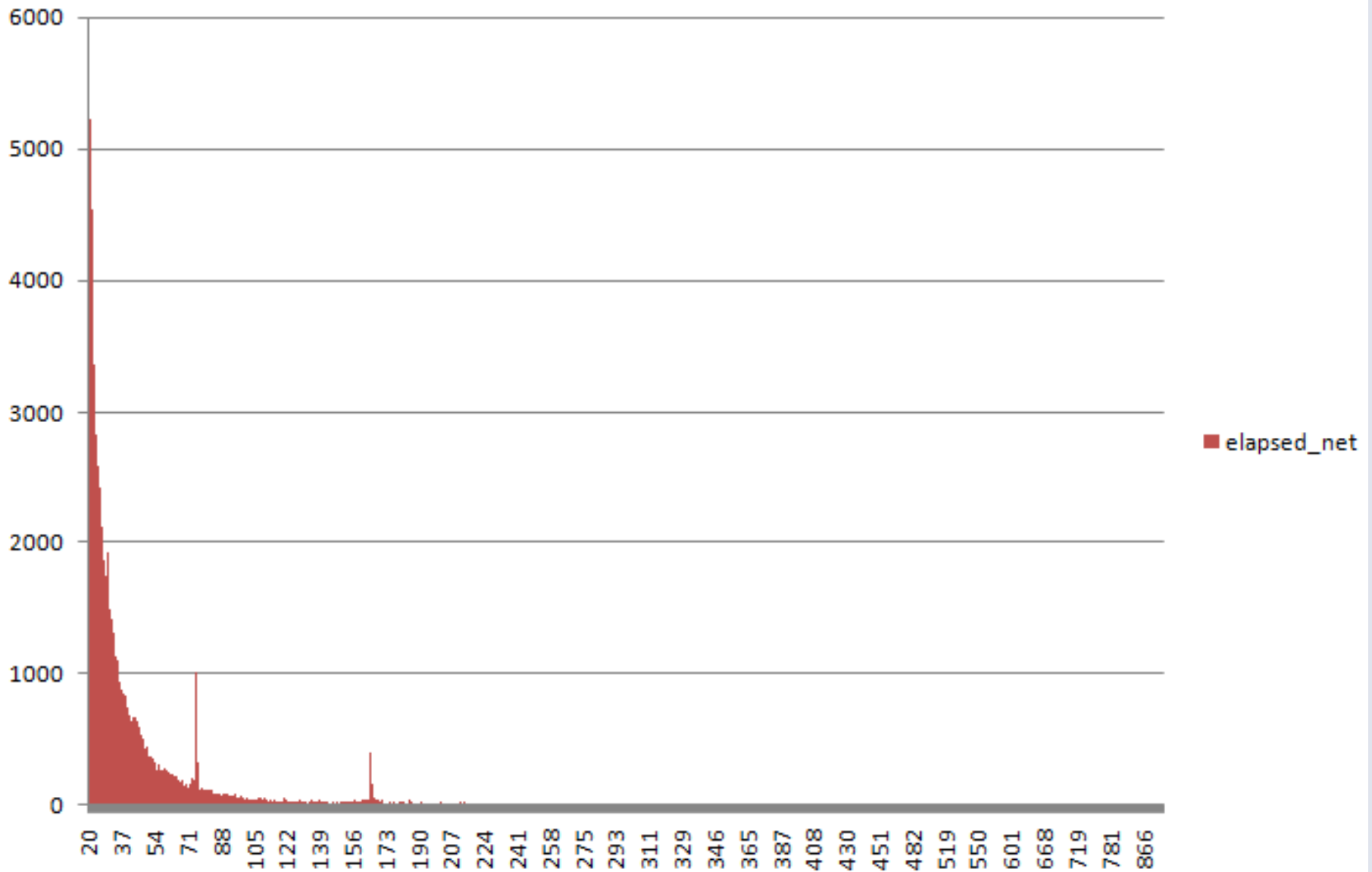
- Javascript client
- Server-side “bug”
 - 4x1, 6x1, 6x2, 6x3 images
 - JSON load
 - JSON load + duration
- % of users
- More development to do

check6 numbers

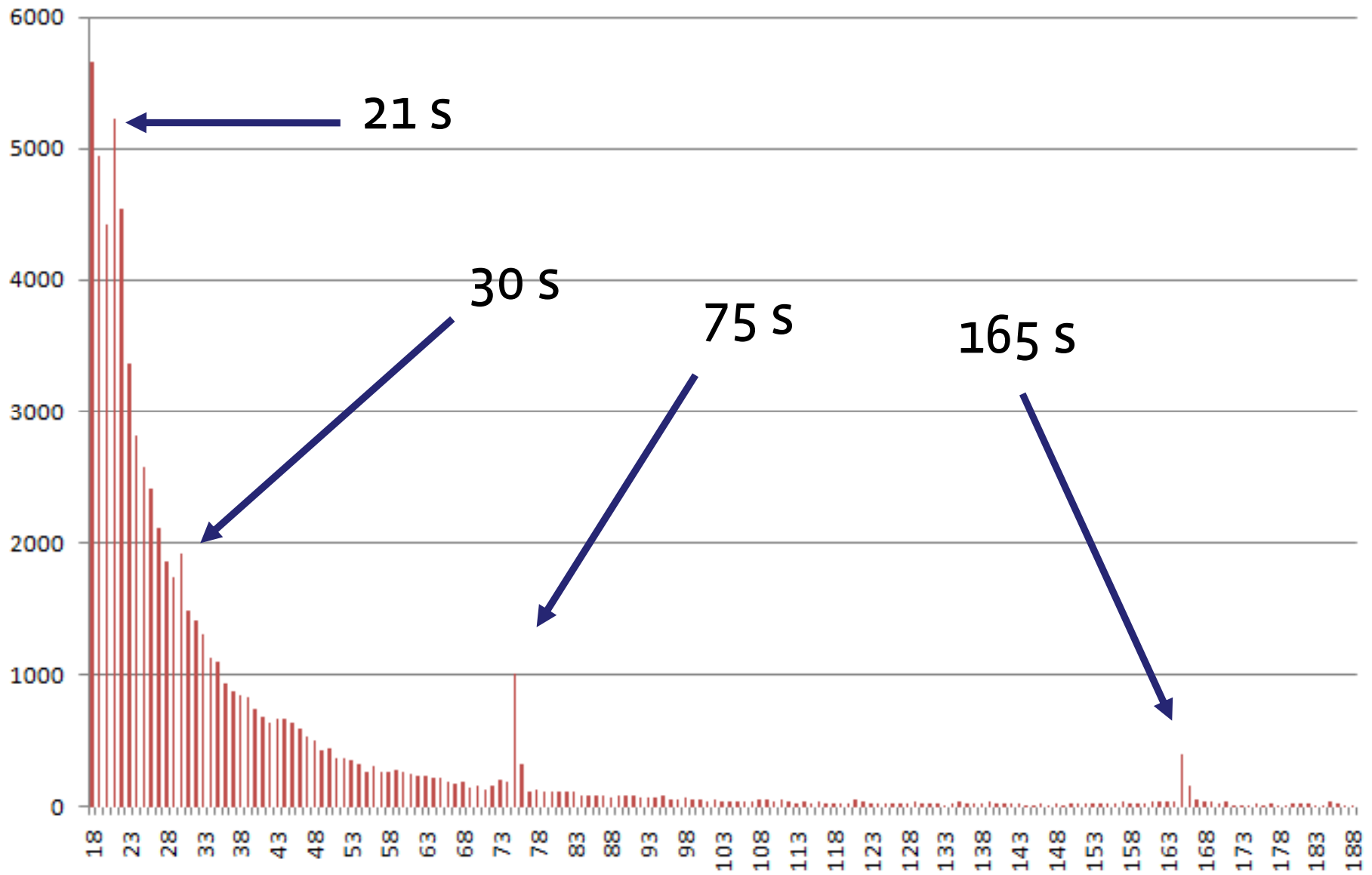
- Global brokenness
- Selected countries brokenness
- OS version
- Timeout values (histogram, clustering)
- Estimate of v6 users (%)

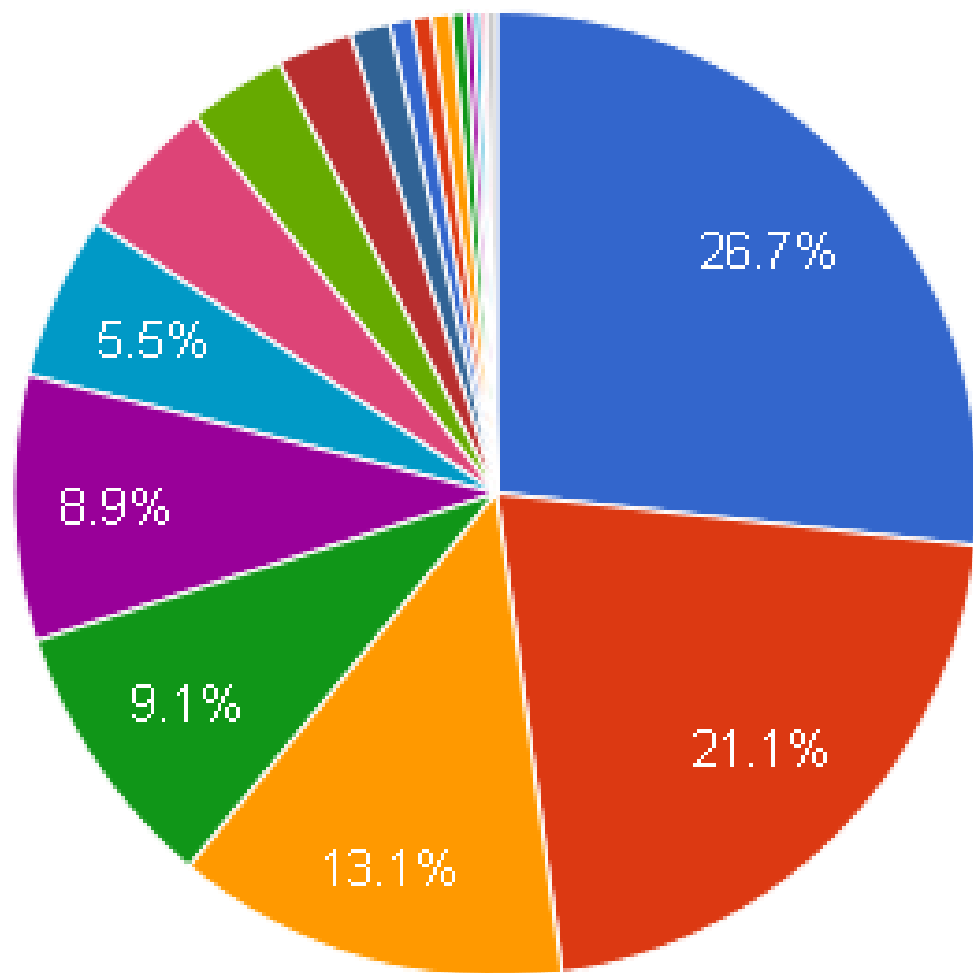


Histogram of check6 elapsed time



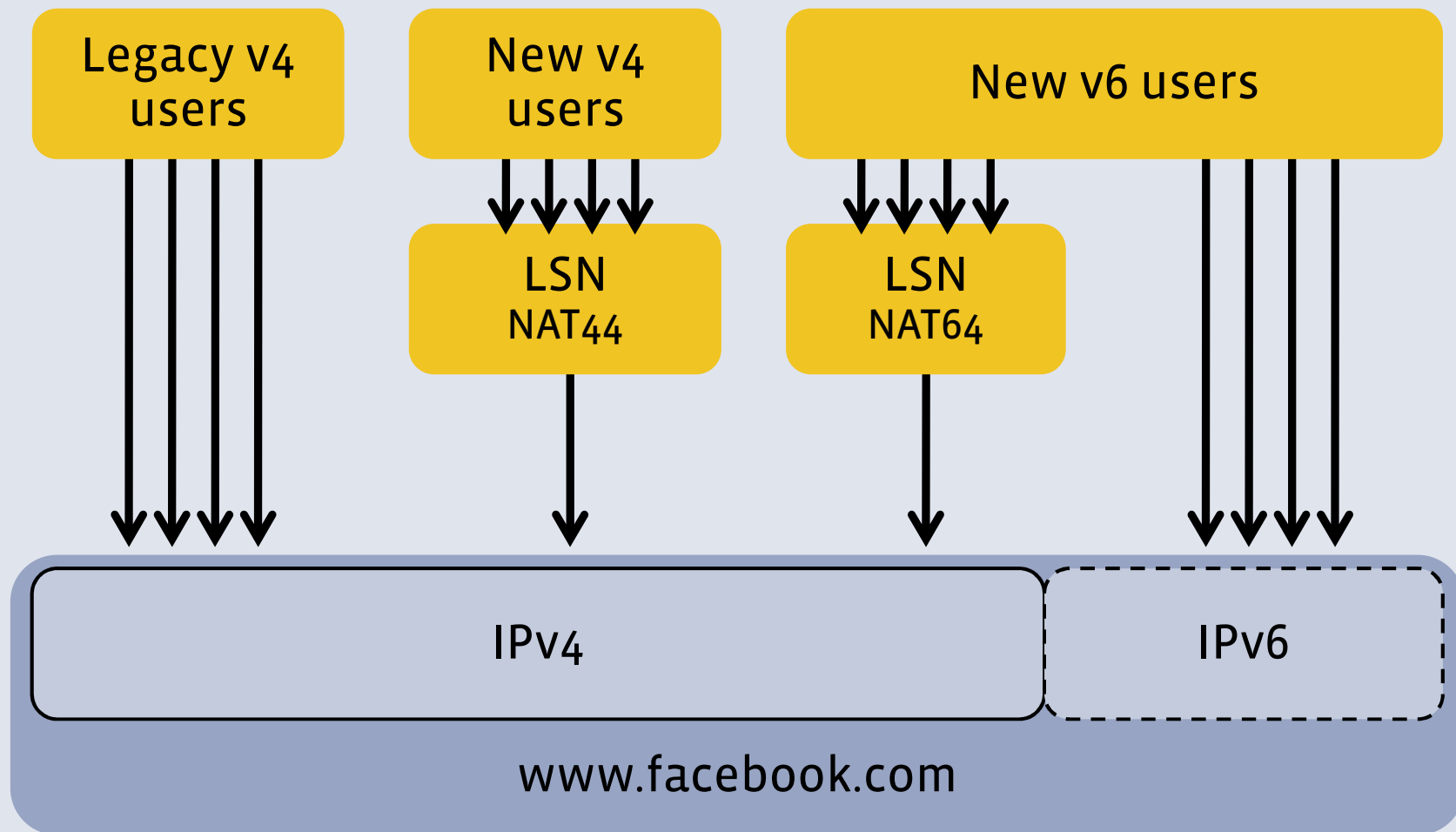
Histogram of check6 elapsed time





- Mac OS X 10_6_6
- Mac OS X 10_5_8
- Mac OS X 10.6
- Mac OS X 10.5
- Mac OS X 10_6_5
- Mac OS X 10_6_4
- Mac OS X 10_4_11
- Mac OS X 10.4
- Mac OS X 10_6_3
- Mac OS X 10_5_7
- Mac OS X 10_6
- Mac OS X 10_6_2

Large scale NAT



LSN

Adds a device between user and websites

Off-path detour and load on translator adds latency

1000s of users share one IP address

Single attacker can poison an address shared by 1000s of users, Attackers can hide easily

Unknown location and uptime of LSN devices

IPv6

Provides direct, native http connection like today

Shortest path, No added latency

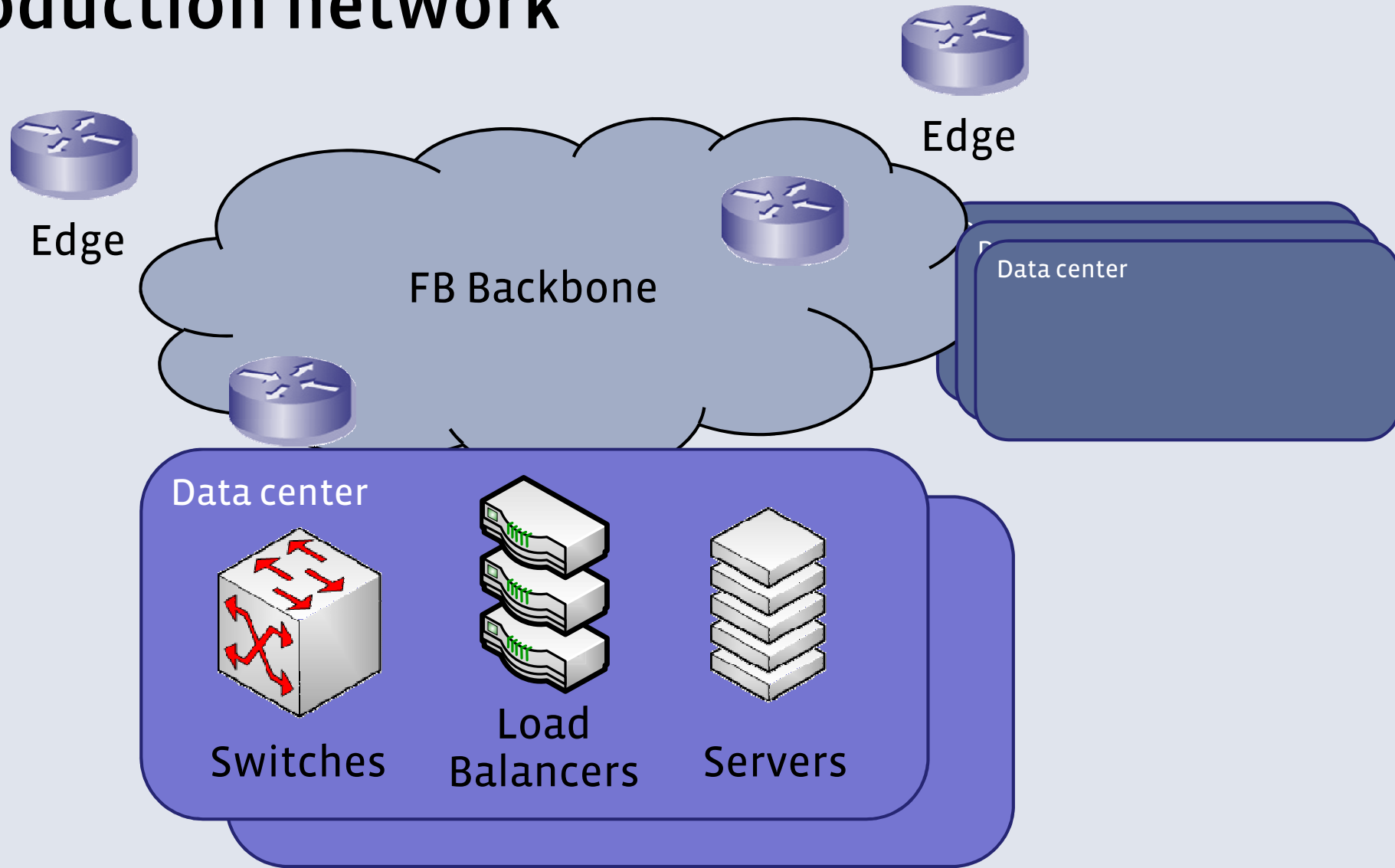
One address per user (or household)

Same security model as today

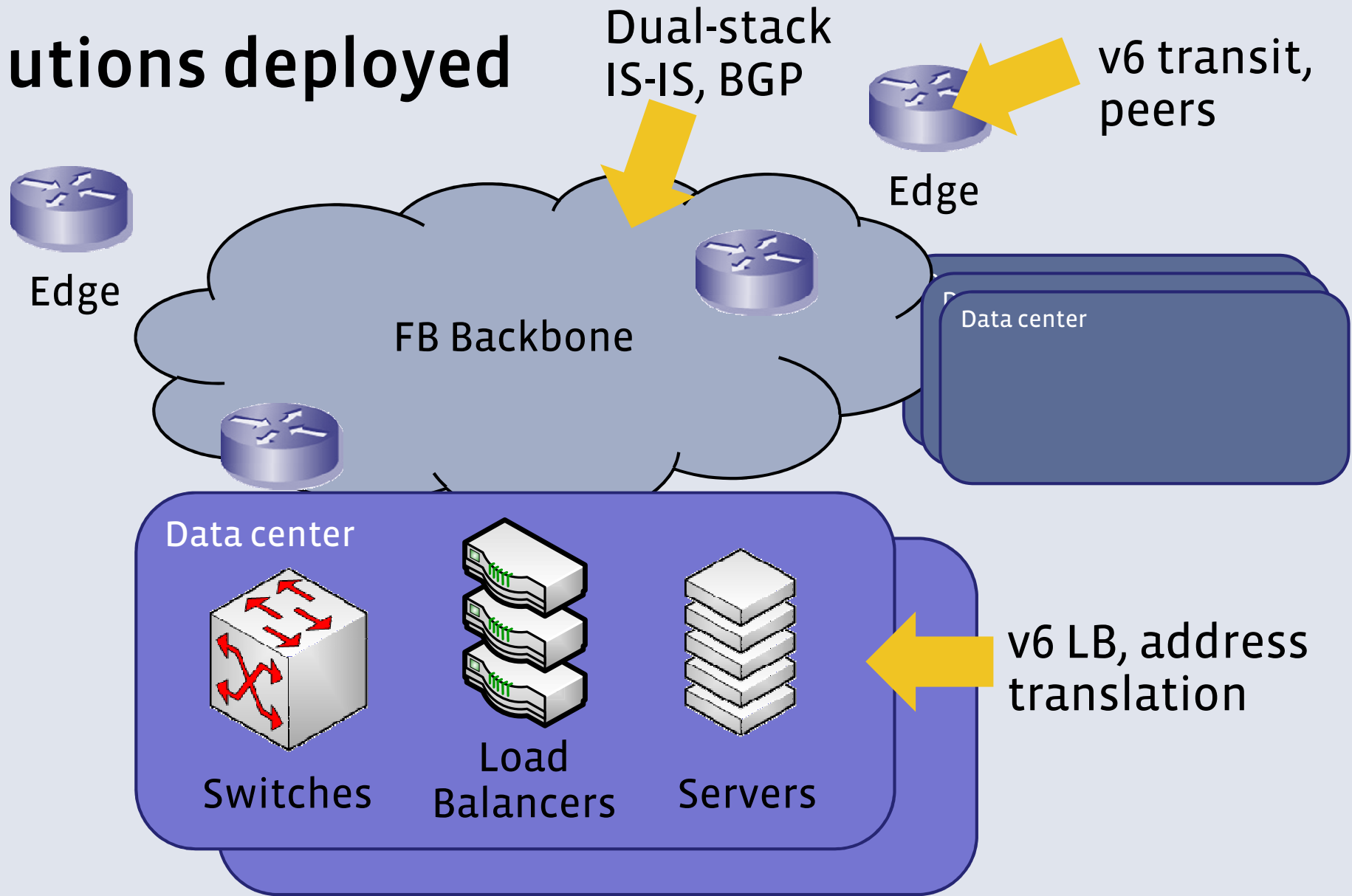
Same SLA model as today

Comparison: Large Scale NAT vs. End-to-end IPv6

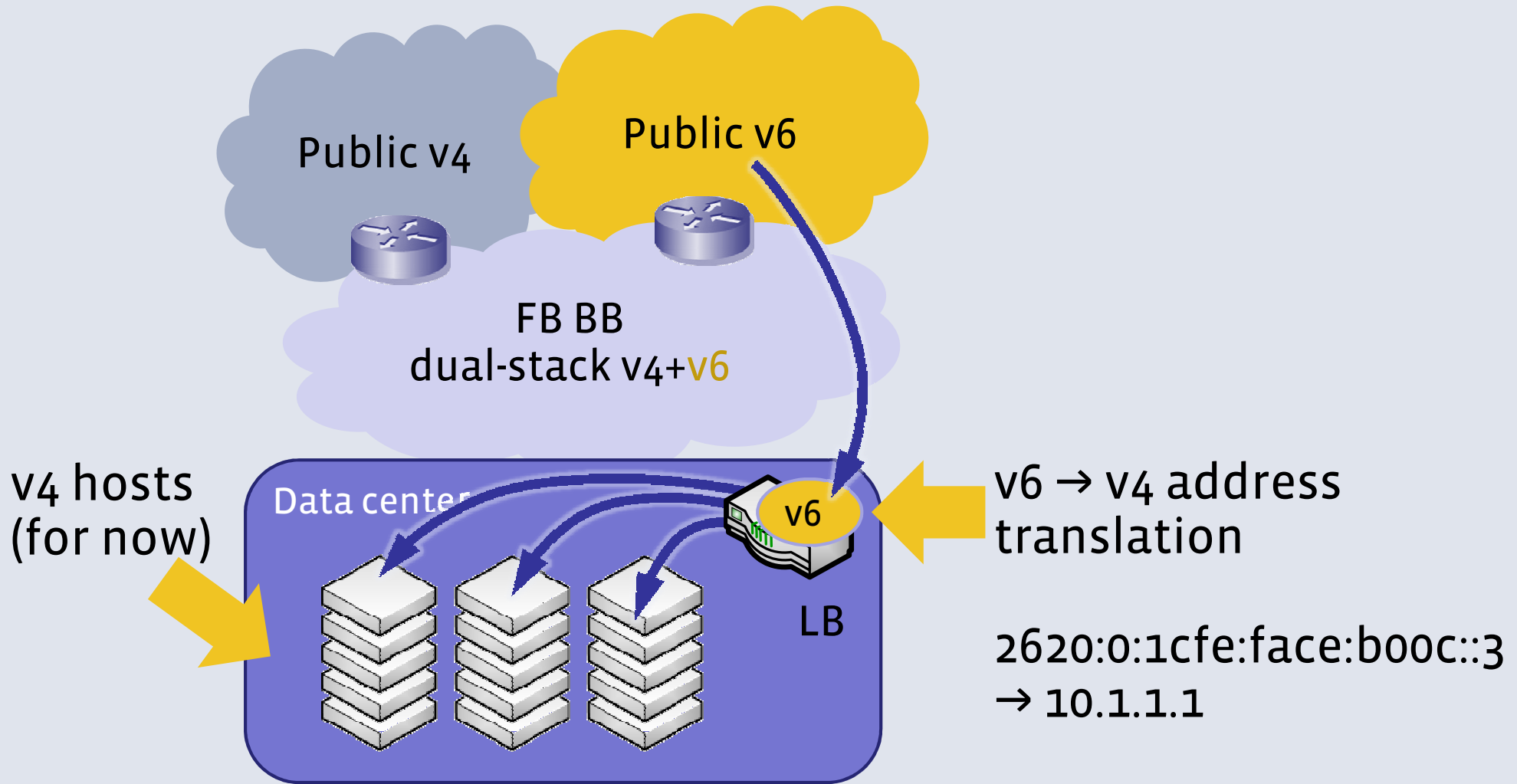
Production network



Solutions deployed



LB address translation



Opening the floodgates



Opening the floodgates

- Understanding the blast radius of AAAA on broken users
- Instrumentation of user experience
- Testing
- Communication
- Taking the leap in doses
- Analysis
- Iteration

World IPv6 Day
8 June 2011



www.v6.facebook.com
m.v6.facebook.com

www.lisp6.facebook.com
m.lisp6.facebook.com

Experimental, non-production

Make your next status update over
IPv6