

My Industrial Placement

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RIPE NCC

- Not-for-profit Membership Organisation in **Amsterdam**, NL
- Regional Internet Registry (RIR)
 - **IP Addresses** (versions 4 & 6) and **AS Numbers**
 - **RIPE Database**
- Other 'good of the Internet' activities
 - DNS root name server - **k.root-servers.net**
 - Oh, and...

Information Services

(My Department)

- Globally distributed Internet measurements
- Collect a lot of data (TBs)
 - on Routing, DNS, & Connectivity
- Team of ~8 Software Engineers
- In attic of old Amsterdam canal house

How we work

- **Scrum**
 - Iterative 2 week development cycle
 - Continuous stakeholder feedback
 - Production grade software
- **Continuous Integration**
 - Automated builds, testing & deployment
 - WiFi-enabled rabbit for announcements!

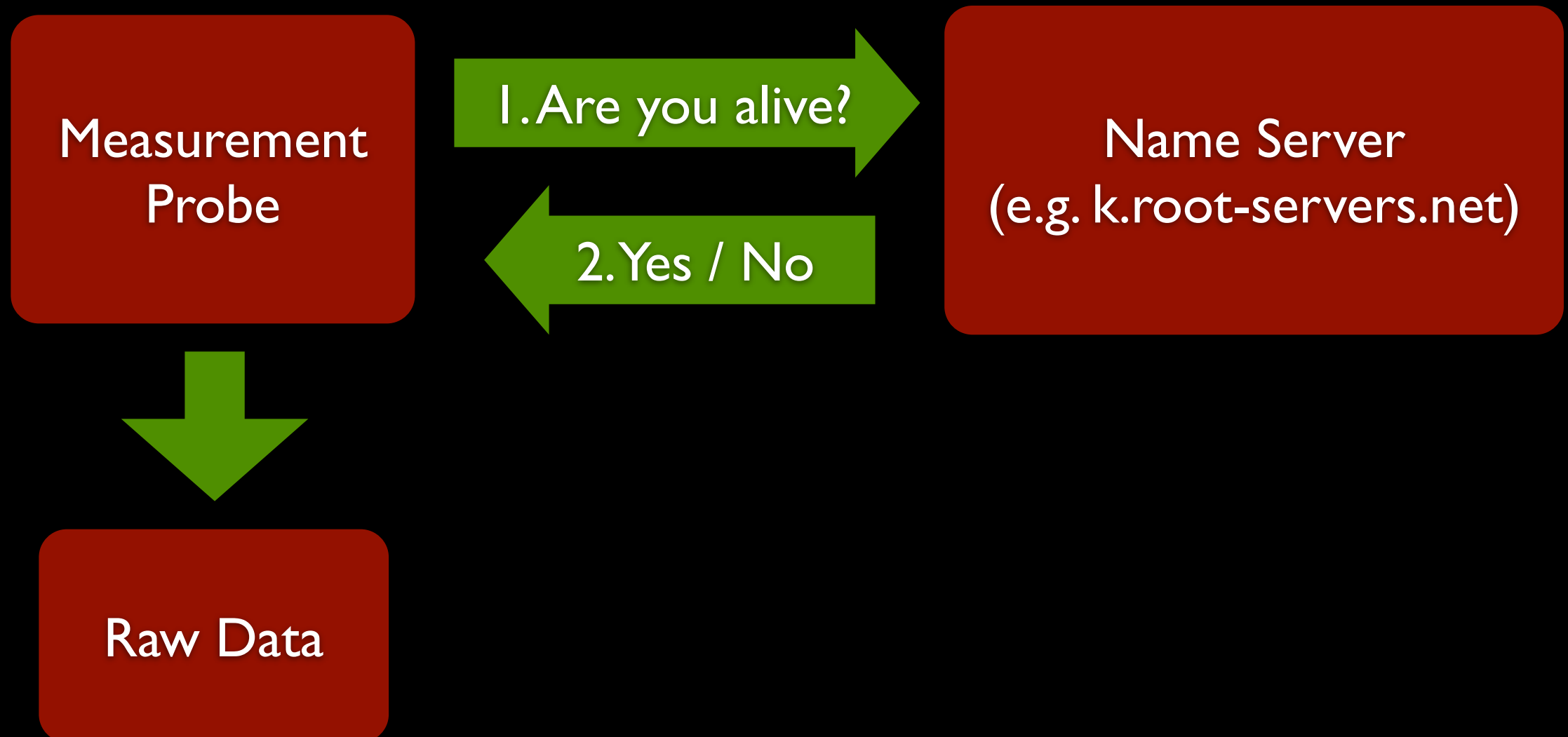
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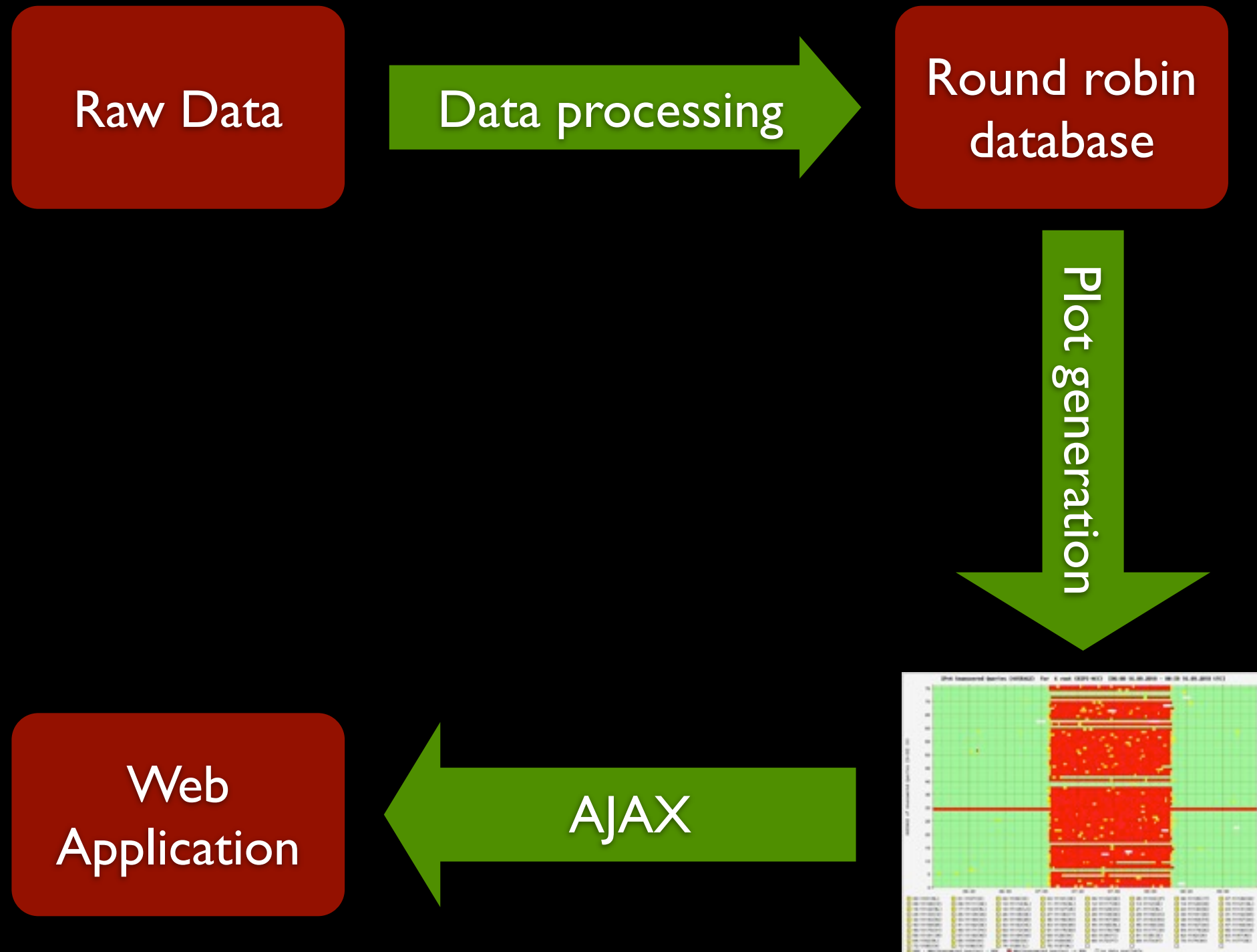


DNSMON

- Globally distributed **DNS monitoring** network
- Monitors Root & Top-Level Domain name servers (e.g. .uk)

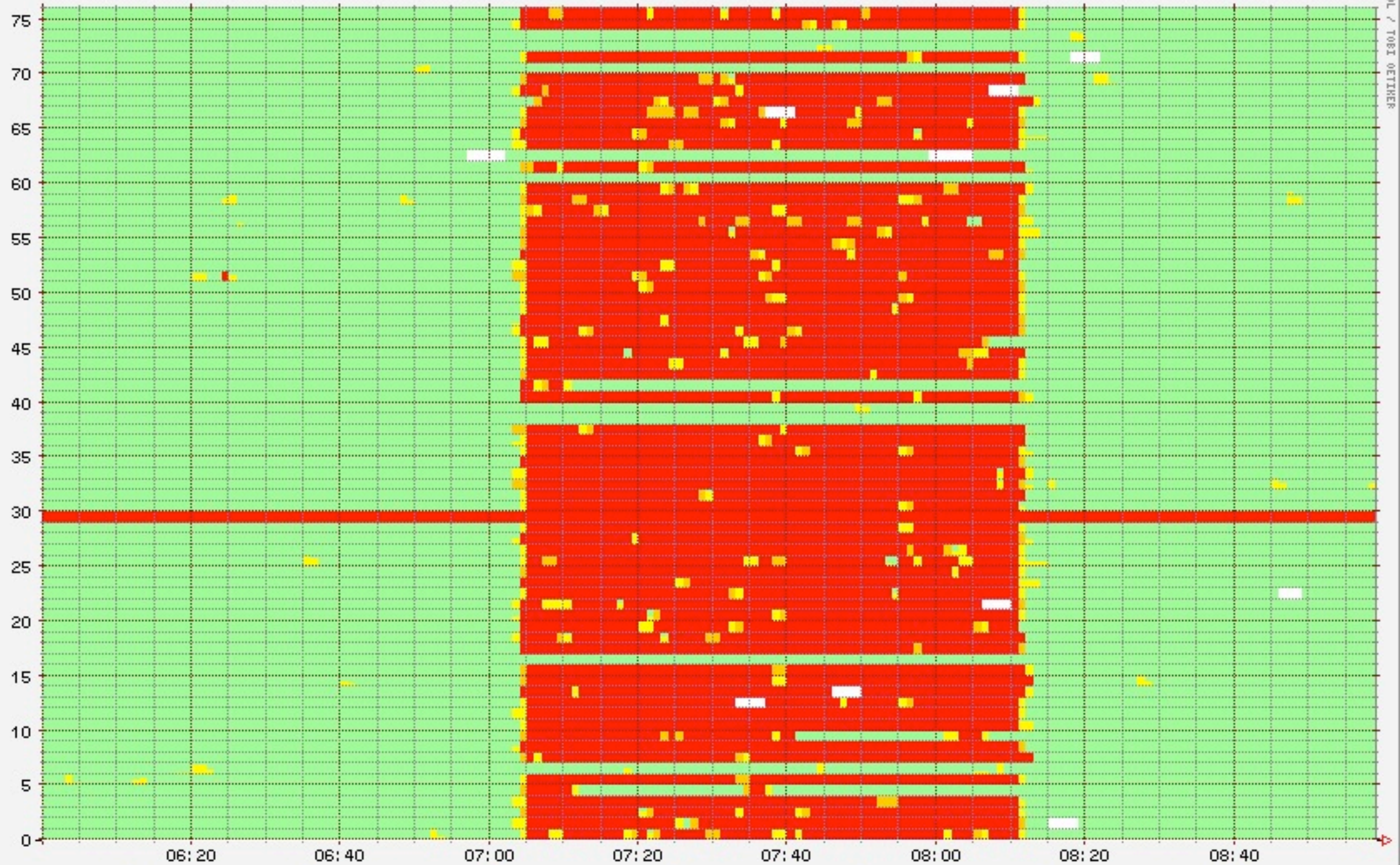


DNSMON



IPv4 Unanswered Queries (AVERAGE) for K root (RIPE-NCC) [06:00 16.09.2010 - 08:59 16.09.2010 UTC]

AVERAGE of Unanswered Queries [0-33] (%)



00: tt01(NL)	01: tt07(SE)	02: tt08(SE)	03: tt101(DE)	04: tt102(DE)	05: tt103(JP)	06: tt105(IT)	07: tt106(GB)
08: tt108(CZ)	09: tt111(DE)	10: tt114(NL)	11: tt115(NL)	12: tt117(DE)	13: tt12(DE)	14: tt120(GB)	15: tt121(NL)
16: tt122(NL)	17: tt123(NL)	18: tt125(LU)	19: tt127(DE)	20: tt129(US)	21: tt13(NL)	22: tt130(DE)	23: tt131(DE)
24: tt133(CZ)	25: tt134(VA)	26: tt135(DE)	27: tt136(CY)	28: tt139(DE)	29: tt140(US)	30: tt141(DE)	31: tt142(BR)
32: tt143(RU)	33: tt144(US)	34: tt145(BR)	35: tt146(RU)	36: tt147(BR)	37: tt153(RU)	38: tt154(FR)	39: tt157(AU)
40: tt159(BR)	41: tt162(DE)	42: tt163(KE)	43: tt164(BR)	44: tt165(NL)	45: tt166(ZA)	46: tt167(HK)	47: tt168(HK)
48: tt170(UY)	49: tt171(PK)	50: tt172(HK)	51: tt175(BD)	52: tt176(TW)	53: tt177(IR)	54: tt179(DE)	55: tt180(CH)
56: tt181(IN)	57: tt182(NZ)	58: tt184(KH)	59: tt26(UK)	60: tt34(FI)	61: tt35(IE)	62: tt42(GR)	63: tt47(NZ)
64: tt52(NL)	65: tt54(UK)	66: tt56(EU)	67: tt69(BE)	68: tt72(PT)	69: tt73(AT)	70: tt74(AU)	71: tt77(DE)
72: tt85(CH)	73: tt86(CH)	74: tt88(IL)	75: tt97(NL)				
■ 66% < MAX(Unanswered Queries) < 90% ■ MAX(Unanswered Queries) >= 90% ■ no data available							

DNSMON

- Raw data collection - legacy C
- Everything else - Python
 - Django web framework for frontend
 - Clever caching for performance
 - Dashings of Javascript for web magic.
 - RabbitMQ messaging system for data

NetSense

<http://netsense.ripe.net>

- Another **Python** / **Django** web app.
- Present Internet data in easily accessible fashion
- Added:
 - **Routing stability** graphs
 - **DNS Lameness** data
 - **IPv6** support to an open-source library



NetSense

RIPE NCC NetSense

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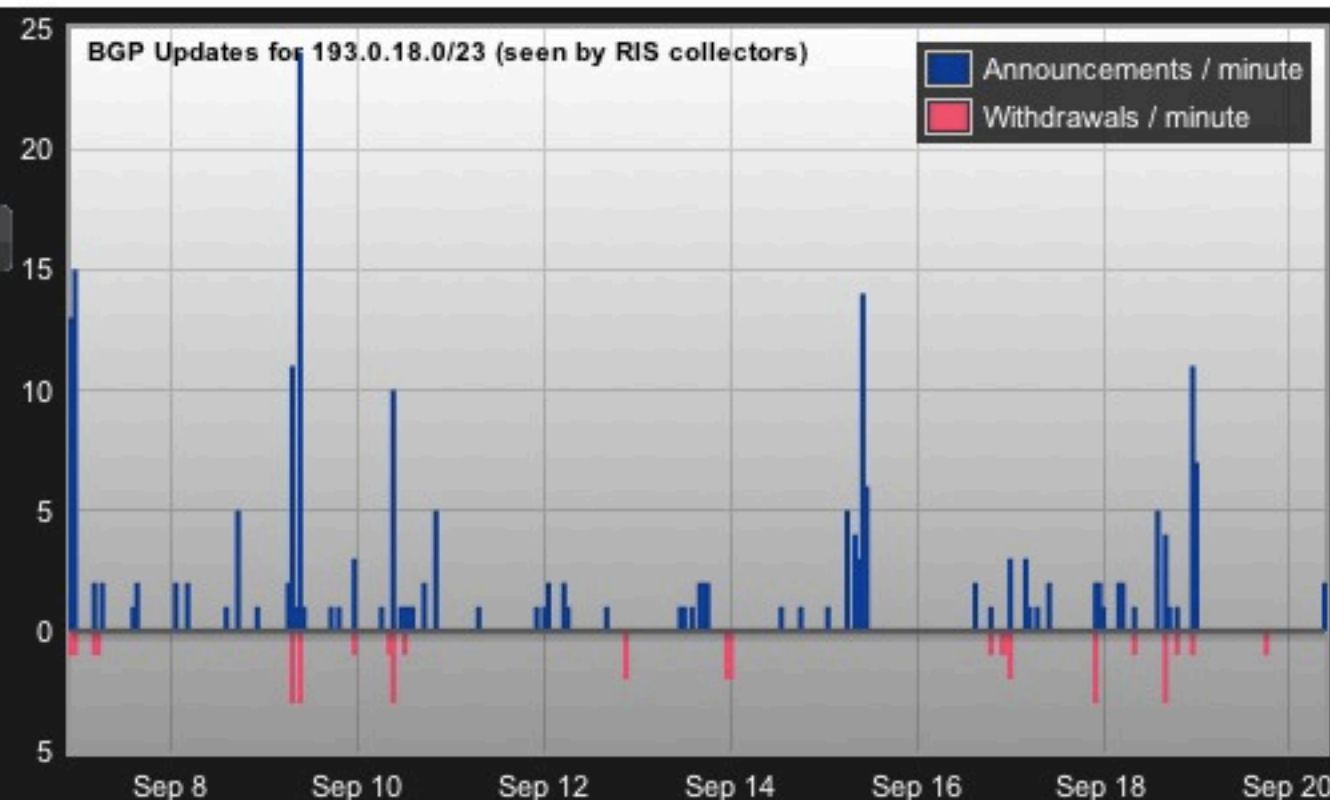
Find out information about your *AS or Prefix*

3333

Sense

AS3333 - RIPE-NCC RIPE Network ...

Prefix ↑	First Seen ↑	Last Update ↑	+
193.0.18.0/23	1 year ago	4 hours ago	▶
193.0.20.0/23	1 year ago	4 hours ago	
193.0.12.0/23	1 year ago	4 hours ago	
193.0.22.0/23	5 months ago	4 hours ago	
2001:610:240::/42	3 months ago	5 hours ago	
193.0.0.0/21	1 year ago	4 hours ago	



STABILITY

VISIBILITY

DNS Lameness

☐ Don't Filter | ☐ All Issues | ☐ Only Errors

Routing Consistency

Prefix ↑

DNS Lameness ↑

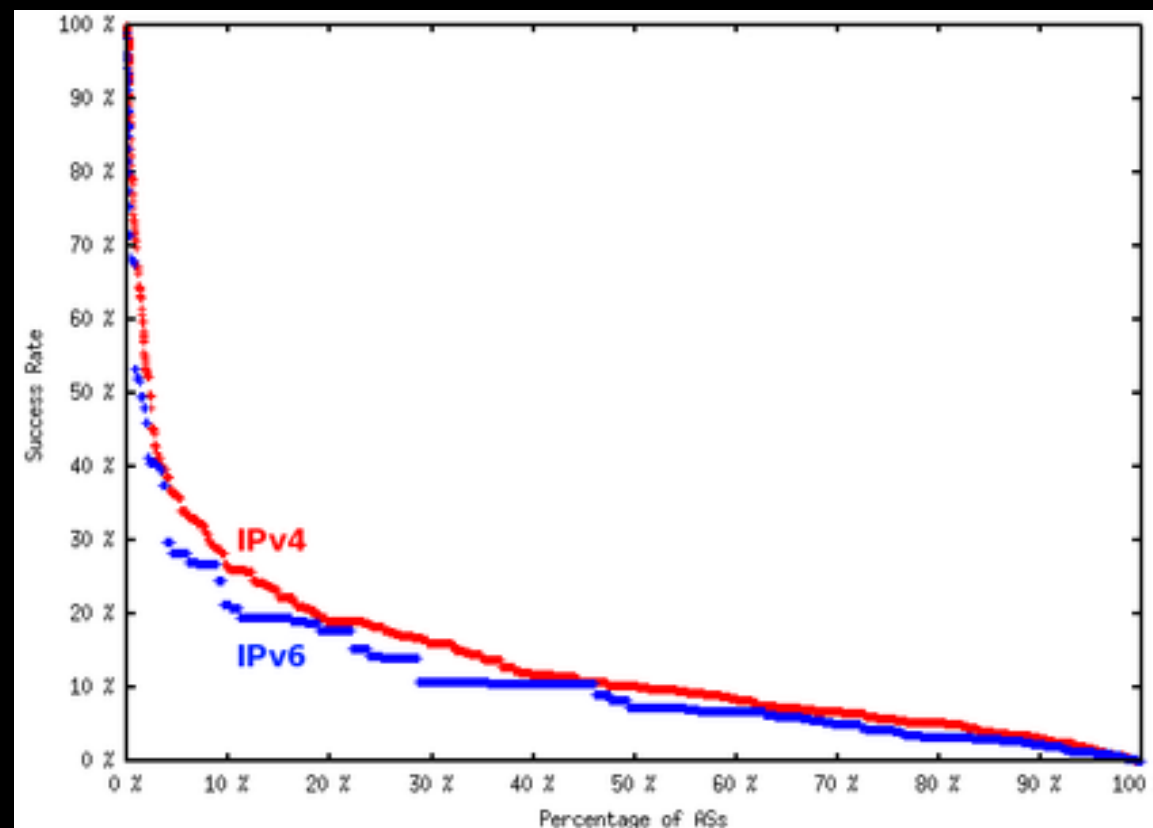
Status ↑

193.0.22.0/23	No Lameness Detected	No Lameness Detected ✓
193.0.0.0/21	Found 1 Errors	Lameness ✗
193.0.18.0/23	No Lameness Detected	No Lameness Detected ✓
193.0.12.0/23	No Lameness Detected	No Lameness Detected ✓
2001:610:240::/42	No Data	Not Present !
193.0.20.0/23	No Lameness Detected	No Lameness Detected ✓

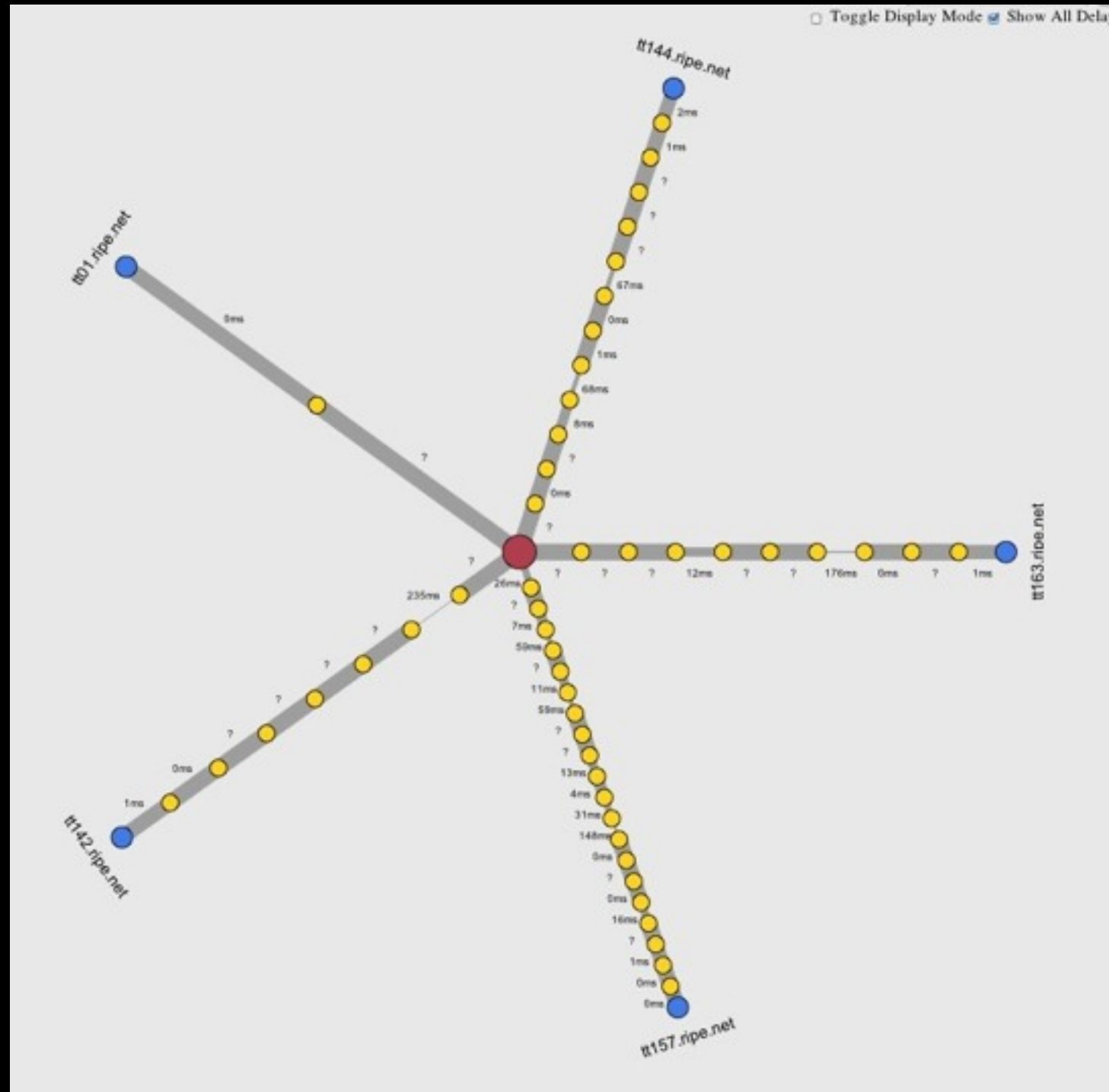
(A little bit of)

Research

- Studied effects of hijacking attack success
- Analysis based on Information Services data.
- Published to <http://labs.ripe.net>



Visual Traceroute Tool



What did I learn?

- Other people need to **understand** your code.
- **Testing** really is important. Unit testing is great.
- To use a **debugger**, and use it well.
- If there's a common problem, there's usually a Python **library** to solve it.

Experience gained?

- Working in a **real** software team, with real deliverables
- Writing **production code**
- **Living abroad!**
- Contributing to **free software**¹ - for the first time!

¹ free as in 'free speech'

Any Questions?

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