



**RIPE
73**

24 - 28 OCT 2016
MADRID, SPAIN

THE IMPACT OF ROUTING ON ANYCAST

(How to) measure a controllable anycast network

INTRODUCTION – WHO AM I?

Wouter de Vries

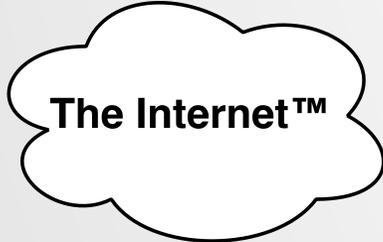
PhD student

Design and Analysis of Communication Systems
Group



LIGHTNING RECAP

Non-anycasted
(i.e. normal) service

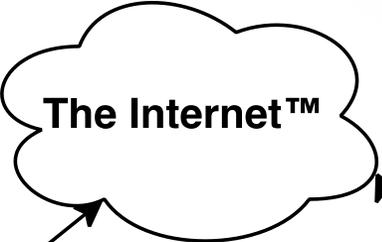


Server A

Magic happens



Anycasted
Service



Server A



Server B

LIGHTNING RECAP

Routing policies “decide” which client reaches which server within an anycasted service



Catchment

SO WHAT IS THE MATTER?

- Routing policies are diverse
- End-to-End network paths can usually not be controlled directly

So: Catchments can be chaotic

SO WHAT IS THE MATTER?

- Routing policies are diverse
- End-to-End network paths can usually not be controlled directly

MEASUREMENTS

So: Catchments can be chaotic

TWO –INITIAL- PROBLEMS

- Existing anycast services are interesting but: mostly static 😞
- How to determine the catchment

INITIAL PROBLEM 1 - SOLUTION

Use an anycast service that can be controlled

Peering[1]

or

Setup your own

[1] Schlinker, Brandon, et al. "PEERING: An AS for us." Proceedings of the 13th ACM Workshop on Hot Topics in Networks. ACM, 2014.

SETTING UP YOUR OWN ANYCAST “SERVICE”

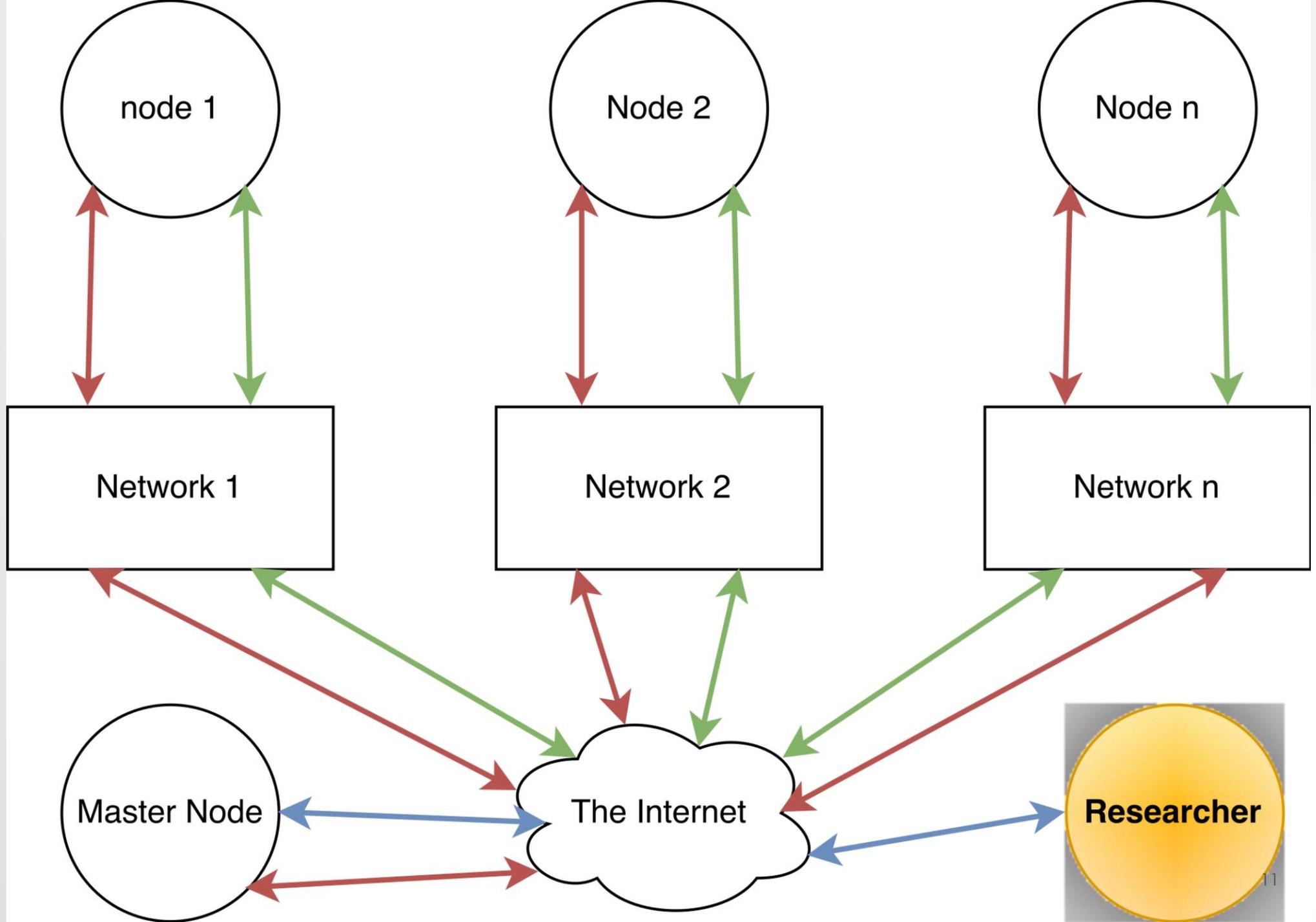
As seen at RIPE69 [2]

- Easier said than done -

[2] Nat Morris, “Anycast on a shoe string”, RIPE69

SETTING UP YOUR OWN ANYCAST NETWORK

- Convince people to host a node/site/instance (VM) ideally for free
- Setup the BGP session



WHAT DO WE HAVE SO FAR?

Name	Upstream AS	Location	Hoster
us-was-anycast01 ✓	1972	United States, Washington	USC/ISI
us-mia-anycast01 ✓	20080	United States, Miami	FIU
nl-ens-anycast01 ✓	1103	Netherlands, Enschede	University of Twente
au-syd-anycast01 ✓	20473	Australia, Sydney	VULTR
fr-par-anycast01 ✓	20473	France, Paris	VULTR
dk-cop- anycast01 ✓	39389	Denmark, Copenhagen	DK-Hostmaster
jp-hnd-anycast01 ✓	2500	Japan, Tokyo	USC/ISI - WIDE
uk-lnd-anycast02 ✓	20473	United Kingdom, London	VULTR
br-gru-anycast01	1251	Brazil, São Paulo	FIU
nl-arn-anycast01	1140	Netherlands, Arnhem	SIDN

TWO INITIAL “PROBLEMS”

- ~~Existing anycast services are interesting~~
~~but: mostly static~~ 😞 ✓
- How to determine the catchment

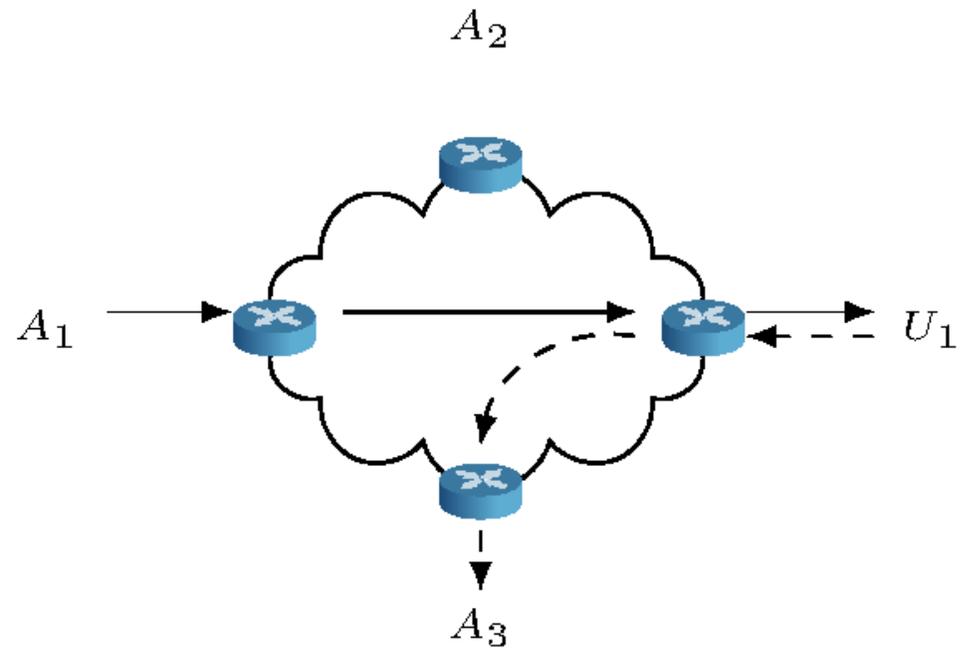
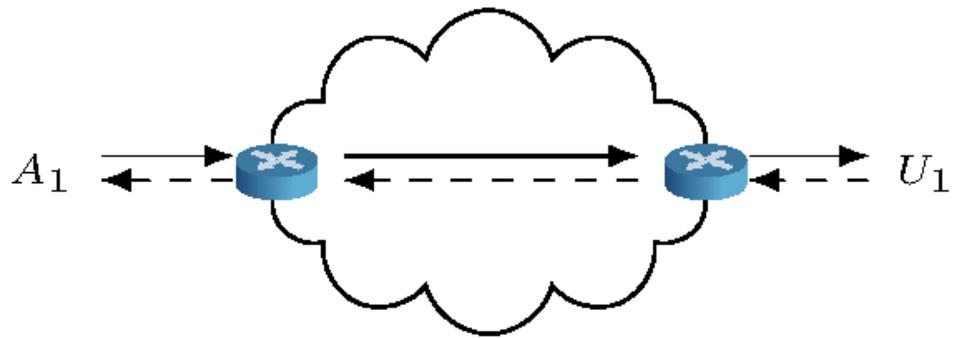
THE OPTIONS

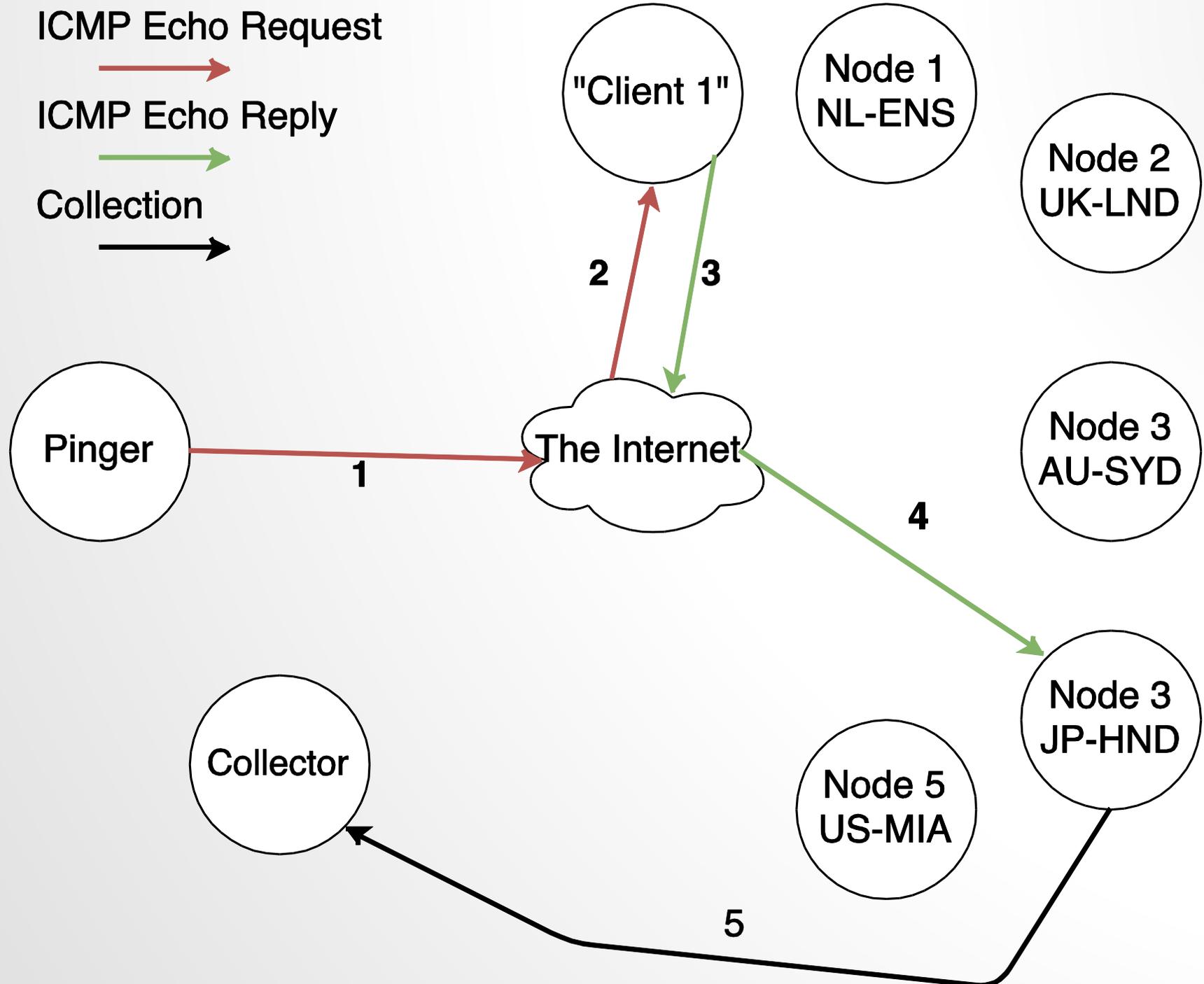
- RIPE Atlas
- PlanetLab, NLNOG Ring, ..., etc (?)
- Measure from the inside

MEASURING FROM THE INSIDE

- 1: Ping The Internet™
- 2: ????????
- 3: We know the catchment

PINGING –FROM THE INSIDE OUT-





IP HITLIST

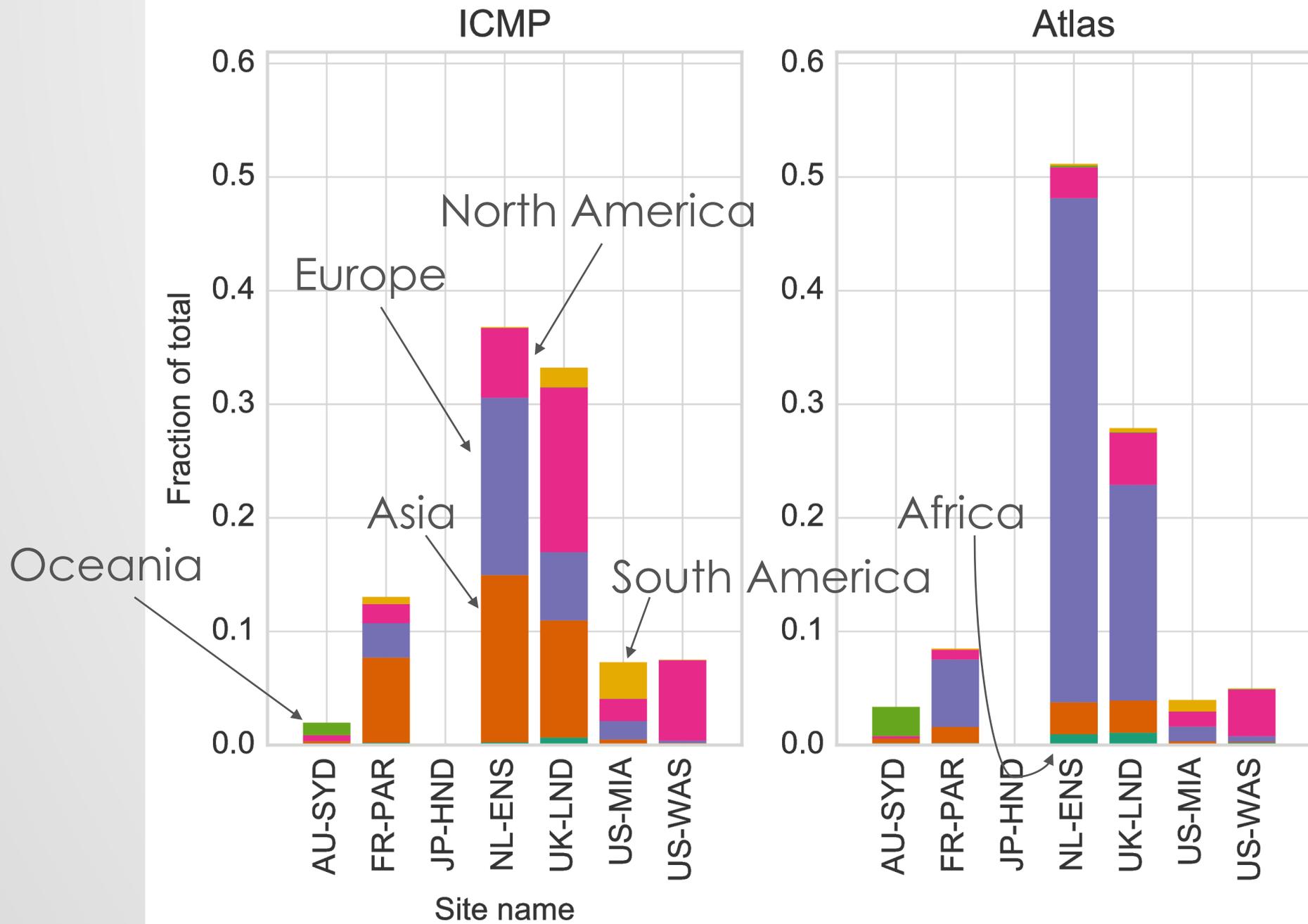
We ping 1 IP(v4) for every IP(v4) /24 prefix

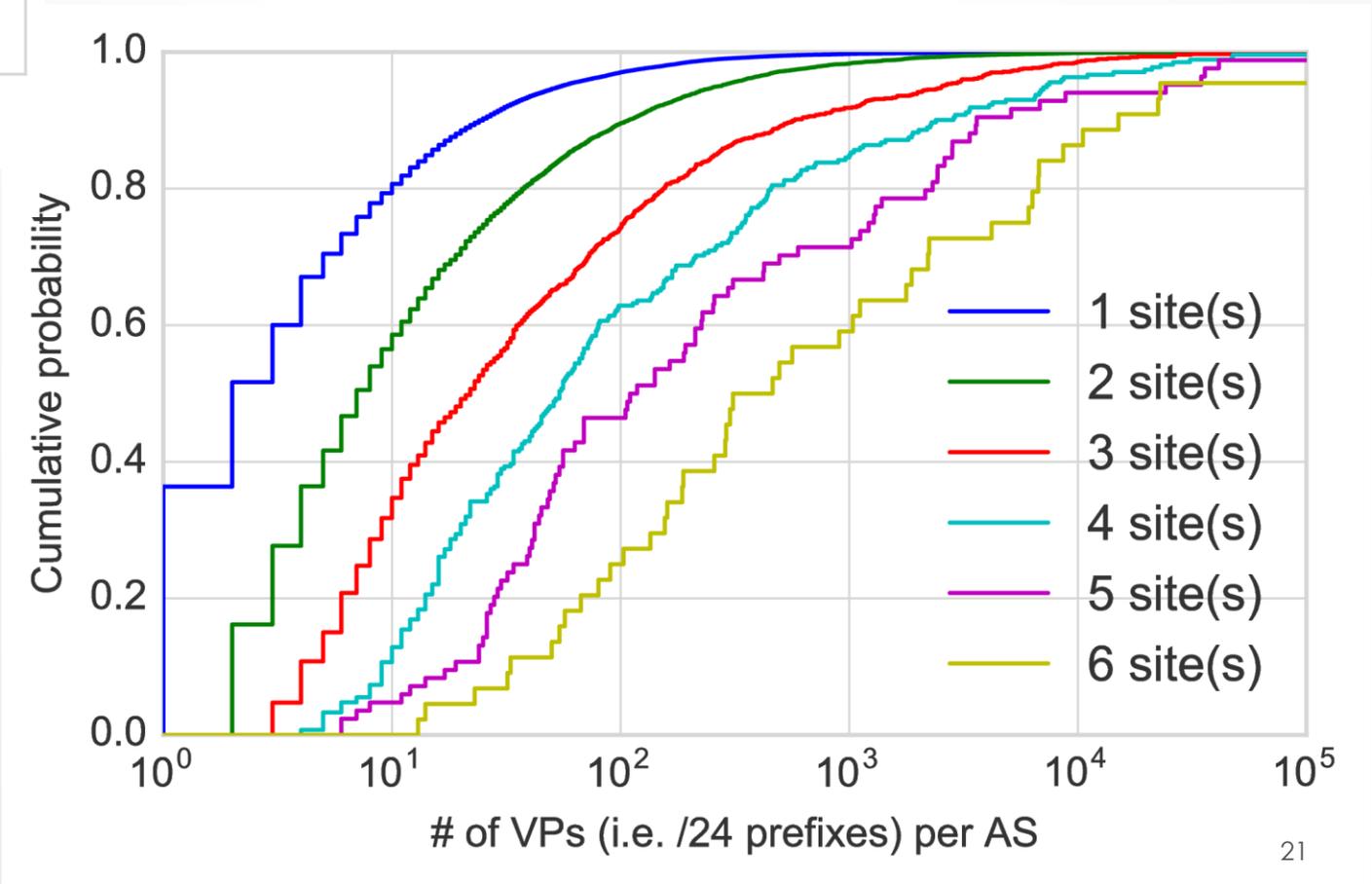
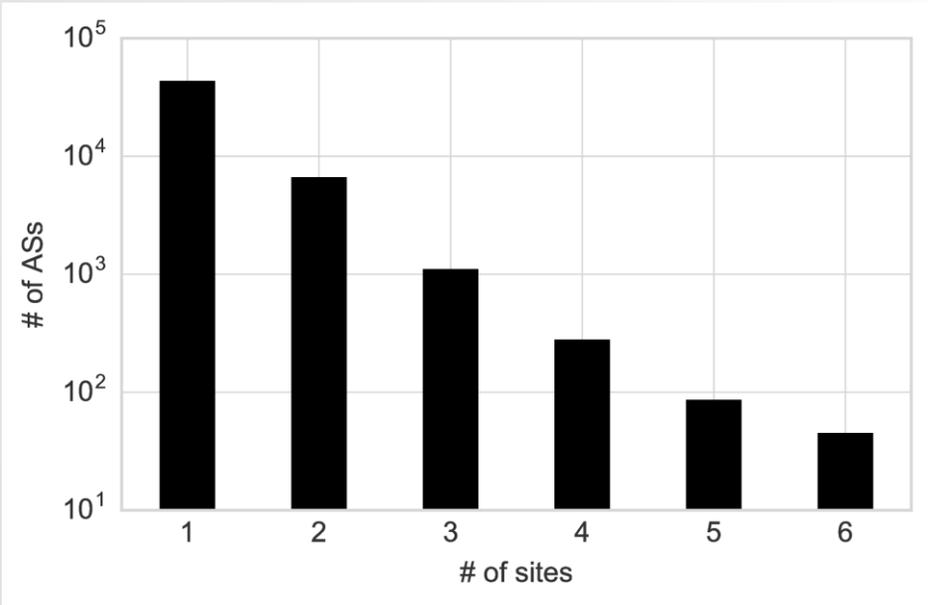
e.g. for 172.16.6.0/23, ping 172.16.6.25 and
172.16.7.29

COVERAGE

Approximately 90% of all ASES

30% of ASES: 5 “VPs” or more





CONCLUSIONS

- Creating your own real-world testbed for BGP is possible
- A ping can give you a lot of information in an anycast environment
- Fertile ground for anycast catchment optimization

DATA & TOOLS

Used tools are available

<https://github.com/woutifier>

Data will be made available soon™

THE END

Questions, Comments

Collaboration proposals are welcome