Lost in Space: Improving Inference of IPv4 Address Space Utilization

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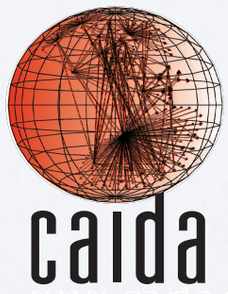


MAPPING USE OF IPV4 SPACE

Why do we care?

Security
- inform host reputation and access control
  - e.g., to mitigate network abuse
- detect BGP hijacking attacks

Policy / Social / Economics
- inform policy on address space allocation
- estimate Internet usage over time
  - e.g., policy, political and social science, economics

Better Data
- identify homogeneous address aggregates
  - e.g., for IP geolocation
- data normalization
  - e.g., per-AS or per-Country normalization

Operations
- detect changes in network operation
- select targets for active measurements,

MAPPING USE OF IPV4 SPACE

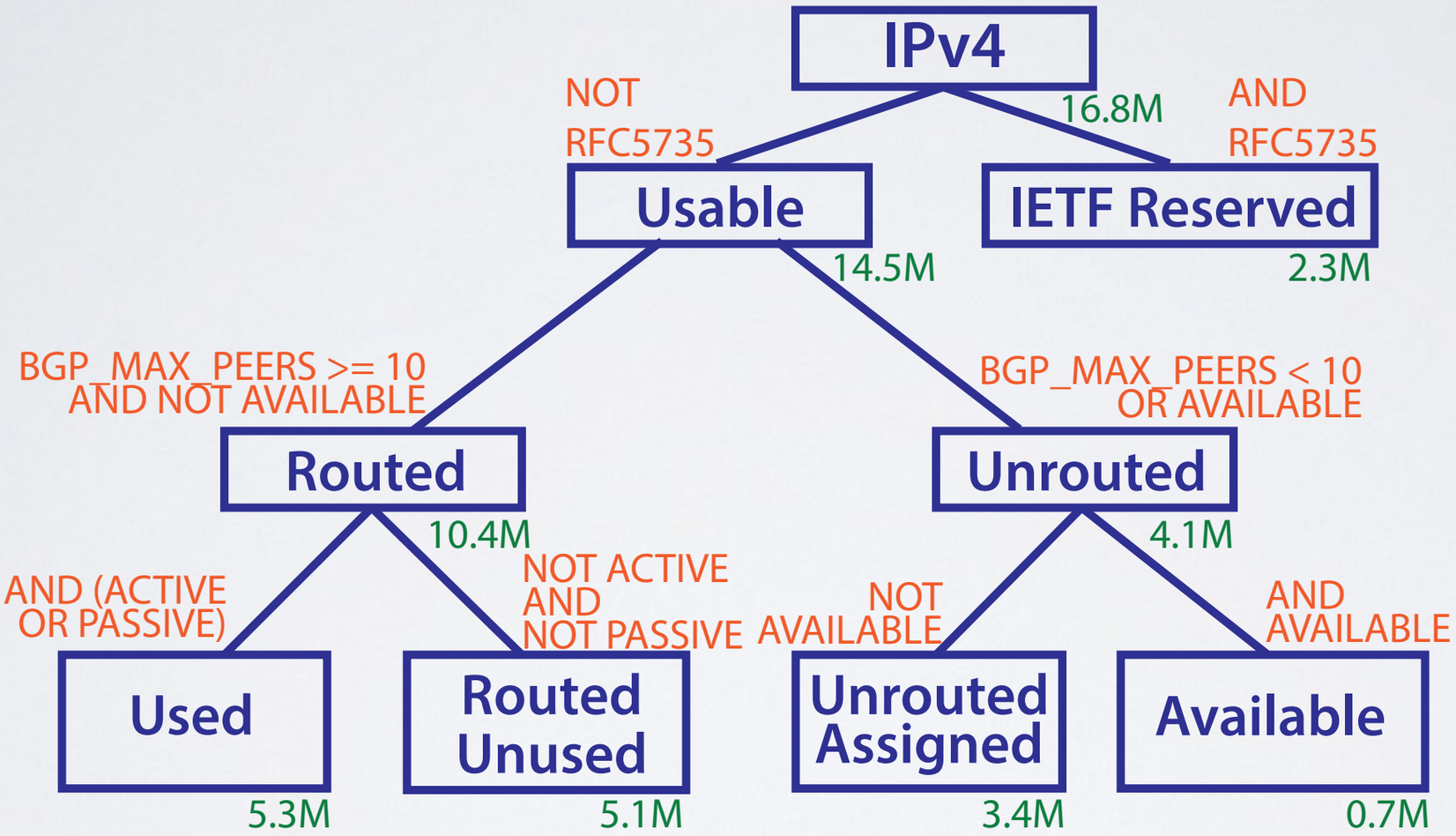
methodology

Dataset	Source type	Data format	Period
UCSD-NT [2]	Traffic: Darknet	full pkt traces	July 23 to August 25, 2013
SWITCH [59]	Traffic: Live Academic Net.	Netflow logs	July 23 to August 25, 2013
IXP [8]	Traffic: IXP	sFlow packet samples	July 8 to July 28, August 12 to September 8, 2013
R-ISP [25]	Traffic: Residential ISP	Tstat [24] logs	July 1 to September 31, 2013
ISI [41]	Active Probing: ICMP ping	logs	July 23 to August 25, 2013
HTTP [28]	Active Probing: HTTP GET	logs	October 29, 2013
ARK-TTL [34]	Active Probing: traceroute	logs	July to September, 2013
BGP [6], [57]	BGP announcements	RIBs	July to September, 2013
Available Blocks [27]	IANA/RIRs	IP ranges	October 1, 2013
NetAcuity Edge [22]	IP Geolocation	IP ranges	July 2013
prefix2AS [16]	BGP announcements	prefix to ASN	July 2013

- active + passive measurement approaches
- passive: main challenge is filtering out *spoofed* and *scanning* traffic

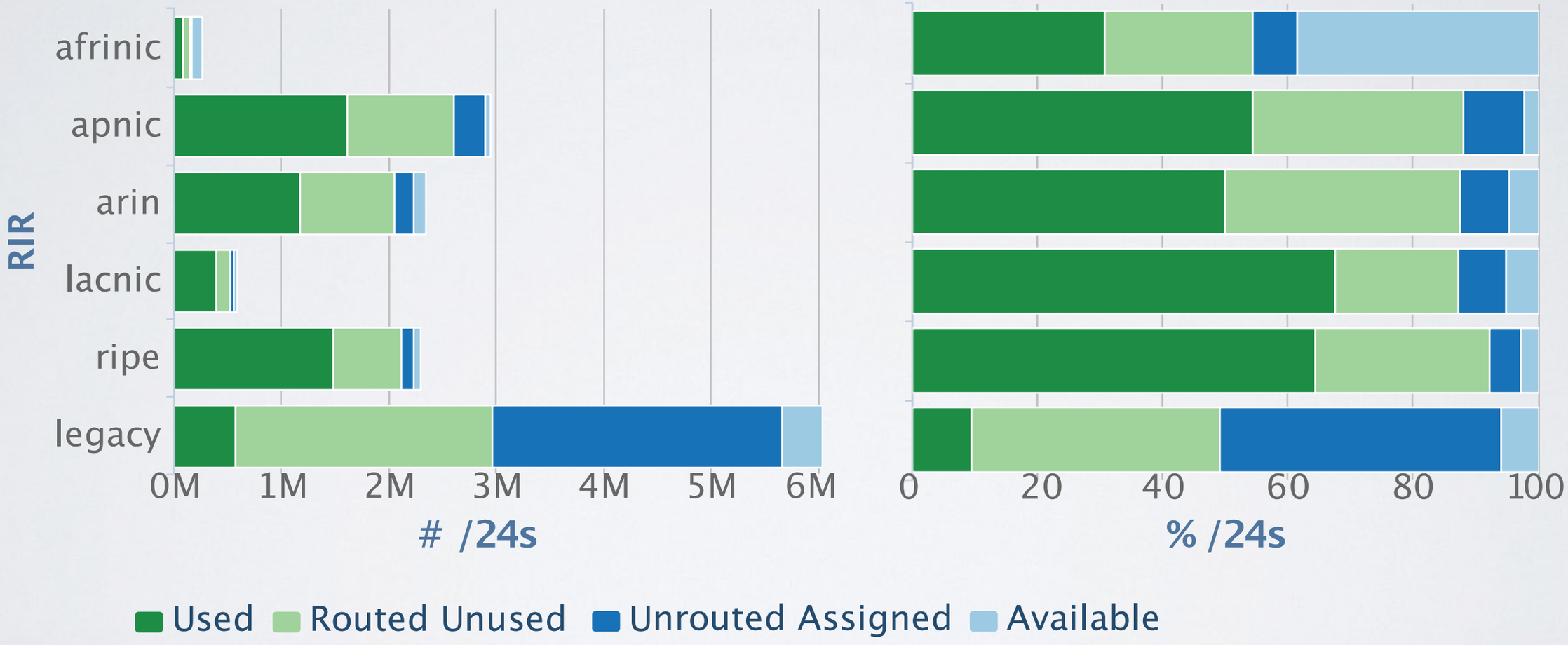
A TAXONOMY OF SPACE USE

announced on BGP doesn't imply it's used

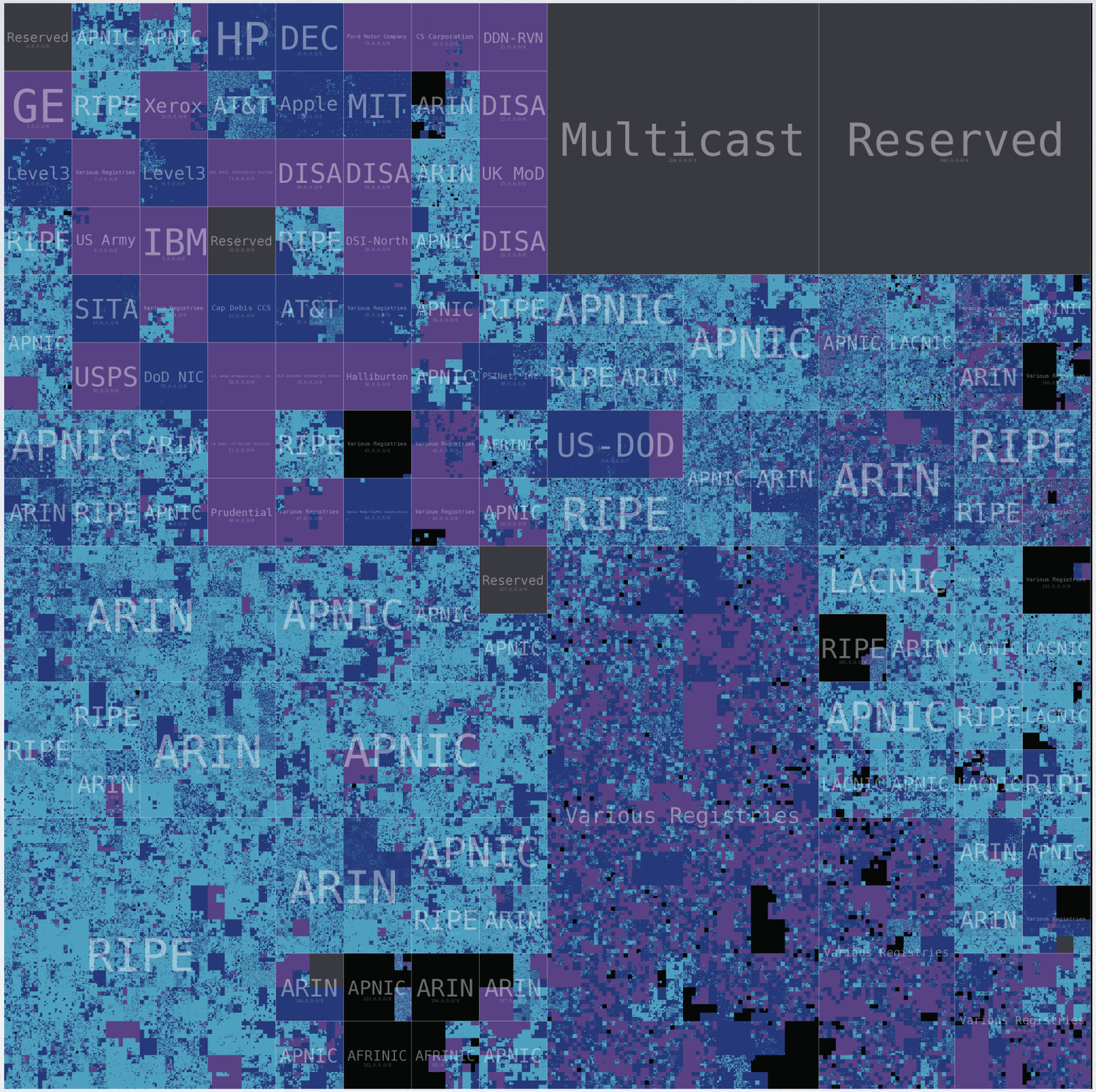


A PEEK AT RESULTS

paper/website are packed with graphs and tables



YOU ARE HERE


Reserved
APNIC
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HP
DEC
Ford Motor Company
CS Corporation
DDN-RVN
Multicast
Reserved
GE
RIPE
Xerox
AT&T
Apple
MIT
ARIN
DISA
Level3
Various Registries
Level3
DoD Intel Information Systems
DISA
DISA
ARIN
UK MoD
RIPE
US Army
IBM
Reserved
RIPE
DSI-North
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SITA
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Cap Debis CCS
AT&T
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AFRINIC
USPS
DoD NIC
Halliburton
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PSINet, Inc.
RIPE
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UK Dept. of Social Security
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CONTRIBUTE

how you can help us

- data data data..

- ***anonymized, no timestamps, no content***
- just /24 blocks you observe (NOT from your network) within a large time frame (e.g., 3 months or even a year)
- 1) existing: server logs, NetFlow records…
- 2) collect: host a simple box running a modified Tstat. opensource code (we don't need access to the machine)

- we share the resulting dataset

THANKS

questions?

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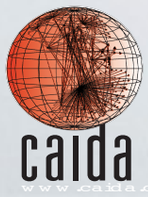

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