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Leviathan: Command and Control Communications on Planet Earth

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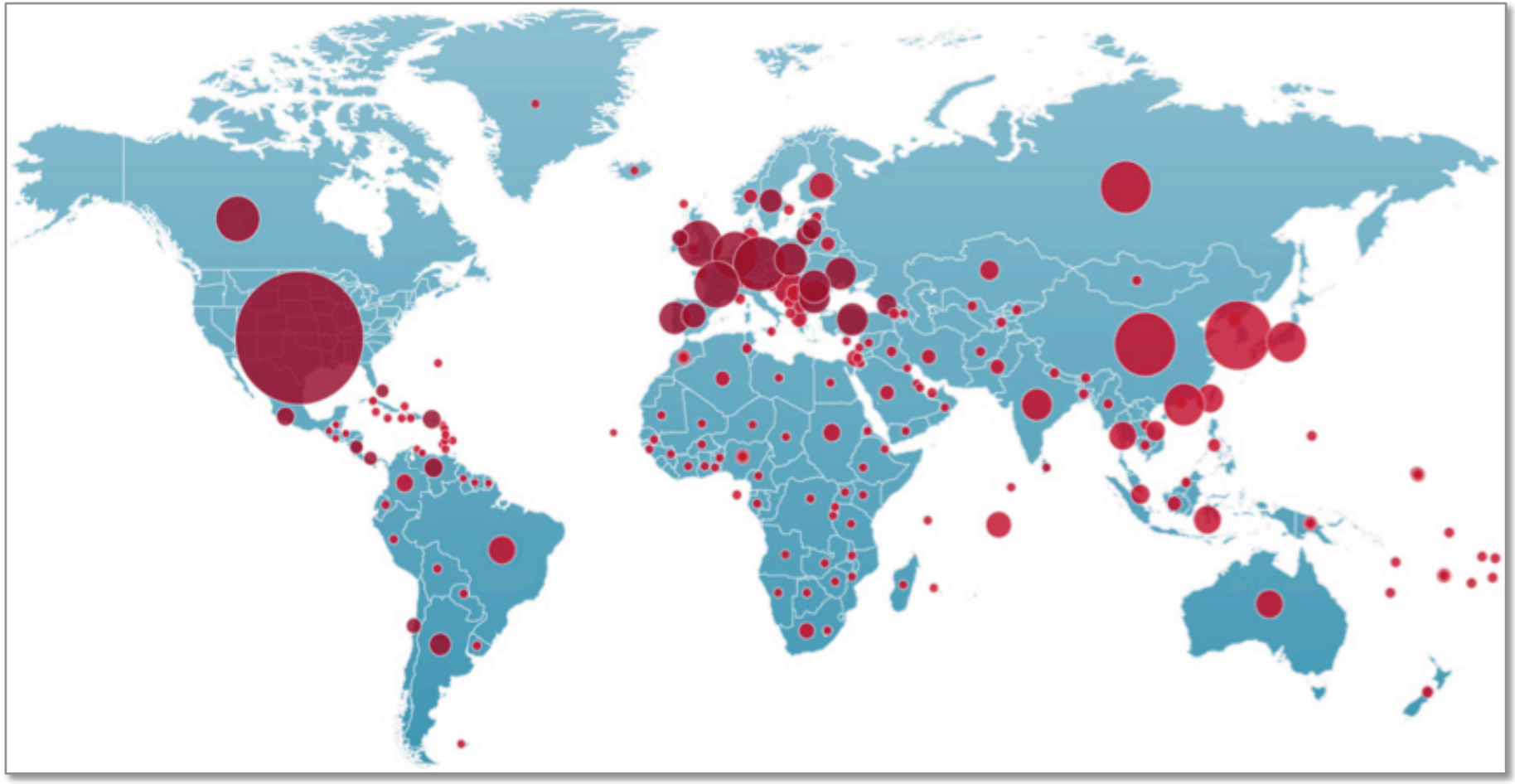
Leviathan

Worldwide malware ecosystem



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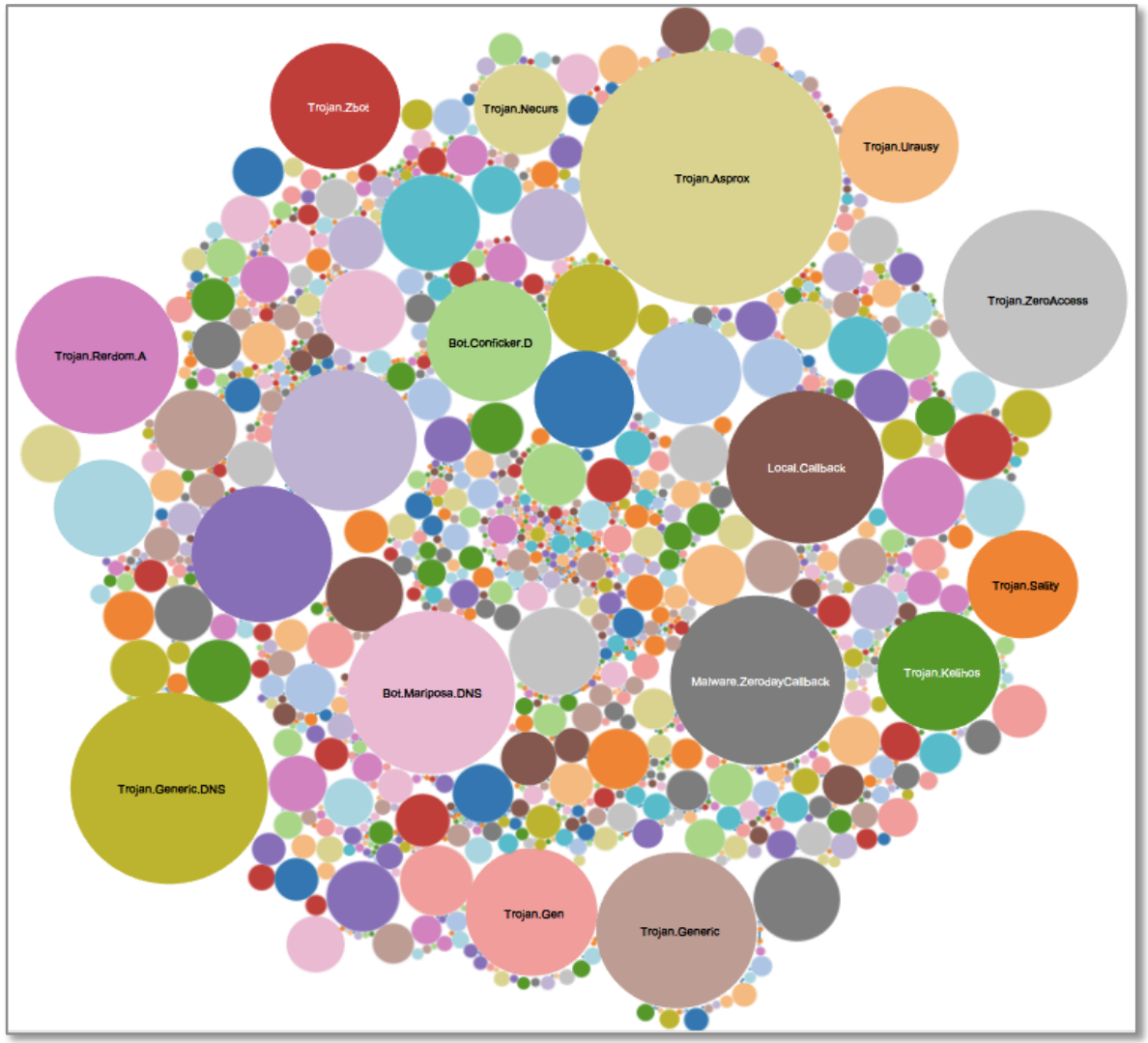
C2 malware signatures



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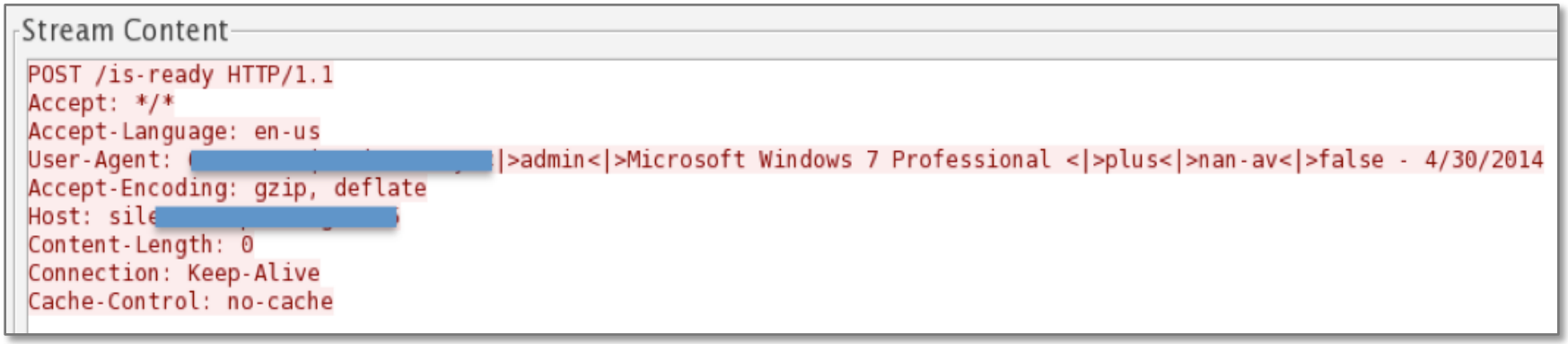
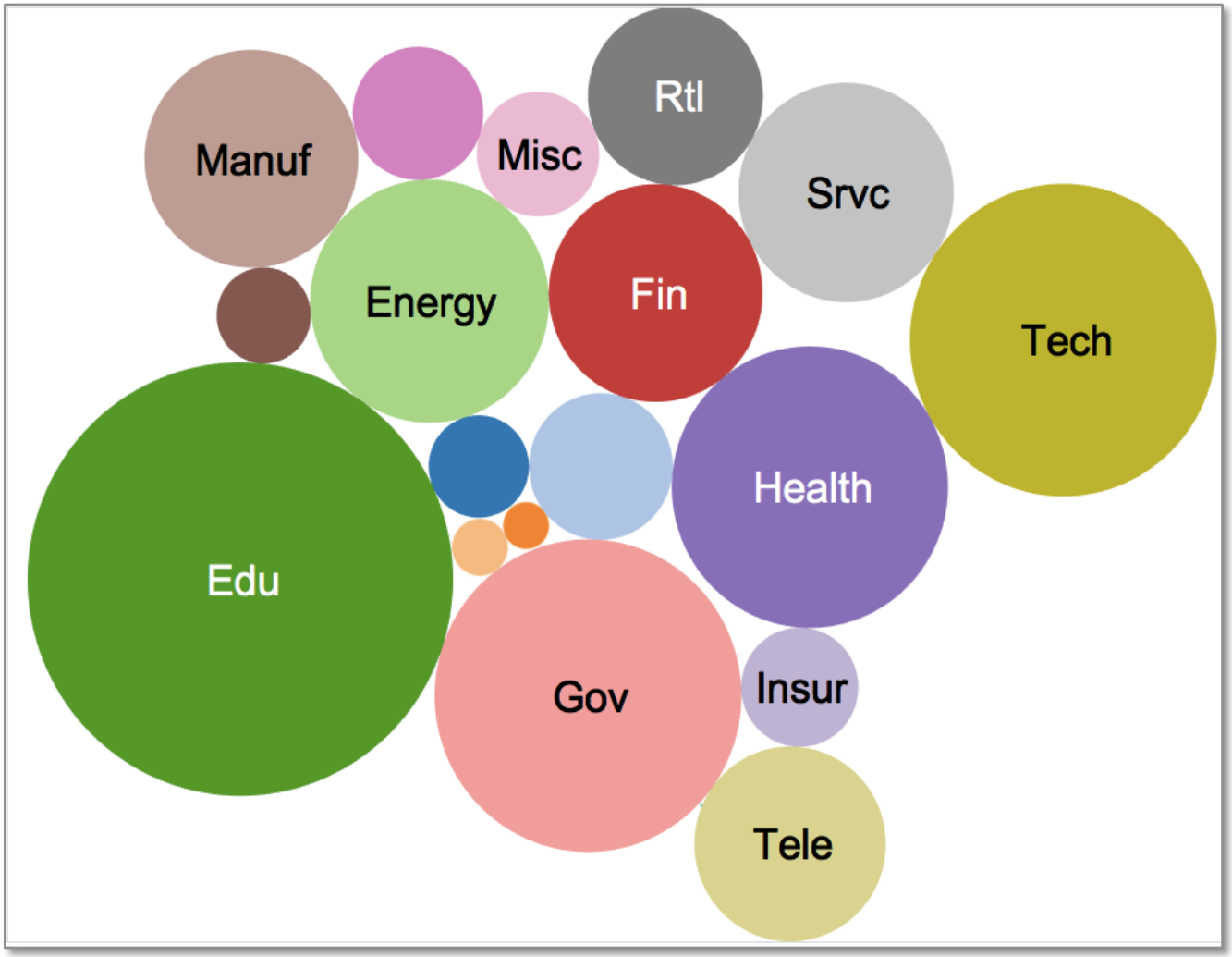
Tactics, techniques, and procedures



lv|'|'|
2YLZgNin2KrZgNmEINmF2YDYo9is2YDZiNixXzQwMENENTEw|'|'|
Remote PC|'|'|admin|'|'|2013-04-22|'|'|USA|'|'|Win XP Professional SP2 x86|'|'|No|'|'|0.5.0E|'|'|..|'|'|
QzpcV0lORE9XU1xzeXN0ZW0zMlxjbWQuZXhl|'|'|[endof]

Every industry vertical owned



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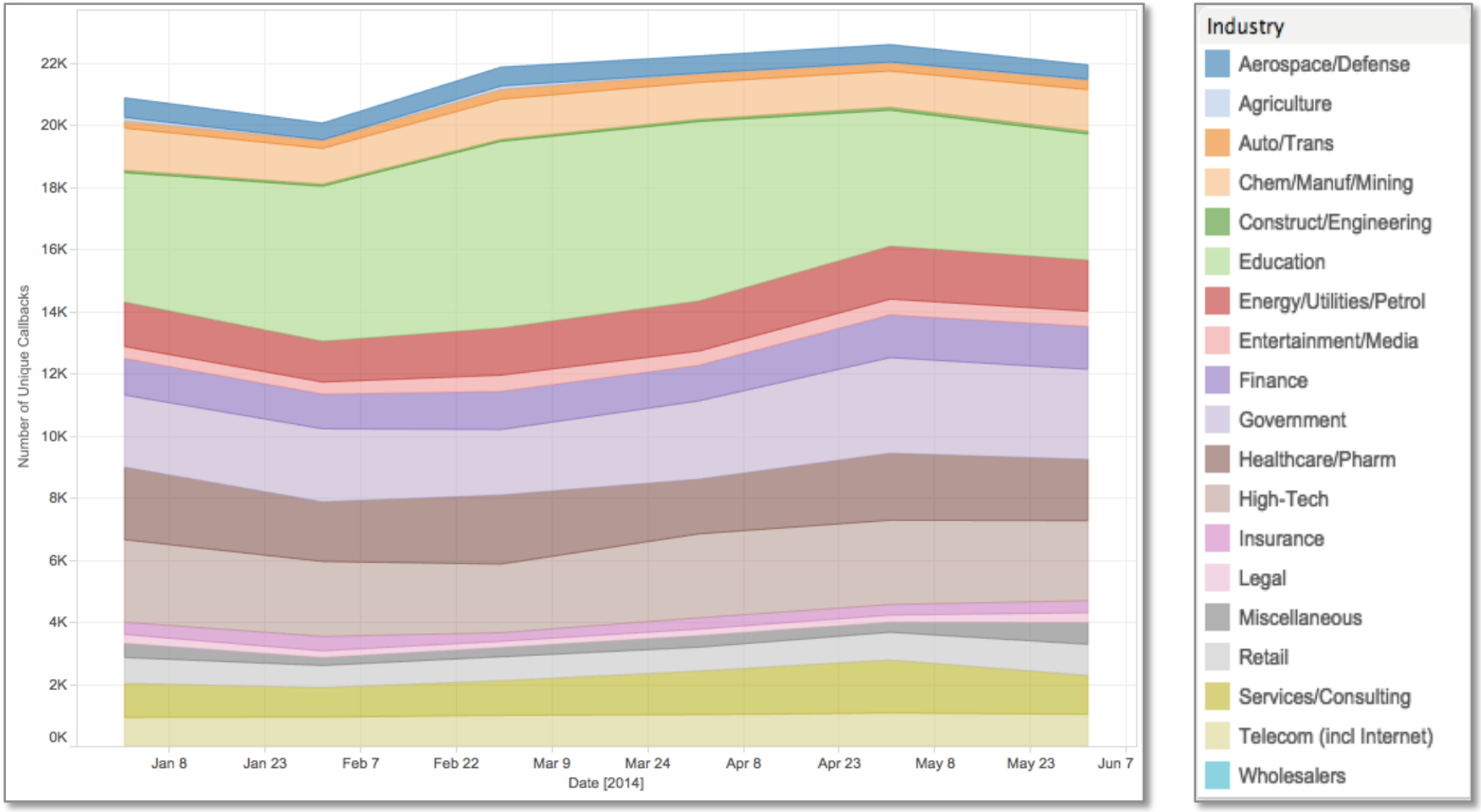
Callbacks: ebb and flow



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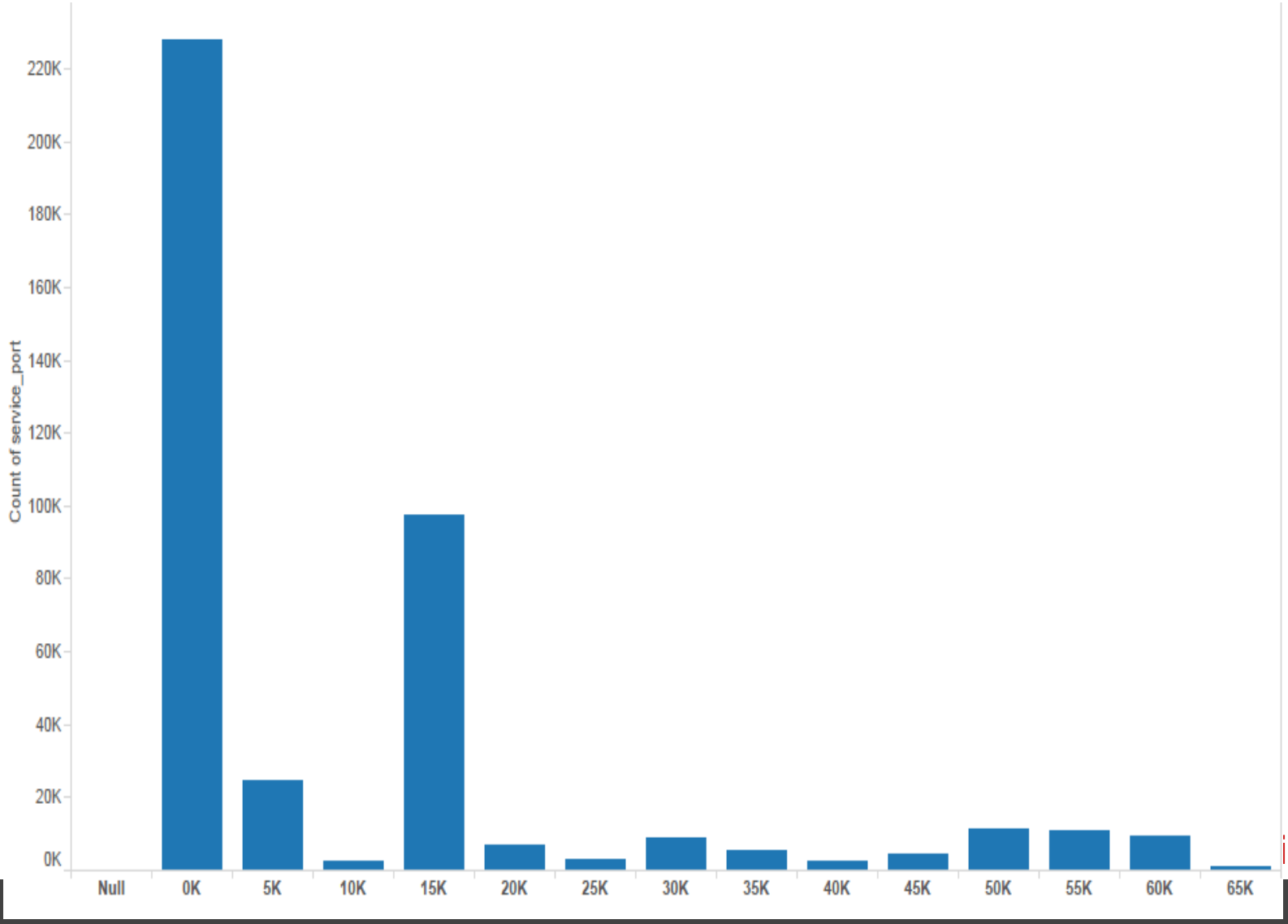
Knock Knock


Count of service_port
220K
200K
180K
160K
140K
120K
100K
80K
60K
40K
20K
0K
Null
0K
5K
10K
15K
20K
25K
30K
35K
40K
45K
50K
55K
60K
65K

Hiding in Plain Site

- Vertical Analysis: Education
  - *Library*
  - *CS department*
  - *School of Law*
- Vertical Analysis: Government
- Country to Country
- Less talk, more rock:
  - For 2013 - APT 2.49, Non 5.92
  - For 2014 - APT 1.6, Non 12.10

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Hiding in plain “site”

- *Unique initial CnC communications:*
- *200+ variants of google (gooqle)*
- *200+ variants of firefox (firefoxupdata)*
- *50+ variants of Facebook (faceboak)*
- *100’s of Microsoft related variants (microsocft, windosw)*
- *Spoofed security or AV sites*

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Semantic signatures

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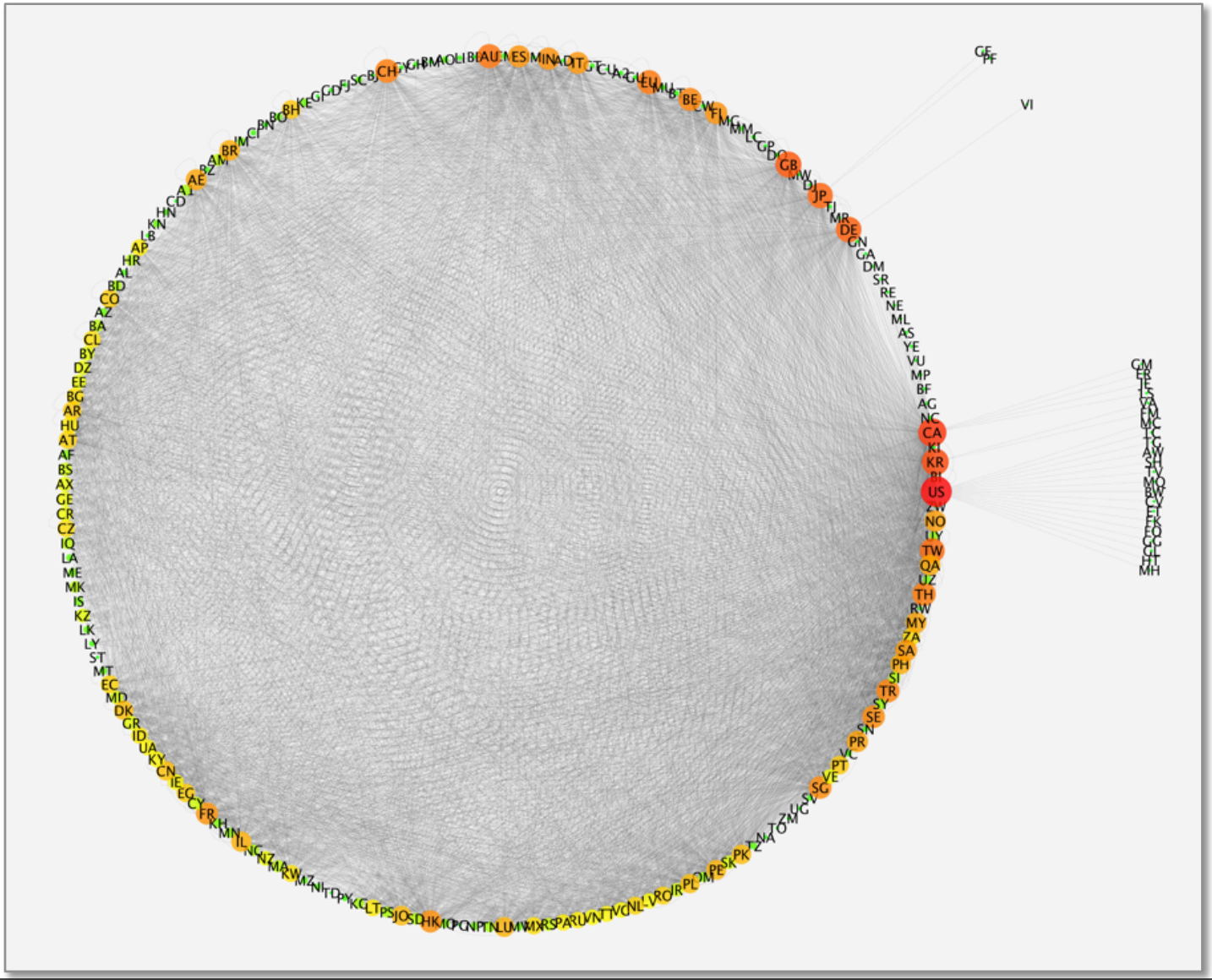
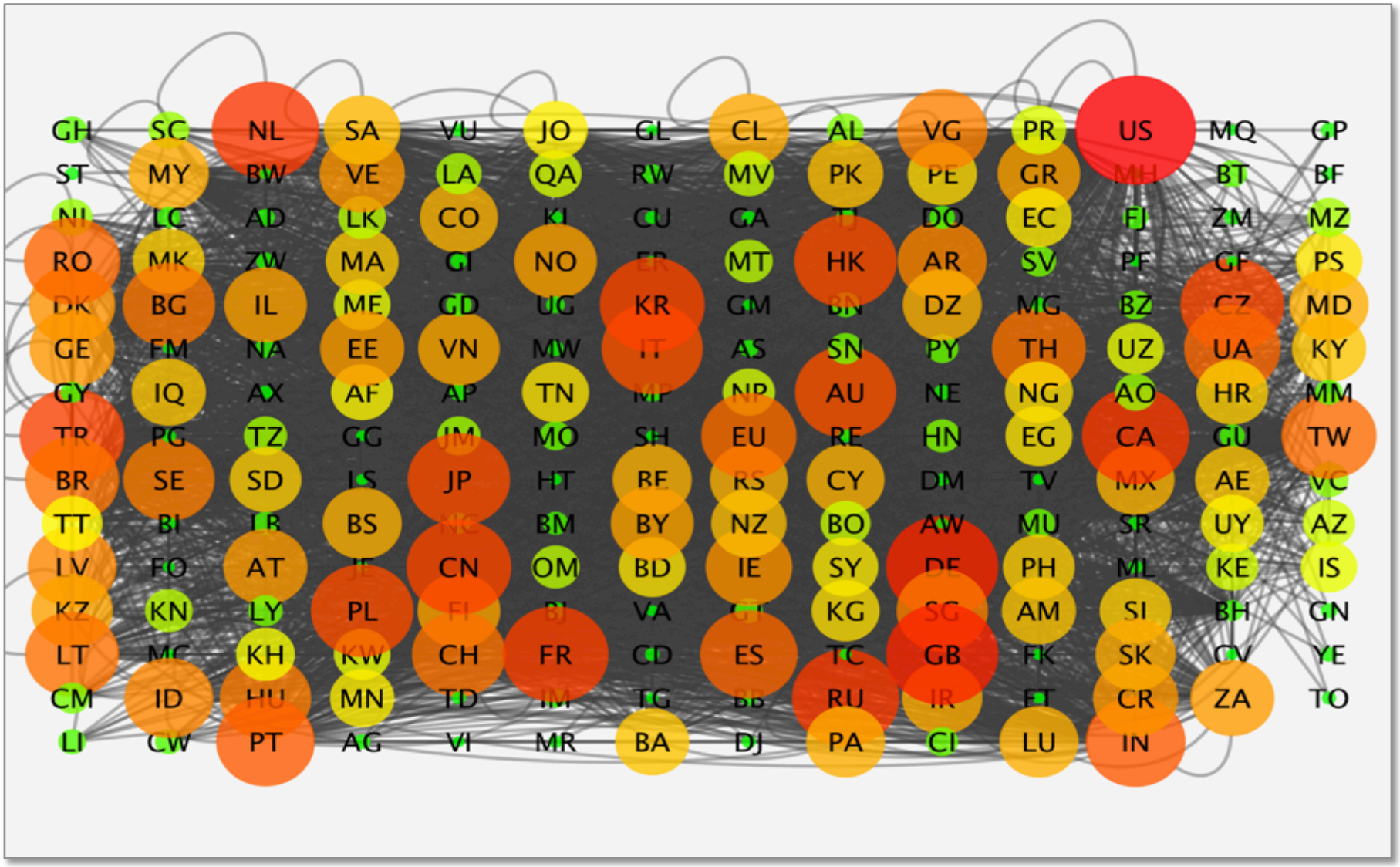
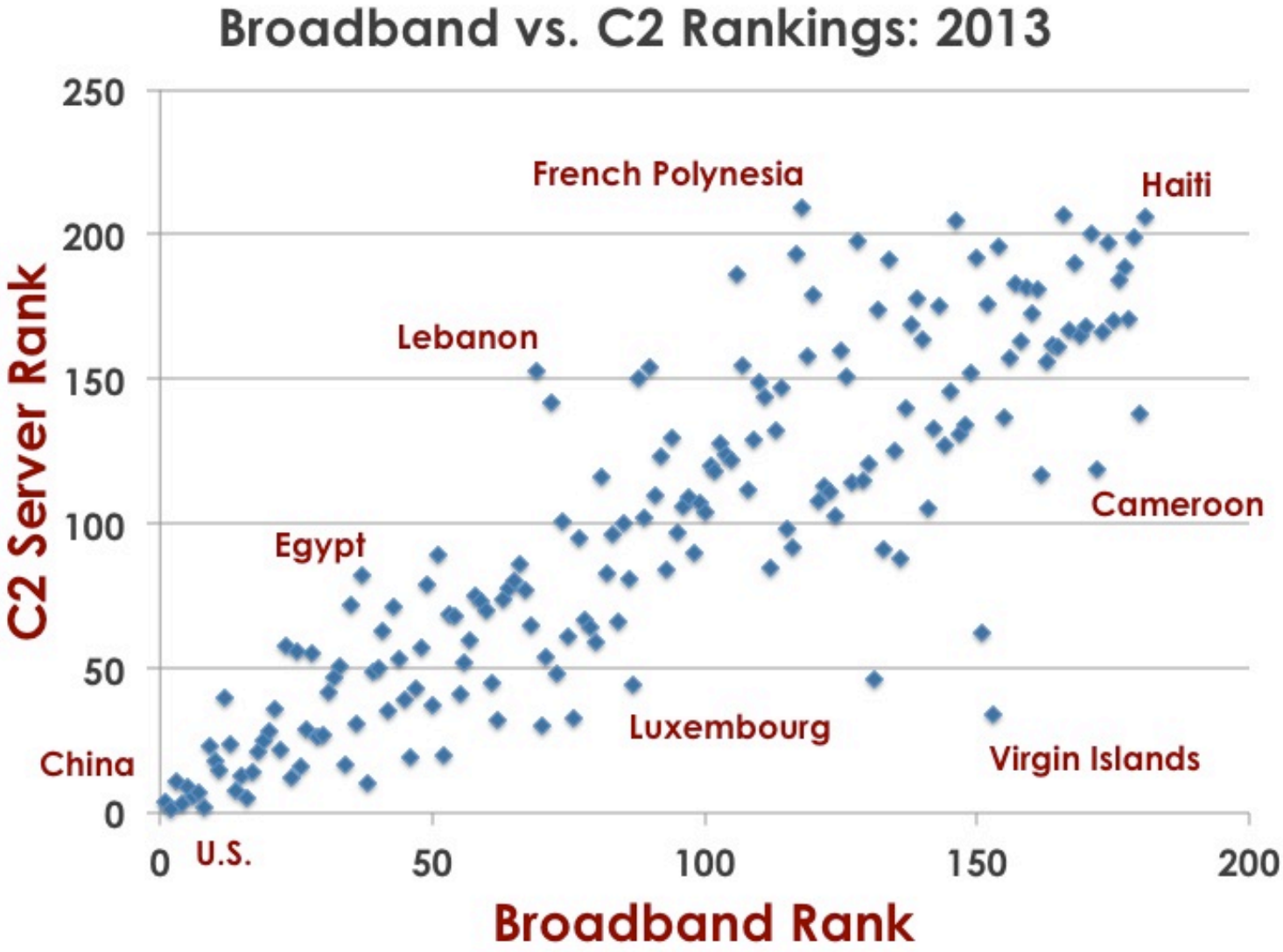
World C2 network map



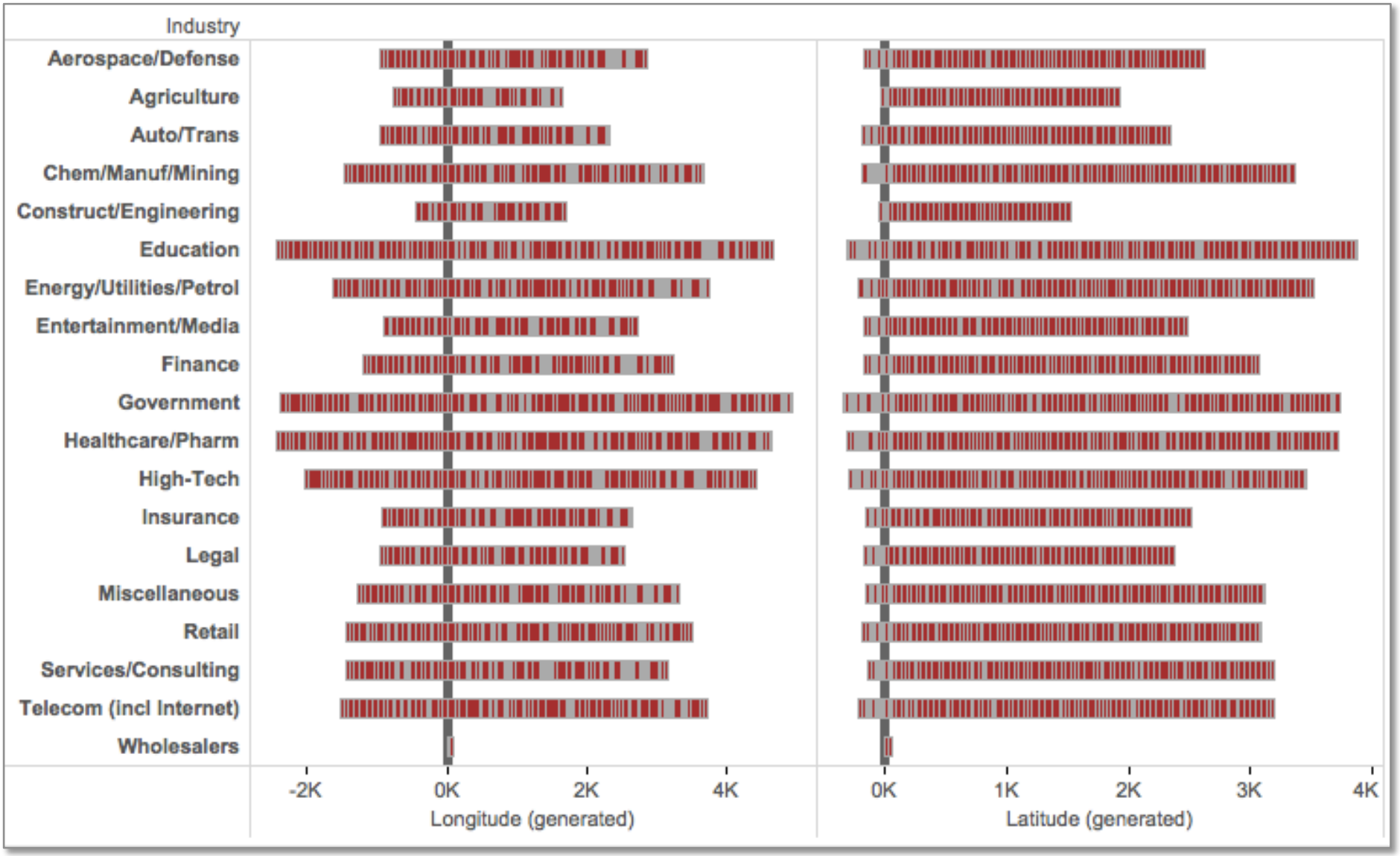
World C2 network heatmap



Connectivity and malware



Callbacks by vertical / country



The king of malware

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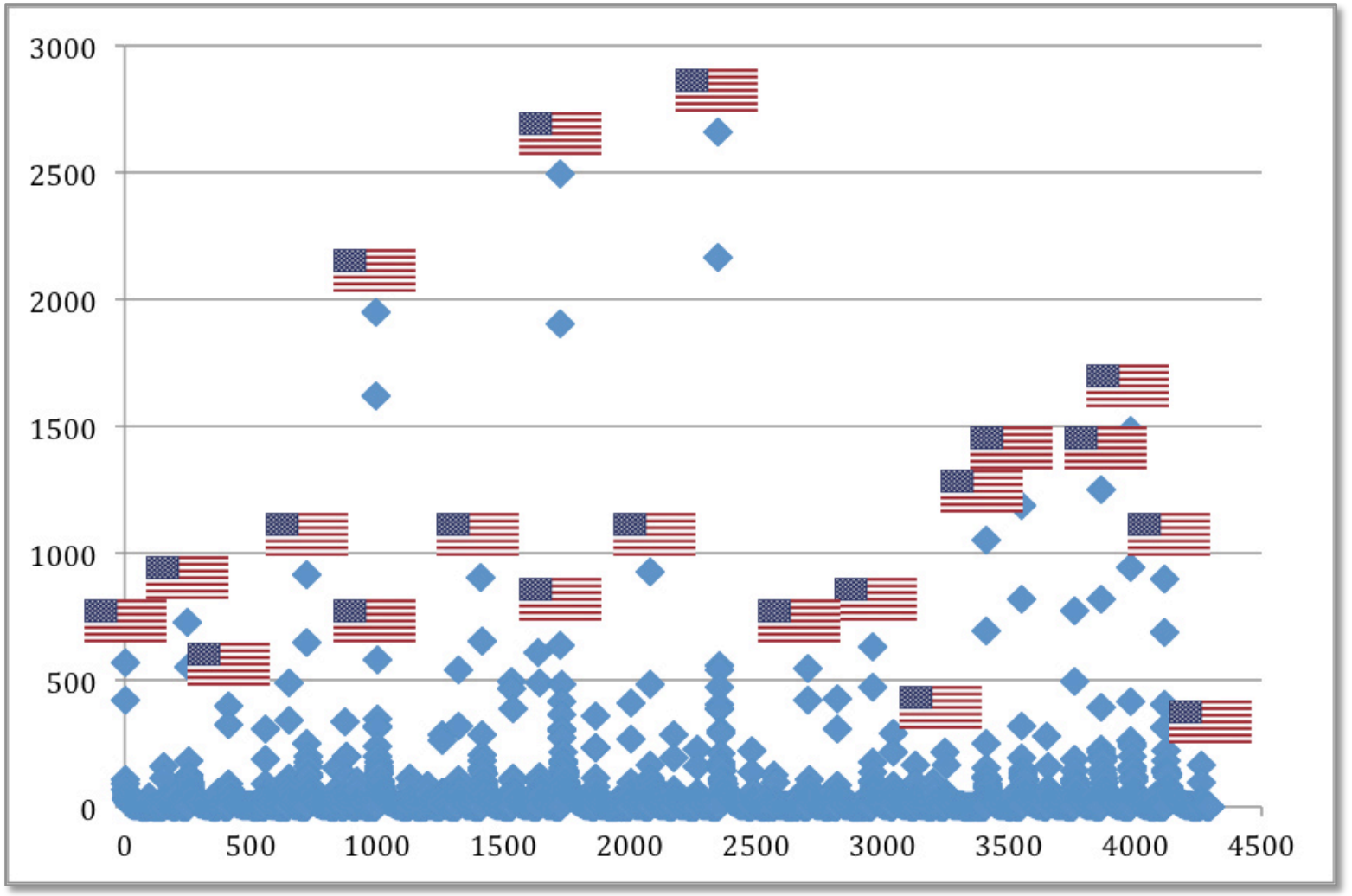
USA: the top callback destination



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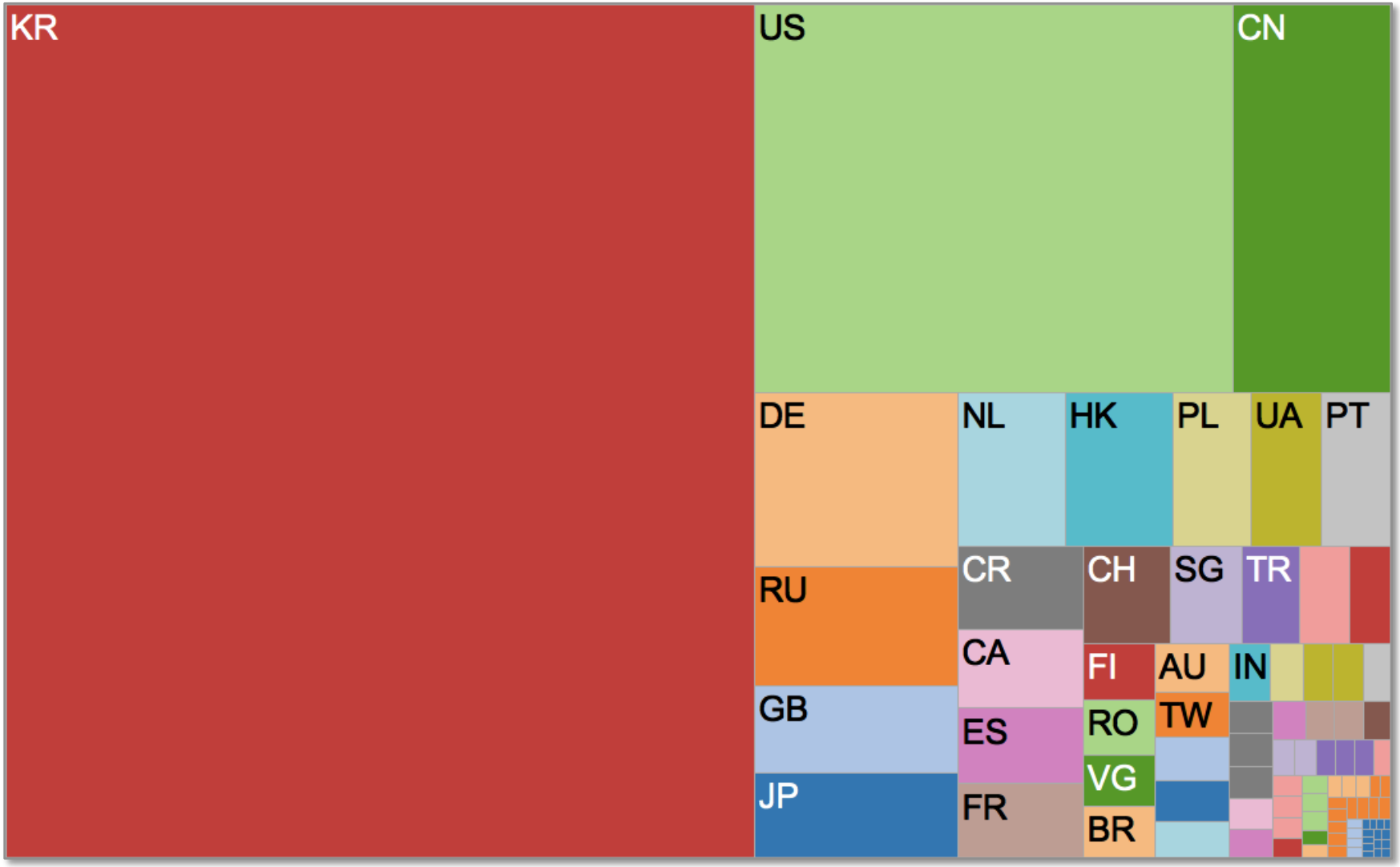
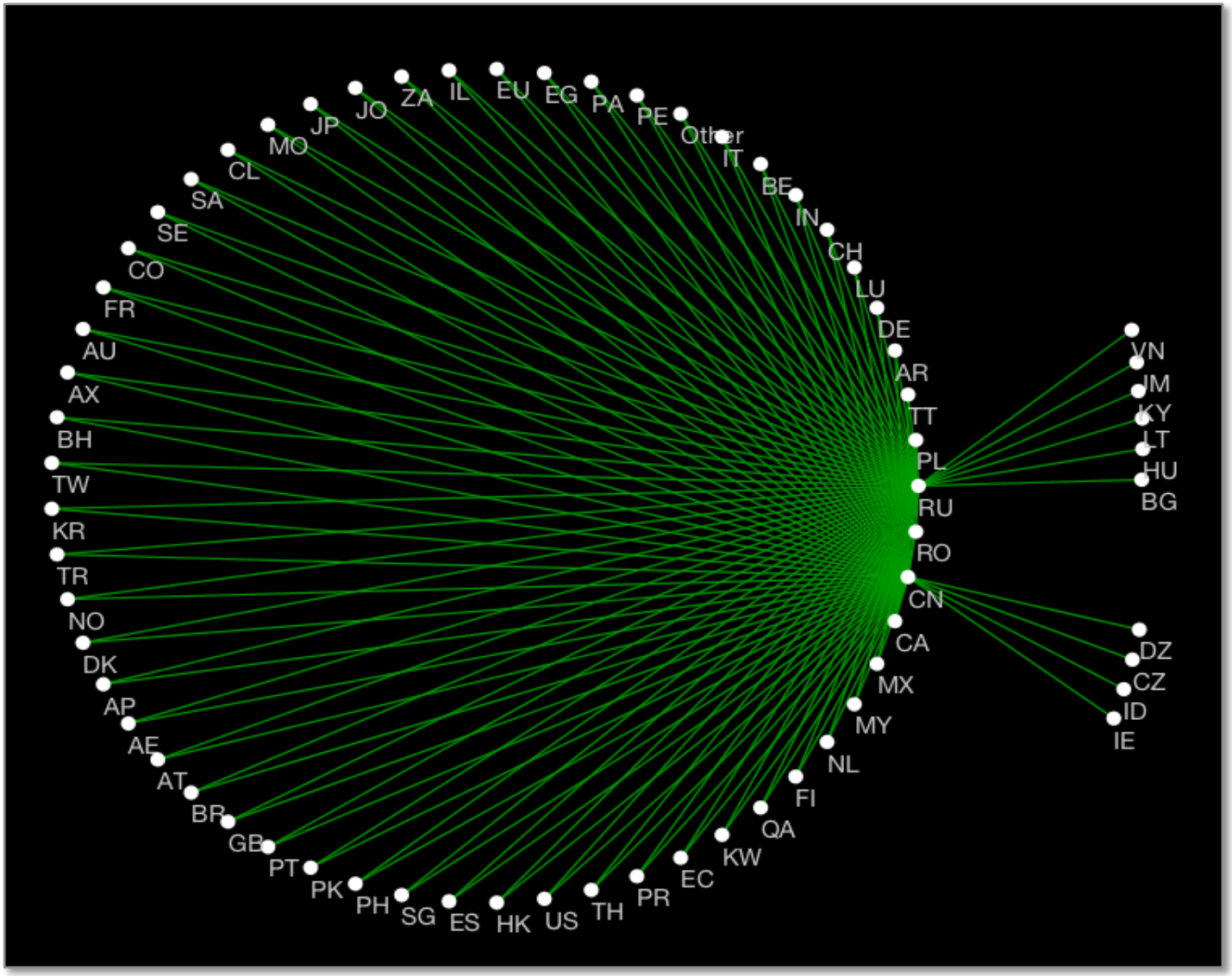
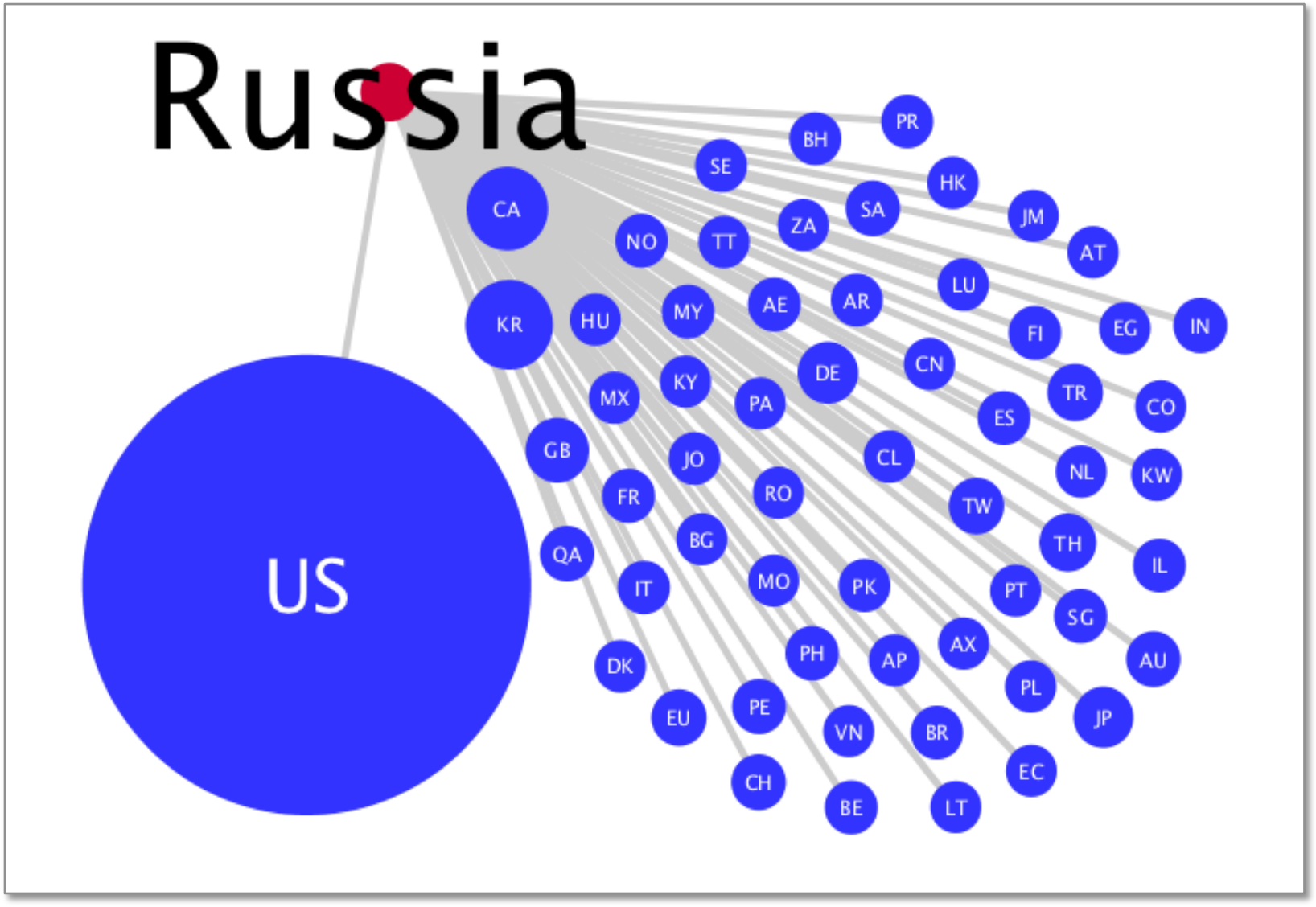
Callback destinations from South Korea



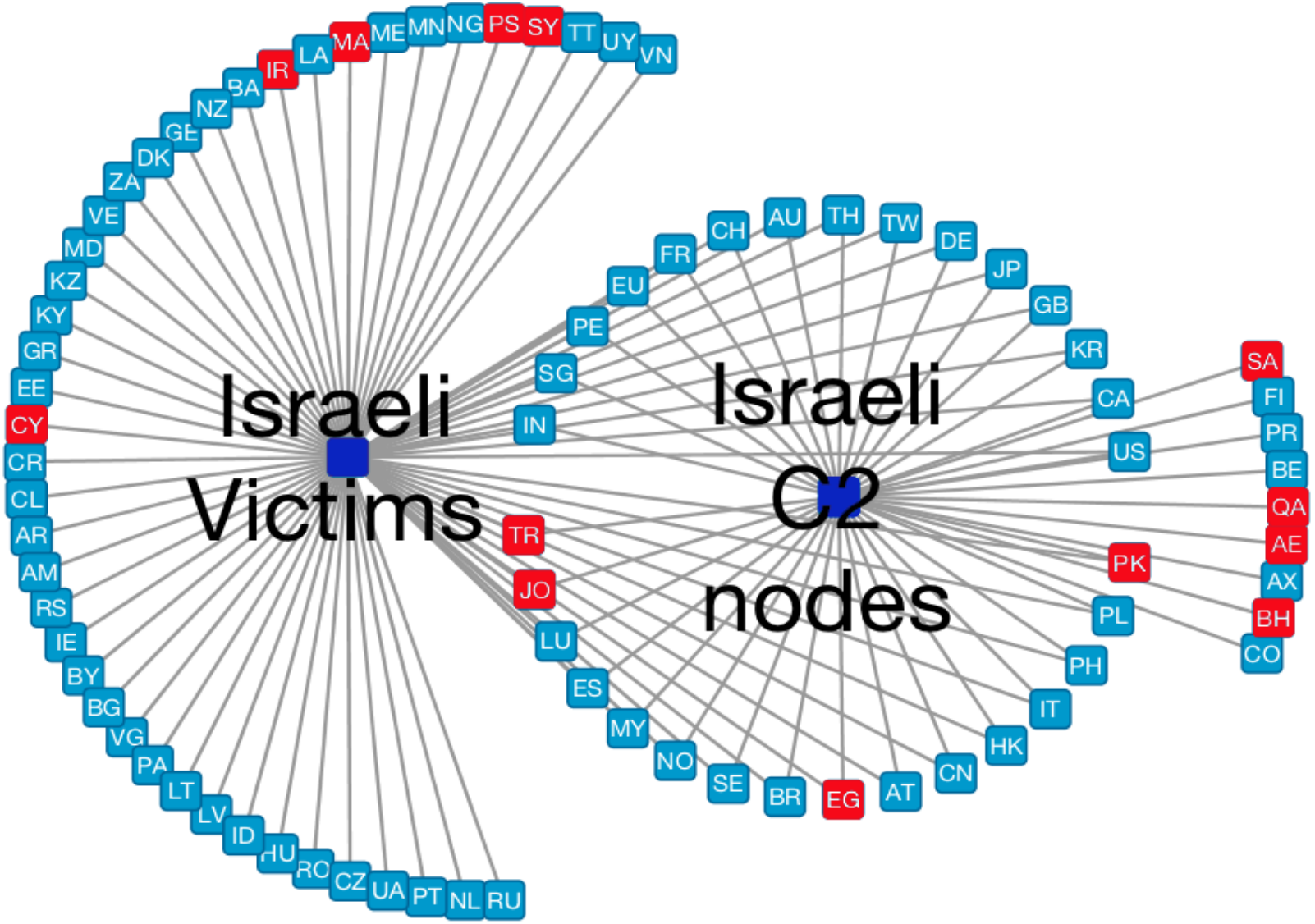
Overlap: investigative headache



USA: also a favorite target



Israel: traffic analysis



Geopolitical reflection: Ukraine crisis

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1	US	US	US	US	US	US	US	US	US	US	US	US	US	US	US	US
2	DE	KR	DE	DE	DE	KR	KR	KR	DE	DE	KR	KR	KR	KR	KR	KR
3	KR	DE	KR	KR	KR	DE	DE	DE	KR	KR	DE	CN	CN	DE	RU	DE
4	CN	CN	CN	CN	NL	NL	GB	CN	CN	CN	CN	NL	DE	CN	DE	RU
5	RU	RU	HK	HK	RU	GB	NL	GB	GB	NL	NL	DE	FR	FR	CN	GB
6	FR	FR	FR	RU	GB	CN	CN	NL	CA	GB	GB	GB	RU	NL	GB	CN
7	NL	GB	NL	NL	CN	RU	CA	CA	NL	RU	CA	FR	NL	RU	NL	NL
8	GB	TR	RU	GB	CA	CA	RU	RU	RU	CA	RU	RU	GB	GB	FR	UA
9	JP	NL	CA	FR	FR	FR	JP	FR	TR	JP	FR	CA	CA	UA	UA	FR
10	PL	CA	TH	CA	HK	HK	PL	JP	FR	UA	UA	UA	UA	CA	CA	CA
11	CA	ID	GB	IT	IN	TR	FR	PL	UA	TR	JP	RO	PT	PT	HK	PL
12	IN	JP	BG	JP	UA	JP	HK	HK	JP	RO	TR	PL	RO	PL	PT	PT
13	RO	HK	TR	PL	PL	IT	UA	UA	PT	CZ	PT	PT	TR	JP	RO	JP
14	IT	UA	UA	UA	JP	PL	PT	CZ	IT	IE	AU	TR	PL	RO	TR	TR
15	UA	PL	JP	BG	TR	AR	IT	BR	CZ	FR	GE	IN	JP	TR	PL	RO
16	ID	RO	IT	TR	PT	UA	TR	IT	PL	PT	HK	JP	BR	CZ	JP	HK
17	HK	IN	PL	IN	BG	RO	VN	TR	HK	PL	PL	ES	CZ	BR	CZ	CZ
18	TW	PA	ID	TH	IT	IN	RO	PT	ES	IT	RO	AU	IT	IT	ES	IT
19	TR	IT	LT	TW	TH	AU	IN	AU	BR	SE	ES	EU	ES	ES	BR	BR
20	HU	TH	IN	CH	RO	BG	SD	TW	IN	HK	IN	HK	HK	HK	IT	TH
	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2013	2014	2014	2014	2014

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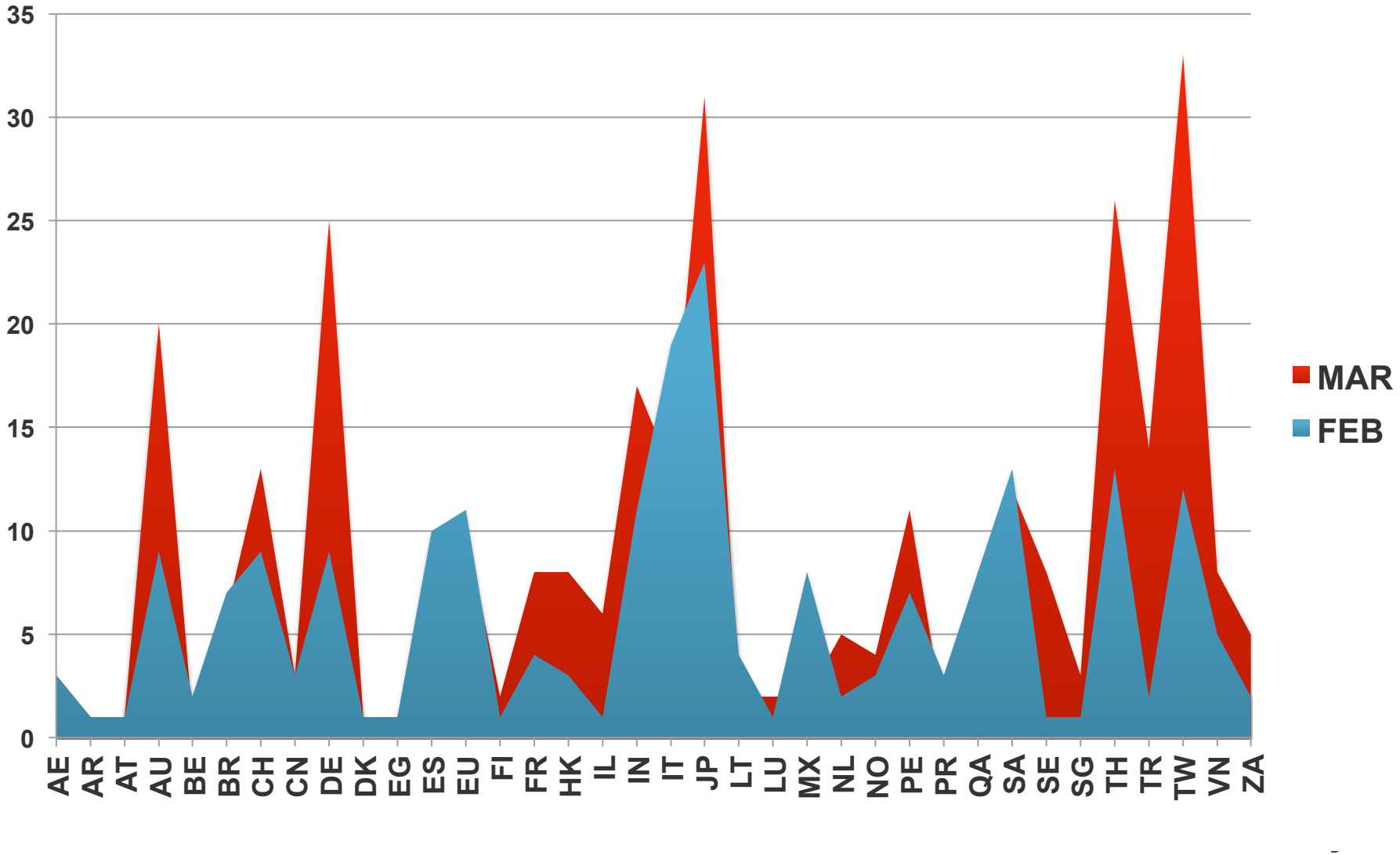
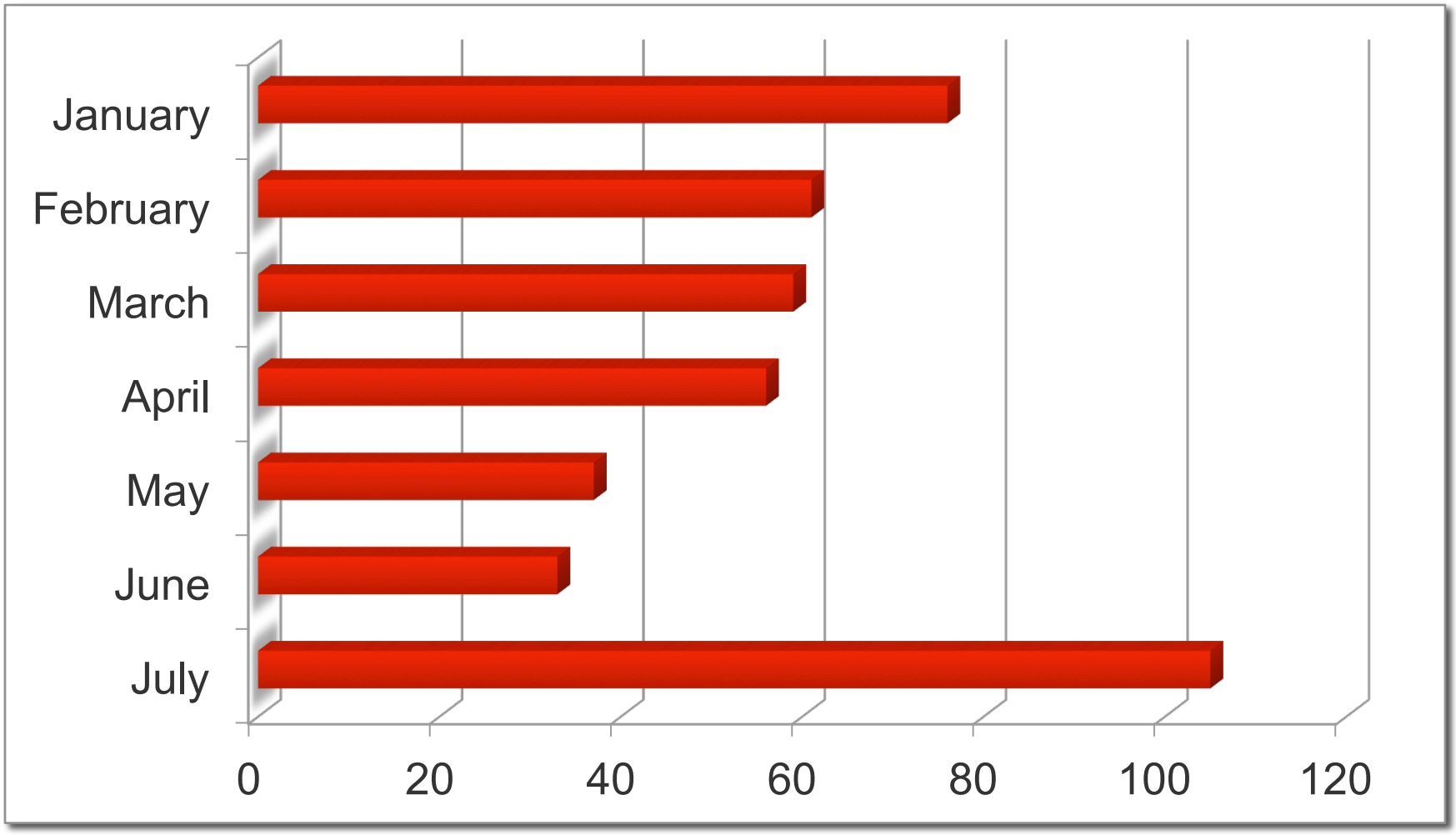
RU-UA unique callbacks by country



Geopolitical reflection: Israel-Gaza crisis



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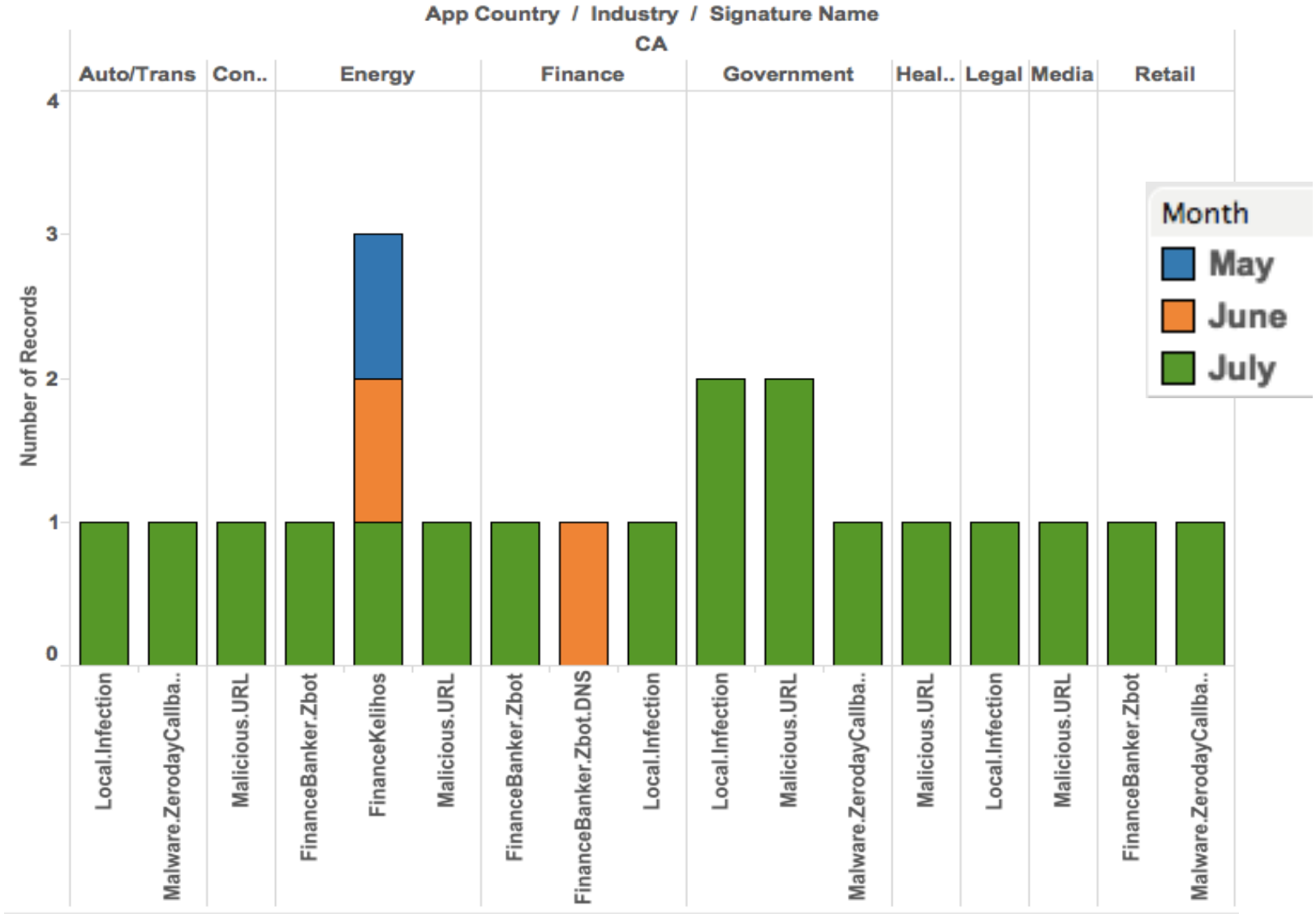
Unique callbacks: CA to IL (2014)



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