

Just Another Measurement of Extension header Survivability (JAMES)

[draft-vyncke-v6ops-james-02](#)

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IETF 114, v6ops

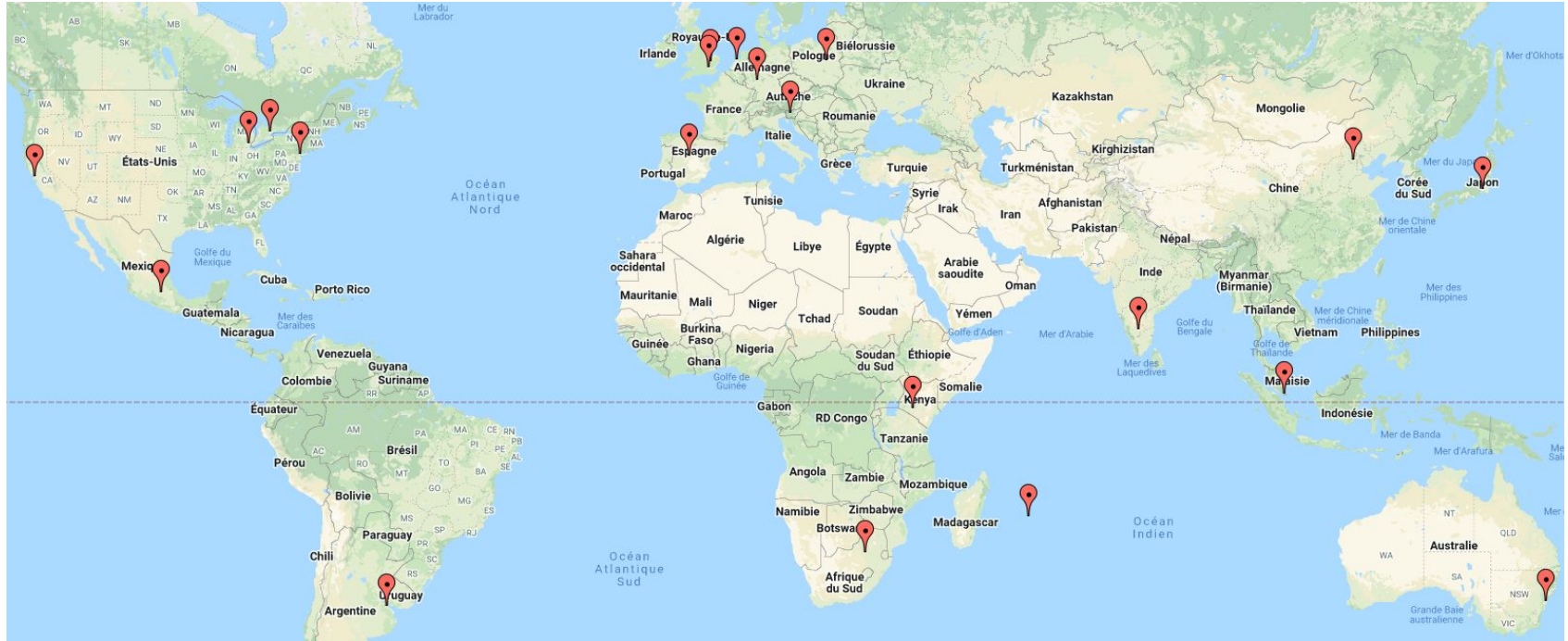
July 26, 2022

Status

draft-vyncke-v6ops-james-v2 updates:

- new vantage points (extended cooperative topology)
- new results (+ diff between UDP and TCP)
- editorial changes

JAMES - Vantage points



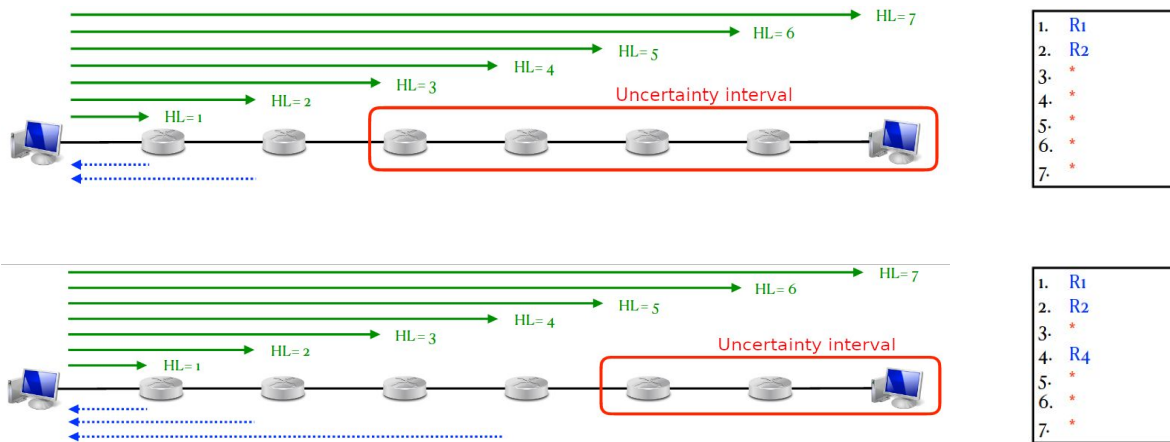
JAMES - Methodology

- Traceroute-like technique
- Each pair (21 VMs) is tested in both direction
- Experiments (UDP and TCP):
 - Hop-by-Hop and Destination Options (size variation)
 - Routing Header (types 0-6)
 - Fragment Header (atomic and non-atomic, size variation)
 - IPSec: Authentication Header (AH) and Encapsulating Security Payload (ESP)
 - No Next Header (protocol 59)
 - Ethernet (protocol 143, RFC 8986)
- Probe traffic is marked as proposed in [draft-vyncke-opsec-probe-attribution](#)

Tricky part

Drop attribution to an AS:

- Uncertainty interval as small as possible
- Corner cases: shared link between ASs, prev/next (un)identified ASn in the trace



Results

Option Type	Length (bytes)	UDP	TCP
Skip	8	8.6%	9.1%
Discard	8	0.0%	0.0%
Skip	256	2.4%	2.4%
Skip w/ PadN	256	0.5%	0.6%
Discard	256	0.0%	0.0%
Skip	512	1.4%	1.5%
Discard	512	0.0%	0.0%

Table 7: Hop-by-hop Header Transmission

Length (bytes)	UDP	TCP
8	97.8%	94.3%
16	97.7%	90.5%
24	97.6%	89.8%
32	93.5%	86.2%
40	93.9%	86.2%
48	93.7%	86.1%
56	93.8%	52.7%
64	45.9%	37.8%
128	10.9%	10.9%
256	4.3%	4.3%
256 w/ PadN	4.3%	4.3%
512	3.1%	3.1%

Table 8: Destination Header Transmission

Routing Header Type	UDP	TCP
0	74.3%	71.2%
1	88.3%	81.4%
2	97.4%	90.4%
3	97.6%	91.3%
4	78.8%	72.6%
5	97.4%	90.9%
6	97.4%	90.0%

Table 3: Per Routing Header Types Transmission

M-flag	UDP	TCP
0 (atomic)	55.8%	49.8%
1	89.2%	87.6%

Table 9: IPv6 Fragments Transmission

Next Header	Transmission
NoNextHeader (59)	98.2%
Ethernet (143)	98.3%
Authentication (AH)	98.1%
ESP	98.3%

Table 11: Transmission of Special IP Protocols

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Next steps

- Continue measurements (wild version)
 - Early results: basically the same trend (to be confirmed)
- Improve the AS drop attribution algorithm

Thank you

<https://gitlab.uliege.be/Benoit.Donnet/james>