



Scalability of IPv6 Transition Technologies for IPv4aaS

draft-lencse-v6ops-transition-scalability

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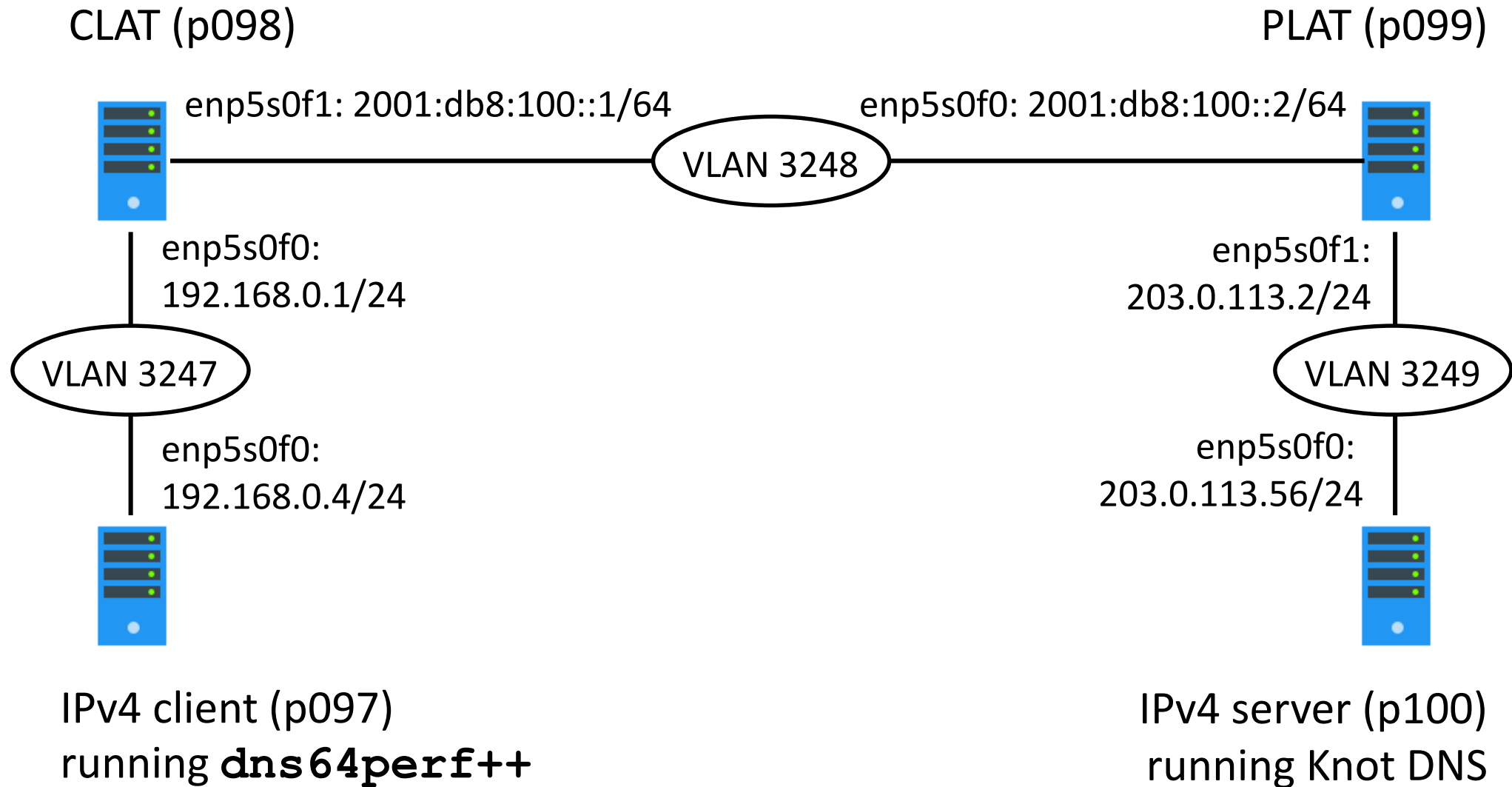
Széchenyi István University

IETF 115, v6ops, November 11, 2022.

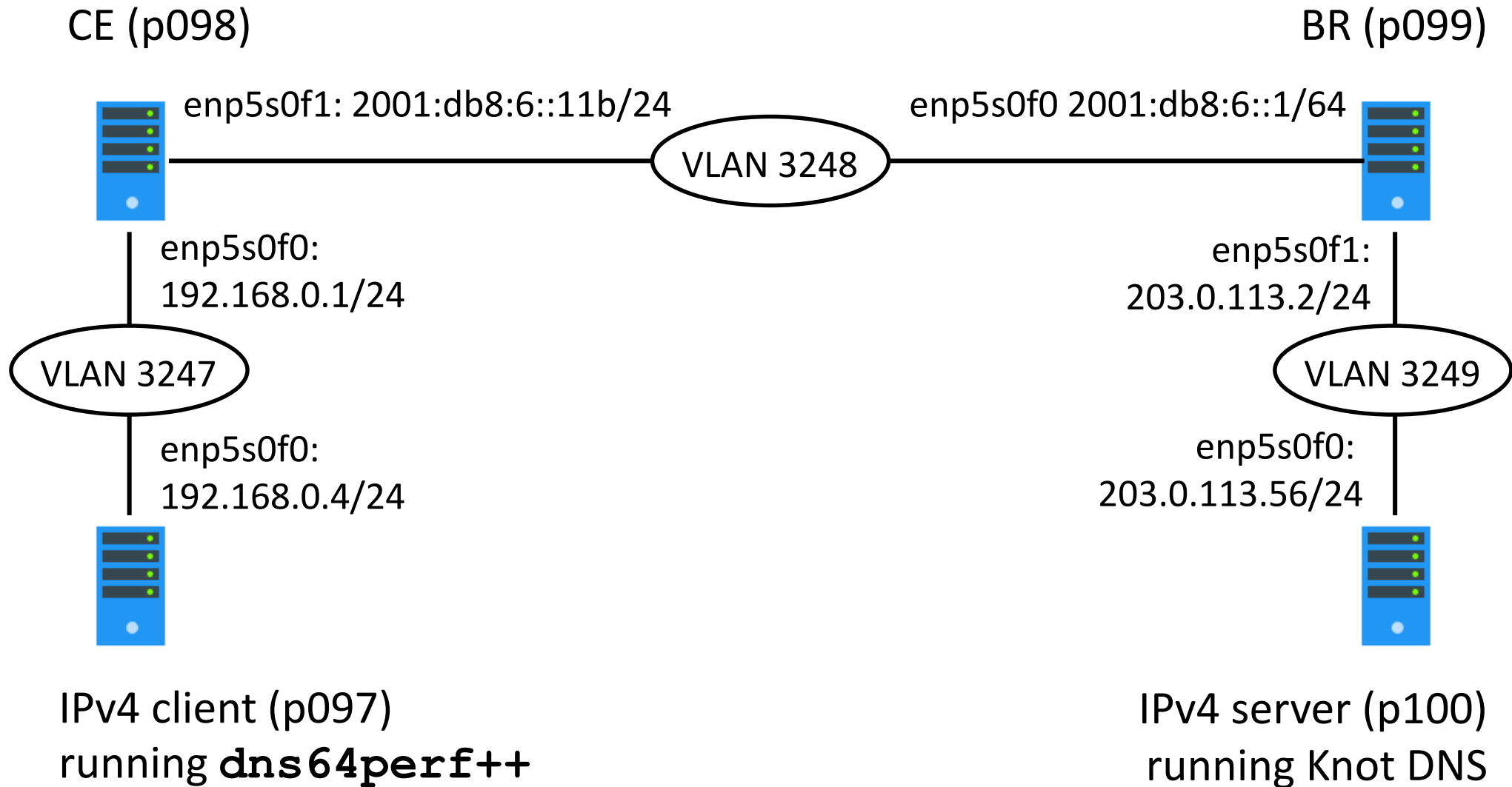
What new results are in this draft?

- Scalability Comparison of the Jool Implementation of the **464XLAT** and of the **MAP-T** IPv4aaS Technologies
 - Jool was recommended at IETF 112
 - It implements both technologies
 - Available under GPLv2 license from: <https://www.jool.mx/en/>
- Testing method
 - The Customer Edge and the Provider Edge devices were benchmarked together
 - DNS traffic was used for testing
 - Because the testing tool was originally developed for DNS64 benchmarking

Measurement setup for benchmarking 464XLAT



Measurement setup for benchmarking MAP-T



Scalability against the number of CPU cores

- The number of CPU cores of the Customer Edge (CLAT / CE) and Provider Edge (PLAT / BR) devices were set to: 1, 2, 4, 8, 16
- Using binary search, the highest query rate (queries per second) was determined at which 99.99% of the DNS queries was resolved within 0.25s timeout time
- Parameters
 - Dell PowerEdge R430 servers (2.1GHz Intel Xeon E5-2683 v4 CPUs, 384GB 2400MHz DDR4 RAM, Intel 10G dual port X540 NIC)
 - Debian 10.11 Linux operating system with 4.19.0-18-amd64 kernel
 - Jool 4.2.0-rc2 (for both 464XLAT and MAP-T)

Scalability of 464XLAT with the number of CPU cores

Number of active CPU cores*	1	2	4	8	16
median (qps)	165,403	236,869	425,021	510,155	530,064
minimum (qps)	163,280	236,185	420,311	499,999	529,881
maximum (qps)	167,041	237,553	425,782	510,321	530,222
proportion: current/previous	-	1.43	1.79	1.20	1.04

*The number of active CPU cores was changed both in the CLAT and the PLAT devices simultaneously, but it was always 32 in the other two servers.

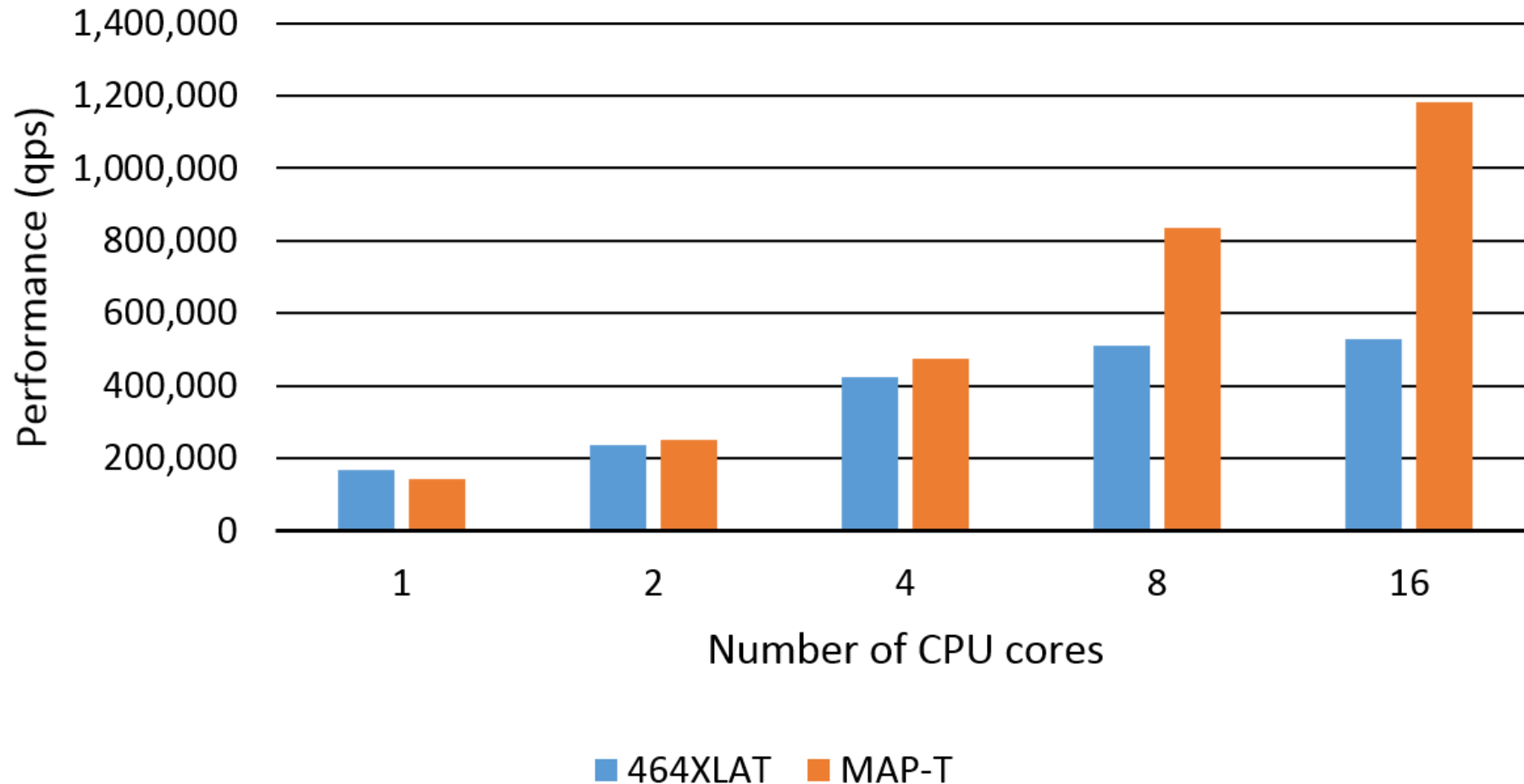
Scalability of MAP-T with the number of CPU cores

Number of active CPU cores*	1	2	4	8	16
median (qps)	143,498	250,858	475,051	835,180	1,183,615
minimum (qps)	140,624	245,311	470,311	812,499	1,179,686
maximum (qps)	145,314	251,953	475,818	837,295	1,184,387
proportion: current/previous	-	1.75	1.89	1.76	1.42

*The number of active CPU cores was changed both in the CE and the BR devices simultaneously, but it was always 32 in the other two servers.

Comparison

Performance of Jool 464XLAT and MAP-T



Are you interested in the details?

- All the details of the measurements are available in:
 - G. Lencse and N. Nagy, “Towards the scalability comparison of the Jool implementation of the 464XLAT and of the MAP-T IPv4aaS technologies”, *International Journal of Communication Systems*, DOI: 10.1002/dac.5354 <https://onlinelibrary.wiley.com/doi/10.1002/dac.5354> (open access)
- Thank your for listening!
- Do you have any questions or comments?