R22 / NIC TX-RX hardware timestamps

9 Nov 2026 | Scope-limited physical measurement | Not a product benchmark

Observed result (operator-supplied R22 output)

Status	PASS_PAIRED_HW_TIMESTAMP_MEASURED
Valid RX/TX hardware pairs	64 / 64
RX raw hardware timestamps	64 / 64
TX raw hardware timestamps	64 / 64
Median paired delta (p50)	136,837 ns / 136.837 microseconds
99th percentile paired delta (p99)	163,625 ns / 163.625 microseconds
UDP ingress	PASS (three attempts)
Server and client exit	0 / 0
Original NIC configuration restored	PASS_ORIGINAL_CONFIGURATION_RESTORED

Proven scope

The test acquired and matched hardware receive/transmit timestamps for 64 UDP datagrams on the same NIC. A functioning client sent the requests, overcoming the previous R21 no-ingress result.

Explicit limitations

The reported p99 is NOT sub-microsecond. Same-NIC RX-to-TX timing is not wire-to-wire network latency, FPGA internal logic latency, or latency of any of the thirteen commercial demonstration profiles.
64 samples are too few for an industrial tail-latency SLA. No p99.9/p99.99 claim, external clock calibration, or independent accredited physical certificate is asserted.

Original evidence and integrity

R22 console output reports successful SHA-256 checking of HWTSTAMP_FINAL.txt, NIC_CLIENT.log, NIC_RESULT.json, NIC_SERVER.log, STAGE.log, UDP_CLIENT.log and UDP_SERVER.log.
Original run directory: R22_NIC_20261109T080726Z_2944 (owner-held external storage). Original logs and exact file digests have not been independently obtained or republished in this appendix.

Source boundary: owner-provided command output, not an independently replayed audit. R10 OWASP evidence and prior historical results remain separate and unchanged.