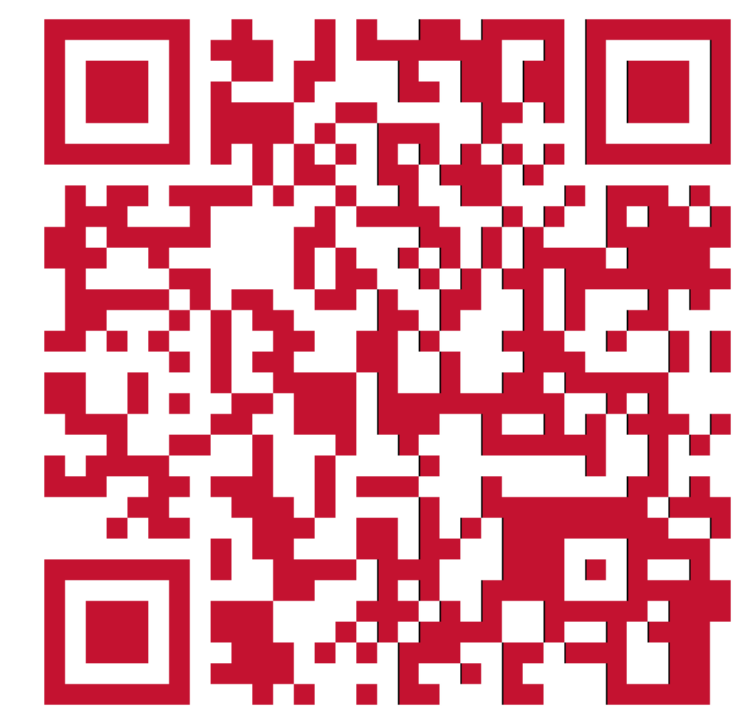


Reconfigurable Computing Challenge 2026

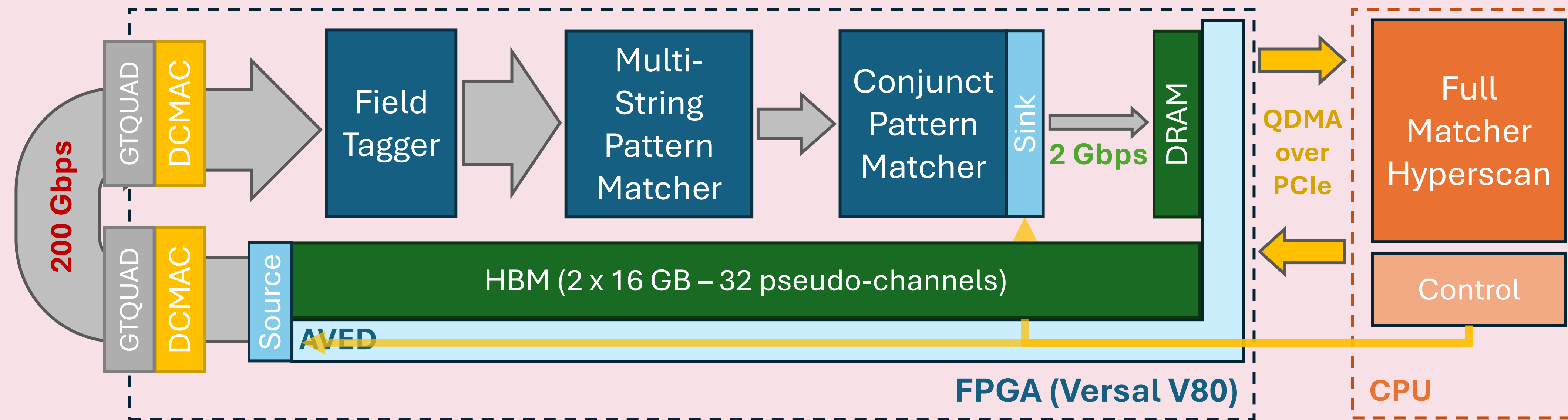
RAPIDSCAN: High-Throughput Parameterized HLS-based Streaming String-Matching Library

Shashank Obla, Carnegie Mellon University | Tommy Tracy II, University of Virginia



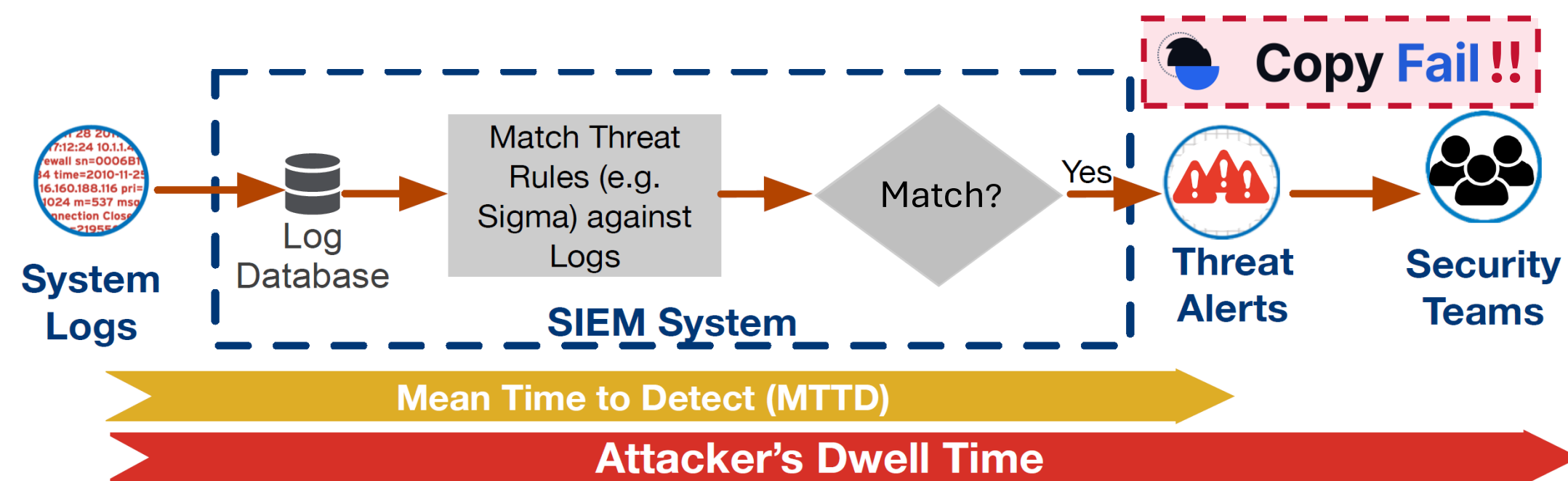
Find the repo here!

Hierarchical filters can process 10,000 rules at line rates of 200 Gbps using only 30% of the V80 fabric filtering traffic by over 100x!



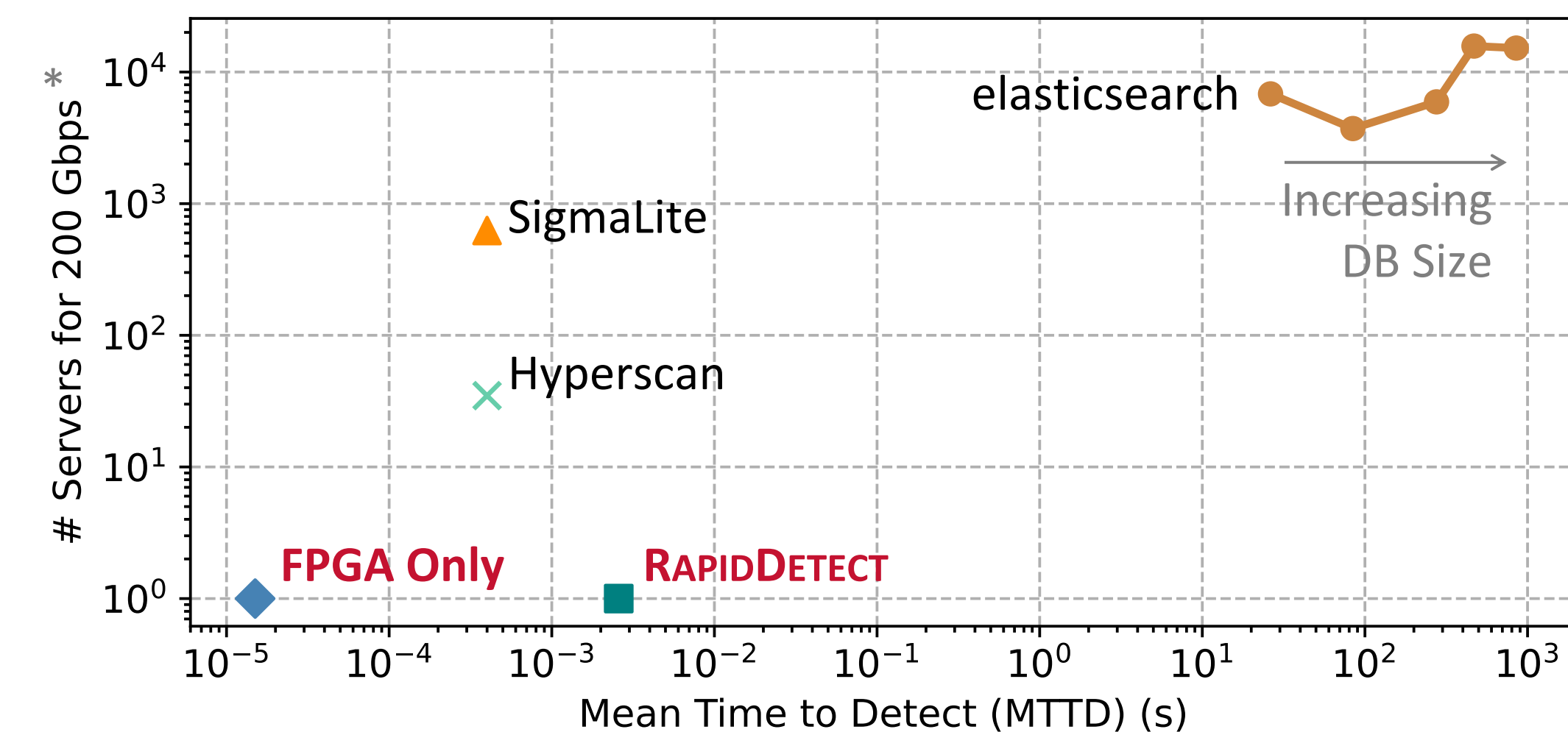
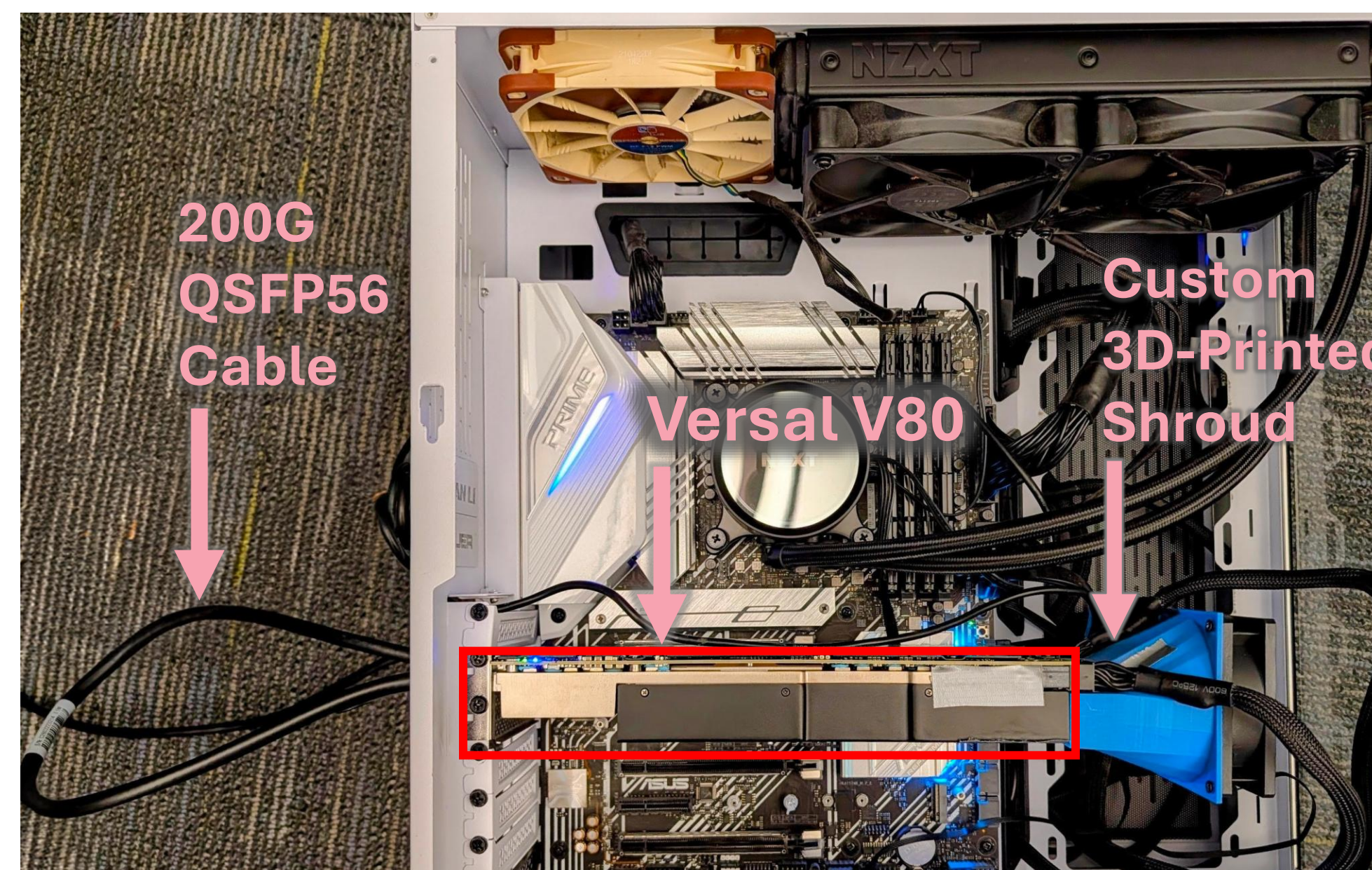
Fully Parameterized in Vitis HLS, RAPIDSCAN's String-Matching kernels can be tuned across applications or used as a benchmark

Early-warning Security Systems use string-based rule matching on Log Events for Threat Detection



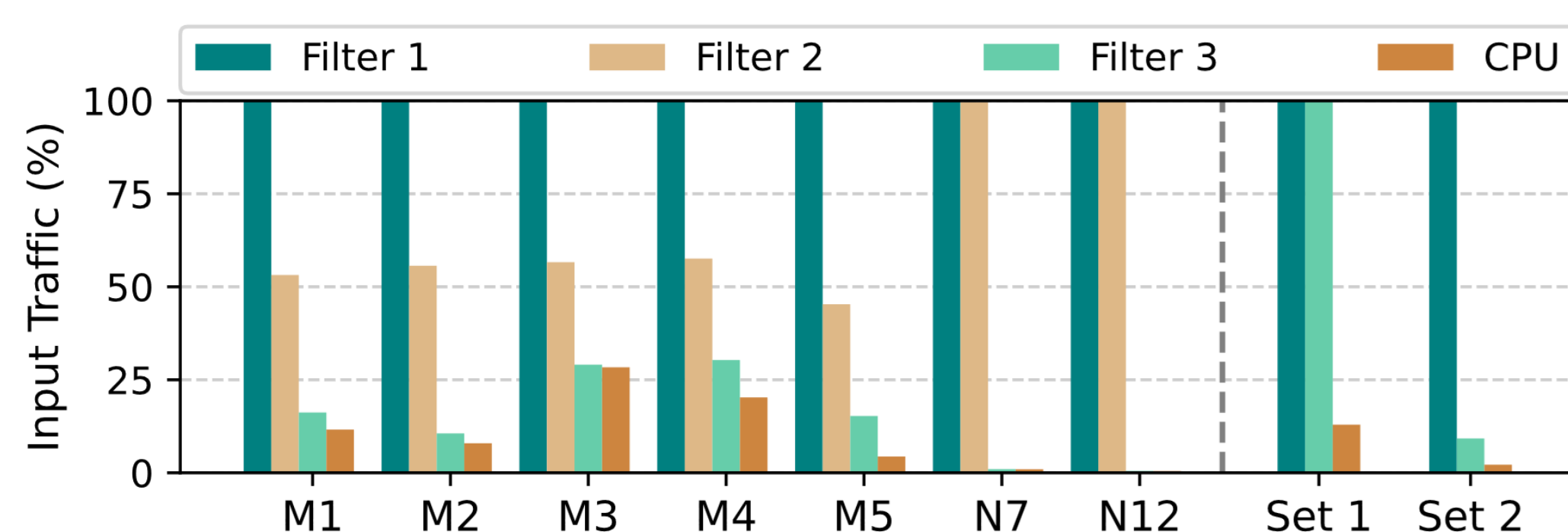
RAPIDDETECT (RAPIDSCAN instantiated for Log Monitoring) is 4x cheaper than state-of-the-art solutions at achieving 200 Gbps with millisecond latency on a single Versal V80-enabled server!

Demo Versal V80 Machine Setup



*Assumes perfect scaling of single server throughput

String Matching is input-dependent and pipeline performance requirements vary with inputs/app



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Carnegie Mellon University