Response Time Analysis: Security Patterns Tier: client, Concurrency: 50 Normal Traffic Pattern Baseline response time distribution Mean: ~100ms, Low variance Mean: 99.5ms Median: 99.0ms  $10^{2}$ 95th: 132.0ms Frequency (log scale)  $10^{0}$ 40 60 80 100 120 140 160 Response Time (ms) Milli-Bottleneck Attack Pattern Short, intense spikes in response times Possible DoS attempt Mean: 495.6ms Median: 494.0ms  $10^{2}$ 95th: 662.0ms Frequency (log scale)  $10^{0}$ 700 200 300 400 500 600 800 Response Time (ms) Resource Exhaustion Pattern Gradual degradation pattern System resource depletion Mean: 297.7ms Median: 198.5ms 95th: 877.3ms Frequency (log scale) 10<sup>1</sup>  $10^{0}$ 500 1000 1500 2000 2500 Response Time (ms) Synchronized Attack Pattern Coordinated attack pattern Multiple simultaneous requests Mean: 389.6ms Median: 361.0ms 95th: 743.0ms  $10^{2}$ Frequency (log scale) 10º 200 400 600 800 1000 1400 0 1200 Response Time (ms) Pattern with Countermeasures Protected system response Reduced impact of attacks Mean: 150.6ms Median: 150.0ms  $10^{2}$ 95th: 200.0ms Frequency (log scale)  $10^{1}$ 10<sup>0</sup> 250 100 150 200 50 Response Time (ms)