EPSRC Engineering and Physical Sciences Research Council

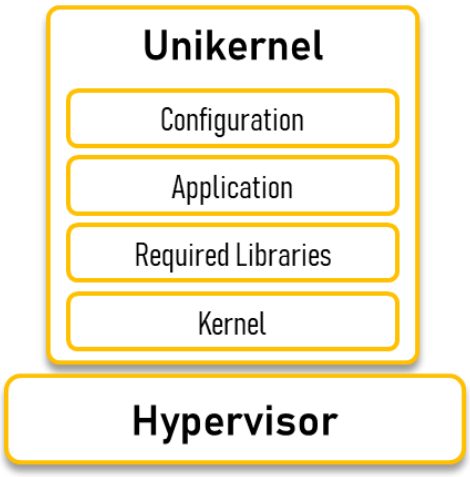
UNIMON

Lightweight Bottleneck Detection for Virtualized Network Services

1 UNIKERNELS

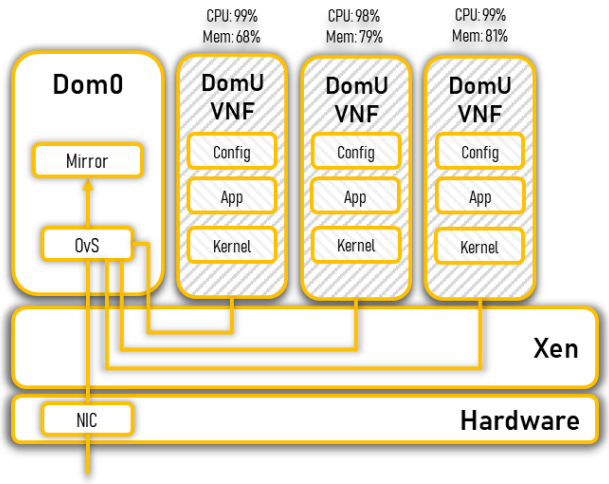
- Single Purpose
- Single Address Space
- Small Size (<5MB)
- Fast Boot Times (order of ms)
- Examples:

[ClickOS, Mirage, Rump]

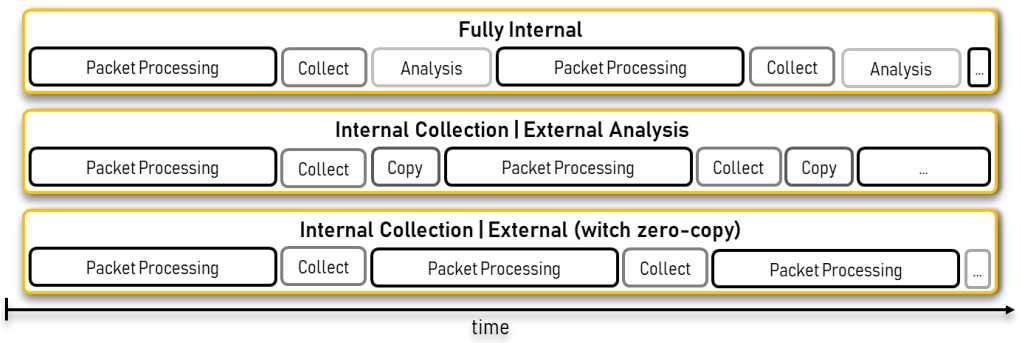


2 PROBLEM

- No Internal Monitoring Features in Micro-VNFs
- Limited by VIM metrics (e.g. OpenStack Ceilometer)
  - Hardware Metrics, Packet Throughput
  - Poll Based NFV uses ~100% CPU
- Detailed Data Required for Effective Policy Management
  - Few Options for Closed-Loop Operations
- High Bandwidth Consumed by Monitoring
- Internal Monitoring Impacts Performance & Size
  - Observer Effect

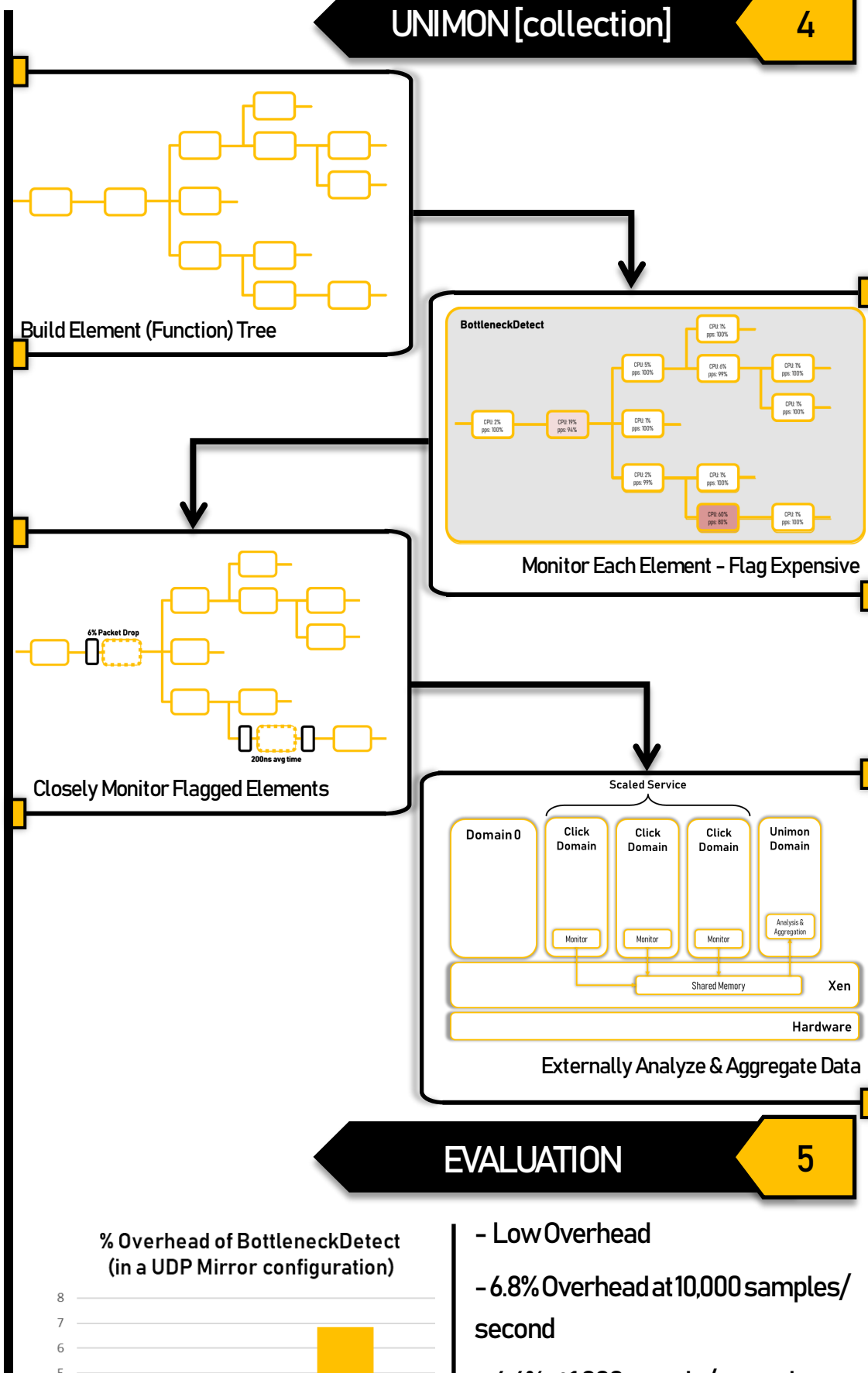


3 UNIMON [analysis]

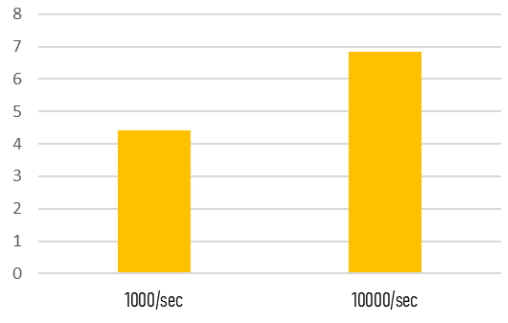


- Externalise analysis onto local system via zero-copy
- Fully internal allows for all monitoring in a single binary image
- Have local and service policy management

4 UNIMON [collection]



5 EVALUATION



- Low Overhead
- 6.8% Overhead at 10,000 samples/second
- 4.4% at 1,000 sample/second
- Precise Monitoring Minimal Overhead

[16 Element Configuration]

6 FUTURE

Local Machine Policy Management (Automation)

Cross-Machine Service Telemetry & Scaling

Live Policy Reconfiguration

Will Fantom
w.fantom@lancs.ac.uk
Lancaster University
InfoLab21