

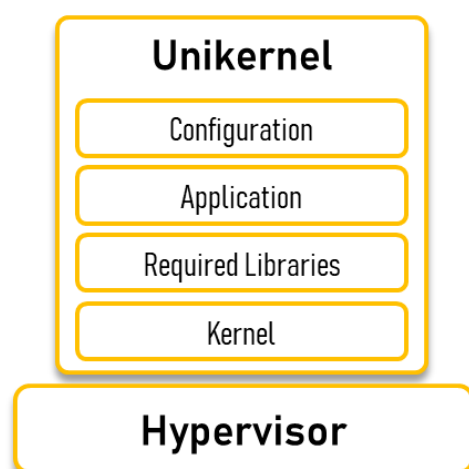
UNIMON

Lightweight Bottleneck Detection for Virtualized Network Services

1

UNIKERNELS

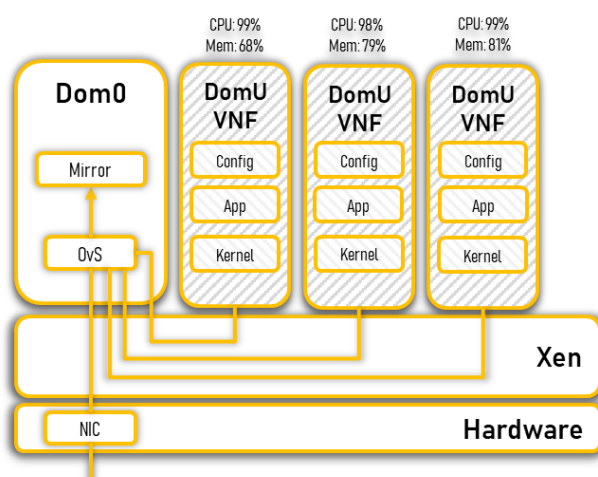
- Single Purpose
- Single Address Space
- Small Size (<5MB)
- Fast Boot Times (order of ms)
- Examples:
[ClickOS, Mirage, Rump]



2

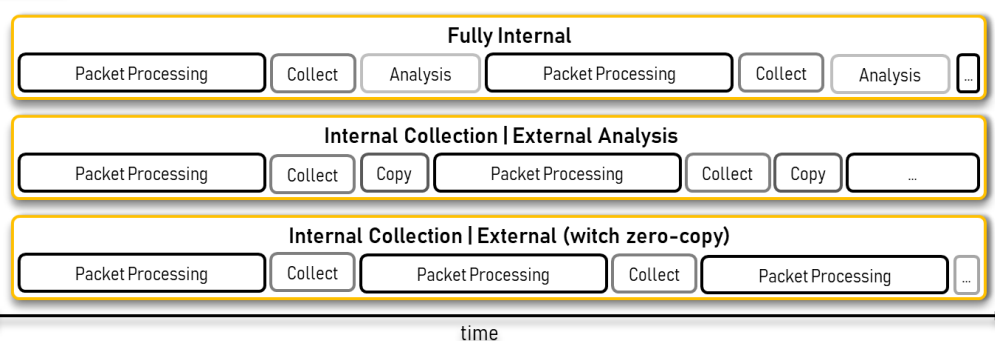
PROBLEM

- 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

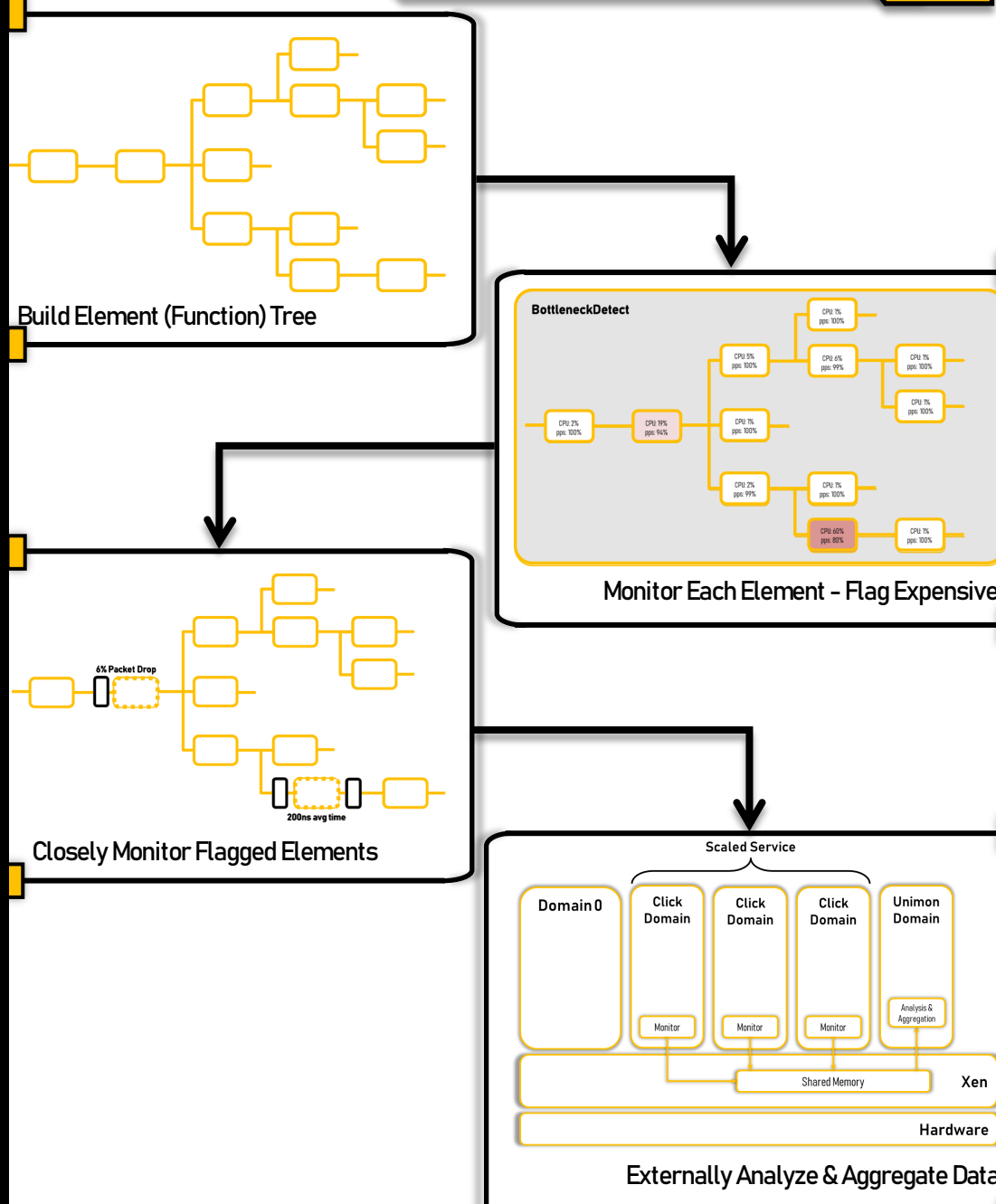
UNIMON[analysis]



- 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

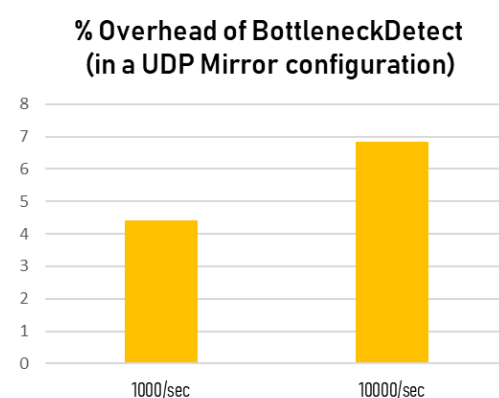
UNIMON[collection]

4



EVALUATION

5



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

[16 Element Configuration]

FUTURE

6

- Local Machine Policy Management (Automation)
- Cross-Machine Service Telemetry & Scaling
- Live Policy Reconfiguration