**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 samples/second
- Precise Monitoring Minimal Overhead

**6. FUTURE**
- Local Machine Policy Management (Automation)
- Cross-Machine Service Telemetry & Scaling
- Live Policy Reconfiguration