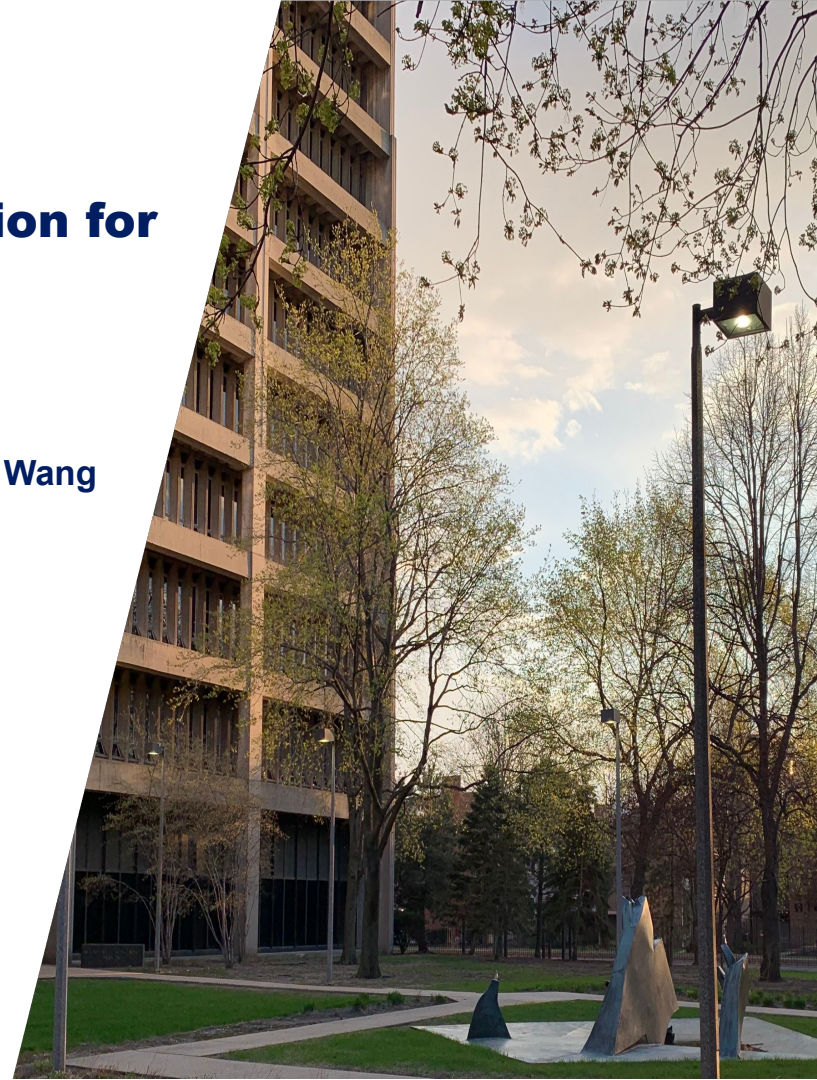


pMVX: Policy-Level Multi-Version Execution for Agentic OS Kernel Self-Tuning

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SySec Research Group



Motivation

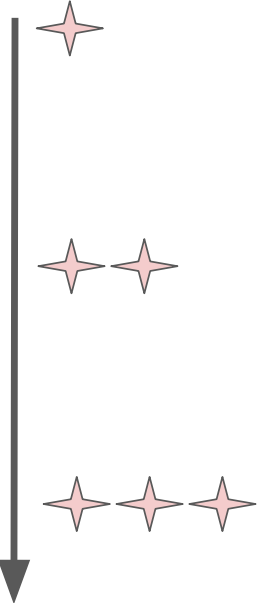
- **Kernel performance depends on pre-determined policies.**
- **Workloads are dynamic and heterogeneous.**
- **Lack of runtime feedback.**

Motivation 2



Sched Policy

Workload at Runtime



Sched Policy

Open Question

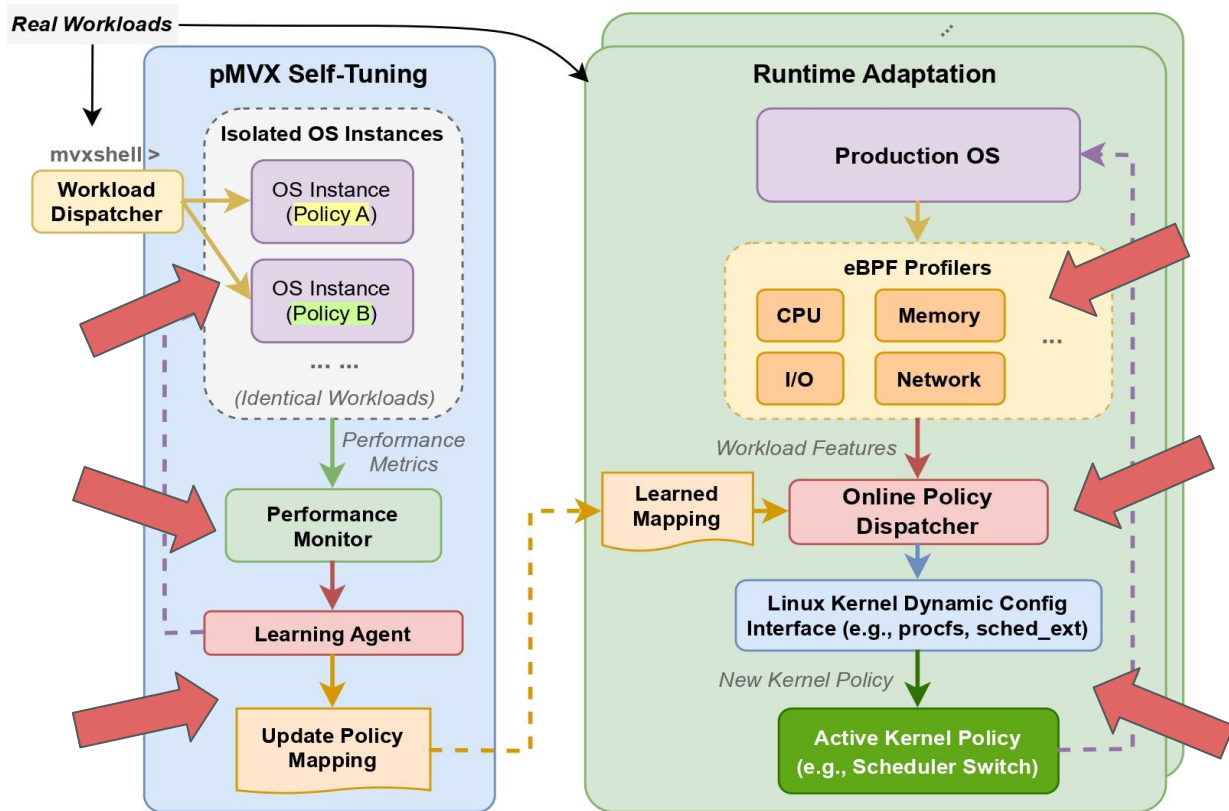
Q) Maintain system stability with different policies/workloads?

Q) What if a different policy been applied to the Kernel?

P-MVX: Policy-Level Multi-Version Execution

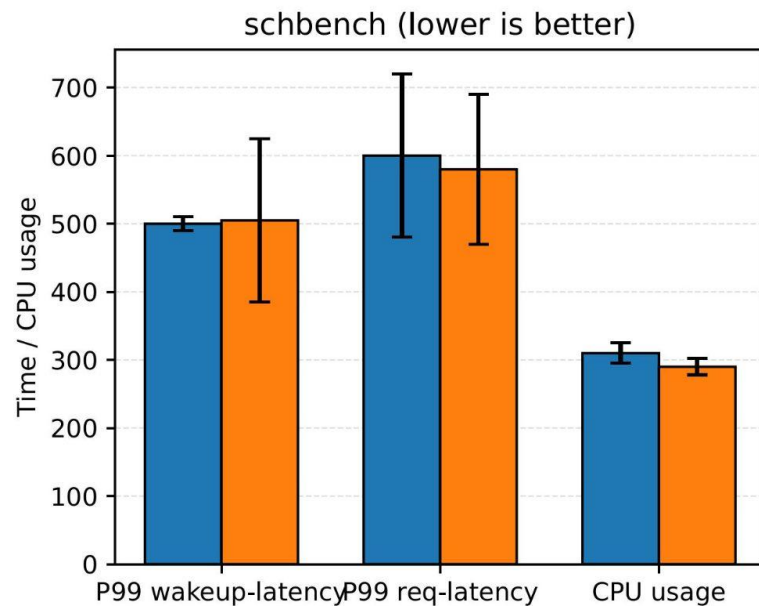
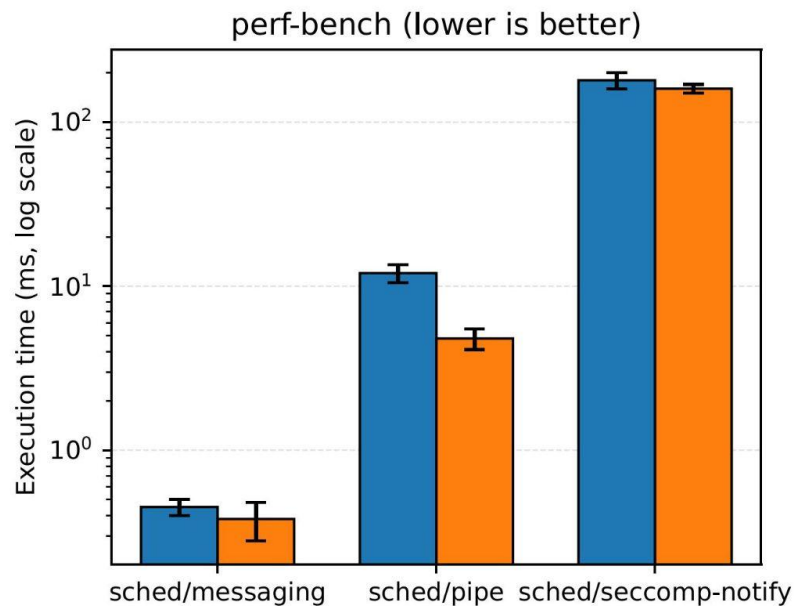
- **Re-use the idea of multi-version execution.**
- **Executes multiple kernel-policy variants concurrently.**
- **A lightweight policy memory agents to query at runtime.**

P-MVX: Policy-Level Multi-Version Execution 2

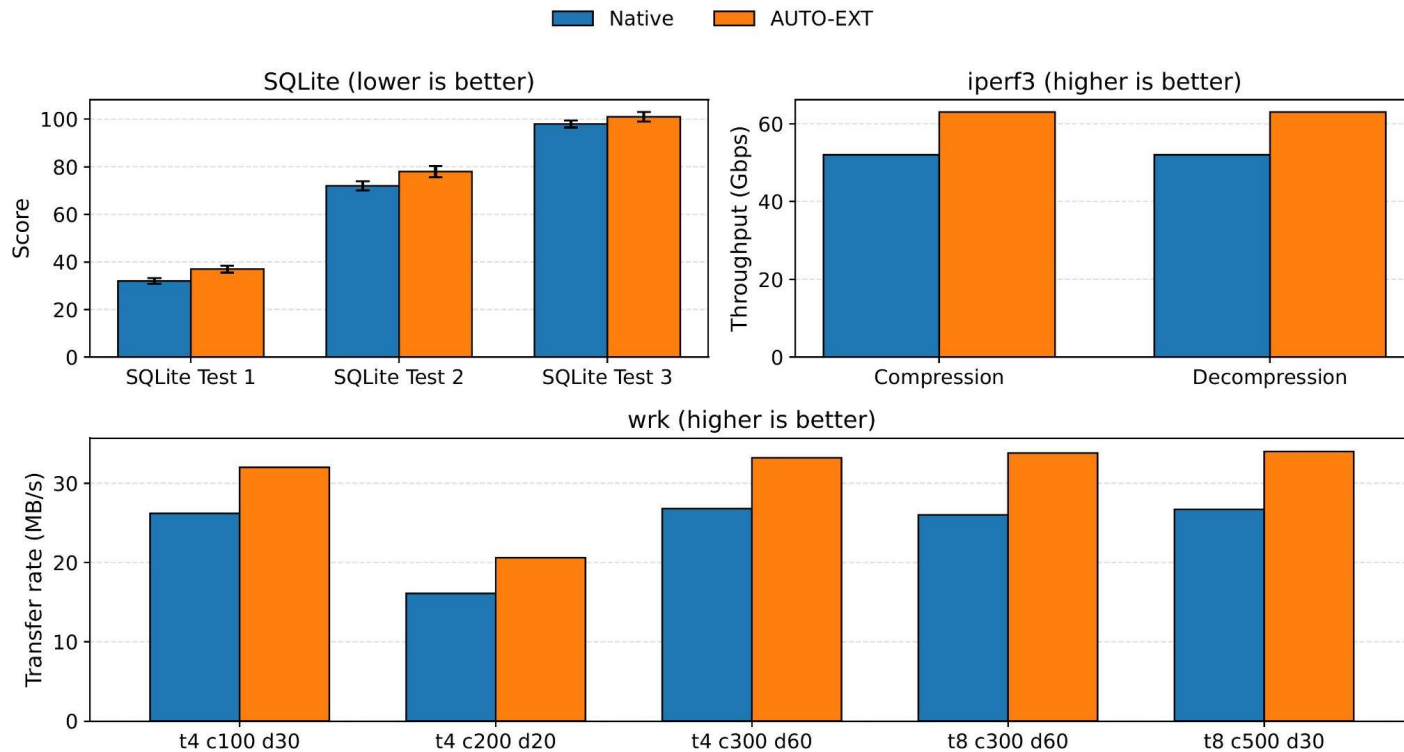


Preliminary Results

Native AUTO-EXT



Preliminary Results 2



Future Directions

- **In-progress:**

- Apply pMVX to generalized use cases.
- Any subsystem with accessible “*policy variance*”.

- **Future work:**

- Safety and rollback mechanisms.
- Managing resource effectively with pMVX.

Questions & Thoughts?





Thank you!