SMiTe: Precise QoS Prediction on Real-System SMT Processors to Improve Utilization in Warehouse Scale Computers

Yunqi Zhang, Michael A. Laurenzano, Jason Mars, Lingjia Tang
Clarity-Lab, Electrical Engineering and Computer Science, University of Michigan, Ann Arbor

Goal: Improve Data Center Utilization

Precise interference prediction identifies “safe” co-locations to improve server utilization

SMT Co-location is Harder than CMP

Unified approach for CMP co-location

Unified approach does not work for SMT

Solution: Ruler-based Methodology

Max utilization in each resource sharing dimension

Decoupled Quantification

Direct Interference Measurement

SMiTe Methodology Overview

Precise Interference Prediction on Real-System SMT Processors

Data Center Utilization Improvement

Commodity Processor

< 2% Prediction Error

42% Utilization Improvement