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# Benchmarking Serverless with SeBS: Past, Present, and Future







# SeBS: The Serverless Benchmark Suite



#### Reproducible Experiments

the materia

Performance & Cost Invocation Overhead Container Eviction





## Serverless has been changing – and so did we!

Communication Function transition Coordinator transition place DynamoDB Redis **S3** Мар detect<sub>1</sub> Cloud Task 韵 w: y<sub>1</sub> 😽 split **Storage** r: text 副 startw: x<sub>1</sub>,...,x<sub>N</sub> detect<sub>N</sub> w: y<sub>N</sub> 🗟 **P2P Applications** 

Workflows ŝ Мар reduce<sub>1</sub> 部 r: y<sub>1</sub> w: z<sub>1</sub> reduce<sub>2</sub> Task r: y<sub>2</sub> \$ shuffle Enter Phase 4 w: z<sub>2</sub> r: y<sub>1</sub>,...,y<sub>M</sub> ξ → end C<sub>0</sub> w: y<sub>1</sub>,...,y<sub>M</sub> ... reduce<sub>M</sub> 6 r: y<sub>M</sub> w: z<sub>M</sub>

**Profiling Multi-function** 

import faas\_profiler\_python as fp

@fp.profile() def serverless\_handler(\*args, \*\*kwargs):





### Serverless is changing – and so are we!

New Benchmarks

**New Serverless Applications** 

Storage & Queue Triggers

Large Applications

**New Platforms** 



Heterogeneous Serverless

AI/ML is Difficult Without GPUs

Trade-offs of GPU Sharing

#### Long-Term Stability

How Does Serverless Performance Change Over Time?

> What Causes High Tail Latency and Outliers?





### What Comes Next for Serverless?

More of SPCL's research:



Where are limits of scalability and resource allocation?

What will be the runtime of the future?

Are going to break free from the vendor lock-in? What will be the next serverless programming model? SeBS SeBS Paper Repo

... or spcl.ethz.ch





Serverless Needs Open Standard for Benchmarking!