

SRECON26 EMEA

Wide Then Deep Debugging With APerf

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He/Him

Compute Specialist Solutions Architect

Amazon Web Services

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Who am I?

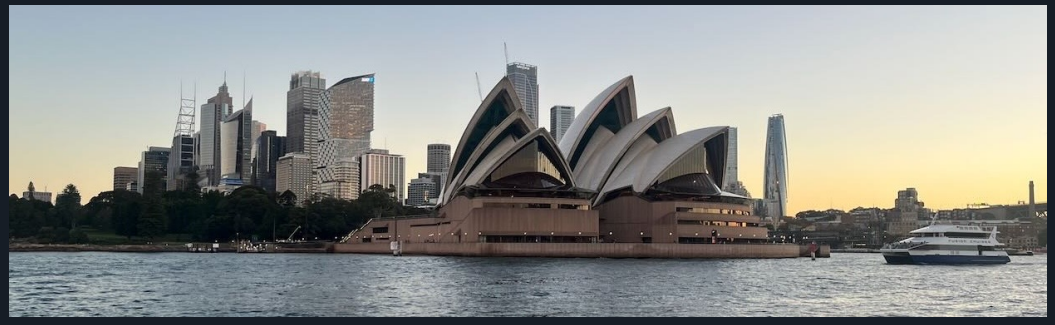
Member of AWS WW Compute team
Joined AWS in 2016 as a HPC specialist in EMEA

Moved to Seattle in 2019 to launch Graviton2



Helped AWS customers to adopt Graviton ever since

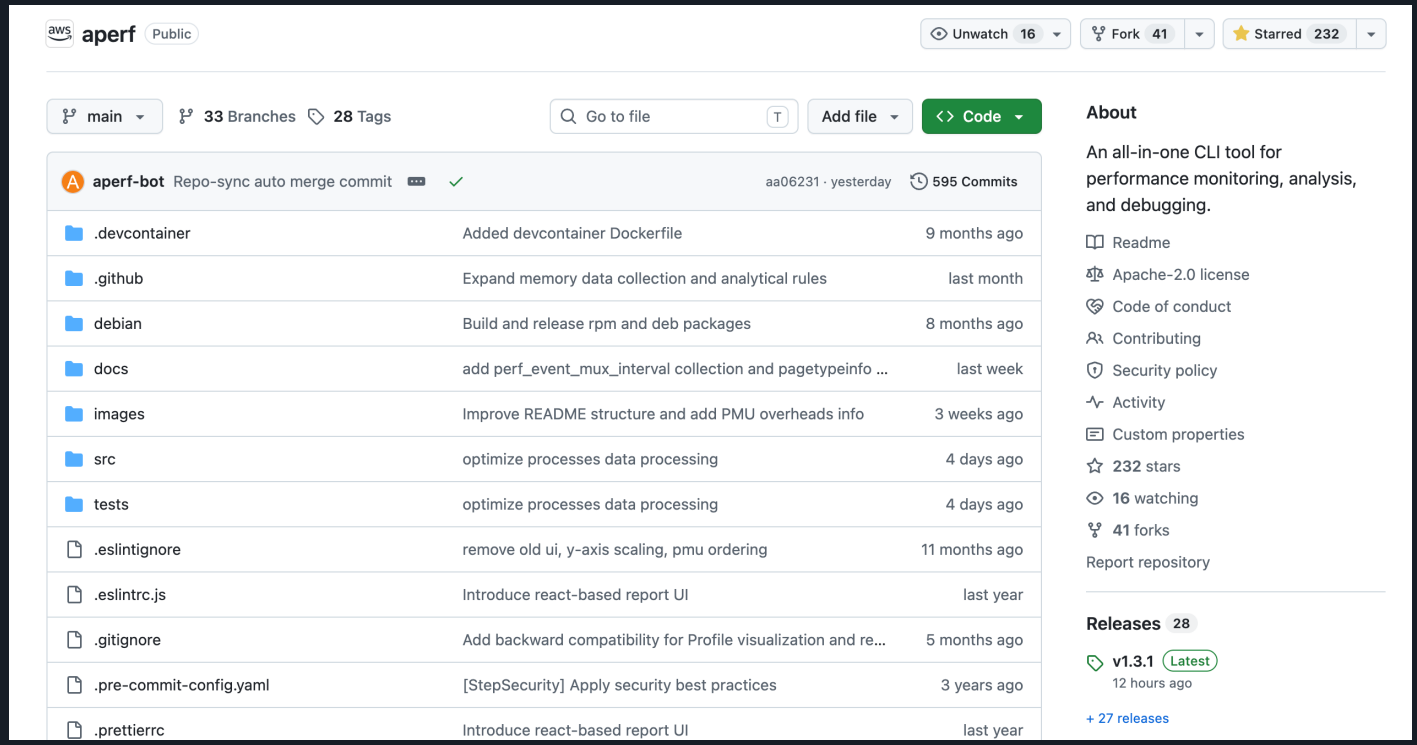
Now lives in Sydney, Australia



Arthur Petitpierre



What is Aperf?



https://github.com/aws/aperf

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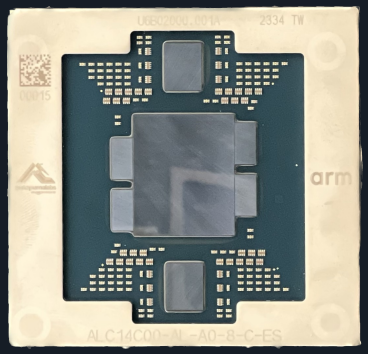
Why yet another performance tool?

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A bit of history



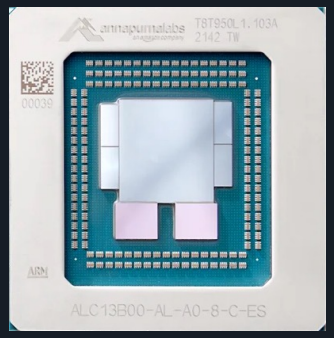
Graviton2 - 2019



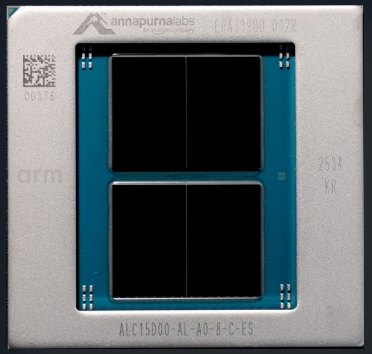
Graviton4 - 2023



Graviton - 2018



Graviton3 - 2021



Graviton5 - 2025

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Challenge? No processor architecture change in … decades!

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A typical customer interaction

Customer: *“We tested your new Graviton processor, it’s slower, why?”*

AWS: *“Thanks for testing, can you give us <insert here a long list of metrics> so that we could help you analyze what is wrong?”*

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Our answer to our own problem: APerf

Key goal: one stop shop tool to collect and share ~~all~~ most of the information needed to conduct a performance analysis

Constraints:
- No customer systems access
- No source code access
- No information about customer systems setup
- The interface between keyboard and chair is busy, distracted and error prone

Solution:
- A single static binary to collect a wide variety of metrics, from cpu utilization to obscure performance counters

Summary:
- Simple to use
- Limited dependencies
- Low overhead (<5% of 1vcpu)



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How does it work?

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Install, collect, generate report, analyze

```
$ curl -fsSL https://github.com/aws/aperf/releases/download/v1.3.1/aperf-v1.3.1-aarch64.tar.gz

$ tar xvzf aperf-v1.3.1-aarch64.tar.gz

$ cd aperf-v1.3.1-aarch64

$ sudo ./aperf record --profile -r my_run

$ ./aperf report -r my_run -n my_report
```

Next step is to download the report, open it in your broswer and start the analysis

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Analysis: wide then deep

- Understanding the test environment
- Analyzing system configuration (kernel version, sysctl, runtime setup)
- What part of the system is slow (USE method and similar)?
- What part of the system is slow (flamegraph)?
- What part of the hardware is slow (PMC)?

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Demo

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Recent features and roadmap

Recent features
- Binaries for MacOS and Windows (report generation only) – released yesterday in v1.3.1
- Added NUMA statistics collection
- Added ENA and EFA statistics collection
- Added memory allocation information collection
- Made Aperf available as RPM and DEB packages
- Built a MCP server to integrate with AI agents

Future features
- Always-on profiling
- Analytics support for profiling data
- Language specific profilers (python, ruby, Go, Rust)

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Contributions and feature requests are welcome



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Thank You!

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