From YAML to Insight: Interactive Visualization of hws Hardware Samples

Tim Thüring, Alexander Van Craen, Dirk Pflüger

hws is a vendor-independent **C++/Python library** that samples various hardware metrics on CPUs and GPUs from **NVIDIA, AMD and Intel**, including native **MPI support** for HPC clusters. This poster showcases its companion tool, that turns the recorded YAML traces into interactive, shareable HTML reports for data exploration and analysis, providing one easy-to-use and consistent workflow from measurement to analysis, on any hardware.

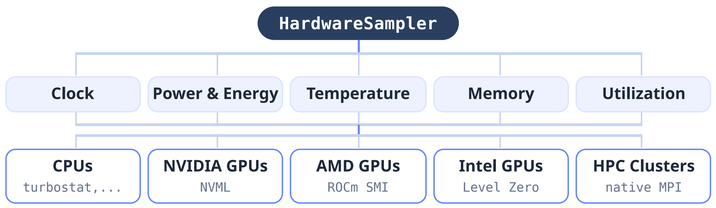
`hws-report`: Interactive Visualization

`hws` samples CPU/GPU metrics → **`results.yaml`** recorded samples → VISUALIZATION **`hws-report.py`** simple transformation → **`report.html`** interactive report in browser

FEATURES

- **Interactive data exploration** — stand-alone, Plotly-powered HTML report
- **Smart filtering** — sidebar filters by device, MPI rank, and metric
- **Energy Dashboard** — overview of per-node and per-GPU energy usage
- **Comparison mode** — overlay two or more runs, e.g. before/after code or configuration changes
- **Custom plot builder** — combine compatible metrics interactively in the browser
- **Named views** — customizable tab layouts (Clock, Power, Temperature, ...)
- **Export anywhere** — PNG, SVG, PDF plots, or raw JSON for downstream analysis

`hws`: Single API, Multiple Backends



Try it yourself → scan the QR codes below

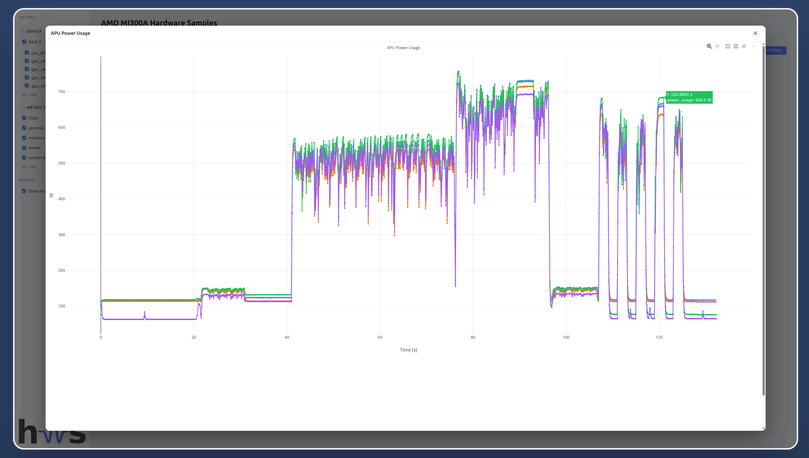
hws Visualizer
github.com/SC-SGS/hws_visualizer

hws Library
github.com/SC-SGS/hardware_sampling

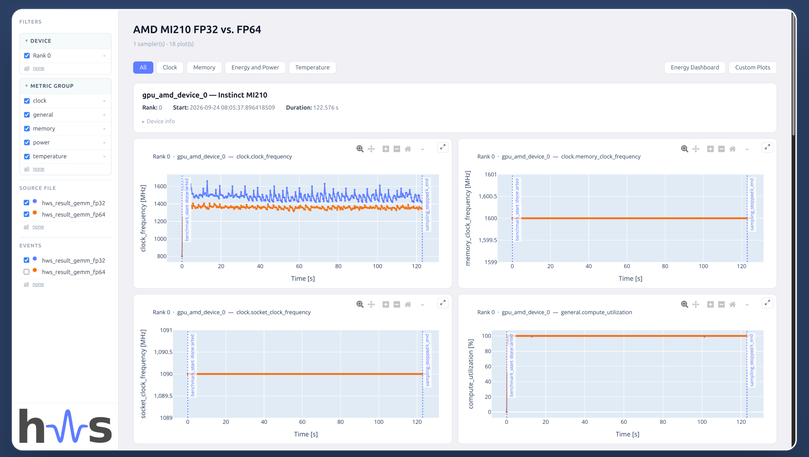
HWS VISUALIZER OVERVIEW



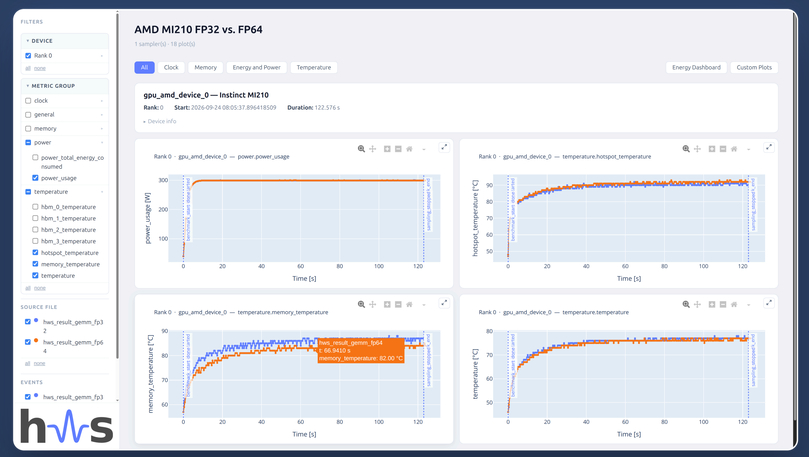
Side-by-side view: energy and power metrics (NVIDIA H100)



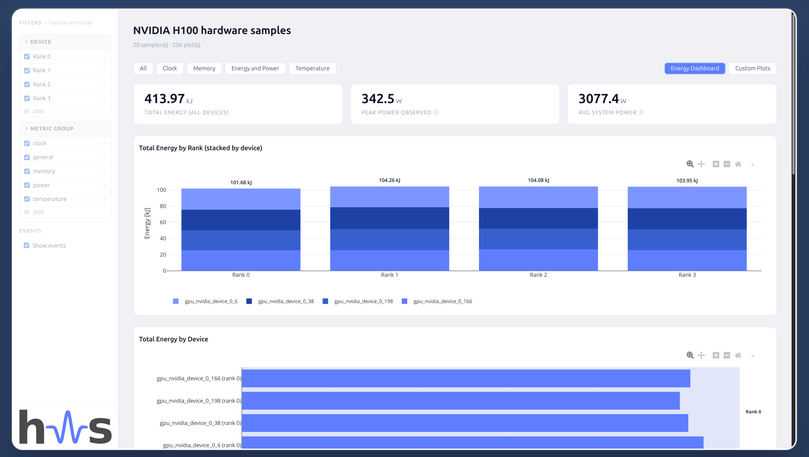
Overlay plot: APU power across devices (AMD MI300A)



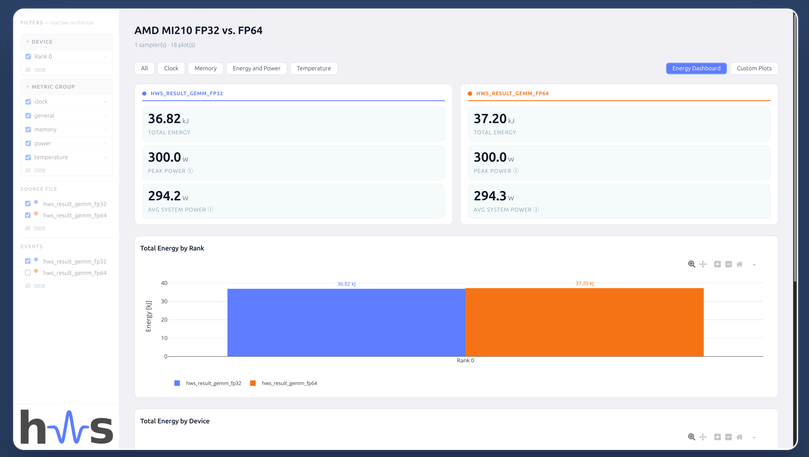
Comparison mode: FP32 vs. FP64 GEMM (AMD MI210)



Comparison mode: filtered for power and temperature samples



Energy Dashboard: 4-node NVIDIA H100 cluster



Energy Dashboard: comparison mode FP32 vs. FP64

University of Stuttgart Institute for Parallel and Distributed Systems (IPVS) — Scientific Computing

An interactive visualizer for a vendor-independent sampling library — Interactive Research e-Poster, SC26

The authors acknowledge support by the state of Baden-Württemberg through bwHPC.