HEPScore status update

D. Giordano, Randy Sobie

HEPiX Benchmarking WG

07 June 2023

About the TF mandate

Objectives accomplished

- Recommend the HEPScore composition
- Strategy for HS06->HEPScore migration
- Coordinate the collection of new workloads
- Onboard WLCG sites for validation

At the WLCG MB on May 16 agreed to close the Task Force activity

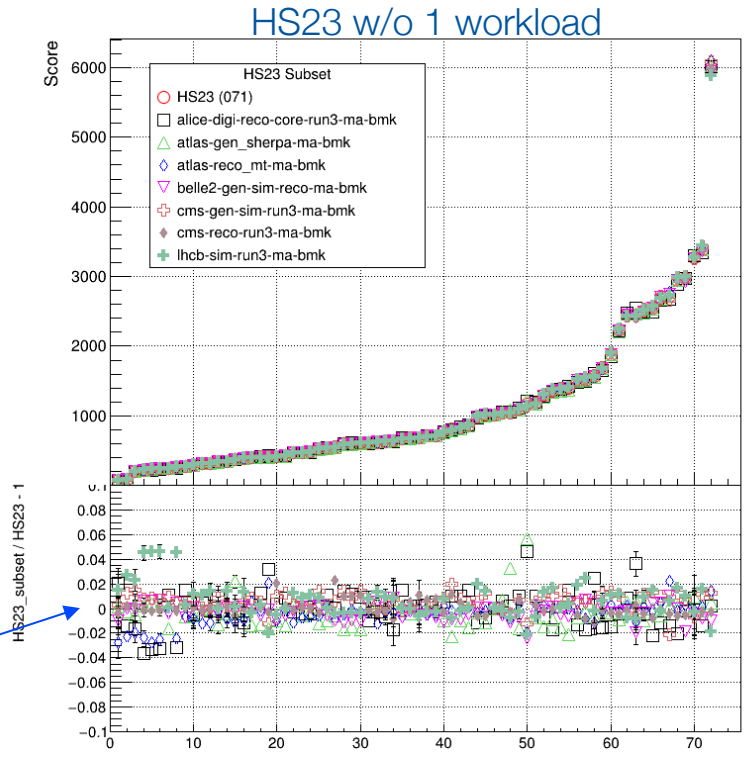
Remaining activities are under the role of other bodies

- Support & development: role of the HEPiX Benchmarking WG
- Monitor the adoption of HEPScore: more an Accounting WG task

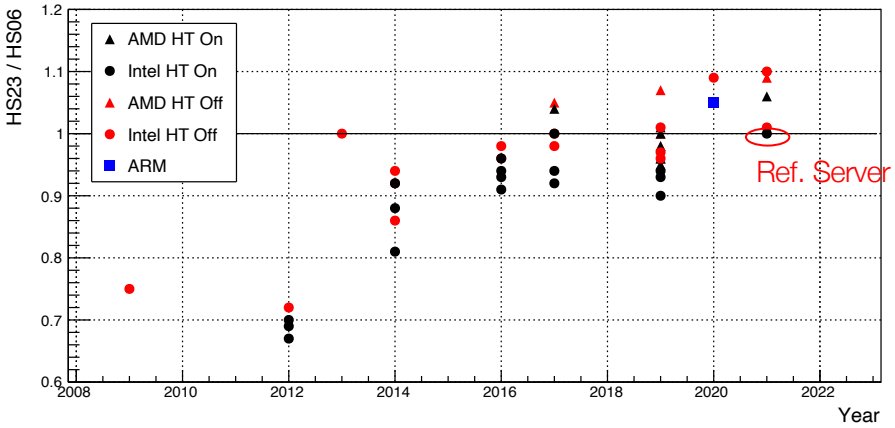
HEPScore23 validation campaign

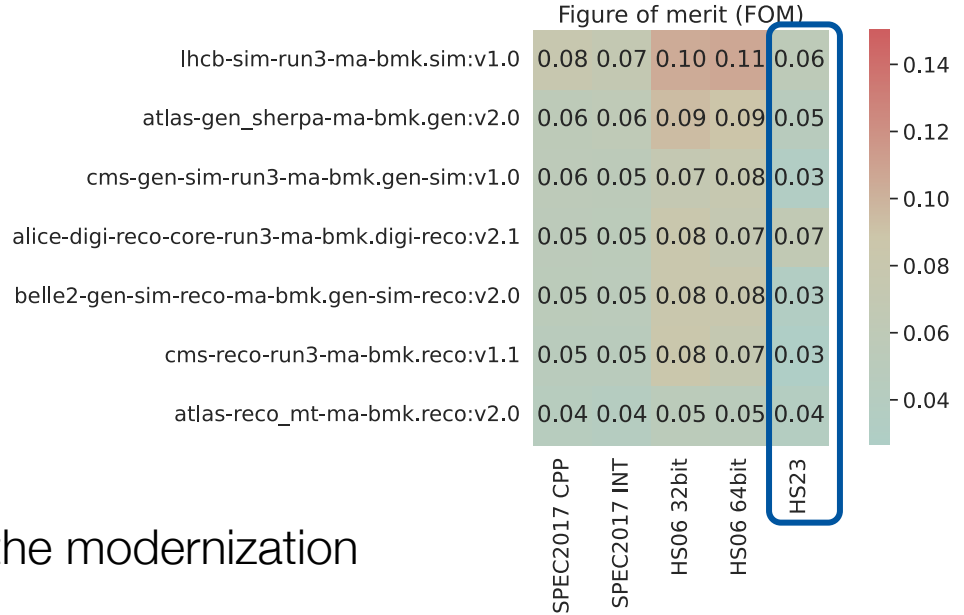
Since March 1st, measurements from a variety of servers and sites

- ~15 sites
- 46 distinct CPU models (Intel, AMD, ARM)
  - Including recent ARM nodes from vendors
- Small spread, ranging from ‰ to few %
- Several studies started
  - Performance Vs Energy
  - Performance in grid job slots
  - Effect of removing from HS23 one of the 7 benchmarks



CPU models by year





HS23 is a more accurate representation of the modernization that has taken place in HEP applications compared to HS06

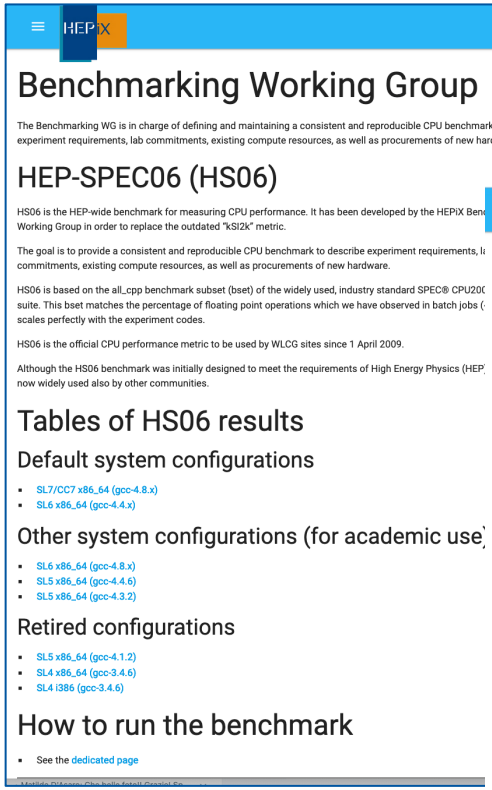
- Figure of merit (FOM) is a high-level measure of that

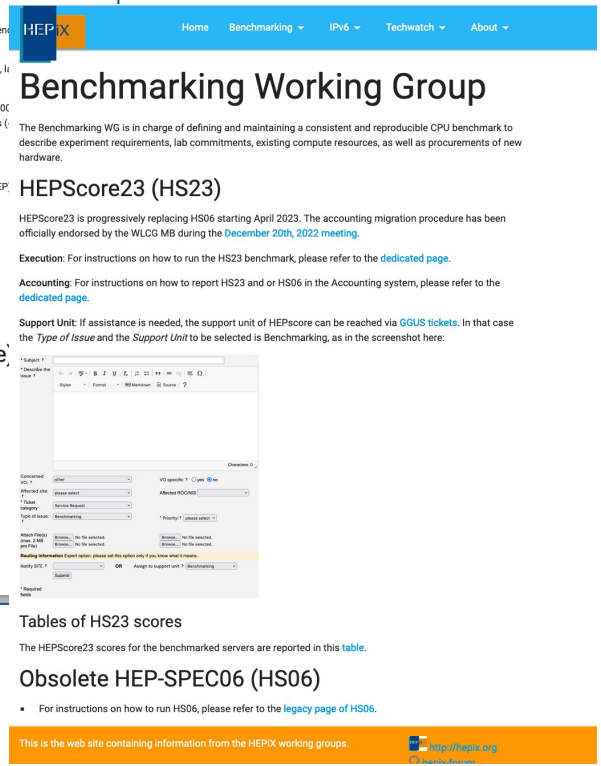
Documentation

Update the official HEPiX benchmarking page

- Report new instructions already reviewed by the TF
- Collect HS23 results as done in the past for HS06
  - Extracted from the benchmarking DB

Harmonize the gitlab documentation of the Suite, HEPScore, HEP Workloads

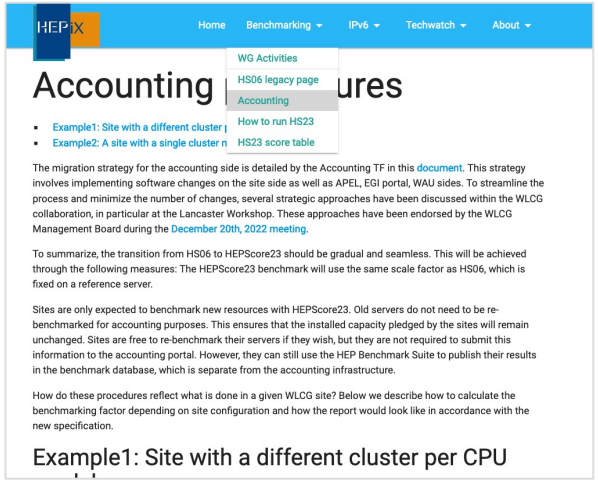


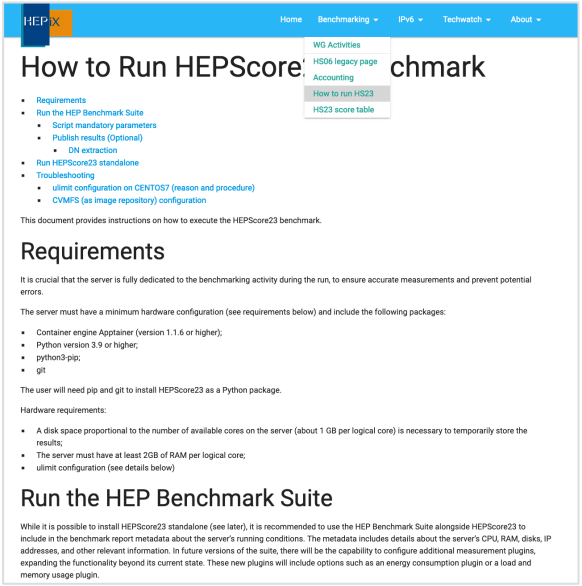


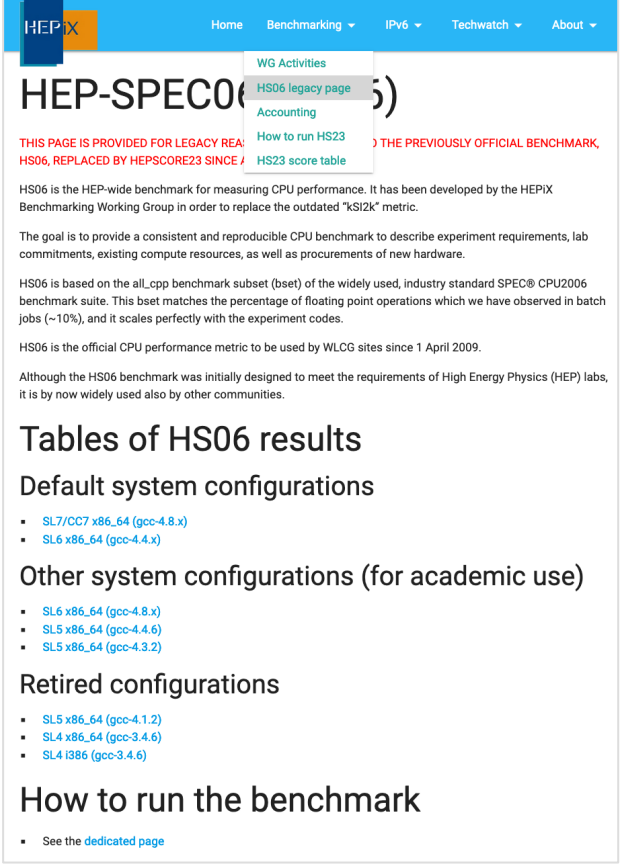
https://w3.hepix.org/benchmarking.html

New documentation

Menu to access old HS06 pages, accounting instructions, and how to run

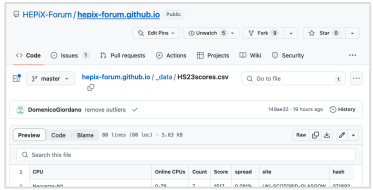






HEPScore23 results table

- Open access as the whole website. No need of ACL as for the Benchmarking DB
- Leverage DataTable to filter, order, paging
  - Not a static table as for HS06
  - Reporting CPU model, number of online CPUs, Number of measurements, score, spread, site and hash of the HEPScore config. Can be extended to other metadata (RAM, OS, etc)
- Data extracted from the Benchmarking DB
  - Semi-automatic procedure under preparation:
    - Perform analysis of the new data via Jupyter notebooks (investigate outliers, fit values, etc)
    - Inject new table raws, as csv, in the github repo hosting the Benchmarking website



HEPiX Home | Benchmarking | IPv6 | Techwatch | About

WG Activities
HS06 legacy page
Accounting
How to run HS23
HS23 score table

Show 10 entries

Search:

CPU	Online CPUs	Count	Score	spread	site	hash
AMD EPYC 7302 16-Core Processor	0-63	1	893	0%	NDGF-UCPH	071892
AMD EPYC 7302 16-Core Processor	0-63	171	981	1.30%	CERN	071892
AMD EPYC 7302 16-Core Processor	0-31	493	768	0.776%	CERN	071892
AMD EPYC 7302 16-Core Processor	0-63	11	1012	0.297%	CC-IN2P3	071892
AMD EPYC 7402 24-Core Processor	0-95	1	1502	0%	UKI-LT2-QMUL	071892
AMD EPYC 7452 32-Core Processor	0-127	16	1516	0.953%	PIC	071892
AMD EPYC 7452 32-Core Processor	0-127	18	1566	2.55%	CA-UVic-Cloud	071892
AMD EPYC 7453 28-Core Processor	0-111	27	1675	1.71%	CC-IN2P3	071892
AMD EPYC 7513 32-Core Processor	0-127	1	1882	0%	UKI-SCOTGRID-GLASGOW	071892
AMD EPYC 7551P 32-Core Processor	0-63	20	637	3.04%	Nikhef	071892

Showing 1 to 10 of 79 entries Previous 1 2 3 4 5 ... 8 Next

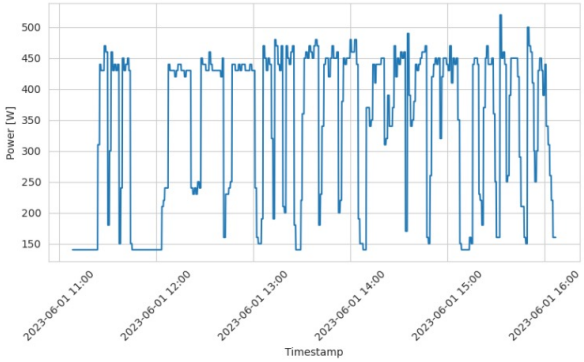
Publication

The plans is to prepare a paper that describes HS23 and the process to get here

- CSBS is the candidate journal: already published the previous paper
- Randy and I as editors
- Authors: all contributors from the Working group and the Task force

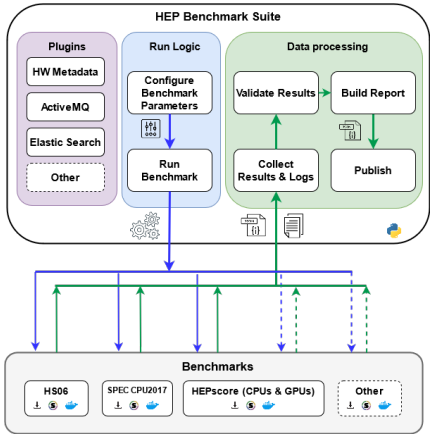
Ongoing work: Suite

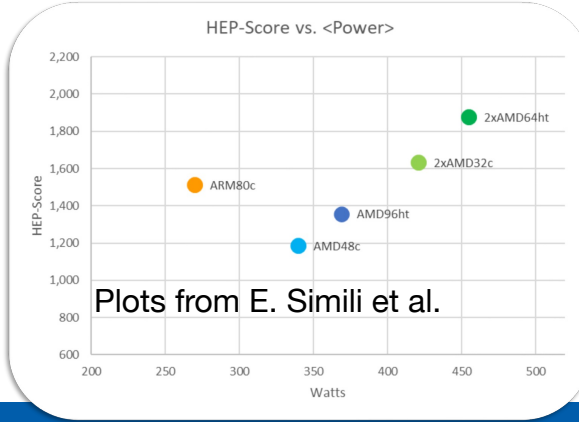
- Extend the metadata plugin library to timeseries metrics: Energy consumption, load, CPU frequency,
- To be correlated with the score measurements



Benchmark report


```
"plugins": {
  "CPUFrequencyPlugin": {
    "pre": {"interval": 60...},
    "hepscore": {"interval": 60...},
    "post": {"interval": 60...}
  },
  "IpmiSdrElistPowerConsumptionPlugin": {
    "pre": {"interval": 60...},
    "hepscore": {
      "interval": 60,
      "tstart": "2023-05-30T14:53:32.982843Z",
      "tend": "2023-05-30T16:58:33.708735Z",
      "unit": "W",
      "values": [
        120,
        120,
        120,
```



Plots from E. Simili et al.

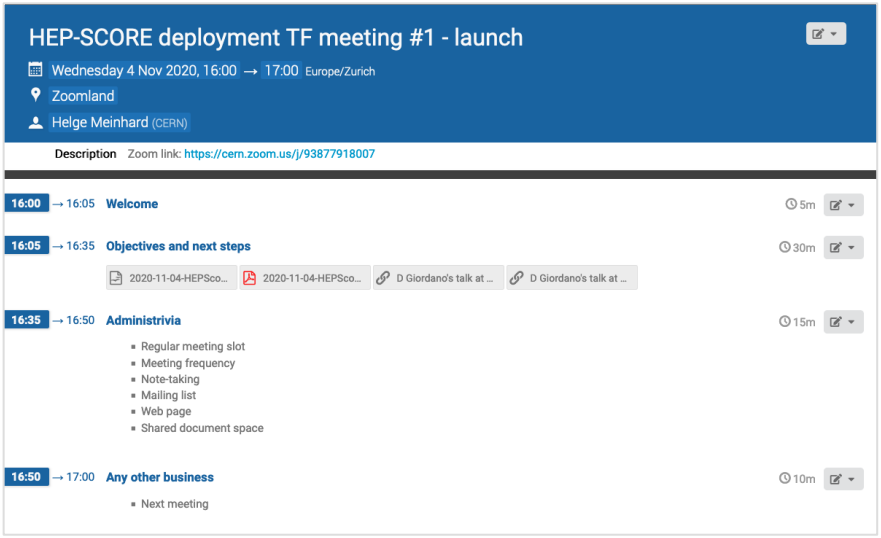
Ongoing work: HEPScore

- ❑ Consolidate the python code
- ❑ Support multiple container registries
- ❑ Release a version v2.0

Ongoing work: HEP Workloads

- ❑ Allow to load a configurable number of cores
- ❑ Improve the validation of input params
- ❑ Study score stability Vs number of events/thread
- ❑ Progress on GPU workloads

THANK YOU!!!



HEP-SCORE deployment TF meeting #1 - launch

Wednesday 4 Nov 2020, 16:00 → 17:00 Europe/Zurich

Zoomland

Helge Meinhard (CERN)

Description Zoom link: https://cern.zoom.us/j/93877918007

16:00 → 16:05 Welcome 5m

16:05 → 16:35 Objectives and next steps 30m

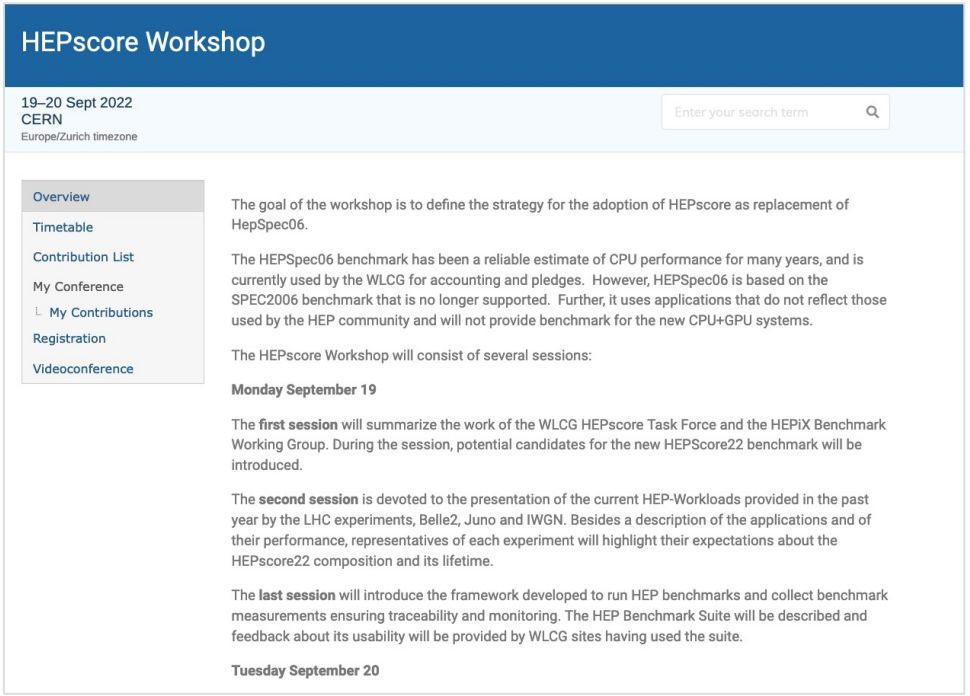
2020-11-04-HEPSco... 2020-11-04-HEPSco... D Giordano's talk at ... D Giordano's talk at ...

16:35 → 16:50 Administrivia 15m

- Regular meeting slot
- Meeting frequency
- Note-taking
- Mailing list
- Web page
- Shared document space

16:50 → 17:00 Any other business 10m

- Next meeting



HEPscore Workshop

19–20 Sept 2022
CERN
Europe/Zurich timezone

Enter your search term

Overview
Timetable
Contribution List
My Conference
My Contributions
Registration
Videoconference

The goal of the workshop is to define the strategy for the adoption of HEPscore as replacement of HepSpec06.

The HEPSpec06 benchmark has been a reliable estimate of CPU performance for many years, and is currently used by the WLCG for accounting and pledges. However, HEPSpec06 is based on the SPEC2006 benchmark that is no longer supported. Further, it uses applications that do not reflect those used by the HEP community and will not provide benchmark for the new CPU+GPU systems.

The HEPscore Workshop will consist of several sessions:

Monday September 19

The **first session** will summarize the work of the WLCG HEPscore Task Force and the HEPiX Benchmark Working Group. During the session, potential candidates for the new HEPScore22 benchmark will be introduced.

The **second session** is devoted to the presentation of the current HEP-Workloads provided in the past year by the LHC experiments, Belle2, Juno and IWGN. Besides a description of the applications and of their performance, representatives of each experiment will highlight their expectations about the HEPscore22 composition and its lifetime.

The **last session** will introduce the framework developed to run HEP benchmarks and collect benchmark measurements ensuring traceability and monitoring. The HEP Benchmark Suite will be described and feedback about its usability will be provided by WLCG sites having used the suite.

Tuesday September 20

That has been a long, motivating, constructive journey!

CERN