HPC-CF @ SC'23 - BoF and survey

The Forum

The HPC Certification Forum is an international and mostly volunteer-based initiative focused on defining, examining and certifying skills required by HPC practitioners. The forum has no intention of creating or directly providing any training content - capturing the skills and creating the examination framework are the main focus. Over the last 5 years significant progress has been made towards creating and expanding the skill tree, which currently consists of the following main branches: HPC Knowledge, Use of HPC Environment, Software Development, Performance Engineering, System Administration and Big Data Analytics. Figure 1 shows the example of the two top levels of the Software Development branch. In total, the tree has **600+** skills listed. Additionally, it is expected that some skills are still missing, especially in the younger two branches - Administration and Big Data Analytics.

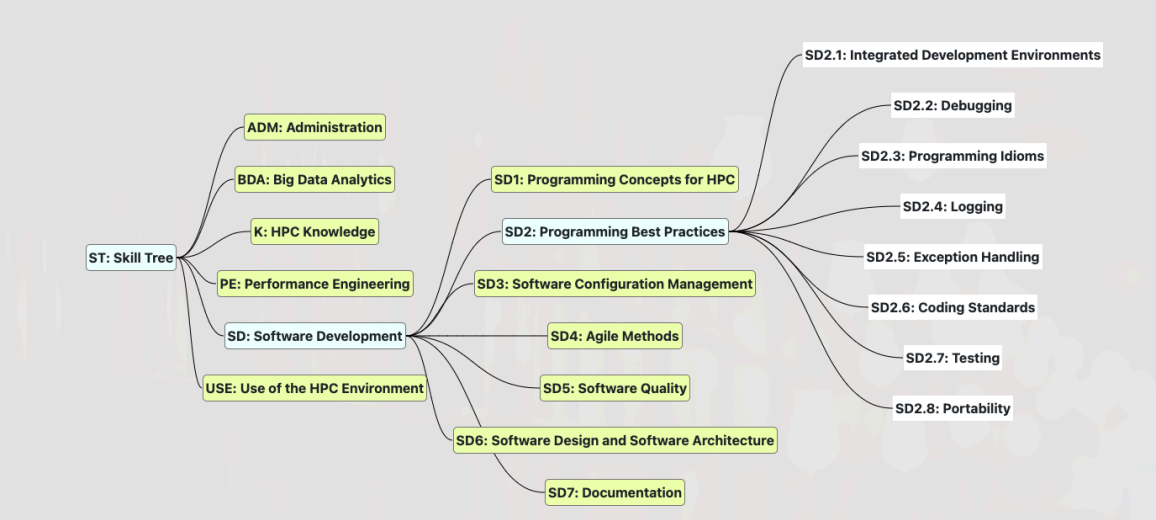
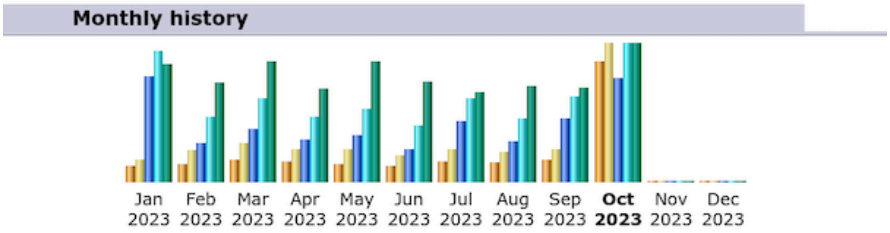


Fig 1. Skill Tree defined by the HPC-CF, with the Software Development branch expanded.

Although the number of contributions from the community has dropped significantly over the pandemic period, the number of visits to the HPC-CF website remains high (Figure 2), signifying the on-going interest. The spike in visits observed in October 2023 is attributed to the Birds of a Feather session appearing in the program of the Supercomputing 2023 conference - Updates from the HPC Certification Forum. The session was intended to (re)introduce the initiative, update on the progress and to discuss and gather feedback on the contribution processes.



Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2023	888	1,259	15,022	18,592	279.48 MB
Feb 2023	951	1,732	5,652	9,244	235.27 MB
Mar 2023	1,261	2,178	7,422	11,789	289.13 MB
Apr 2023	1,160	1,884	6,016	9,316	221.20 MB
May 2023	1,011	1,862	6,535	10,243	286.53 MB
Jun 2023	926	1,525	4,740	7,860	241.17 MB
Jul 2023	1,132	1,868	8,595	11,785	215.43 MB
Aug 2023	1,093	1,713	5,785	9,120	229.01 MB
Sep 2023	1,264	1,840	8,989	12,038	225.70 MB
Oct 2023	6,746	7,742	14,766	19,600	330.20 MB
Nov 2023	0	0	0	0	0
Dec 2023	0	0	0	0	0
Total	16,432	23,603	83,522	119,587	2.49 GB

Fig 2 - HPC-CF website statistics for January - October 2023.

SC'23 BoF

The Birds of a Feather session was run at the SC'23 in Denver on Wednesday 15 November at 12:15-1:15, competing with 14 other BoFs and other SC events. Although we only had about 20 attendees, they were very engaged and most of them participated in the live Mentimeter survey, Q&As and the general discussion. The survey consisted of 11 questions that ranged from multiple choice, to scale, to open-ended questions. The questions had between 9 and 12 respondents, and despite the relatively low numbers, the results are still very useful and should inform the further development of the initiative.

Survey results

In the first question we asked why the attendees became interested in the HPC Certification Forum - this was a multiple choice question that allowed multiple replies per person. The answers, in the order of votes received, were: 1) general interest - 7 votes, 2) interested in the the skill tree, definitions and learning outcomes - 6 votes, 3) I would like to contribute - 5 votes, 4) interested in the examination process - 4 votes, 5) I'm trying to do something similar - 3 votes and 6) I want to take the certification - 1 vote. The responses correspond to the fact that most people in the room were educators and trainers rather than consumers of the training materials.

The goal of the second question was to determine which aspects of the HPC-CF are seen as the most important by the community. The attendees were asked to assign the score between 1 to 5 (with 1 being not important and 5 being very important) to the following aspects: Skill tree development, mapping the skills onto the existing training materials, developing examinations and certifying the skills. The average scores for each category are shown in Figure 3. The skill

tree development received the highest score of 4.6. The other three aspects are seen as slightly less important, with scores between 3.5 and 3.9.

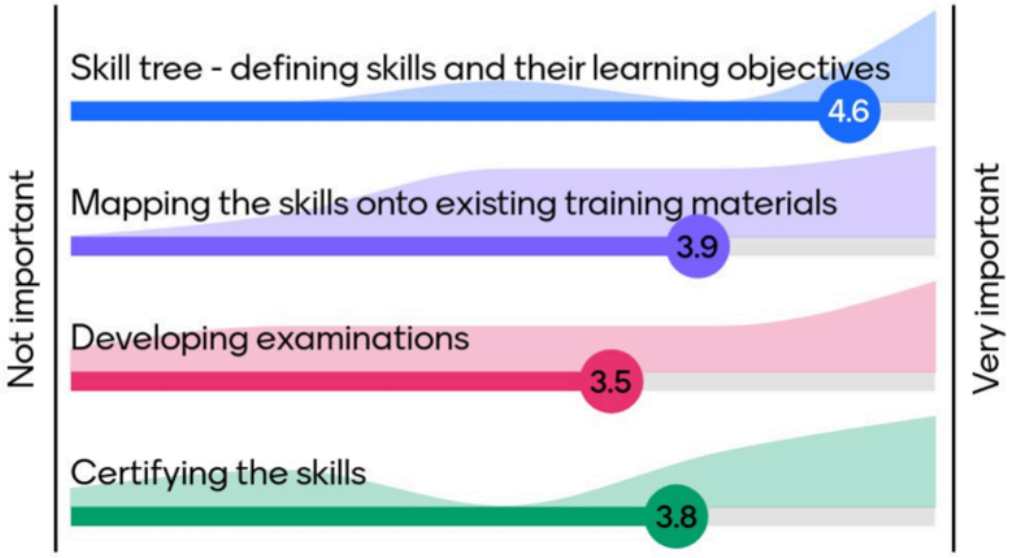


Fig 3 - Average importance assigned by the SC'23 BoF session attendees to the goals of the HPC-CF.

When asked about their willingness to contribute to the effort, almost all attendees indicated they would be happy to contribute, with most of them willing to spend between 1-4 hours monthly. The next question was focused on establishing how people would like to contribute. The two answers that received the most votes were: providing skill definition, descriptions and learning objectives, and cross-referencing the skills with the existing training materials - both received 7 votes. Providing the examination questions option received 3 votes, helping to run events and contributing to the management options got 2 votes and working on the website received only 1 vote.

Figure 4 shows the responses to the 'How can we encourage you to contribute?' question. The highest number of votes was given to better documentation - 36%, then staff support and events received 18% each, followed by video tutorials - 14%. The other option (which included having more specific examples) got 9% and finally, there was a single vote for a more straightforward process.

Then we asked about the main obstacles currently preventing the attendees from contributing. Most of them felt they don't know enough about HPC-CF (6 votes) or they don't have enough time (5 votes). Finally, 2 people say they don't know how to contribute.

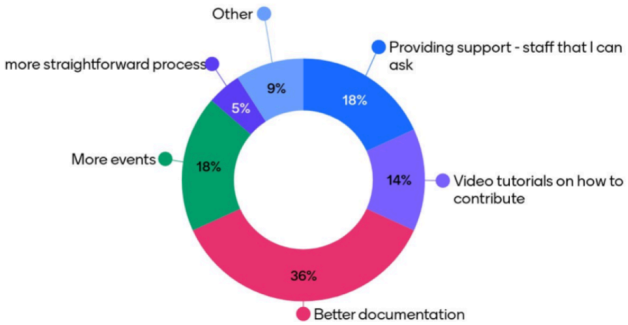


Fig 4 - The chart shows how the BoF attendees would like to be supported in their efforts to contribute to the HPC-CF.

When asked if they would consider cross-referencing the skills defined by the HPC-CF with their existing content, all of the attendees answered yes. Therefore, the next question was focused on understanding what support or guidance was needed to encourage that process.

This was an open-ended question and some of the answers included:

- Examples that illustrate how the mapping could be done, including links to existing public materials;
- Tutorials or webinars providing step-by-step guidance for the whole process, including a success story contribution;
- A list of preferred and searchable tags with direct permanent links to specific skills;
- Well defined and documented metadata required to link the training materials (e.g. citation info, license, etc);
- And prioritization of what skills need to be expanded more than others - including the missing and not fully defined skills.

The last two questions were focused on understanding which branches of the skill tree people were most interested in and which they felt most confident in contributing to. The answers are shown in Figure 5. Overall, the two categories that the attendees were the most interested in were: HPC Knowledge and Use of HPC Environment, with the other four categories being slightly behind with the average scores ranging from 3.2 to 3.7. This indicates that although the attendees might be interested in the specific branches based on their experience or current role, they believe all skill categories are important. The confidence levels for different categories show a slightly different story - most attendees felt confident in contributing to the HPC Knowledge and Use of HPC Environment branches, but not really that confident in contributing to all the other categories. The Software Development branch received a relatively low average score of 2, which probably reflects the fact that not many people in the HPC community had any formal education and training in that aspect.

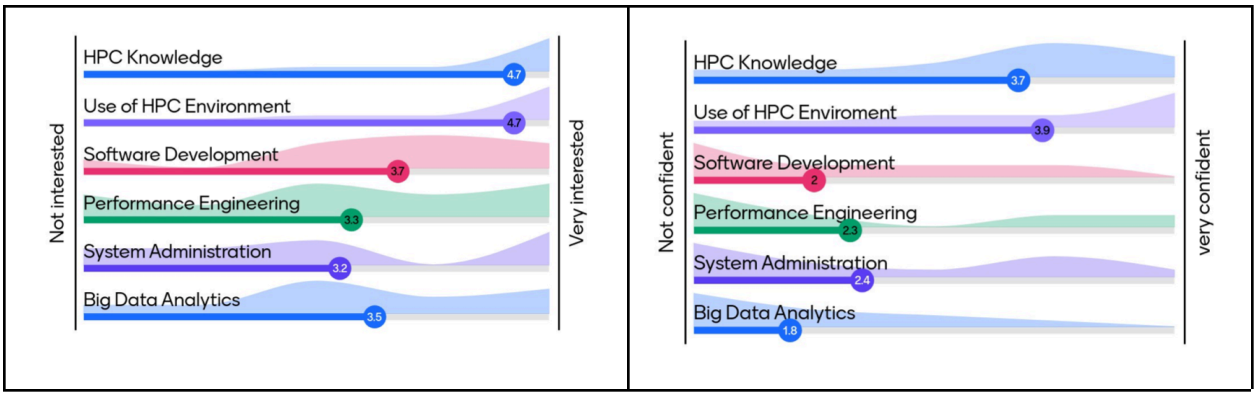


Fig 5 - The interest of the attendees in the skills from the main skill branches (left) and their confidence in contributing to those categories (right).

Conclusions & Next steps

Overall, the BoF was very interactive, with mostly people leaving their email addresses to facilitate their future contributions. It also provided us with useful information about the overall perception of the initiative, the contribution processes and related issues. There is definitely an appetite for more sessions outlining the contribution processes and perhaps even contribute-a-thon events. People are keen to see the initiative grow and are happy to contribute some of their time, but fitting that time into their busy schedule is hard, especially if they are not sure how to do it, or what is needed. To that end, providing a list of skills that are not fully defined and soliciting specific contributions from the community, might be a good way of further developing the skill tree.

How to Contribute

If you are interested in contributing to the HPC-CF (in any way, please get in touch!). Some of the way in which you can contribute include:

- Developing and expanding the skill tree
- Cross-referencing the skill tree and your training content
- Contributing the examination questions
- HPC-CF management

More information about the contribution process please visit the processes page on the HPC-CF website.