Building on the European Exascale Approach: SC13 BOF Summary

Led by Europe's three complementary exascale research projects, CRESTA, DEEP and Mont-Blanc, the aim of this BOF was to explore different exascale strategies and looking to build the project's exascale community beyond Europe. The BOF was well attended, with an estimated 90-100 people. Chaired by Dr.-Ing. Bernd Mohr, key representatives from the three projects answered questions and contributed to a lively discussion.

The BOF began with the representatives giving a short overview of their projects. CRESTA highlighted their software co-design approach, which they couple with a mix of incremental and disruptive strategies. DEEP described their architecture, which provides a bridge between a highly scalable architecture and a low-medium scalable architecture (general purpose). Mont-Blanc described their use of European skills in embedded computing and their use of low-power mobile technologies.

This was followed by an interactive question and answer session, discussing questions such as whether the European approach, which utilises a very large number of codes, has an advantage over e.g. the three US co-design centres. There was a series of specific questions about the project's hardware and hardware assumptions. IO and Big Data issued were raised, as were the mechanisms used for addressing dynamic scaling issues within the applications. The BOF finished with an interesting discussion on the legacy of each of the projects.

Associated with the BOF, the project's prepared an on-line questionnaire. This was publicised at the BOF and via email and made available on the European Exascale Booth. 54 people responded, of these 17 attended the BOF. This asked questions about the European approach to achieving exascale as well as questions about the approach of other countries and continents. A summary of these results is enclosed.

European Exascale Projects

SurveyMonkey

1. How confident are you that the European approach to solving the exascale challenge will result in an exascale system?

		Response Percent	Response Count
Very confident		20.8%	11
Confident		**35.8%**	**19**
Moderately confident		26.4%	14
Unsure		13.2%	7
Not confident		3.8%	2
		answered question	**53**
		skipped question	**1**

2. How confident are you that the European approach to solving the exascale challenge will result in exascale enabled European applications and software?

		Response Percent	Response Count
Very confident		25.9%	14
Confident		**44.4%**	**24**
Moderately confident		20.4%	11
Unsure		9.3%	5
Not confident		0.0%	0
		answered question	**54**
		skipped question	**0**

3. Are you aware of the research and development funds available from the European Commission to achieve Exascale?

		Response Percent	Response Count
Yes		**94.4%**	**51**
No		5.6%	3
	answered question		**54**
	skipped question		**0**

4. Do you believe the scale of European investment is appropriate in order to achieve Exascale?

		Response Percent	Response Count
More investment is needed		**77.8%**	**42**
Current investment is sufficient		9.3%	5
Unsure		13.0%	7
	answered question		**54**
	skipped question		**0**

5. Do you think Europe has laid out a credible plan to achieve Exascale?

	Response Percent	Response Count
Yes	18.5%	10
Probably	**38.9%**	**21**
Maybe	27.8%	15
Unlikely	13.0%	7
Definitely not	1.9%	1
Unsure	0.0%	0
	answered question	**54**
	skipped question	**0**

6. Are you aware of the following European HPC and Exascale projects and initiatives? (You may select more than one option)

	Response Percent	Response Count
PRACE	**100.0%**	**54**
EESI and EESI-2	51.9%	28
HPC Planet	16.7%	9
ETP4HPC	64.8%	35
	answered question	**54**
	skipped question	**0**

7. Do you think further investment is needed in developing European software and applications for exascale?

	Response Percent	Response Count
Yes, significant investment	**61.1%**	**33**
Yes, some investment	33.3%	18
No	1.9%	1
Unsure	3.7%	2
answered question		**54**
skipped question		**0**

8. Do you think further investment is needed in developing European hardware for exascale?

	Response Percent	Response Count
Yes, significant investment	**55.6%**	**30**
Yes, some investment	24.1%	13
No	7.4%	4
Unsure	13.0%	7
answered question		**54**
skipped question		**0**

9. How significant is the power problem for future exascale platforms?

	Response Percent	Response Count
Unsolvable	0.0%	0
Only solvable with revolutionary technology	**59.3%**	**32**
Solvable with evolution of current technology	40.7%	22
Easily solvable	0.0%	0
	answered question	**54**
	skipped question	**0**

10. How significant is the resiliency problem for future exascale platforms?

	Response Percent	Response Count
Unsolvable	0.0%	0
Only solvable with revolutionary technology	41.5%	22
Solvable with evolution of current technology	**58.5%**	**31**
Easily solvable	0.0%	0
	answered question	**53**
	skipped question	**1**

11. How significant is I/O for future exascale platforms?

	Response Percent	Response Count
Unsolvable	0.0%	0
Only solvable with revolutionary technology	40.4%	21
Solvable with evolution of current technology	**59.6%**	**31**
Easily solvable	0.0%	0
	answered question	**52**
	skipped question	**2**

12. What level of co-design is required to develop exascale hardware, software an applications using a co-design approach?

	Response Percent	Response Count
Full integration across the whole hardware/ software/ application stack	30.8%	16
Integration across key layers of the hardware/ software /application stack	**57.7%**	**30**
Some integration	11.5%	6
No integration	0.0%	0
	answered question	**52**
	skipped question	**2**

13. What application areas do you think will be able to exploit exascale technology?

	Response Count
	22
answered question	**22**
skipped question	**32**

14. Which country or continent do you think will build the first exascale computer?

		Response Percent	Response Count
US		35.8%	19
Japan		3.8%	2
Europe		13.2%	7
China		**47.2%**	**25**
None		0.0%	0
		Other (please specify)	0
		answered question	**53**
		skipped question	**1**

15. Which country or continent do you think Europe should look to collaborate with over exascale developments (you may choose more than one option)?

	Response Percent	Response Count
US	**81.5%**	**44**
Japan	59.3%	32
Europe	53.7%	29
China	33.3%	18
Other	5.6%	3
None	3.7%	2
Provide further details of potential collaborations and the associated countries		2
answered question		**54**
skipped question		**0**

16. Did you attend any of the following events? (you may choose more than one option)

	Response Percent	Response Count
SC13	**96.0%**	**24**
The SC13 European Exascale BOF	68.0%	17
answered question		**25**
skipped question		**29**