

A clarifying look at the ETP4HPC role in EuroHPC and opportunities for European SMEs



1 Apr 2019 Sassenheim - At the ETP4HPC meeting on March 18, 2019 in Sassenheim, The Netherlands, Primeur Magazine talked about the ecosystem around HPC in Europe with three ETP4HPC members including Pascale Bernier-Bruna, Communication Officer for ETP4HPC; Fabrizio Magugliani from E4 Computer Engineering in Italy; and Axel Auweter from MEGWARE in Germany.

Primeur Magazine: Pascale, can you tell us what ETP4HPC is?

Pascale Bernier-Bruna: ETP4HPC is an association of European HPC stakeholders. We have a diversity of members that include industrial companies, both vendors and end users. We have academics, research labs and we have a number of SMEs as part of our members. Our association has been advising the European Commission on the European HPC research programme for about seven years.

Primeur Magazine: Can you tell us a little bit about yourself, Fabrizio?

Fabrizio Magugliani: My name is Fabrizio Magugliani. I work for E4 Computer Engineering. This is an SME based in the Emilia-Romagna region which is in the centre of Italy. E4 Computer Engineering has a long story of developing HPC systems since the very beginning. As an example, we were the first company to bring our accelerated cluster to the market. It demonstrates the leadership in HPC research. In the last year, we installed a large IBM Power8-based system at Cineca. This system was within the PRACE PCP project. It was a

research and production system and it made the TOP500 and Green500 lists. This is one of the E4 achievements in this very challenging market.

Primeur Magazine: Thank you. And Axel?

Axel Auweter: I am Axel Auweter from MEGWARE. We have almost 30 years of experience in customary computing solutions for demanding customers in a variety of fields. For more than 20 years, we focus almost entirely on the HPC market and we have been visible with more than 40 placements in the TOP500 list with our systems. Of course, we are accompanying this also with quite some R&D that we conduct in the field. On one hand, we have our own developments in the field of liquid cooling technology and on the other hand, we are also having our own software solution for cluster management.

Primeur Magazine: One of the discussion points today in HPC is EuroHPC and I think that is also on the agenda of the ETP4HPC meeting today and tomorrow. ETP4HPC has a specific role. What is the role of ETP4HPC in EuroHPC?

Pascale Bernier-Bruna: Basically, our role as advisor to the European Commission continues with the EuroHPC Joint Undertaking. We are a private member of EuroHPC, one of the two private members, together with the Big Data Value Association (BDVA). We are part of the Advisory Group to EuroHPC, so we will continue to produce a strategic research agenda. Our role was already that before EuroHPC. We are representing the HPC industry and HPC users to further the definition of the HPC Work Programmes. That is more or less how it works.

Primeur Magazine: Yes, it is continuous work.

Pascale Bernier-Bruna: It is continuous work. The legal entities are changing but our work is continuing.

Primeur Magazine: One of the things that they want to do in EuroHPC is to get European technology and to get more European hardware and system integrators involved into producing hardware so, in this way, you, for instance, come into the picture. Axel, can you explain how you see that role?

Axel Auweter: In Europe, we are indeed very strong in terms of that we have a lot of innovation happening in SMEs. I think this is really one of the key strengths of the European industry in general. There are indeed a lot of great building blocks for technology in HPC systems that you can source from the European SMEs. By joining forces under the framework of EuroHPC, we have now a vehicle where these forces effectively can be joined into larger European systems that eventually maximize the contents of European technology in larger installations, for example, towards exascale systems.

Fabrizio Magugliani: EuroHPC is a huge catalyst opportunity. It is sponsoring research and investing money in the development, not only of systems but also of the entire ecosystem and the workflow. This is going to bring a huge competitive boost to the European companies, not only SMEs working directly in the HPC environment but also to all the small and medium companies which require to be competitive in the market and to stay on the market. That is why EuroHPC is a driver of competitiveness for the European ecosystem beyond HPC itself. We will be more competitive. Our companies will be more competitive and we will basically compete on an equal foot with the US, Chinese and Japanese programmes. Without EuroHPC

and the funding it provides for the development of an ecosystem, we will lag behind the competition curve.

Primeur Magazine: *That is the overall goal. If everything works out, it is great, but what is needed to make it work out, Axel?*

Axel Auweter: I would say that the joining of forces is indeed one of the biggest steps that we made with the establishment of EuroHPC because, as opposed to the countries that we are competing with, Europe is of course not as united. There is a diversity among different European Member States and uniting them with a single goal, I think, is indeed key to realize an equal playing field here. But then again, it is not just about competing in this international race of supercomputers. It is also, as Fabrizio has already outlined, about enabling more and more of the European industries as a whole to use HPC efficiently. I think this is also, and EuroHPC puts a strong focus on that, where we have to discuss the needs of SMEs, some of which are already using HPC as a day-to-day technology to increase their competitiveness. However, there are a lot of companies where we still need to do groundwork and start with the very basics to get them closer to the technology and also proving to them that HPC as a technology will actually increase their competitiveness in their particular field.

Fabrizio Magugliani: I totally agree with what Axel is saying. In addition to the competitiveness, part of EuroHPC is the very interesting European Processor Initiative (EPI) of which E4 is a member. This is the first native and well funded initiative to develop a native European processor where we basically disengage from the technological dependency to the non-European processors. This is another side of the picture. Not only EuroHPC is driving the creation of the ecosystem but is also nurturing this processor which will enable Europe to be technologically independent from anybody else in the world.

Primeur Magazine: *Yes, it would be important for the European ecosystem. Of course, people then ask the question: 'Will that be in time and when?'*

Fabrizio Magugliani: That is a very good question. We all are behind that. We all are honestly and genuinely convinced that it may work if we all are going in the same direction. As of now, the EPI effort has been fairly consistent. We have already started to work. We already have some preliminary blueprint of what the processor is going to be. If we go on with the same stamina, with the same mindset about that, we will succeed. In addition to the pure processor itself, the European Processor Initiative will also bring a huge innovation in the development of codes, applications and packages suited for the exascale class system because just having a processor is a part of the picture. We also need to have applications running on it and people able to program this system because, unless some code optimization is done for exascale, the current codes which were developed in the sixties or seventies will never run at speed on this system. This is one of the objectives of EPI, to not only have the processor inside the system but also this number of students, PhD or Master engineering computer scientists, who will be the backbone of the European competitiveness in the next decade.

Primeur Magazine: *There is a lot of research, a lot of development necessary for this. Is that also something your company is involved in?*

Fabrizio Magugliani: We are involved in it but it is a global initiative. We are involved. MEGWARE has tools, capabilities and skills to be involved in this. We have to start with a small number of 27 members but the objective is to open this initiative also to other members and drive the European HPC ecosystem which is not only the 27 members as of now but

opening much more and larger, to involve all the stakeholders, all the people who can bring some technology of their own to this system.

Axel Auweter: Although MEGWARE is not a member of the European Processor Initiative, we do see the potential it brings and we do see how the whole initiative has actually created the momentum that Fabrizio has talked about. We also see that, as opposed to the last decade where scientists could just rely on machines getting faster by themselves without them doing much work, we now see that the entire technology landscape in HPC or in the IT industry in general is widening up. We see more and more special purpose processors. We see more computer architectures popping into the market. I think for future scientists acting in the HPC space it will be crucial to deal with this heterogeneity of systems, deal with systems of higher complexity, and maybe systems that integrate multiple architectural concepts into one. EPI is such an important building block in this as it showcases to our European scientists and HPC users that they do have to do something and that they do need to invest into their codes. Independent of the success of the European processor itself, it will make our HPC community, our HPC users ready for this technological change. I think this is what we will get for sure, independent of the success of the EPI that we all hope for.

Fabrizio Magugliani: ETP4HPC has a role in the EuroHPC Joint Undertaking through the Research Infrastructure Advisory Group as Pascale mentioned before and Axel is one of the ETP4HPC representatives within the Research Infrastructure Advisory Group (RIAG) so ETP4HPC is providing EuroHPC with its own background, skill, and vision through the strategic research agenda which is a document available on the ETP4HPC website. Everybody can [download](#) it and we are open to get any input or any recommendation about this document. Through Axel and the other representatives of ETP4HPC in the RIAG, we bring that input, this innovation into EuroHPC. This is a nice chain of added value starting from the users which is the galaxy of the people outside to the bone, to the critical part of EuroHPC through this RIAG and the other initiatives.

Primeur Magazine: RIAG is about the technical organisation. EuroHPC is also a funding mechanism and a funding organisation where countries and the European Union are putting money in, to try, in this way, to develop more than they would do individually. What are the things they should look at if they want to support the companies inside the HPC ecosystem? What do they have to pay attention to?

Fabrizio Magugliani: You said it right. The funding scheme of EuroHPC is 50 percent funding for each project funded by the European Commission and 50 percent funded by the Member States. This is a way to make sure that there won't be thrown any funding to the people without any feedback or return of investment. Engaging with the countries and having the countries fund for a part in the project make sure that there will be a check and balance between the countries and the European Union and the results must come.

Primeur Magazine: But for the research and innovation programmes it is 50 percent from the countries. When you are an Italian company, you have to go to the Italian government. When you are a German company, you have to go to the German government. Of course, you get more money so it makes sense to have some difficulty added but do you think that this will work?

Axel Auweter: It has to be seen how this will work in practice. For the research and innovation activities we are still waiting for the first calls to be released. We will see how that turns out in practice. What we can say, is that there are quite a lot of joint undertakings that have been

launched in different fields by the European Commission where the whole set-up has been proven quite successfully. The Member States have the ability to raise their interests and bring in their ideas up front. If they set their priorities and bring them into the joint undertaking as they can actually do, they don't need to be as critical about this co-funding in the end because they can make sure they can put all the effort that it needs to set out their own research priorities straight from the beginning. For this, they might act as national consultations with the various stakeholders in their country before acting as a country within the EuroHPC Joint Undertaking.

Fabrizio Magugliani: Within EPI, Atos, a very large European company, is the prime contractor. They have the people able to drive the development of the processor. Barcelona Supercomputing Center (BSC) is the project leader for the accelerator. These are two large European institutions, one commercial and one academic, driving the two components of the European Processor Initiative with some contacting point where two different architectures are going to be merged in one single or multiple try-out systems.

Primeur Magazine: *This is a last question to all three of you and starting with Axel. How do you see the future of the European HPC ecosystem in about five years from now?*

Axel Auweter: Obviously, our hope is to grow our business by remaining innovative and competitive but as an ETP4HPC member we have always been very customer centric. For us, I think, the biggest success that we would like to see coming out of EuroHPC is when we manage to really pick up a much larger fraction of HPC users across all domains in the industry, maybe life sciences, maybe engineering companies, and grow HPC as a valuable tool for them.

Fabrizio Magugliani: The HPC environment is very challenging. The SMEs have some time to fight against larger guys. Our only way to have success is being innovative, being cost-effective, being the first to deliver innovative solutions. I see E4 as delivering innovative, clever, smart solutions designed by our team. I think our people and MEGWARE people are the key for getting success in the next five years. We have to grow people able to compete with the brain against the larger guys.

Pascale Bernier-Bruna: The European HPC ecosystem will thrive really under EuroHPC. It is a great opportunity, particularly for our members. With the increased focus on European technology, I think it is a great chance for all of us. I'm fairly optimistic.

Primeur Magazine: *Thank you for your time. Perhaps, we should meet in another five years to see how it worked out.*

Pascale Bernier-Bruna: Yes, we will have hundreds of members by then.

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