Andy (Presenter)

Good morning, Good afternoon, Good evening!
Welcome to another in the Elevate series of podcasts where we look at innovation and how technology is driving real change. As you went through COVID, all sorts of things happened, but one of the most important things is I think we all learned to be more agile, and you see that in the way the vaccines were developed so quickly and there was no cutting of corners or shortcutting, this was a change in the way that everyone, the researchers, the authorities were working. And a lot of that was driven by technology. And in the center of that, it was high performance compute. So, in terms of all the genomics, all of the modeling necessary to create that virus, there was a hugely important technology solution. Now, that technology solution, if you looked at it traditionally, could not be agile, even if there was unlimited budget.
Building out a new platform still required hardware to be delivered, to be racked, to be commissioned. But the cloud changes that, and so many believe that cloud is… Cloud reduces, removes the barriers to innovation. And that's why, you know, today I'm really excited to be talking about high performance compute and how that is shifting an industry perspective within the cloud.
I'm very excited. I'm joined by Gauhar from, from Microsoft and from HL Tech. Gaurav. So, let it kick off by asking Gauhar to introduce himself and just talk a little bit about his experiences of the high-performance computer market and the trends that he's seeing.

Gauhar

Hi everyone. I'm Gauhar Junnarkar. I'm a principal PM in Microsoft Azure's High Performance Computing Product team. I'm based in Redmond. I spend most of the time with key partners to engage and enable their HPC usage on Azure. I started my career as a mechanical engineer and I spent several years working on design and simulation projects. We, we estimate the HPC market to be approximately a $45 billion market growing at, at about 7% year on year.
Now, what's most interesting about the stat is that 47% of HPC customers are testing these workloads in the cloud. So, at Microsoft, obviously we see this as a huge opportunity. The HPC usage is seen across a broad range of areas. I know, Andy, you mentioned genomics. Beyond genomics, there's manufacturing, there's climate modeling, there's financial services, there's oil and gas. There's all kinds of industry verticals that HPC finds itself in. Additionally, we're also seeing a convergence of traditional HPC, which is your typical simulation or, you know, Palo Processing type Use Cases with artificial intelligence wherein customers are using our platform for Use

Cases, for doing AI training and high-end inferencing in all of these areas. So, I'd say yes, the market is growing at an astounding pace.

Andy (Presenter)

Why don't you just introduce yourself briefly and then talk about how HCL has been solving these problems for, for customers? What sort of problems are there and how our customers are benefiting from the way that we're able to work with them?

Gaurav Sharma

Thanks, Andy!
Hi everyone! Thanks for joining in.
This is Gaurav Sharma. I head the Global products, Offerings and Go To market for HCL in the Hybrid Cloud business unit. This group is centrally responsible for evaluating technologies, positioning technologies in the various customer scenarios looking at Use Cases and the Go To market for all the strategic and other Niche partners in the Hybrid Cloud business space. Now Andy and Gauhar spoke about Use Cases. They also spoke about how HPC is destined to grow and I agree with them. A lot of this growth is attributed to all the applications, the Use Cases like ‘Simulations’, ‘Deep Dive Data Analytics’ in the LSH, FS, Media, Entertainment, Oil & Gas, all these verticals, different organizations. Courtesy Cloud, the anti-barriers for adopting this technology also gets lowered as well as the new consumption models that are coming in. So, all in all, it is good news for HPC. But for the organizations who are destined to use HPC or who are using HPC and want to benefit more from them, there are certain challenges that they would want to overcome and these challenges are something that we work with our customers, organizations every day. Now these challenges could be anything from the manual work that is being done today in terms of scheduling, in terms of Legacy Systems, it could be the lack of skillset. Ecosystem plays a very big role so access to that Ecosystem in terms of ISVs, frameworks, strategic partnerships, Open Source apps, every time looking at the best that is available in the market. It’s something which is a key to differentiation. Lack of best practices and benchmarks also makes a lot of difference. Now if you have to look at efficiency, you have to look at lower cost then these best practices and benchmarks surely can help. The automation and the Integrations also play a big part. Not being able to automate the regular jobs or the manual diagnosis of problems have their own issues in terms of realizing the value from HPC. Add to it the complexity in terms of the data governance and the security. Now, for instance, LSH domain. There are large data sets that are being generated in this

domain - Personalized medicine research, for instance, how do you look at the PII, Data management. So, all these are something which, which the customers have to overcome in order to make sure that they are able to realize the value from HPC faster and better. Lastly the tools in clustering, automation, there are so many of them, right? How do you look at the best fit for your environments each day, every day and in all the scenarios. Those are the kind of problems that we see and we try to work with our customers in terms of overcoming them so that their HPC environments are the best or they can leverage value out of those HPC environments when they deem to invest that. Now, in terms of the work that we do with our customers, that includes a lot of cross vertical domain experience for best practices and benchmarks for, let's say, efficient asset utilization. Best practices also in terms of customers asking us ' which are the most performing HPC VMs, which, who has the broadest GPU portfolio, how should they look at the GPU portfolio in the light of their needs, Consumption Model comparisons, what is fastest with Infiny Band and RDMA support, 'how do you look at the ease of cluster management and native integration into HPC Client apps, "how do you build automation at every step in Cluster Built Scalability process, diagnosis, resolving failures, Performance Management. All of these are something which we learn everyday and we try to implement with our customers, work with our partners like Microsoft on these problems and try to bring our experience into large customer engagements. For example, a large Swiss Life Sciences customer were looking at CPU and GPU based instances, multiple applications, complex design, lot of legacy, manual processes. We worked with that customer and accelerated time to value with a simplified HPC design, config and operate processes. End to end services is another way of saying that, you know, 'how do you include the complete monitoring, health checks, increased uptime of the complete environment?' There's another US based global semi-conductor organization where large data sets and environment was involved. They needed faster probationing, lot of design work was required, best fit analysis was required. When we designed the solution with them both in terms of technology and operations via Consumption Model, it resulted in faster data processing and analysis near real time and real time analysis with new design and operations, right? Similar Use Cases exist with large Energy companies in Europe, automobile manufacturers in all the domains. So, there is a, there is a, there is an environment and there is a problem and we try to solve it by our experience, by our work with the partners, strategic partners like Microsoft and the IP accelerators that we build on top of it along with our operations and consumption models that help our customers everyday.

Andy (Presenter)

What role does a high-performance compute partner play in the Microsoft ecosystem and what resources do Microsoft make available to help those partners win in this space?

Gauhar

You know, our partners are really the way we go to market, right? HPC partners are our first-class citizens on Azure, and we really want to invest in these in partners to, to really scale our business. Right? So let me answer your question in two dimensions. So, from a product perspective, and I know Gaurav touched on it a little bit around some of the complexities around infrastructure and what we have. So let me kind of double click on that a little bit. So, from a product perspective, our platform is built, is purpose built for software applications. So, for example, in the area of CFD are like tightly coupled simulations, right? We have lots and lots, of course. Bernard and the high-end interconnect Gaurav mentioned RDMA to really show superior performance, you know, to your customers. So typical job that runs on premises for oftentimes for multiple days, you know, some sort of a simulation which can, you know, it can potentially be complete in a much shorter timeframe when it's configured correctly, right? So, for a customer who is looking to accelerate product development, we can make a drastic reduction in the amount of time that it takes for them to get to market.
Now, for partner like HCL, from a go to market perspective, we also offer several ways to win customers, right? So, we have a specialized investment fund for things like Pilot POCs. Essentially all POCs are sponsored. We have a dedicated partner architecture team which will enable and assist HCL to build new, new customers. We have a dedicated benchmarking team which will help customers, you know, do customer benchmarking on Azure. So, these are some of the things that we have available today for, for HCL to sort of go on in business.

Andy (Presenter)

Can you tell us a little bit about how we're building that relationship with Microsoft and the value that that relationships will be able to bring to customers to enhance the way, the way that we are delivering value?

Gaurav Sharma

So, I think with, with Microsoft, there's been a longstanding relationship for over three decades, and there's been a lot of investment into joint solutions. We work very very closely with their product and engineering teams that not only give us the solution depth, but also the reach to solve any customer problem together. There's co-investment into labs, so labs are much more than a place to demo for us, labs are where we can show the art of possible, where the Use Cases can be tested, problems can be simulated on that.
Then very importantly, there is a whole lot of ecosystem that Microsoft has built around HPC, which we can leverage as a result of this strategic partnership that we have. Lastly, on the skill side, you know, we have joint academies that are there. So the skills are something which, technology is as good as, you know, as it is being operated. So, you need skills, you need the new roles to be there. You need the, you need the skills to actually go ahead and build, consult, extend, operate all of those environments. And that is where this partnership does wonders for the, for the customers that are pre validated architectures, blueprints that are there. The solution depth, the engineering depth that I mentioned before also helps us to have talent being retained as well because at all levels we are working with Microsoft together.

Andy (Presenter)

How does Azure position high performance compute in the cloud and what differentiates that from their, their competitors?

Gauhar

So, let me just take a step back. So, Azure HPC is really comprised of compute networking and storage services, which are tuned to support HPC applications. So as of November 2021, Microsoft Azure was recognized as a top ten supercomputer in the world. We delivered like almost 30 petaflops of performance per second. We used an architecture which was used in EMV, a big processor with 48 cores and Nvidia A100 GPU with over 80 gigabytes of memory. And our platform continues, has continued to constantly break boundaries on what can be done in the cloud, right? So, we, we see this as a real, like this is our, our infrastructure platform is our differentiator compared to our competition. Essentially, the world we position Azure is we say like we believe that Azure HPC is the only cloud that is purpose built for any application from any domain, any industry, or any Use Case.

Our cloud is, is intelligent, that is, we have the ability to build and train new machine learning models with auto scaling, cloud computing, building DevOps. Agile HPC is also versatile. We, we utilized rapid direct prototyping to production scale for your HPC application, avoiding any queuing or clustering that users typically face. And finally, like our, the biggest thing that we offer to enterprise customers is we are a trusted cloud, we adopt a security first stance to keep your data and your information protected, whether it's in transit or in rest. So, I think those are some of our differentiators and happy to sort of go into that further.

Andy (Presenter)

So, with all of that, what is the way forward for high performance compute? What are the new Use Cases you see and how can organizations leverage that experience?

Gaurav Sharma

Sure Andy, thanks. As far as a way forward for HPC is concerned, first and foremost, we will continue to invest in the ecosystem and strategic partnerships like Microsoft, so you will see a lot of IPs, accelerators, new Consumption Models, Technology solutions being released, coming in Best fit new cases for our customers, Benchmarks, Best practices, all of them. HPC as a market, if I were to say, in terms of looking at the way forward for the market itself. We believe that HPC has very strong growth numbers expected in the coming few years but we also believe, at the same time, that skills and talent attention would be something that organizations will struggle, will continue to struggle and there we also do see a lot of new roles popping up as we continue to move our HPC environments to Cloud. So, new roles like Capacity Management, FinOps, they will pop up and new skills, new strategies would be required to operate and consume. End to end offerings will become very important. So, consult, build, extend, operate, from all facets, not only from a technology stand point , but also from a people, process standpoint will become more and more important. We also do believe, from our experience and the best practices that we have, that assessment led approach is the best approach. So, any organization who is willing to modernize or who is willing to take their environments to Cloud, the best place to start is to have an assessment led approach. It would not only help them have the best fit strategy but also it will help them in terms of safeguarding their existing investments as well as from a road map perspective. It would also be very important for organizations to manage the complexity of the solutions that I spoke about and the access to ecosystem including the Benchmarks, the Best practices. All of these will help the organizations to reduce time

to value an innovation which is the key primary driver in our view that should be driving the HPC Investments on that. Lastly, the key also is how do you incorporate the Intelligence and AI in your Use Cases as well as in managing the HPC workloads. There are a lot of new age workloads that we see or Use Cases like designing new products, Simulation in the Pharma Industry, Fraud analytics in the FS, Statistical analysis in the weather department or Oil and Gas Verticals, Advanced Imaging, Image processing in Surveillance. All of these are Use Cases where customers would look forward to an ecosystem approach, organizations would look forward to having new roles, having managed operations, they would look forward to how incorporating a lot of Intelligence, AI in their environments and that is where we see the future of HPC, going forward.

Andy (Presenter)

Gaurav, thanks.
Gauhar, just any sort of final comments in wrap up?

Gauhar

I just wanted to thank you for the opportunity first of all, and then also for, you know, we already have a great success story with UD trucks. We continue to sort of, the goal is really to build on that and to, to kind of, you know, you know, as you said, like collaborate together and build a center of excellence. So, I'm looking forward to that and I'm excited to see what, what we have in our joint future together. No, I really thank you for the opportunity, Andy, for for having me on this podcast. We've got a couple of good customer stories that we, that we can leverage some work on and continue to build out the center of excellence. So, looking forward to what's coming down the road.

Andy (Presenter)

So, Gauhar, Gaurav, thank you very much. Like I said, hugely exciting. I think this is an area of, of massive complexity and we're only going to see it get more and more complicated as these engineering demands, these demands from life sciences, from AI, from EML, all all sort of grow in demand, allowing us to leverage the cloud. So, both of you, thank you very much.
Really appreciate the conversation and the time. Thank you.