

Intel® and Microsoft Push SAP Infrastructure Forward With CXL, Intel® Xeon® 6, and Azure



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As data pours into SAP HANA from SAP Business Data Cloud, Microsoft Fabric, and new AI initiatives, many ASUG members are planning for larger SAP instances that push the limits of traditional infrastructure. Microsoft and Intel® have been working with SAP to break through those limits and deliver more value for customers.

At SAP Sapphire and the ASUG Annual Conference in May, ASUG spoke with Juergen Thomas, Partner Architect at

Microsoft Corp.; Bryan Hiestand, Architect at Intel; and Elyse Ge Hylander, Senior Director of Azure Compute at Microsoft, about the latest result of that work. Azure Mv4-series virtual machines combine Intel Xeon 6 processors with Compute Express Link (CXL) and Intel flat memory mode, enabling SAP HANA to scale more efficiently.

The interviewees' comments have been organized by topic and edited for length and clarity.

Three-way Partnership that Delivers Co-Innovation for SAP Customers

The Mv4 series grew out of a relationship between Intel, Microsoft, and SAP that predates Azure itself. SAP shapes that work in two ways, as a partner and, through its own cloud services, as one of Microsoft and Intel's most important customers. That collaboration extends to how they are helping customers increase scalability, reliability, and security while reducing risk across the SAP stack. Here's what the panel had to say about how that relationship works.

Juergen Thomas, Microsoft: "Intel, SAP, Microsoft, we've long been in business together. It started way before Azure existed. I recall that I was sitting with Intel representatives at SAP in 1996, representing Microsoft at that point in time. With their SaaS services, [SAP is] a gigantic customer of ours now, of

the two of us now. And so they are one of the most important customer voices we have. Especially the CXL project was one where the three parties were working in a great manner together."

Bryan Hiestand, Intel: "The three-way collaboration with SAP and Microsoft is very important because we want to listen to what they need. Sometimes that's challenging because their requirements change, and then we have to change. But in the end, that's the best thing for the customer, and that's what we want."

Elyse Ge Hylander, Microsoft: "Security is a big piece of the three-way joint partnership. On the stack level, we integrate a Sentinel security solution for the entire SAP workloads... As we're heading towards a generative AI world, I do think security becomes even more and more important. There's a lot more work to do [on] how we strengthen security for the emerging AI workloads as well as in-memory databases."

Fresh Firsts for SAP on M-Series

Mv4 is built on the Intel Xeon 6 platform, which Intel and Microsoft spent a few years developing together, and it marks a first for SAP workloads on Azure. Alongside it, Microsoft has introduced Mbv4, an M-series family built for certain storage and IO intensive workloads. Both Mv4 and Mbv4 series are in public preview as of this writing.

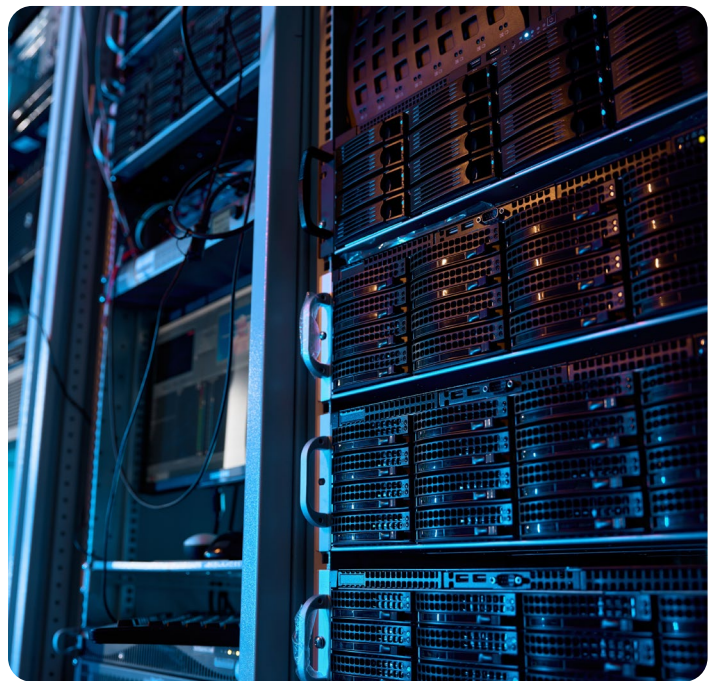
BH: “We’ve been working on Intel Xeon 6 together with Microsoft for a few years, and we’re very excited to see the fruits of our partnership come out in this new product. It addresses a lot of the needs we’re seeing from customers for a solution that scales efficiently without compromising on performance.”

EGH: “CXL is a kind of joint innovation between Microsoft and Intel, and Mv4 is the first deployed VM family with CXL-attached memory.”

JT: “[SAP HANA is] an in-memory database, but it’s a database. And databases tend to write data down to storage as well because memory is not a persistent store. So, what we see is an increasing demand on storage bandwidth as well, and that is something that we are addressing with a new technology that we have in Azure Boost that allows us to go way higher in the storage bandwidth and in the storage IOPS.”

EGH: “In the upcoming release, we’ll be introducing a new family of the M-series called Mbv4. It basically has very, very high IOPS as well as throughput to the remote storage. For example, with this new family, we’re able to achieve 780K I/O operations per second as well as 16 gigabytes of storage throughput. This represents about a 20% improvement on the IOPS as well as a 60% [improvement in] throughput over the previous generation, Mbv3, which is running on fourth-gen Xeon processors.”

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Breaking Through the Memory Wall with Mv4

In traditional server design, memory is tied to the CPU, so adding memory has meant adding sockets and cores. However, CPU performance has exceeded memory growth, so some workloads need to be able to scale memory separately from CPU resources. CXL breaks that dependency, and Intel’s Flat Memory Mode makes the added memory easy to adopt with no software changes required. For members planning very large instances, that means more room to scale up on a simpler platform.

EGH: “Traditional server architecture has a known constraint, which is called the memory wall. [It] means you have difficulty scaling memory capacity and bandwidth with CPU growth using pure CPU-attached memory. By using the memory extension via CXL technology, we’re able to support up to 8-terabyte databases on a two-socket platform using Intel’s sixth-gen processor, where traditionally that has required a four-socket processor.”

BH: “With CXL, we can scale up memory using fewer, but very efficient, performant cores. Flat Memory Mode, which is unique to the Intel Xeon 6 platform

with CXL, makes it very easy for customers to adopt this technology and scale up on a simpler platform without really compromising performance. There is a small performance impact, but in our testing, it was about 3%.”

JT: “What we also see pretty clearly is that there is a limit on what a database can scale in number of CPUs. So, what we are seeing and predicting for the future is that S/4HANA scale-out is becoming a very important thing, where customer deployments, especially also on RISE, that need 96 terabytes of memory cannot be done in a scale-up manner. It’s important then to have good bandwidth in networking between those virtual machines so that the scale-out is working very well. And that’s also something that we’re addressing.”

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Improved Economics

Running the same database on half the sockets changes the math on both cost and power, and in Intel’s testing, the performance trade-off was about 3%. The gains extend to the processor itself, where Intel and Microsoft are working to get more out of every watt across Azure’s global footprint.

EGH: “[Using CXL] is not only more cost-efficient; it really helps consume much, much less power.”

BH: “You get all the advantages of scalability and the implied cost advantages, performance per dollar, in a very easy-to-implement way with SAP.”

JT: “We all know today that the hyperscalers are under tremendous pressure to get enough power into their data centers. So, on our side, the thing is, how can we, with future generations of hardware, be more power efficient and get more work done with less power?”

“If it’s only 50 watts, for example, that doesn’t sound like a lot for a server. But think about Azure, where we deploy millions of such servers every year. If you take 50 watts by a million, you’re already reaching quite a large amount of power. This is also one of the collaborations we have with Intel in the process of development, to see how these processors can deliver more work using less power.”

Ready for AI

Agentic AI is adding new demands to SAP landscapes, with agents drawing on SAP HANA as a data source and moving between applications through APIs. The panel emphasized that much of this work runs on CPUs, which makes built-in acceleration, security, and platform longevity key considerations for members planning their next infrastructure investment. Here’s what they had to say about AI-readiness.

BH: “We’re seeing fast growth with agentic AI. From HANA being a database and the data source to other applications, and other SAP applications running on top of that and using agents to access that data and those applications, we’re seeing the CPU, particularly the Intel Xeon CPU, playing a very major role in that kind of AI agentic workflow. It’s a combination of CPU and GPU.

“When we’re working with Microsoft, for example, for general-purpose compute, we have our Dv7 and Ev7 series on Intel Xeon 6. Tying that with the CPU and the built-in accelerators like AMX, and creating the agentic workflow that goes from the application layer through APIs back to data sources and back to HANA, I think it’s the whole orchestration of these workflows that’s pretty exciting.

“We’re not suggesting [AMX is] going to take the place of GPUs, but what we’re saying is this can help with certain scenarios to run AI workflows or AI tasks in a very efficient way.”

JT: “[We] think about GPUs as we talk about AI, but reality is that a lot of the AI workflows are really using the traditional CPUs, and having accelerators on those really helps tremendously. Mv4 is certainly a future platform that we are building on top of, and that will run for many, many years in our data centers.”

EGH: “We talked about the innovation on the CXL being a breakthrough technology, and we have seen people want to try it out not only for in-memory databases. We’ve seen some companies trying it for inference, such as KV cache for large language models. Do try it out. Being a brand-new technology, this is a great way to see how technology will scale in your environment.”

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