I3D.NET BOOSTS GAME HOSTING WITH AMD EPYC™ 4000 SERIES CPUS

CASE STUDY

Gaming host i3D.net deployed Supermicro servers powered by AMD EPYC 4000 Series CPUs, boosting single-core speed 52 percent and doubling node density

AMD × **i3D.net**

Hosting popular multiplayer games globally online has a different set of requirements than general-purpose cloud services. While hyperscalers benefit from packing as many compute cores into the least amount of space, online gaming needs to deliver the best possible performance so users can enjoy a great experience. Ubisoft-owned i3D. net has been deploying AMD processors to provide its excellent game hosting for a few years, and for its most recent rollout AMD EPYC™ 4000 Series Server CPUs had exactly the right characteristics.

> **"AMD has the best performance out there for a very attractive cost."**
> Paul Louvet, Senior Product Manager, BareMetal, i3D.net

"i3D.net started its first office in student housing in Rotterdam more than 20 years ago and hosted Unreal Tournament game servers," says Paul Louvet, Senior Product Manager, BareMetal, i3D.net. Since then, the company has hosted major games such as Battlefield 2 from EA and many more titles afterward. The company became so good at what it did that Ubisoft acquired it in 2018. "We have a core focus on Gaming, Entertainment, and Media Services (GEMS), and we also serve a growing range of enterprise workloads and real-time communications. But the key challenge for gaming is performance."

One of the main game server workloads is matchmaking, where gamers are grouped by location and latency levels, so they have a similar quality of experience in the same match. "That must happen very quickly, so there is a lot of compute required," says Louvet. Performance is also key once the match has started. "This is what we call tick rate base workload, which is the frequency at which we update players. That can happen hundreds of times per second, depending on the type of game."

"If it's a fast-paced game, we need to update all the players simultaneously and the tick rate needs to be consistent," adds Louvet. "Otherwise, lag causes a bad experience." This kind of inconsistent performance is called jitter. "We don't need hardware that is super performant 99 percent of the time but varies for one percent. We need to have the long tail of performance to be completely stable all the time."

SINGLE-CORE PERFORMANCE IS KING FOR GAMING

This is how game serving diverges from enterprise infrastructure. "We don't care much about the core count of the CPU," argues Louvet. "What matters is the performance of every single core, so we'd rather scale using a lot of small machines rather than one big one."

INDUSTRY
Online game hosting

CHALLENGES
Online gaming servers require high single-core performance that can be reliably delivered 100% of the time without "jitter" in response; new servers required for Dune: Awakening rollout

SOLUTION
Multi-node 3U Supermicro servers powered by AMD EPYC™ 4464P Server CPUs, enabling 96 nodes per rack while remaining within the 9kW power budget

RESULTS
52% single-core performance increase over the company's prior solution and double node density per rack, delivering a stable, jitter-free gaming experience.

AMD TECHNOLOGY AT A GLANCE
AMD EPYC™ 4464P Server CPUs

TECHNOLOGY PARTNER

SUPERMICRO®

i3D.net achieves exceptional single-core performance for game hosting with Supermicro MicroCloud AS -3015MR-H8TNR servers equipped with AMD EPYC CPUs.

This requires an alternative solution to a typical cloud service, which benefits from big servers with lots of cores and RAM to support as many virtual machines as possible on a single node.

This need for frequency over core count is epitomized by i3D.net's latest rollout. The company had been planning an upgrade, but this was brought forward to support Funcom's recently launched massively multiplayer online game Dune: Awakening. "We provided the necessary scale with Supermicro and AMD EPYC 4464P processors, having pre-qualified the CPU very early in the engagement process with the customer," says Louvet.

> **"The single-core performance of our bm9.hmm.12 offering powered by AMD EPYC 4464P CPUs was 52 percent higher than our previous solution."**
>
> Paul Louvet, Senior Product Manager,
> BareMetal, i3D.net

Funcom originally suggested 16-core CPUs, but these were 170W processors. Instead, i3D.net suggested that the 12-core AMD EPYC 4464P CPU's 65W consumption would provide a better TCO per user. "Every efficiency we make in direct operating costs can be passed to our customer," says Louvet.

AMD EPYC SERVER CPUS DOUBLE NODES PER RACK

Supermicro's unique form factor options helped significantly with this strategy, offering eight discrete nodes within a single 3U MicroCloud chassis. This enabled consolidation of hosting space, switches, and cabling. "We can fit 96 nodes in a single rack," says Louvet. "That is more than double what we could do before, and with the 65W AMD EPYC CPUs, we stay within a 9kW per rack envelope, which fits most data centers."

This is particularly valuable when i3D.net needs to use metropolitan data centers as close as possible to Internet connectivity hubs to minimize user latency. "We really relied on AMD and Supermicro for the launch of this new platform," says Daan Jonkers, Team Lead Supply Chain Management, i3D.net.

The Supermicro chassis includes 8 independent servers, each with a single AMD EPYC 4464P processor. The Supermicro servers also include dual redundant power supplies. "This adds reliability," says Louvet. "Having the AMD data center business unit handling the product also makes the whole solution robust in terms of escalation, firmware management and the day-to-day business relationship."

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"The support is robust too," adds Jonkers. "We have been working with the AMD EPYC products for a long time, so within our company, there is a lot of confidence in the EPYC lineup and the support it gets."

"Our initial Geekbench tests showed that the single-core performance of our bm9.hmm.12 offering powered by AMD EPYC 4464P CPUs was 52 percent higher than our previous solution," continues Louvet. This performance was also in a different league to public cloud offerings. "But the real test is when a customer tells us how many concurrent users and game instances they can run. Funcom saw stable performance with no sign of jitter. It just worked out of the box. There are no extra hoops to get the most performance, with one CPU on one CCD, so we don't have to manage the topology of the processor either."

More players connect seamlessly through i3D.net game servers equipped with AMD EPYC CPUs.

THE DEPENDABLE AMD ROADMAP

i3D.net found that migrating from Intel-based servers to AMD was seamless. "When I propose a choice between Intel and AMD to a customer, AMD typically offers stronger TCO and performance per watt," says Louvet. This has encouraged customers to optimize their code for AMD as well."

"The key customer benefit is performance," says Louvet. "AMD has the best performance out there for a very attractive cost. The high frequency is the most important factor, but also the control power envelope." The longevity of a socket format across multiple CPU generations has been invaluable too. "That's very good for us because when we buy a chassis, we invest a lot of time qualifying the platform. It protects our investment to have the capacity to refresh using the same platform. Just upgrading the CPU means we can run for an extra two years with the latest technology. The long lifecycle of AMD EPYC CPUs has already been proven for two generations now."

The company is now looking for CPU upgrades on its current AMD EPYC platform. "With the 4545P, we expect even better performance," says Jonkers. "Our very next bare metal offering will be bm9.hmm.16 using the 4545P," adds Louvet. "We already have some benchmarks, and we know that the single-core performance is almost the same as before, but with four extra cores for the same power usage. That's incredible. This CPU will allow us to have much better TCO per core."

"i3D.net now has around 1,800 nodes powered by AMD EPYC 4000 Series CPUs, but we will add more soon," says Louvet. "We want to expand globally, refreshing on the 5th Gen. There is a lot of experience of AMD technology now in the market. The roadmap execution has been like clockwork, which gives us confidence in AMD's engineering and manufacturing capability. We know when to refresh."

"The technology advancement that AMD is realizing is very impressive," concludes Jonkers.

The AMD EPYC CPU roadmap gives i3D.net confidence in long-term platform stability and innovation.

WANT TO LEARN HOW AMD EPYC PROCESSORS MIGHT WORK FOR YOU?
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ABOUT I3D.NET

i3D.net is a leading provider of high-performance hosting and network services, specializing in the online gaming industry. Now part of Ubisoft, the company manages a vast, low-latency network with data centers worldwide. Its bare metal servers and cloud solutions are engineered for optimal performance, scalability, and reliability, powering many of the world's largest multiplayer games. i3D.net offers robust anti-DDoS protection to ensure a seamless online experience for millions of players, catering to both game developers and enterprise clients. For more information visit i3D.net.

ABOUT AMD

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