



ProfitBricks customizes cloud computing with Supermicro and AMD technology

Evolving infrastructure as a service

Founded in 2009, public cloud service provider ProfitBricks emerged from 1&1 Internet, the world's largest hosting provider with 70,000 servers and 10 million customers worldwide.

"Cloud computing in 2009 was just getting started. It was slow and very difficult to use. And it was overpriced. Our founders assembled teams in Berlin, Germany and Cambridge, Massachusetts to launch a second-generation cloud platform," says William Toll, VP of Marketing at ProfitBricks.

As part of a dominant trend toward Infrastructure as a Service (IaaS), cloud computing is consumption-based. Customers pay for what they use. Toll explains, "Companies now realize that it's fine to outsource their hardware. Privately owned physical servers make no sense anymore. You don't run your own electricity plant to power your office. You switch on your lights and the power is there."

In addition to eliminating a company's need to research, purchase and install its own server hardware, cloud computing also erases the subsequent costs, risks and troubles of maintaining a data center. "When we do maintenance, our customers are unaware. Let's say something happens and a server needs to be replaced. We can move customers off that server without them ever knowing, replace that server and put it back in place, test it, and then move customers back on. That would be a huge project for IT to do on their own. But as a cloud provider, that's something we just don't want to burden customers with. In the world of cloud, it's all about getting access to the hardware and not worrying about it. And that's exactly what we provide," says Toll.

SOFTWARE PARTNER:

ProfitBricks
www.profitbricks.com

IN PARTNERSHIP WITH:

Supermicro

INDUSTRY:

Cloud computing

CHALLENGES:

- Deliver high-performance, flexible cloud services
- Maximize system availability and uptime
- Control total performance costs

SOLUTION:

- Cloud 2.0 servers from Supermicro featuring multicore AMD Opteron™ processors
- AMD processors deliver price/performance, core density and hardware-assisted virtualization (AMD-V)

RESULTS:

- Offers dedicated, customizable CPU core and RAM options
- Highest performing public cloud computing service available¹
- Holds price/performance leadership in the cloud marketplace²

AMD TECHNOLOGY AT A GLANCE:

AMD Opteron™ 6000 series processors

"Our CEO, Achim Weiss, and his technical team are big fans of AMD and Supermicro. We knew that in order to offer a high-performance, flexible cloud-computing product, it was all about CPU cores. We looked at both Intel and AMD. Our choice in 2010 – as we started to purchase all that equipment, prepare for our beta and eventually launch last year – was AMD CPUs."

William Toll,
VP of Marketing, ProfitBricks

“Our mission is to build out hardware for thousands of customers. That hardware needs to be scalable and repeatable. Making the decision to go AMD in a specific chip in 2010 – we’ll live with that decision for awhile. We can add additional servers and build out more clusters in our data centers as more customers come onboard. That’s absolutely critical.”

William Toll,
VP of Marketing, ProfitBricks

Cloud 2.0 – The need for dedicated, flexible capacities

While cloud computing offers enormous potential, the ProfitBricks teams were well aware back in 2009 that the services offered by the first-generation cloud providers that came before them were nowhere near reaching that potential. Even the most successful cloud providers were slow, expensive and difficult to use.

Public cloud computing operates on a multitenant infrastructure – multiple customers sharing the same servers, storage and network. “One of the problems that first-generation cloud platforms had was they would share the CPU, memory and network. This is why from 2009 until today, customers couldn’t get guaranteed performance. There was always potential for another customer on the server having a big job. Maybe they’re running their end-of-the-month accounting suite. Or maybe they’re in e-commerce sales and having a big day. Or there is a Web application that everybody is suddenly pulling up. The server would get taxed by that one customer,” says Toll.

First-generation cloud services ProfitBricks’ main differentiator would be to deliver dedicated server capacity to individual customers. Not only that, ProfitBricks wanted to offer their customers the flexibility to select the exact number of CPU cores and RAM desired for a particular job, rather than the dominant industry standard set-capacity packages.

“When I order a server, I want to specify exactly how many CPU cores and exactly how much RAM I’m going to have for each of my workloads. A database wants more RAM. A DNA sequencing application wants more CPU cores. At these other first-generation cloud providers, you’re forced to take small, medium or large packages. That’s it.

“They also have limits. One of our competitors only allows 24 CPU cores per server, even though servers can be built with almost triple that core count. At ProfitBricks, we wanted our customers to have the fullest range of options – every single server can be a different size,” says Toll.

Bringing a solution to market with Supermicro and AMD

To achieve their objective of uniquely providing cloud services with dedicated, custom-server capacities, ProfitBricks decided to launch on Supermicro servers featuring multicore AMD Opteron™ processors.

Toll explains, “Our founders are very familiar with infrastructure. Our CEO, Achim Weiss, and his technical team are big fans of AMD and Supermicro. We knew that in order to offer a high-performance, flexible cloud-computing product, it was all about CPU cores. We looked at both Intel and AMD. Our choice in 2010 – as we started to purchase all that equipment, prepare for our beta and eventually launch last year – was AMD CPUs.



“We’re exclusively AMD and have been since launch,” says Pete Johnson, ProfitBricks’ cloud platform evangelist. “One of the things that our technology does that other infrastructure service providers can’t are the customized instance sizes. We can go from one to 62 cores or from one to 240 gigs of RAM. If you had an in-memory database, and maybe you only want two cores because it’s not CPU intensive but you want 240 gigs of RAM because there’s a lot of data in there, you can do that on our system.”

“The same is true if you flip that around and think about simulations that need high CPU and low RAM. For example, rendering farms or a thermodynamic simulation for engine parts – you can do high CPU-load of 62 cores with maybe two or three gigs of RAM,” says Johnson.

“Folks that need extremes can’t get that from other cloud providers. With our system, because you get to choose, it’s flexible. You can get exactly what you need instead of what others are forcing you to buy. On other systems, you’re forced to buy CPU and RAM in lock-step with one another and the size might never exactly fit what you need,” says Johnson.

Toll adds, “I know without question that the key that brings this all together is our selection of KVM as a virtualization platform, Supermicro as a server hardware platform and the tight integration that AMD has with Supermicro.” KVM (Kernel-based Virtual Machine) is a full virtualization solution for Linux on x86 hardware containing virtualization extensions – such as AMD-V™ technology, a hardware-assisted virtualization feature of AMD Opteron™ processors.

Rather than some competitors’ marketing schemes of offering virtual CPUs or a share of a server’s capacity calculated in gigahertz, ProfitBricks offers discrete and dedicated CPU cores for each and every customer.

“We’re one of the only cloud providers that offers dedicated CPU cores. Our founders designed a system using KVM virtualization and some essential core-based bit-level work to enable features like dedicated CPU cores and dedicated RAM. So for the first time, when you buy cloud computing from an infrastructure service provider like ProfitBricks, what you buy is what you get,” says Toll.

Maximizing price/performance and efficiency

ProfitBricks has quickly established itself as a leader for next-generation cloud computing. “Of all the cloud providers in the market today, we are unquestionably the highest performing. We’re also one of the least expensive. That draws the attention of both business folks and technical folks who are just now looking at cloud computing,” says Toll.

The company’s technical leadership team offers a direct correlation between their success in this particular area and their choice of processor. “ProfitBricks provides the highest price/performance ratio in the public cloud computing space, and similarly, AMD processors provide the best price/performance ratio with the highest core density,” says Uwe Geier,³ ProfitBricks head of system operations.

In terms of controlling data center costs for their own operations, energy efficiency is always a serious consideration when it comes to selecting a processing technology. Toll explains, “We select out data centers in the US and in Germany based on many factors. First and foremost is keeping them out of harm’s way. Second to that is power and cooling. CPUs generate heat and use high amounts of power for the size of the hardware. Our data centers are extremely green and they run very efficiently in terms of power and cooling.”

Geier adds, “Energy is as much as two-thirds of our variable costs, so it is very important for us to make use of energy-efficient technologies. The AMD Opteron processors we selected support C-state low-power modes.”

Open standards and accessible partners

“In terms of scalability, it is very important to be able to expand our technologies and pass through those expansions to our customers. AMD’s highest core count processors supports our ability to scale and quickly address the needs of customers,” says Geier.

“We always need to have a lot of headroom. A customer can come along and need 5,000 cores for a few hours to run a big job. If they’re willing to pay for it, we need to have those cores available. This is changing the business model of the hardware industry. And certainly AMD is part of that for us,” says Toll.

Pete Johnson adds, “The key thing about scalability for us is being able to quickly add new cores to our pool of resources and give our customers options they don’t have other places. It’s pretty commonplace in the public cloud world to use horizontal scaling to tackle a problem, so adding more virtual machines to an existing pool of virtual machines. We enable vertical scaling – the ability to add CPU and RAM resources to an existing running VM without rebooting.”

At the very top of ProfitBricks’ target customer list for these sorts of jobs are companies exploring big data. “Big data requires a lot of CPU cores, a lot of RAM and certainly high-performance networking. Where in the past an organization would not be able to afford 5,000 cores for a big data job, now they can. They can gain access to more cores for a short period of time with very low cost,” says Toll.

ProfitBricks’ billing model is also a key differentiator. “Most cloud providers bill by the hour; we bill by the minute. A customer can come along, take 5,000 cores to run their job, and shut it down after 26 minutes when it’s over,” says Toll.

Another popular segment for ProfitBricks is gaming. “The gaming industry is now bigger than the movie industry. When you think about thousands of developers around the world working together to build these games, they need access to lots of machines in all different time zones. After development, they do a lot of testing and then they deliver those games. These are all things that cloud computing is perfect for,” says Toll. As a game becomes popular, it can scale up on the cloud. As a title starts to lose momentum, it can then scale down just as easily.

Beyond the technology capabilities of their processors, another reason for ProfitBricks’ collaboration with AMD comes from the company’s popularity in these and other key markets. “I like AMD from a marketing perspective. In certain segments of the market, AMD leads. Research laboratories, government institutions and organizations that need a lot of CPU power work very closely with AMD,” says Toll. In every aspect, AMD and ProfitBricks is a partnership poised to go big at any moment.

www.amd.com/opteron

1. footnote missing
2. footnote missing
3. <http://www.profitbricks.com/sites/default/files/cloud-spectator-cloud-computing-performance-benchmark-report-profitbricks-amazon-rackspace.pdf>

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