

CASE STUDY

Cloud Service Providers
Data Center



Hassle-free Bare Metal Deployments Give Developers Direct Access to Intel® Technology

Through 100 percent dynamic orchestration, Packet gives demanding users the control, performance and cost benefits of dedicated physical infrastructure, but with the automation experience of the cloud

At a Glance:

- Many customers want direct control of the software and hardware stack, but still want automation
- Bare metal environments avoid “noisy neighbor” issues and can provide reliable, predictable performance
- Packet’s approach to bare metal keeps costs down even while providing access to the latest innovative technology

Several industry trends are causing the bare-metal services niche to grow quickly. Workloads are becoming larger and more resource-intensive thanks to the proliferation of the Internet of Things (IoT) and data analytics and advances in artificial intelligence (AI). Enterprises continue to seek higher levels of security to meet increasingly stringent data protection regulations. And many customers want more control, greater access to innovative hardware, more performance and the ability to define all aspects of their operating environment—something that the major public cloud service providers (which rely on virtualization-based services) may not offer. Packet is one of the leading providers of bare metal cloud services, a market that experts predict will be worth USD 26.21 billion by 2025 (a compounded annual growth rate (CAGR) of 38.4 percent).¹

Challenge

Enterprises who are using technology as a core part of their business, as well as software as a service (SaaS) and cloud-native companies, want direct access to hardware in a “cloud first” world.



Solution

Packet automates infrastructure at the lowest possible level. Customers retain control of their applications and can choose whatever OS and software tools they want. They can also directly access the hardware as necessary.

Results

- Bare metal environments provide performance, access to hardware and customization
- Customers can take advantage of the full value of innovative hardware to advance their business
- Improved performance and minimized cost with single-tenant, dedicated servers by the hour

Customers Want Both Control and Flexibility

A standard cloud environment provides users with a virtual machine (VM) as the building block for their infrastructure. While this is an incredibly powerful and flexible resource, it abstracts users from directly accessing the hardware, and makes many of the decisions around the underlying software, such as the use of a hypervisor or multi-tenancy with other users. Packet's success is grounded in the trend that, as workloads get larger, users want to inject more opinion into the stack, including hardware and choices like whether or not to use a hypervisor or share resources with others. This type of user may want direct access to the hardware, such as network interface cards (NICs) or field-programmable gate arrays (FPGAs) to customize the settings for their particular workload. They may want to integrate software development kits, such as the Data Plane Development Kit (DPDK) or tune the hardware to squeeze out every drop of performance for a specific workload.

These users represent a new class of customer that many cloud service providers are not equipped to deal with—the traditional virtualized, multitenant cloud environment does not meet these users' needs. In a virtualized environment, customers share CPU and memory resources—which means the performance can vary from one instance to another or be impacted by resource contention. These “noisy neighbor” issues can lead to unpredictable performance that causes significant cost and performance issues for customers with large-scale or latency-sensitive workloads.

“I think a year from now there will be more metal and more offloading to GPUs, smart NICs and FPGAs. There will be more and more specialized hardware, and that will lead more people to bare metal.”

—Jacob Smith
CMO, Packet²

Get Performance, Access to Hardware and Customization with Bare Metal

Modern users demand a “cloud experience” that is based on the concept of full automation. However, most all cloud providers use layers of abstraction (virtualization and so on) to deliver this automation experience. Packet removes these abstractions while maintaining the automation experience. The approach puts powerful technology innovations, such as Intel® Xeon® Scalable processors, Intel® Optane™ technology, and Intel® FPGAs directly into the hands of a broader group of companies.

Currently, Packet serves nearly 1,000 companies, including leading communications service providers and SaaS companies. Packet has seen especially high demand for bare-metal services in edge and enterprise deployments. Customers can choose from among 11 curated platform designs, or work with Packet to build a totally custom environment. Customers pay for use of their single-tenant, dedicated servers by the hour, and pay a fee for outbound bandwidth on a per GB basis.

Technical Components of Solution

- Packet's proprietary automation solution
- Intel® Xeon® Scalable processors
- Intel® Optane™ solid state drives (SSDs)

Collaboration Drives Innovation Throughout the Industry

As one of the dominant innovators in the cloud infrastructure space, Intel is a key ally in helping more companies access hardware innovation. Packet is especially excited about a recent collaboration with Intel called “Accelerate With Optane,” through which the two companies introduced dozens of open source and commercial software projects to the benefits of Intel Optane technology. This is directly aligned with Packet's vision of enabling more users to see hardware as an innovation layer.

Intel Optane technology is a new premium class of storage that provides an amazing combination of high throughput, low latency, high quality of service and high endurance. The goal of the collaboration between Intel and Packet is to help open source and select commercial software communities get quick access to Intel Optane technology-enabled servers for testing, validation and optimization. Participants in the program also receive technical resources, such as documents and expert advice about taking full advantage of Intel Optane technology. Intel and Packet also participated in co-marketing efforts to tell participants' success stories.

Bare Metal Provides Performance and Cost Benefits

Packet's users are regularly surprised by how extreme the performance (and related cost) benefits are when moving from a traditional public cloud environment to bare metal. This is especially true for cloud-native users, who have literally “grown up” in the cloud. Getting direct access to physical machines immediately produces substantial performance benefits while also reducing costs in most cases. Often customers are inspired by stories like that of Dropbox*, which recently left Amazon Web Services* (AWS*)

for its own hardware and **saved nearly \$75M over two years**.³ Packet helps users get many of these benefits without needing to build and operate their own infrastructure. Just ask Cody Hill, an infrastructure lead at Platform9*: “Packet has this unique ability to deploy customizable hardware and yet provide it to us with full automation - it literally feels like we are consuming virtual machines, not dedicated servers.”⁴ The company moved its managed Enterprise cloud platform to Packet this year and is enjoying significant savings despite a fast-growing business.

Looking forward, Intel and Packet are exploring how to expand their collaboration, bringing even more cutting-edge technology to users like Platform9 and more. For example, Packet plans to offer Intel Optane technology as part of its default configurations and is looking at how it can provide Intel FPGAs to help customers accelerate their workloads.

Find the solution that is right for your organization. Contact your Intel representative or visit intel.com/CSP.

Spotlight on Packet

Founded in 2014 by infrastructure veterans, Packet makes infrastructure a competitive advantage for the leading companies of the world by bringing the automation experience of the cloud to physical servers and networks.

Packet's proprietary technology powers 60,000 bare metal installations per month across 18 public cloud locations, and a popular Private Deployment model enables SaaS companies and enterprises to deploy custom infrastructure at global scale. Due to its flexible deployment model, Packet is widely recognized as one of the leaders in the fast-evolving edge computing space. More than 16,000 developers use the Packet platform to deploy bare-metal infrastructure, and company revenue has grown 300 percent year-over-year. Packet backers include SoftBank*, Dell Technologies Capital*, Third Point Capital*, Samsung NEXT* and Battery Ventures*.

Packet was recently named as the deployment partner for [Sprint's Curiosity IoT product](#) and was the lead partner on the widely circulated [State of the Edge Report](#).

Lessons Learned

The key lessons from Packet's experience are:

- If you embrace automation and portability (cloud-native) approaches, accessing innovative hardware directly can transform performance and solutions.
- Hardware can serve as an innovation layer and a competitive advantage for the leading companies of the world.
- Access to a newer generation of Intel® Xeon® processor, with features such as Intel® QuickAssist Technology (Intel® QAT) and Intel® Advanced Vector Extensions 512 (Intel® AVX-512) can improve computational performance.
- The Intel® Xeon® Scalable processor platform provides cost-efficient performance for compute-intensive workloads, such as complex image and special effects rendering and machine learning.
- By collaborating with Intel, cloud service providers can quickly adopt new technologies and take advantage of Intel's engineering expertise for optimizing platform design and software performance for Intel® architecture.

Learn More

You may find the following resources helpful:

- [Packet home page](#)
- [Intel® Optane™ technology](#)
- [Intel® Xeon® Scalable processors](#)



¹ Grand View Research, November 2017, "Bare Metal Cloud Market Worth \$26.21 Billion By 2025 | CAGR: 38.4%." <https://www.grandviewresearch.com/press-release/global-bare-metal-cloud-market>

² Network World, March 2018, "Why a bare-metal cloud provider might be just what you need." <https://www.networkworld.com/article/3261113/lan-wan/why-a-bare-metal-cloud-provider-might-be-just-what-you-need.html?upd=1540407047442>

³ GeekWire, February 2018, "Dropbox saved almost \$75 million over two years by building its own tech infrastructure." <https://www.geekwire.com/2018/dropbox-saved-almost-75-million-two-years-building-tech-infrastructure/>

⁴ <https://www.packet.com/about/customers/platform9/>

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