

Family guide

# HP Moonshot System



The industry's first workload-optimized server



February 2014

# Designed for the data center and built for the planet

Offering breakthrough, scale-out performance for lightweight workloads—delivered in a compact, energy and cost-efficient package.

## Drastically improved infrastructure economics

Rather than continue to spend precious budget dollars on energy for power and cooling, you can use HP Moonshot System and save. In fact, when HP migrated its own webpages and objects from legacy servers to HP Moonshot, we cut energy consumption by a whopping 89 percent.

“If I have smaller chunks of hardware that I can throw at problems, I can optimize from the bottom up. I can use smaller servers for the same workload, and make better use of the server’s processing power. We manage Moonshot servers the same way we manage our other Linux servers. They just come in a cool 45-server package.”<sup>1</sup>

—Volker Otto, Director for Platform Services and Automation of IT Infrastructure, HP

## Reaching for the stars—and the moon

Today, powerful processors are embedded in a wide variety of devices—servers, notebooks, tablets, smart phones, and many more. With each new generation, these processors become increasingly smaller, but pack more power—enabling them to support a multitude of functions, including connecting to the Internet. In the new world of the “Internet of Things” (IoT), billions of devices can track, gather, and process information, as well as provide a diverse assortment of services, all while seamlessly interacting with other data and devices. The IoT demands something extraordinary that offers high performance, massive scalability, and much improved cost-effectiveness. And HP has it—the HP Moonshot System.

## What is the HP Moonshot System?

An exciting new system that delivers unprecedented cost-saving benefits—including up to 89 percent less energy consumption, 94 percent less data center space, 63 percent lower purchase cost, and 97 percent less complexity<sup>2</sup>—HP Moonshot Systems include four primary components:

- **HP Moonshot Server Cartridges**—Workload optimized servers, able to handle a wide variety of workloads, but optimized for the lightweight workloads customers request most often—Web serving, cloud, hosted desktop infrastructure, and more.
- **HP Moonshot Chassis**—Supporting shared power, cooling, management, and fabric for 45 individually serviceable hot-pluggable server cartridges, the Moonshot 1500 Chassis enables each server to use less energy, cabling, space, and cost, while also reducing complexity.
- **HP Moonshot Uplinks**—Delivering flexible, low-latency uplink connectivity to simplify deployment, the uplink module supports a range of current and future networking capabilities for the HP Moonshot System.
- **HP Moonshot Switches**—Enabling ideal performance, the switch module provides a dedicated, low-latency 1GbE bandwidth path to each node in the Moonshot System.

## Bringing it all together

HP hardware is a critical part of the Moonshot System. But the “special sauce” that optimizes each server cartridge for a particular workload is the technology delivered through the HP Pathfinder Innovation Ecosystem program. Including technology from leaders in their respective areas—e.g., Web, hosting,—means you can access groundbreaking solutions in months, instead of years. Partners in the HP Pathfinder Innovation Ecosystem include AMD, Intel®, Microsoft®, Red Hat®, SUSE, and many more.

<sup>1</sup> [h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA5-0059ENW&cc=us&lc=en](http://h20195.www2.hp.com/v2/GetDocument.aspx?docname=4AA5-0059ENW&cc=us&lc=en)

<sup>2</sup> HP ProLiant Moonshot 45-cartridge server configuration; HP Engineering internal research

# 4

Choose from four server cartridges available with HP Moonshot System—each optimized for different workloads, all designed to save energy, space, cost, and complexity.

## Innovate like the “big guys”

When PayPal tested HP ProLiant m300 Server Cartridges in August 2013, they found it to be “a true departure from business as usual in the data center.”

“This is the first time I’ve seen anybody really rethink hardware fundamentally in years. Moonshot is the first time people sat down and said, how can we do it differently than we’ve done it before? How can we make it smaller, faster, cheaper, and more efficient with better power utilization?”

—S. Ryan Quick, Principal Architect, Advanced Technology Group, PayPal

## Meet the HP Moonshot server cartridges

During the day-to-day activities of your organization, you support numerous workloads. Traditional IT says, “Use a general-purpose server to handle all workloads.” The new IoT says, “Deploy the right server for the workload.”

HP agrees with the new IoT thinking—which is why we offer a series of workload-optimized server cartridges, each one designed for particular workloads. With HP Moonshot, you can deploy the right level of performance with efficiency, at scale.

### HP ProLiant Server Cartridge

As the original Moonshot offering, this single-processor server cartridge based on Intel Atom Processor S1260 was designed to handle static Web and dedicated hosting workloads, and it remains the most cost-effective server cartridge for that purpose. Trust Moonshot server cartridges for:

- Hosting external and internal websites, including portions of websites that deliver basic static content or use caching to enhance performance
- Dedicated hosting
- Your innovation lab or test environment for new technologies
- Replacing traditional, legacy Web servers, helping reduce complexity and operating cost
- Delivering Web content, such as product, or collaboration materials



### **HP ProLiant m300 Server Cartridge**

Until now, you've used traditional servers to meet your Web service and content delivery needs. These servers were built with lots of horsepower to handle the repetitive, simultaneous, lightweight tasks most often associated with these workloads, which led to significant under-utilization of your server resources.

Instead, you can get the right fit for the workload with the HP ProLiant m300 Server Cartridge. Powered by a single Intel Atom Processor C2750, the m300 is optimized for providing breakthrough scale-out performance for Web applications.

### **HP ProLiant m700 Server Cartridge**

Building on the success of the original Moonshot cartridge, the HP ProLiant m700 Server Cartridge goes three steps further by delivering four servers on one cartridge. Powered by a quad-core AMD Opteron X2150 processor with a built-in accelerator, the m700 offers exceptional graphics capabilities—making it the perfect choice for hosted desktop infrastructure.

### **HP Moonshot Starter Systems**

A fully populated HP Moonshot System holds up to 45 Moonshot Server Cartridges in a 4.3U HP Moonshot 1500 chassis. You now have the flexibility to order HP Moonshot in increments of 15 server cartridges with the HP Moonshot Starter System and add-on HP Moonshot Server Multipacks.

Offered at a lower entry cost than a fully loaded HP Moonshot System, the HP Moonshot Starter System is a complete, pre-configured system in a box designed to scale by adding more Moonshot Server Multipacks. These solutions enable you to test the waters with HP's latest cutting-edge technology and then move forward incrementally.

- Deploy with confidence; Moonshot Starter Systems are pre-configured with 15 server cartridges, uplink and switch modules, and power supplies.
- Grow as you need, when you need, with Moonshot Server Multipacks (15 server cartridge packs).
- Order a Starter System with HP ProLiant Moonshot Server Cartridges, HP ProLiant m300 Server Cartridges, or HP ProLiant m700 Server Cartridges.



## Moonshot server cartridges at a glance

Server cartridge	Workload	Processor	RAM per node	Storage	Controllers	Operating systems	Availability features
<b>HP ProLiant Moonshot Server Cartridge</b>	Static content delivery	Intel Atom Processor S1260	8 Gb	1 SFF SATA or SSD 500 GB or 1 TB	Network controller: Broadcom 5720 Two ports per controller Single Broadcom 5720 embedded LAN on motherboard per S1260 processor Storage controller; Marvell 9125	Canonical Ubuntu Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES)	Up to 2X of each: Moonshot-45G Switch Module Moonshot-6SFP Uplink Module
<b>HP ProLiant m300 Server Cartridge</b>	Dynamic content delivery; Web services	Intel Atom C2750 SOC	32 Gb	1 SFF SATA or SSD 500 GB or 1 TB	Embedded in SOC	Canonical Ubuntu RHEL SLES	Up to 2X of each: Moonshot-45G Switch Module Moonshot-6SFP Uplink Module
<b>HP ProLiant m700 Server Cartridge</b>	Hosted desktop infrastructure	4 x AMD Opteron X2150 APU	8 Gb	32 GB per APU	Embedded in SOC	Microsoft Windows® 7 Server Windows® Server 2012 Windows Server 2012 R2	Up to 2X of each: Moonshot-180G Switch Module Moonshot-4QSFP+ Uplink Module

### Maximum results, minimal environmental impact

Based in Albuquerque, New Mexico, serverCONDO provides server hosting services to the global marketplace—enabling people to rent a server inside the serverCONDO data center and use it however they prefer.

To reach the goal of guaranteed 99.999 percent uptime, while also being eco-friendly, serverCONDO chose HP Moonshot servers to power their data center. Today, serverCONDO offers customers a hosting solution built on HP technology that uses 89 percent less energy than the competition.

“When we saw Moonshot, we really started to see our business model blossom. HP Moonshot servers are smaller, less complex, more energy efficient, and take up less room than any server we’ve seen.”<sup>3</sup>

—John Brown, President, serverCONDO

<sup>3</sup> [hp.com/h20195/v2/GetPDF.aspx%2F4AA4-9986ENW.pdf](http://hp.com/h20195/v2/GetPDF.aspx%2F4AA4-9986ENW.pdf)

## HP Moonshot Networking Modules

Depending on which server cartridges you choose, your HP Moonshot 1500 Chassis will be outfitted with a designated Switch Module. In addition, each Switch Module is paired with an Uplink Module to communicate to the external network. By disaggregating the uplinks from the internal switch, you gain greater flexibility for deploying your choice of external interconnects and future-proofing your investment.

The pair of Switch and Uplink Modules provide high speed, low-latency Ethernet connectivity while dramatically reducing cost and complexity of deploying solutions at scale. The Moonshot System can support up to two Switch and Uplink Module pairs, which can be independently configured for redundancy or traffic isolation. Each Switch Module delivers 1 Gb Ethernet to each node in a Moonshot System via a dedicated high-speed fabric interconnect lane. Together, the Moonshot-45G Switch Module and Moonshot-6SFP Uplink Module feature forty-five 1GbE downlink ports with six 10GbE SFP+ uplink ports. Similarly, the Moonshot-180G Switch Module and Moonshot-4QSFP+ Uplink Module feature one hundred eighty 1GbE downlink ports with four 40GbE QSFP+ uplink ports. Multiple modules can be stacked within or across multiple chassis, reducing the cost of top-of-rack switches and providing failover in the event of a switch or uplink failure.

HP ProLiant m300 Server Cartridges and HP ProLiant Moonshot Server Cartridges ship with the HP Moonshot-45G Switch Module and HP Moonshot-6SFP Uplink Module; HP ProLiant m700 Server Cartridges ship with the HP Moonshot-180G Switch Module and HP Moonshot-4QSFP+ Uplink Module.

## HP software for Moonshot System

In addition to server cartridges, switch modules, and uplink modules, the HP Moonshot System can also include a wide variety of HP software. Depending on your needs, you can choose from the following HP offerings.

### HP Moonshot Chassis Management Module

Managing the health of the chassis and servers inside, the HP Moonshot 1500 Chassis Management Module includes a command-line interface accessible via SSH to configure the chassis and server settings, as well as control server power and UID lights. In addition, the module:

- Uses Virtual Serial Port to access servers and flash firmware within the chassis
- Supports IPMI management
- Supports the SL Advanced Power Management protocol (SL-APM) to simplify hardware monitoring and management

You can find more information on SL-APM at <ftp://ftp.hp.com/pub/softlib2/software1/pubsw-windows/p1533399047/v70092/574949-006.pdf>.

### HP Cloud OS for Moonshot

Based on OpenStack—a massively scalable cloud operating system—HP Cloud OS provides the foundation for the HP Cloud common architecture across private, public, and hybrid cloud delivery. In fact, HP Cloud OS is the world's first OpenStack-based cloud technology platform for hybrid delivery. Today, you can leverage the open source benefits of HP Cloud OS for Moonshot with HP ProLiant Moonshot Server Cartridges and HP ProLiant m300 Server Cartridges. You can use enterprise-grade HP Cloud OS for Moonshot to:

- **Simplify OpenStack installation, management, and updates**—With automated live content distribution and easier installation and configuration processes. This way, you can reduce manually-intensive processes from hundreds of steps over multiple packages to a simple, automated process.
- **Speed bare-metal provisioning**—To save significant time by using a self-service portal that automates workload deployment directly on physical nodes, rather than going through a hypervisor.
- **Enhance service lifecycle management**—With a model-based infrastructure topology for multi-tier workloads. Extensible administration and monitoring dashboards also allow you to automate deployment of single and multi-tier workloads in a Moonshot environment. View and control your entire Moonshot infrastructure from a single window.

HP Cloud OS for Moonshot enables rapid innovation, helping enterprises and service providers avoid lock-in, minimize complexity, and support massive scale-out cloud environments with beneficial economics of an open source architecture. As a leader and a top contributor in the OpenStack community, HP brings industry-leading innovation, expertise and best practices with HP Cloud OS technology to help you drive better business outcomes.

You can find more information on HP Cloud OS at [hp.com/go/cloudos](http://hp.com/go/cloudos).

### HP Insight Cluster Management Utility

Based on extensive experience delivering high-performance computing solutions, HP developed the HP Insight Cluster Management Utility (Insight CMU). This advanced solution enables cost-effective, user-friendly, error-free management of high performance clusters. Designed for managing a large number of standalone systems, HP Insight CMU is the perfect fit for HP Moonshot System. HP Insight CMU's simple graphical interface:

- Enables an at-a-glance per-server view of the entire Moonshot System
- Allows rapid provisioning of software to all nodes of a system
- Provides frictionless scalable operating environment installation, remote management, and analytics
- Supports all Moonshot server cartridges in the chassis

Please visit [hp.com/go/cmu](http://hp.com/go/cmu) to find the latest white paper, brochure, and flash demo.

## Resources

[White paper](#)

[Videos](#)

[HP Discovery Lab](#)

## Get the service and support you need

To get all the benefits of the most advanced server architecture available today, you might need a little help from the experts at HP. You can choose from a rich portfolio of HP services to meet your needs across the entire IT lifecycle. These services include:

- IT Consulting—Utilizing a portfolio of services optimized for HP Moonshot System, we work with your teams to quickly meet your technology goals. Together, we can plan and design the right strategy for you to leverage the power of HP Moonshot.
- Training—Get your key administrators up to speed quickly with this three-day hands-on training course where they'll learn to deploy, configure, and manage Moonshot servers.
- Installation Services—Whether you choose onsite installation or the HP Factory Express service, having trained HP experts install Moonshot Systems can get you started more quickly.
- Factory Express—Provides customization and deployment services, along with your storage and server purchases. We can customize hardware to your exact specifications in the factory—helping speed deployment.
- Foundation Care—Provides core support services with a variety of coverage windows to suit your needs and budget. You can purchase support for each Moonshot System to cover everything inside the chassis.
- Datacenter Care—A must-have service for your IT staff as you move to Moonshot. Sold in addition to Foundation Care reactive support, this level of service enhances your call experience and gives you proactive advice and assistance from Moonshot-knowledgeable resources.
- Datacenter Care for Hyperscale Customers—Provides the unique support experience you need while implementing a Hyperscale environment. Our service professionals will help you manage the complexities created by scale, speed of operation, rate of change, and multiple relationships.
- Financial Services—Customize your IT lifecycle management, from acquisition of new IT, management of existing assets, and removal of unneeded equipment.

Every Moonshot chassis comes with warranty and Canonical Ubuntu operating system support.

**Learn more at**  
[hp.com/go/moonshot](http://hp.com/go/moonshot)

**Sign up for updates**  
[hp.com/go/getupdated](http://hp.com/go/getupdated)



Share with colleagues



Rate this document

© Copyright 2013–2014 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

AMD is a trademark of Advanced Micro Devices Inc. Intel is a trademark of Intel Corporation in the U.S. and other countries. Microsoft, Windows, and Windows 7 are U.S. registered trademarks of the Microsoft group of companies. Red Hat is a registered trademark of Red Hat Inc. in the United States and other countries.

