PRODUCT BRIEF

SUPERMICRO MICROCLOUD DELIVERS EXTREME DENSITY FOR SMB'S AND WEB HOSTING ENVIRONMENTS

New AMD EPYC™ 4005 Processors Are Energy-Efficient CPUs Designed for a Wide Range of Growing Business Applications

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Executive Summary

Many web-based applications require a significant amount of processing power to serve web pages, host CPU-based gaming, or act as a web cache. Each application instance does not require a significant amount of processing power, but a considerable amount of computing power may be needed in aggregate. Still, with a tremendous amount of traffic and a considerable number of users, a rack-scale solution can increase performance with lower costs compared to older generations. The Supermicro MicroCloud is an ideal solution for environments with a high number of user requests, wherecosts must be kept low.

Benefits of the Supermicro MicroCloud

- Purpose-Built - MicroCloud provides an Internet hosting option in which a physical server (or servers) can be dedicated to a single customer. The customer has complete control over the machine so that they can optimize it for their unique requirements, including performance and security.
- Cost Optimized – MicroCloud is ideal for the SMB market, which often prefers private IT infrastructure for control, cost, and security reasons. The Supermicro MicroCloud is excellent for hosted infrastructure.
- Easy Servicing - Plug-and-Play system; hot-swappable components, interconnects, and servers are all cold-aisle accessible, giving the flexibility to raise the temperature of your data center and thus lower cooling costs.
- High Density / Space-saving Design – The Supermicro MicroCloud with AMD EPYC 4005 processors is available with 5, 8, or 10 nodes in a compact 3U chassis, which saves space without compromising performance.

Ideal Workloads for Supermicro MicroCloud

There are a number of workloads that will benefit from the Supermicro MicroCloud rack-scale solution.

- Web Hosting – Large numbers of servers may be needed to accommodate spikes in web traffic while delivering web pages within the expected time frame. While many connections may share a single node, a sizeable, scalable solution is needed when traffic grows.
- Content Delivery Networks (CDN) – Separate servers enable CDNs to handle different and multiple source streams from the content manifest files in different resolutions and formats.
- Online Gaming – Online games require back-end servers to manage communications and simultaneously serve information to many devices. While the demands of each connection may not be large, in the aggregate, a solution that can provide a consistent response is required. An attached GPU can be used for gaming graphics.
- Virtual Desktop Interface (VDI) – In many industries and work environments, such as call centers, retail terminals, and media production, desktop PCs are managed remotely, implemented virtually by IT, and controlled by a central server. These servers can handle a limited number of connections, and the solution needs to be scalable as workloads may increase over time with new applications.
- Corporate Services – Facilitates internal services such as DNS (domain name service), WINS (Windows Internet Name Service), and print servers.
- Centralized code development – With multi-threaded processing, which reduces compile times.

Supermicro MicroCloud Servers with AMD EPYC 4005 Processors

The Supermicro MicroCloud system is a chassis containing 5, 8, or 10 individual AMD-based servers. The AS -3015MR-H10TNR, AS -3015MR-H8TNR, and the AS -3015-H5TNR servers are designed to accommodate any AMD EPYC 4005 CPU family. The specifics include:

- Single AMD EPYC 4005 processor
- Up to 192 GB of ECC DDR5-5600 MHz memory (up to 2 DIMMs per channel)
- PCIe 5.0 low profile slot and a PCIe 4.0 x8 Micro-LP slot
- 2x 1/20/25G MLP networking option per node
- 1 Dedicated IMPI per node via a centralized dedicated port

The Supermicro MicroCloud server is designed for easy serviceability, with 2 drive bays per node, which are hot-swappable. NVMe drive bays are installed by default, with SAS3 or SATA3 supported with an optional RAID card.

The Supermicro MicroCloud is also available with several CPU options from AMD, including:

- AMD EPYC 4565P
- AMD EPYC 4545P
- AMD EPYC 4465P
- AMD EPYC 4345P
- AMD EPYC 4245P
- AMD EPYC 4585PX

Rack-Scale MicroCloud Benefits

With the Supermicro MicroCloud's compact server design, a significant number of servers can be installed in a standard 42U high chassis. The lower power requirements (65W to 170W) result in significant computing power per watt per rack compared to standard 1U servers (assuming an external switch that is not located within the rack).

	Standard 1U Server	MicroCloud 3U – 10 servers	Ratio to 1U servers
Servers / Rack	42	10*14 = 140	3.33
Cores / Rack	42*16 = 672	140*16 = 2,240	3.33

Chassis with AMD EPYC 4005 Processors

The current version of the Supermicro MicroCloud chassis can hold up to 10 individual servers, each of which can be removed without affecting the other nodes. This allows data center administrators to keep the chassis working even if a node fails. In addition, more powerful servers can be added at any time to increase the performance of the overall chassis. The MicroCloud chassis comes with the following features, which can reduce the time to identify the health of the systems. An LED light panel on the front of the chassis determines the health of each node, while a rear port for the IPMI management feature allows for communicating with any of the eight nodes.

Depending on the GPU choice, the varying numbers of servers can be accommodated in a single chassis.

Figure 1 - Supermicro MicroCloud with 10,8, and 5 Servers

Configuration	10 Systems Per Chassis	8 Systems Per Chassis	5 Systems Per Chassis
CPU	1X AMD EPYC 4005	1 x AMD EPYC 4005	1X AMD EPYC 4005
GPUs	1 Single-Width GPU Per Server (NVIDIA L4)	1 Single-Width GPU Server (NVIDIA L4)	1 Double-Width full-height GPU (up to 350W) Per Server
Maximum Memory	4 DIMMS: Up to 192GB @5600MT/s (2DPC)	4 DIMMS; Up to 192GB@5600MT/s (2 DPC)	4 DIMMS: Up to 192GB @5600MT/s (2DPC)
Storage	2 internal fixed 2.5" PCIe 5.0 NVMe drive bays 2 internal fixed 2.5" SATA drive bays	2 internal fixed 2.5" PCIe 5.0 NVMe drive bays 2 internal fixed 2.5" SATA drive bays	2 internal fixed 2.5" PCIe 5.0 NVMe drive bays 2 internal fixed 2.5" SATA drive bays

Rack-Scale Advantages

The Supermicro MicroCloud is designed to be part of a rack-scale solution, enabling significant computing power for cloud-based applications. The cumulative advance of the Supermicro MicroCloud design results in:

- Lower cable count – Significantly lower cable count compared to a rack of 1U servers, as the servers within the chassis need less cabling
- Increase in Performance – Compared to 1U industry-standard servers, when the entire rack delivers 3.3 times more compute and can be accommodated in the same square footage, assuming the same CPU is installed.

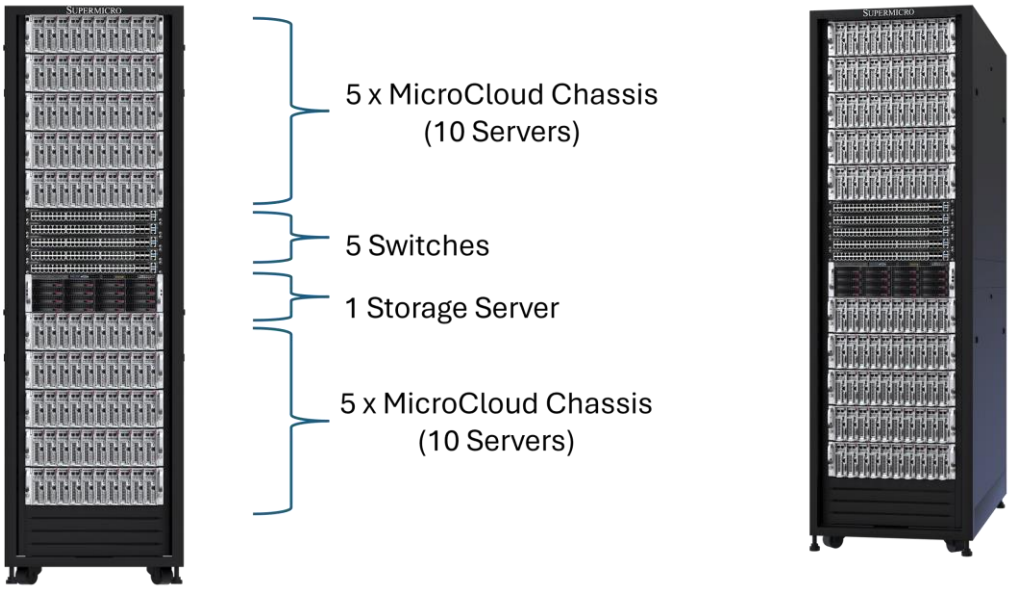

Figure 2 - 10 Node MicroCloud at Rack-Scale

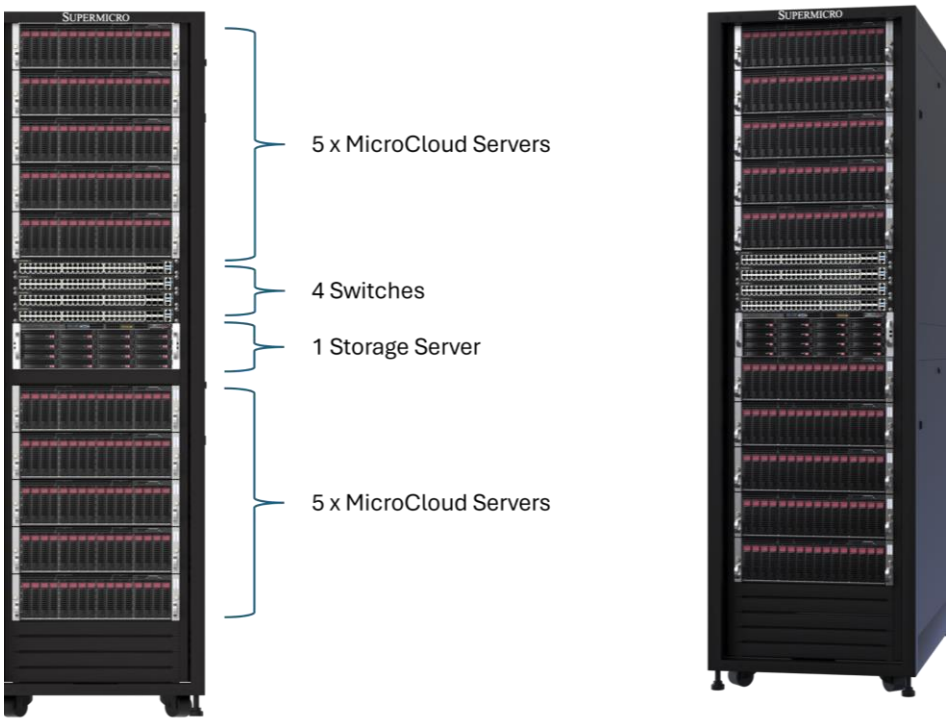

Figure 3 – 8 Node MicroCloud at Rack-Scale

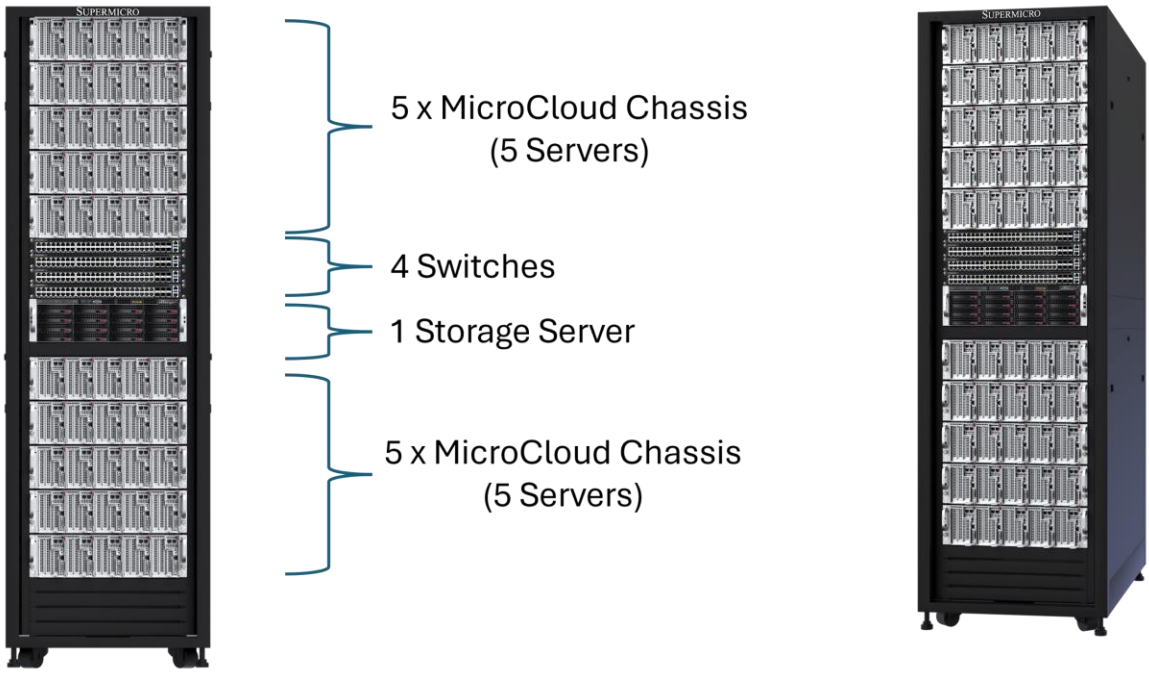

Figure 4 - Supermicro MicroCloud rack with 5 Servers Per Chassis

AMD EPYC 4005 Series Specifics

The AMD EPYC 4005 processors offer a wide range of performance, power, and price options. For the Supermicro MicroCloud, the AMD EPYC series is ideal for web-based workloads.

AMD EPYC CPU	Zen 5 Cores	L3 Cache (MB)	TDP	F_{Base} (GHz)	F_{Max} Boost(GHz)
EPYC 4565P	16	64	170W	4.3	4.7
EPYC 4545P	16	64	65W	3.0	5.4
EPYC 4465P	12	64	65W	3.4	5.4
EPYC 4345P	8	32	65W	3.8	5.5
EPYC 4245P	6	32	65W	3.9	5.4
EPYC 4585PX	16	128	170W	4.3	5.7

The AMD EPYC 4585PX is built with AMD 3D v-cache™ technology, which increases the performance of memory-bound applications.

Summary

The Supermicro MicroCloud addresses the requirements for a range of workloads, where density is a key factor. The new servers, with the AMD EPYC 4005 processors, are ideal for low-power and high-density environments. Up to 140 individual servers can be accommodated in a single 42U rack, saving valuable data center space, yet delivering the required performance for today's cloud-native workloads.

For More Information – visit: https://www.supermicro.com/en/products/microcloud

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