



Supermicro MicroBlade Micro Server Cost and Density with Blade Advantages

Introduction

The Supermicro MicroBlade server platform is a high density compute solution developed to provide optimized performance for scale-out workloads such as dedicated hosting, web front-end, social media/content delivery, or highly parallel workloads required by non-relational databases and business intelligence reporting. MicroBlade is designed from the ground up to provide easy remote management, industry-leading energy efficiency, and superior cable reduction vs. 1U rack servers.

MicroBlade Components

The 6U MicroBlade enclosure can house up to 28 micro server blades, each with four independent Intel® Atom™ C2000 nodes - for a total of 112 nodes. MicroBlade can also support up to 28 Xeon E3-1200 v3 UP or Xeon E5-2600 v3 DP nodes, with the ability to mix processor types within the same enclosure. Each enclosure comes with four or eight 80 Plus Platinum certified digital power supplies. Optimized cooling is provided by eight high efficiency cooling fans. One chassis management module (CMM) can be added to the enclosure, as well as up to four 40/10GbE switch modules. MicroBlade systems can be installed in a 19" rack. Up to seven 6U blade enclosures may be installed into a industry standard 42U rack.



Figure 1 – MicroBlade enclosure, fully populated.

MicroBlade Key Features

- 112 Intel® Atom™ C2000 Nodes in 6U
- 95% efficiency, Platinum, N+1 or N+N redundant digital power supplies
- Up to 95% space savings over 1U rack servers
- Up to 99% cable reduction
- Ease of Use with Remote Management Software
- Supports up to 28 Xeon® DP and UP nodes

MicroBlade Optimal Workloads



Web Hosting

MicroBlade can deliver dynamic web content faster, improving data center efficiency.



Social Media

MicroBlade's expandable architecture is ideal for handling database queries that scale up as the user base grows.



Web Front End

Speed up web page delivery and maximize your web-content effectiveness with MicroBlade.

Easy Remote Management

The MicroBlade chassis management module (CMM) provides total remote control of individual server blades, power supplies, cooling fans, and networking switches. System administrators enjoy the management ease and

reassurance of continuous onboard instrumentation monitoring, including sensors for temperature, power status, voltage and fan speed. MicroBlade remote management enables rebooting of individual blades for maximum flexibility and ease of use (see Figure 2).

Power Off	Power On	Power Cycle	Power Reset	Graceful Shutdown	AC Cycle	PwrFail Policy	ACLost Policy	Refresh
Blade	Name	Model	Pwr Status	Max Pwr	KVM	UID	Error	
Blade A1	B1SA4-F	On	On/Off	130	UID	Normal		
Blade A2	B1SA4-F	On	On/Off	130	UID	Normal		
Blade A3	B1SA4-F	On	On/Off	130	UID	Normal		
Blade A4	B1SA4-F	On	On/Off	130	UID	Normal		
Blade A6	B1SA4-F	On	On/Off	130	UID	Normal		
Blade A6	B1SA4-F	On	On/Off	130	UID	Normal		
Blade A7	B1SA4-F	On	On/Off	130	UID	Normal		
Blade A8	B1SA4-F	On	On/Off	130	UID	Normal		
Blade B11	B1SA4-F	On	On/Off	130	UID	Normal		
Blade B12	B1SA4-F	On	On/Off	130	UID	Normal		
Blade B13	B1SA4-F	On	On/Off	130	UID	Normal		
Blade B14	B1SA4-F	On	On/Off	130	UID	Normal		

Figure 2 – The MicroBlade CMM enables policy-based power and temperature management.

The CMM also provides remote access to the BIOS configuration and operating system console information via SOL (Serial over LAN) or embedded KVM connections.

Because the remote management console has a separate processor, all monitoring and control functions operate independently regardless of server blade operation or system power-on status.

Industry-leading Energy Efficiency

Supermicro is an industry leader in creating datacenter solutions that incorporate high-efficiency components and power supplies to minimize total cost of ownership (TCO) and reduce the environmental impact of datacenter operations. The MicroBlade is no exception. The MicroBlade server enclosure can be populated with up to eight (N+1 or N+N redundant) 1600W Platinum certified digital power supplies. These high-efficiency digital power supplies are up to 95% efficient, which means that only 5% or less of the output power of each PSU is lost as heat. Higher efficiency means lower cooling requirements, lower power bills, and lower impact on the environment. With the ability to use a processor with a power budget as low as 6 watts, MicroBlade provides exceptional value when compared with individual 1U servers.

A fully populated MicroBlade system can operate 38% more efficiently than 112 similarly configured 1U Atom-based micro servers with three management switches and three production

network switches in three 42U racks, or 53% more efficiently than a similarly configured traditional datacenter optimized server. Linpack benchmarks demonstrate that 112 1U Avoton servers in a rack with three Ethernet switches require approximately 2,566 watts more energy than a similarly configured MicroBlade. 1U Intel Xeon E3-1200 v3 product family servers required at least 4,806 watts more energy. These results are summarized in Table 1.

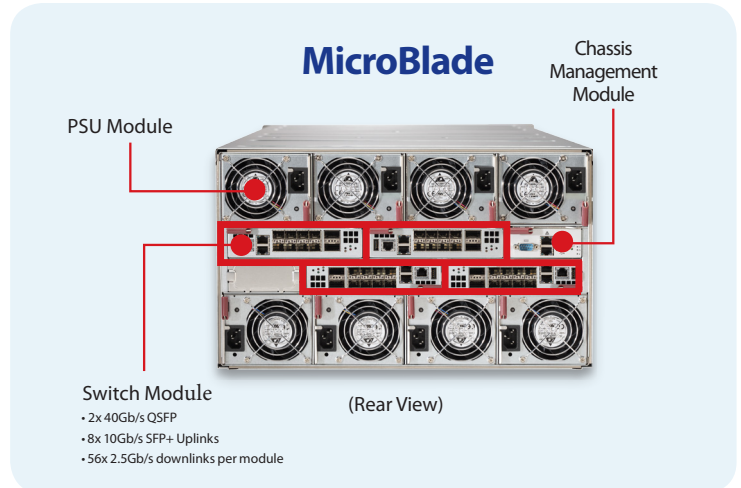


Figure 3 – MicroBlade rear view including PSUs, CMM, and Switch Modules.

MicroBlade also offers the industry’s best power redundancy and fault-tolerance. Whereas other micro server enclosures provide only a maximum of N+1 redundant power supplies per chassis, each Supermicro MicroBlade comes with native N+1 redundancy that can scale up to N+N, even with a fully loaded enclosure at maximum output.³

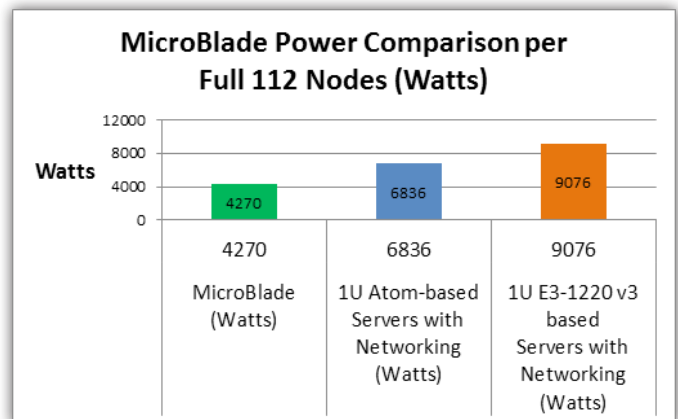


Table 1–Power consumption is per 112 nodes with redundant power supplies in a rack-mounted datacenter environment.²

99% Cable Reduction vs. 1U Rack Servers

Supermicro's MicroBlade is architected to achieve an extremely high node density when compared with a traditional datacenter server, reducing physical footprint by as much as 95% versus 1U rack servers. Instead of 1 or 2 nodes per 1U of rack space, MicroBlade can achieve a density that is above 18 nodes per 1U of rack space. This node density reduces MicroBlade's need for cabling by up to 99% versus 1U rack architectures.

To understand how this is possible, consider that a single, standard, 42U rack populated with 7 fully populated MicroBlade enclosures would require up to a total of 63 cables: 28 for every switch port in all of the chassis (7 x 4 = 28), 7 for remote management to the CMM (7 x 1 = 7), and 28 for the necessary power supplies (7 x 4 = 28). A comparable number of individual 1U rack servers would require twenty 42U racks.

Each rack would require 60 cables to provide a connection to a core switch (20 x 3 x 1 = 60), 2,340 cables to connect each 1U server node to the 2 regular network switches and 1 management network switch (20 x 39 x 3 = 2,340), 1,560 cables to provide redundant power to each server across 20 racks (20 x 39 x 2 = 1,560), and 320 power cables to provide redundant energy to each switch (20 x 3 x 2 = 120). Thus, a 784-node 1U configuration would require a total of 4,080 cables. Compared with 1U servers, MicroBlade enables cable reduction of up to 99% (1 - 63/4,080 = 99%). Figure 4 demonstrates how cable reduction of up to 99% can be achieved when implementing a fully-populated MicroBlade instead of a comparable 1U architecture.

Conclusion

The Supermicro MicroBlade system is an ideal solution to address the needs of highly parallel, scale-out workloads that are increasingly demanded of the datacenter. The Supermicro MicroBlade is an ideal platform to manage these workloads due to its high node density, best-in-class energy efficiency, and small physical footprint. Whether it is configured with 28 Xeon E5-2600 v3 DP nodes, 28 Xeon E3-1200 v3 UP nodes, or 112 Intel® Atom™ based nodes, no other micro server solution brings together all of these capabilities into a platform that is so easy to manage and scale. In a dedicated web hosting environment, MicroBlade is the only solution that combines scalable, high-density, and low-cost computing with simple, remote, web-based management, and extremely reduced cabling requirements.

We Keep IT Green®

The Supermicro MicroBlade is the industry-leading micro server solution optimized for the Intel® Atom™ processor C2000 product family (formerly codenamed Avoton and Rangeley). It is designed for low power (sub 20W), compact storage and lightweight, scale-out computing workloads that are essential for building a sustainable, cost- and performance-optimized datacenter. For more information about MicroBlade contact your Supermicro sales representative today. At Supermicro, We Keep IT Green.®

References

1. Based on Supermicro internal analysis of Supermicro MicroBlade server products.
2. Based on 112 nodes at 44W per node, with a maximum of 39 nodes per rack, and two Layer3 Switches at 212W each and one Layer2 Switch at 42W each.

7048-A(Layer 3 switch) : 100% load - 212w
http://www.arista.com/assets/data/pdf/Datasheets/7048T-A_DataSheet.pdf
4. Based on 784 server nodes. 1U servers would require twenty 42U racks vs. one 42U rack outfitted with MicroBlade.

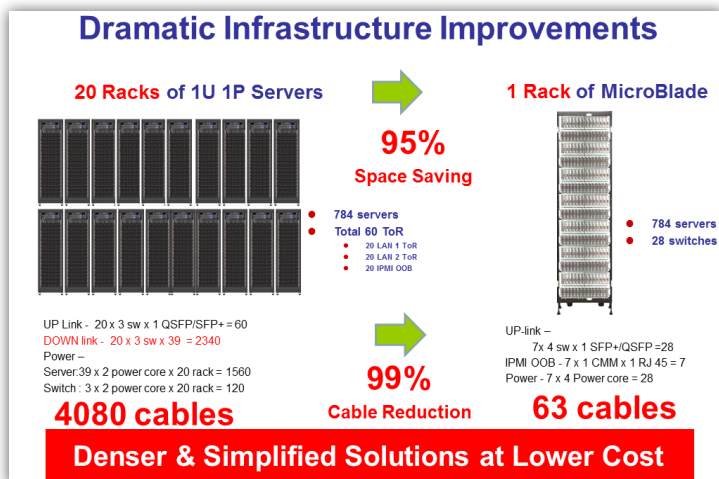


Figure 4–Cable reduction with MicroBlade vs.112 1U servers.

For more information about Supermicro's MicroBlade solutions, visit <http://www.supermicro.com/products/MicroBlade/index.cfm>