

**SSI**

SERVER SYSTEM INFRASTRUCTURE<sup>(SM)</sup> FORUM  
*Managing Component Interfaces*

**Solving Blade-Based Server Industry Challenges  
with SSI Forum Open Standards**

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## Executive Summary

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In today's business environment, blade-based servers offer critical advantages to companies seeking to expand business services while containing or cutting their IT costs. The blade-based server market is responding, but it's hampered in its ability to offer innovative solutions at competitive prices. The Server System Infrastructure<sup>(SM)</sup> (SSI) Forum, a server industry group established in 2008, manages an industry-wide initiative to standardize blade-based server components and interfaces. SSI Forum standards enable growing opportunities for component vendors, System Integrators (SIs), and IT departments to benefit from what blade-based server technologies can deliver.

## Challenges of the Blade-based Servers Explosion

Demand for blade-based servers is exploding. And with it comes a growing need to make it easier for IT departments to take advantage of the benefits that blade-based servers offer companies, from small and medium businesses (SMB) to enterprises.

At a projected CAGR in excess of 20 percent from 2007 to 2012,<sup>1</sup> and 26 percent of servers being blade-based by 2012, blades will offer a significant market opportunity for several years (Figure 1).

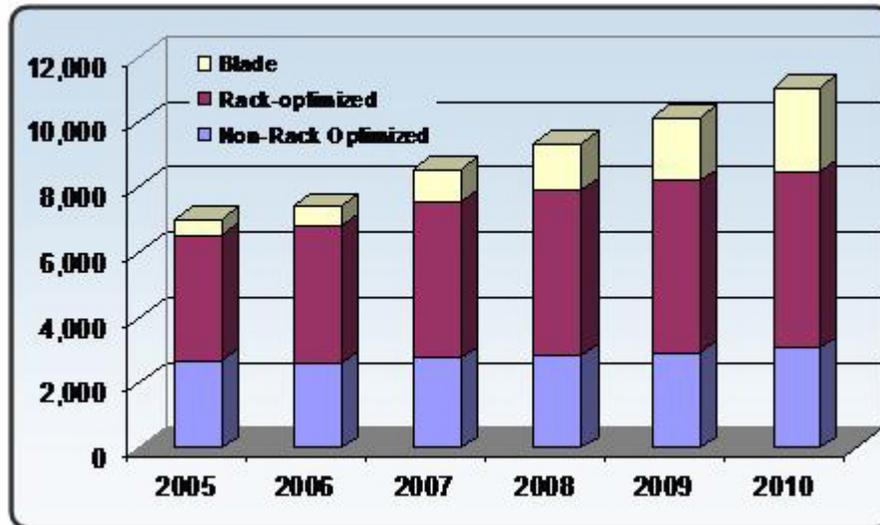


Figure 1. Server Market Segment Projected Growth (Source: IDC, 2008)

What makes blade-based servers so attractive? They pack a lot of potential into a smaller footprint and help reduce power/cooling costs. For example, when you consider the costs of six single-height 'pizza box' servers with dedicated hard drives in each compared to a blade-based server system with the same number of blade-based servers and expandable storage, companies can save as much as 30 percent on power and cooling costs alone.<sup>2</sup>

Today, a few multi-national corporations provide the majority of turnkey blade-based server solutions. Many smaller companies offer innovative blade-based server-based components that a limited number of system integrators and SMBs package into effective solutions. And because of a lack of open, industry standards within this particular server segment, each package is a customized solution. Essentially, the ecosystem is fractured. The environment puts SMBs and other companies considering blade-based server systems in a difficult position:

- Lack of standardization across components drives up engineering costs for vendors to enter the marketplace with innovative devices and software
- A limited number of leading system suppliers results in vendor lock-in for IT departments

- Costs are dictated by the customization of systems and limited competition in the marketplace
- Limited interoperability amongst a range of devices restricts solution flexibility
- Fewer suppliers, the high cost of innovation and market entry, and vendor lock-in mean IT departments have to compromise on the kinds of innovative services they can offer to their operations

Blade-based server standards would reduce or eliminate many of these challenges, making it easier for businesses to adopt blade-based server solutions.

## **Standardizing Blade-based Servers**

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As an organization, The SSI Forum builds on over ten years of open standards for redundant server power systems, rack-mount server chassis, power control and management, and other components and services that simplify the build of server solutions. In 2008, the organization announced the development of additional *blade-based server standards* to address customer and ecosystem challenges.

### **Open Specifications**

In 2009, SSI Forum Working Groups released several specifications for blade-based server components to be applied throughout the industry. These specifications followed review within the organization, typical of an open standards validation and ratification process. Released specifications include:

- *SSI Compute Blade Specification* – A set of standard hardware and management interfaces for the creation of SSI-compliant blade-based server platforms
- *SSI Compute Blade Mezzanine Specification* - Defines the interfaces between the compute module, the midplane, and plug-in mezzanine card for SSI-compliant blade-based server compute modules
- *SSI Chassis Management Module (CMM) Specification* - Defines a set of standard hardware and management interfaces for SSI-compliant blade server platforms
- *SSI Switch Management Specification* - Defines the requirements for management of SSI-compliant I/O switches used in an SSI-compliant blade-based server platform
- *SSI System Management Design Guide* - Defines a set of management interfaces for the creation of SSI-compliant blade-based server platforms
- *SSI Ethernet Base Midplane Design Guide* - Defines criteria for creation of key areas of SSI-compliant midplane/backplane, while leaving full midplane/backplane design open to OEM differentiation/innovation
- *SSI Ethernet Midplane Electric Specification* - Defines electrical requirements for the printed circuit board (PCB) design of a mid-plane supporting SSI blade and switches with emphasis on the electrical design of the high speed fabrics. These fabrics include backplane Ethernet IEEE

- *SSI External Management Specification* - Defines the requirements for management of SSI-compliant blade-based server platform

In addition, The SSI Forum continues to manage existing specifications for electronics bays and power supplies. IBM® BladeCenter switch specifications are also available to SSI Forum members, allowing access to the BladeCenter switch ecosystem to all members who are developing SSI Forum-compliant switching technology.

## **Compliance and Interoperability Testing Support**

To accelerate development, testing, and adoption of open standards-based components and systems, the organization formed the SSI Forum Compliance and Interoperability (C & I) Working Group. This Working Group develops the necessary tools and standardized testing practices to help the server community get to market faster with SSI Forum-compliant products.

In 2009, the C & I Working Group launched the SSI Forum C & I program and released several kits to help accelerate SSI Forum-compliant product development and testing by OEMs, ODMs, and SIs. These kits include the following:

- SSI Product Development Kit (PDK) for SSI Forum-compliant product development
- SSI Integrator Test Kits (ITK) for testing of products in chassis
- SSI Module Compliance Test Kits for testing various functionalities of modules within a chassis

In addition, the Compliance and interoperability program comprehends the need for interoperability to be demonstrated for SSI Forum-compliant systems and BladeCenter systems.

Other value-added test kits from SSI Forum members are becoming available to help accelerate testing of SSI Forum-compliant products.

## **Open and Available on SSI Forum Web Site**

SSI Forum members can access all specifications and find information on its PDKs and Test Kits at <https://ssiforum.org>. The specifications are also available to *prospective members* for evaluation purposes. See the web site for details.

## **Strong Vendor Commitment**

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Over 40 manufacturers, suppliers, and SIs in the server components community support the SSI Forum and its standards initiatives. Many SSI Forum-compliant products are already available today. Technology leaders, OEMs, LOEMs, ODMs, and IHVs participate in various SSI Forum Working Groups, and in the SSI Forum C & I program. Their widespread commitment benefits both their customers and the entire blade-based server industry.

## Industry Benefits

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Manufacturers, suppliers, and SIs in the server components community support the new standards efforts. Their commitment will deliver significant benefits to both their customers and the entire blade-based server industry.

### Customer Benefits

Blade-based server standards, supported by a growing industry, means greater benefits for customers, including:

*"Standards allow the industry to move forward without each individual company having to do the ground up implementation on its own. ... Because of standards, everyone can innovate and everyone can interoperate."*

*Craig Barrett, former Intel CEO*

- *Reduced acquisition and migration costs* – Standards help lower vendor engineering and market entry costs, which drive customer pricing.
- *Reduced operating and maintenance costs* – A standards-based system can help reduce the costs of parts and service because of the increased component availability from cost-competitive suppliers.
- *Ensured compliance* – Standards for interoperability and compliance help IT departments meet their objectives dictated by corporate policies and regulations.
- *Faster time-to-solutions* – Standards guarantee interoperability among system components and faster solution builds through a simpler integration path.
- *Greater flexibility and choice* – Standardized components allow IT departments and SIs to select from a broader market that offers more components.
- *Better business solutions* – Standards enable new, interoperable, and innovative hardware and software components that add up to greater customization of a business solution designed to meet a company's unique needs,
- *Increased competitive advantage* – Standards-based solutions eliminate vendor lock-in. That means IT departments can expand their systems' capabilities using innovative components as they become available – without waiting for a particular vendor's component. Quicker access to improved business services can give the company a true competitive advantage,

## Ecosystem Benefits

Standardization across a market and industry has well-documented benefits for the ecosystem, too. The new blade-based server standard will offer several benefits, including:

- **Reduced manufacturing costs.** While a single design might provide a good solution in a blade-based server-based system, lack of standardization across the market means a vendor must produce a different version for each chassis. That drives up costs. SSI Forum standards allow a vendor to produce a single component at lower costs for a wider range of solutions.
- *Reduced engineering costs.* Interconnects (mechanical and electrical), software communications, and power standards eliminate these engineering efforts.
- *Faster time-to-market.* With much of the technology already determined by the standard, there is less work to do, allowing companies to deliver products faster.
- *Enabling innovation.* Eliminating the mundane aspects of engineering allows developers to focus on real value-added capabilities of their products.
- *Innovative ideas set vendors apart.* Innovation equals competitive advantage.

The new blade-based server standards will benefit vendors and customers together, helping blade-based server-based solutions to continue to grow.

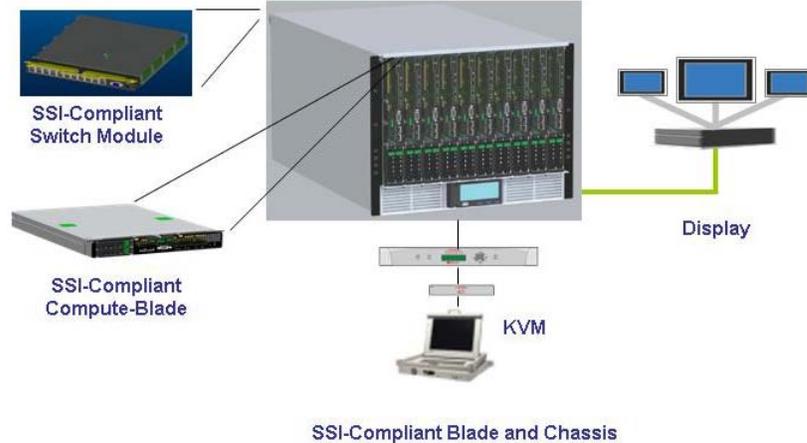
## Solutions for Today and the Future

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SSI Forum standards are not just about the future of the blade-based servers market. They seek to optimize the platform for existing data center power and cooling infrastructures, taking into account the challenges data centers and vendors face today, and the solutions available to them. In addition, SSI Forum standards focus on costs, interoperability, and other aspects.

SSI Forum standards emphasize rack motherboard and design re-use to protect customer and vendor investments in the industry. They also allow headroom for at least three generations of processor and fabric technology. Most importantly, the standards provide for member innovation and differentiation, two key factors that drive progress in any industry and enable competitive advantage.

SSI Forum standards offer the greatest benefits to participants – vendors and customers alike – in the fastest-growing segment of the server market. SSI Forum standards enable opportunity for growth and innovation – today and tomorrow.



*Figure 2. SSI Forum Open Standards-based Blade-based Server Platform.*

## Conclusion

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With blade-based servers being the fastest growing segment of the server market, vendors and SIs are presented new opportunities for growth. To lower the barriers of entry into this market and to enable innovation, The SSI Forum standardizes critical aspects of blade-based server components and interfaces.

The early adopters of the standards, those who engage now and plan with standardization in mind, will be in the best positions to reduce their costs of entry into the blade-based servers market and capture market segment share.

Visit [ssiforum.org](http://ssiforum.org) for more information on the following:

- How to join SSI
- Specifications for server systems and blade-based servers
- SSI Forum C & I program, and development and test kits
- Events, such as trade shows and technical seminars, where you can see blade-based servers and learn about the technologies
- All the latest news on specifications development and SSI Forum-related activities

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<sup>1</sup> Source: IDC 2008.

<sup>2</sup> White paper: "Intel® Modular Server built on Intel® Multi-Flex Technology."