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Rakuten Supercharges Microsoft FAST Searches with Fusion-io

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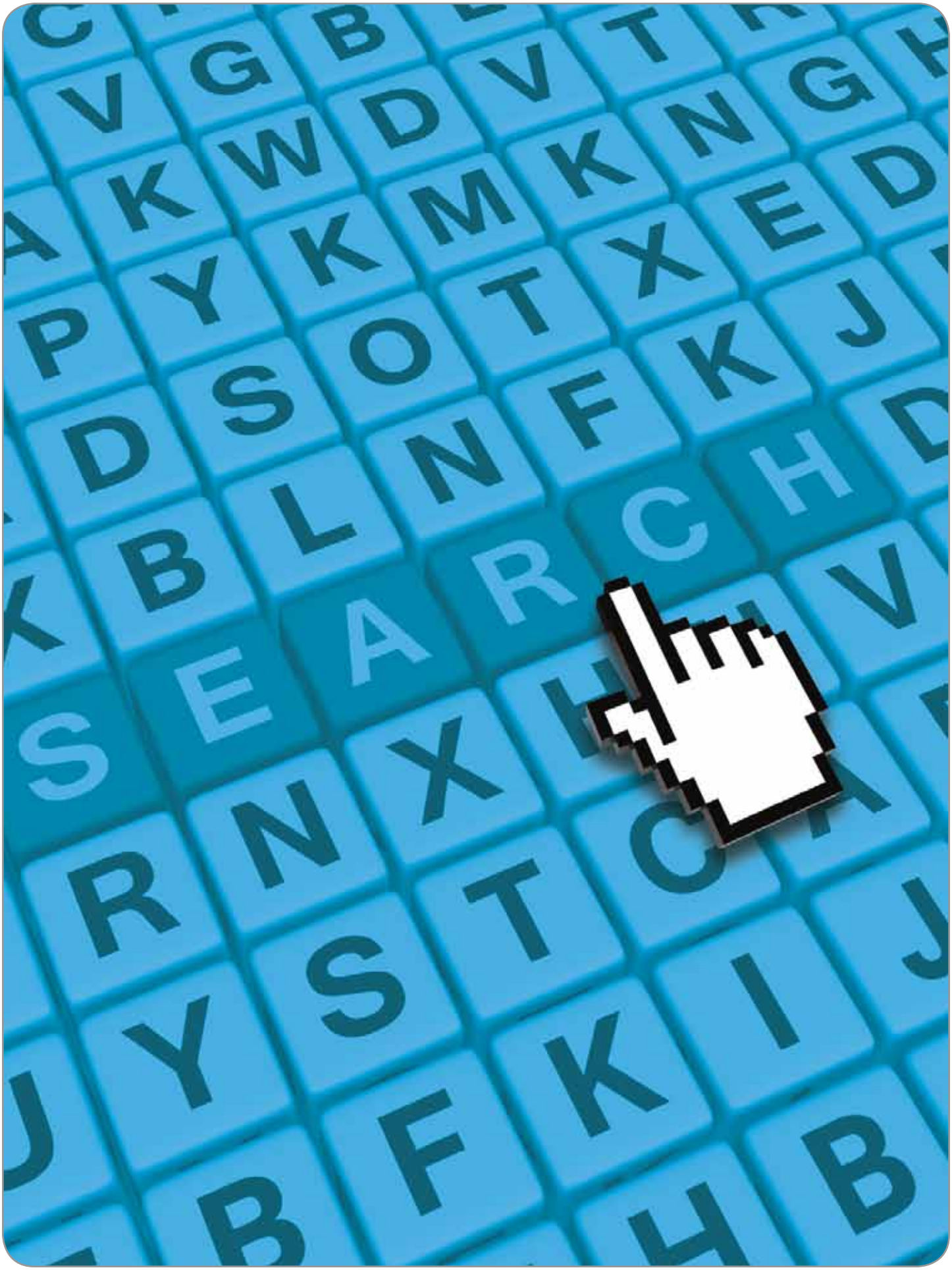
SEARCH

Rakuten Supercharges Microsoft FAST Searches with Fusion-io

Fusion-io dramatically improves response times, while stopping the scale out and reining in power and space costs.

The Challenge

Rakuten is an innovative full line internet services organization that operates one of the largest online shopping sites in the world. It needed a way to maintain acceptable performance levels for Microsoft FAST Enterprise Search Platform (ESP), even as transaction numbers and volumes grew daily.

Rakuten's conventional scale-out, search system consisted of a few hundred servers and its needs were rapidly expanding. This solution was becoming less attractive every day for several reasons:

1. Huge upfront capital costs for hardware to get marginal performance gains.
2. Increasing costs for space and power.
3. Increasing system complexity, which increased maintenance costs and decreased system reliability.

The Solution

Tests on a MySQL database cluster showed they could consolidate their slave databases to dramatically reduce hardware, space, and power costs, while increasing query processing by four times. Upon seeing these results, they immediately began evaluating how they could extend these benefits to their few hundred server search platform.

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SUMMARY OF BENEFITS

(FUSION-IO ESTIMATE)

- ***Less than 1/2*** *the hardware*
- ***Less than 1/2*** *the rack space*
- ***Less than 1/2*** *power, cooling, and maintenance costs*
- ***3x search performance***
- ***$4 million less*** *than closest competitive bid*

"The ioDrives completely freed our search platform from the I/O bottleneck. Now, adding processing power and improving application queries will produce real results."

IT Professional

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STOPPING FAST SCALE OUT

In Japan, space and power are at a premium. Its data center was running out of space, but it couldn't affordably acquire more. It also wanted to optimize its data center's power efficiency, but knew power and cooling costs would only increase if it continued to use its scale out architecture.

Implementing Fusion-io enabled Rakuten to achieve the following:

- Less than 50% rack space. Rakuten eliminated the disk arrays from its search servers, allowing it to replace a few hundred 2U servers with 5% fewer 1U servers.
- Slash power and cooling costs. Rakuten replaced racks of power-hungry disk arrays with power-efficient and low-heat NAND flash. It also reduced the space it had to cool by half.
- Dramatically lower maintenance and improved reliability. Administrators now had 70% fewer hard disks to maintain. This meant much lower maintenance costs. On top of the maintenance savings, the new system had far fewer failure points, making for a more reliable system overall.
- Immediate ROI on repurposed servers. Rakuten purchased a few hundred new servers. This allowed it to reduce its bottom line cost by the amortized life of the existing servers, which they repurposed throughout the company.

MAKING FAST SEARCHES EVEN FASTER

The ioDrives did even more than deliver on their promise to stop the data center scale out. They used the CPU much more efficiently and productively. CPU utilization was one-third that of the previous servers, which effectively tripled system performance capacity.

This offered Rakuten the following benefits:

1. Improved customer experience. With triple the performance, Rakuten ensured a best-in-class experience for customers searching for products.

2. Significant headroom for growth. Instead of continually adding servers to accommodate growth, Rakuten administrators could now focus on more meaningful ways to improve its systems. Scaling performance would also be much easier and require much less hardware, software, power, cooling, and maintenance.

3. Enabled innovation. The performance headroom allowed them to add highly desired and innovative products and services without impacting the customer experience. One such system was an SDK to allow merchants to develop plug-ins to access the organization's products from their own sites. Prior to implementing ioDrives, the investment required to support potential traffic increases would have been cost-prohibitive.

$4 MILLION DOLLAR PRICE SAVINGS

As if cutting its server needs in half and dramatically improving search performance weren't enough, the cost of the Fusion-io system beat Rakuten's closest competitive bid by over $4 million dollars.

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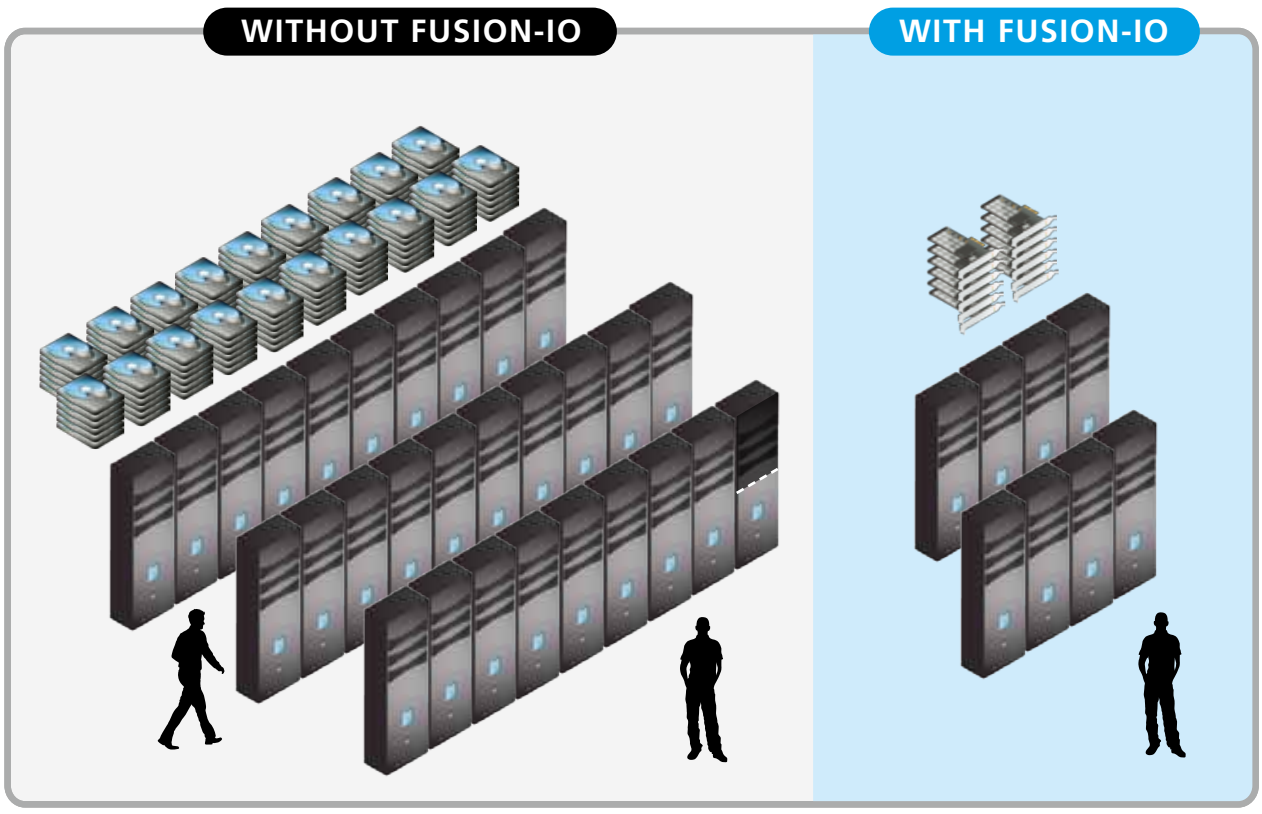
System Changes

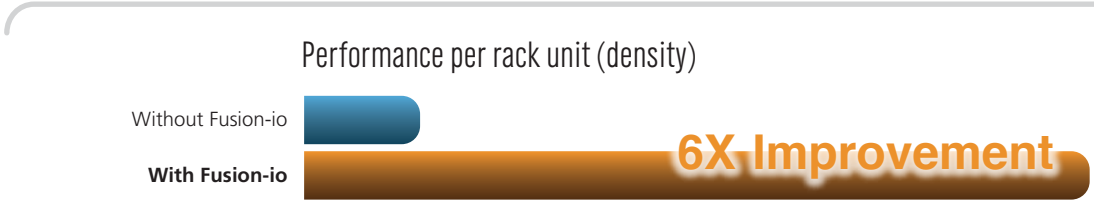
SYSTEM BEFORE

- IA Server, 2 x QuadCore, 48GB RAM (2U)
- OS: Linux
- Application: FAST ESP

CHANGES TO SYSTEM

- IA Server (Dell), 2 x QuadCore, 48GB RAM (1U)
- OS: Linux
- Application: FAST ESP





Consolidated servers by more than half, while tripling the performance of each server. 2*3 = 6 times greater performance density.

FUSION-IO

Summary

Implementing Fusion-io gave Rakuten the following benefits:
(Fusion-io estimate)

- ***Less than 1/2*** the hardware
- ***Less than 1/2*** the rack space
- ***Less than 1/2*** power, cooling, and maintenance costs
- ***3x search performance***
- ***$4 million less*** than closest competitive bid

Company Description

Created by Chairman and CEO Hiroshi Mikitani, Rakuten is one of the biggest internet services company in the world, in a variety of companies from online auction, finance, travel, research, blog, insurance, and even a professional baseball team. Rakuten Ichiba manages its internet shopping mall, which carries over 60,000,000 products from over 35,000 merchants.

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