

Service Provider Increases Scalability, Gains Competitive Edge

SoftLayer Technologies aggregates server racks with Catalyst Switches, enabling customers to add servers in any rack.

EXECUTIVE SUMMARY
SoftLayer Technologies, Inc. <ul style="list-style-type: none"> • Service Provider • Plano, Texas • 5500 customers
CHALLENGE <ul style="list-style-type: none"> • Scale to accommodate business growth • Differentiate server hosting service • Minimize operational costs
SOLUTION <ul style="list-style-type: none"> • Connected racks to Cisco Catalyst 4900M Switches • Connected Cisco Catalyst 4900M Switches to Cisco Catalyst 6500 Flagship Switch
RESULTS <ul style="list-style-type: none"> • Can support 10 Gigabit Ethernet server interface without an architecture upgrade, protecting investment • Attracted customers with a pay-as-you-grow business model • Did not add to management burden

Challenge

Founded in 2005, SoftLayer Technologies, Inc. provides global, on-demand data center and hosting services from three data centers in Dallas, Texas; Seattle, Washington; and Washington D.C. Customers of all sizes pay a monthly fee to use SoftLayer's servers for a wide range of applications, including web hosting, back-office business applications, Software-as-a-Service (SaaS) environments, and grid and high-performance computing (HPC).

SoftLayer wanted a new data center switching architecture that could accommodate expected growth for many years. The company adds 10 to 20 new server racks monthly, each with up to 44 servers. "What's more, bandwidth per server has doubled over the last two years, and we don't see it slowing down anytime soon," says Nathan Day, chief technology officer, SoftLayer. "We needed the scalability to support more customers, servers, and IP traffic without a major switch upgrade."

Designed correctly, a new 10 Gigabit Ethernet switching architecture would give SoftLayer a competitive advantage in attracting enterprise customers. In most data centers today, all servers in a cluster need to reside in the same rack. Therefore, customers have to predict application growth and pay to reserve rack space before they need it. "With a very-low-latency switching solution, we could give customers the option to use servers in different racks, and even in different data centers," says Sean Charnock, vice president of business development, SoftLayer. "A pay-as-you-go model is very attractive, especially in the current economic climate."

Solution

After evaluating 10 Gigabit Ethernet aggregation switches from leading vendors, SoftLayer chose the Cisco Catalyst[®] 4900M Series Switch, for the following reasons:

- **Flexibility:** SoftLayer can configure the Cisco Catalyst 4900M Series Switches with just the right number of modular 10 Gigabit Ethernet ports. "We can also use either Layer 2 or Layer 3 routing, and the other solutions did not offer this choice," Day says.
- **Convenience of an end-to-end solution:** Using Cisco gear at the access, aggregation, and core layers simplifies service and support, reducing operational costs.
- **Support for 10 Gigabit Ethernet server connectivity:** "We want to be ready for 10 Gigabit Ethernet servers," says Day. "We plan to use this platform for a long time."

In the new architecture, each set of ten racks connects to dual Cisco Catalyst 4900M Series Switches. These switches connect to the Cisco 6500 Series Switch (see "Technical Implementation").

The Cisco Catalyst 4900M Series Switch provides the very low latency needed to connect multiple servers to support demanding cluster applications such as HPC, grid computing, and streaming video. “One customer thought that his cluster had to be in the same rack, because the application couldn’t even tolerate a couple hundredths of a second latency,” says Day. “He was pleasantly surprised that we were able to provision his cluster across two different racks managed by the same Cisco Catalyst 4900M switch, with the same performance as if the servers shared the same rack.”

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— Sean Charnock, Vice President of Business Development, SoftLayer Technologies, Inc.

Results

Preparation for the Future

“When 10 Gigabit Ethernet NICs [Network Interface Cards] become widely available, we won’t have to make any changes to our architecture,” Charnock says. “We are now set up to support 10 Gigabit Ethernet from servers to appliances and across data centers.”

Day adds, “The investment in Cisco Catalyst 4900M Switches will pay dividends in the future by enabling us to support more traffic between racks over our core network.”

Attractive Economics for Customers

With traditional hosted service providers, customers have to predict future application growth so that they can reserve the needed space in the same rack holding their current servers. But SoftLayer’s customers can use servers on any rack, which means they don’t pay for a server until they need it. What makes this possible is the low latency of the Cisco Catalyst 4900M Series Switch. “To the customer, the servers might as well be in the same rack because the performance is no different,” says Day. “Customers appreciate the pay-as-you-grow model because they don’t have to pay for assets or bandwidth capacity that they don’t currently need. And we have minimized space and power consumption by reducing the number of partially filled racks.”

SoftLayer is publicizing its investments to future-proof the network. “Our pricing model has distinguished us from competitors,” says Charnock. “It has definitely increased interest in our service from enterprise customers.”

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Rapid Provisioning

The architecture supports two separate networks: a public network and a private network that interconnects servers in different racks or even in different data centers. “Customers can introduce a new application without having to wait while we build a customized architecture, as they do in traditional data centers,” says Charnock. “This enables us to differentiate ourselves through faster provisioning.”

Simplified Management

SoftLayer uses an automated provisioning system when customers need new servers or bandwidth. The company was able to continue using the same software after adding the Cisco Catalyst 4900M Series Switch. “Automating deployment with another vendor’s solution would have taken much longer,” Charnock says. “The Cisco IOS Software is easy to include automation systems.”

Technical Implementation

SoftLayer’s new data center switching architecture is as follows:

- Each rack-mounted server has two Gigabit Ethernet connections to the Internet.
- Each set of 10 racks aggregates into a pair of Cisco Catalyst 4900M Series Switches over 10 Gigabit Ethernet uplinks. One switch is used for the public network and the other for a private network interconnecting each customer’s servers. “In essence, we get 40 Gigabit Ethernet to the rack: 20 Gbps to the public network, and 20 to our private network,” Day says.
- The Cisco Catalyst 4900M Series switches, in turn, aggregate into the Cisco Catalyst 6500 Series Switch over four 10 Gigabit Ethernet links.
- The private network has access to an Internet Small Computer System Interface (iSCSI) storage area network.
- All three data centers connect to each other over 10 Gigabit Ethernet dark fiber in a ring topology. “We encourage our customers to host their servers in more than one location, and transit over the dark fiber is free to them,” says Day. The low-latency, high-performance link between data centers enables SoftLayer to offer additional revenue-generating services, such as disaster recovery and global load balancing.

PRODUCT LIST

Routing and Switching

- Cisco Catalyst 6509 Flagship Switch
- Cisco Catalyst 4900M Switch

Security

- Cisco Guard DDoS Mitigation Appliance

For More Information

To find out more about Cisco data center solutions, visit:

<http://www.cisco.com/go/datacenter>.



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