

How Linksys Successfully Integrated with the Cisco Network Infrastructure

Selective IT integration approach improves network performance, security, resilience, and costs for Linksys division.

Cisco IT Case Study / Business Management / Linksys Acquisition Integration: Unlike Cisco's previous acquisitions, Linksys remained a separate division, altering the company's standardized acquisition model. This case study describes the acquisition from the perspective of Cisco IT, which undertook a "selective integration" approach, integrating most infrastructure and some governance. Cisco customers can draw on Cisco IT's real-world experience in this area to help support similar enterprise needs.

"The challenge is that the division prizes its agility, and the corporate parent prizes standardized processes. The trick is to accommodate both desires in a way that results in the best overall business growth."

— Tim Merrifield, Director of IT Acquisition Integration

CHALLENGE

Acquisition integration has become a unique core competency of Cisco Systems®, which had acquired 96 companies as of March 2005. Tim Merrifield, director of IT acquisition integration, has overseen all but one of these acquisitions and is responsible for strategy relating to infrastructure, governance, and applications. "Our model was very standardized until acquisition 82: Linksys," says Merrifield. "Cisco bought companies that were small in size and, like us, sold hardware and services to other businesses. We had it down to a science—if we closed a deal on Wednesday, the

next Monday the company would be fully integrated, with a brand-new Cisco infrastructure."

The new twist arrived in late 2004. Unlike Cisco's other acquisitions, Linksys® runs a different type of business than Cisco. Cisco builds highly configurable products to order while Linksys builds off-the-shelf products to forecast. Cisco sells directly to enterprise and service provider customers while Linksys sells exclusively through channels. Cisco manages engineering and manufacturing internally while Linksys outsources these activities to Taiwan. "The only similarity between Cisco and Linksys is that both companies provide networking products," says Merrifield.

"Therefore, the executive team decided that Linksys would operate as a separate division."

Even as a separate division, Linksys needed some level of integration with its corporate parent, including legal, fiscal calendars, accounting practices, and facilities. It didn't make sense for Linksys to rent a business office in Singapore, for instance, when Cisco already owned office space. From the beginning, it was clear that IT was a perfect area of synergy—why should Linksys build a global network when Cisco already had a scalable, secure, high-performing network infrastructure in place?

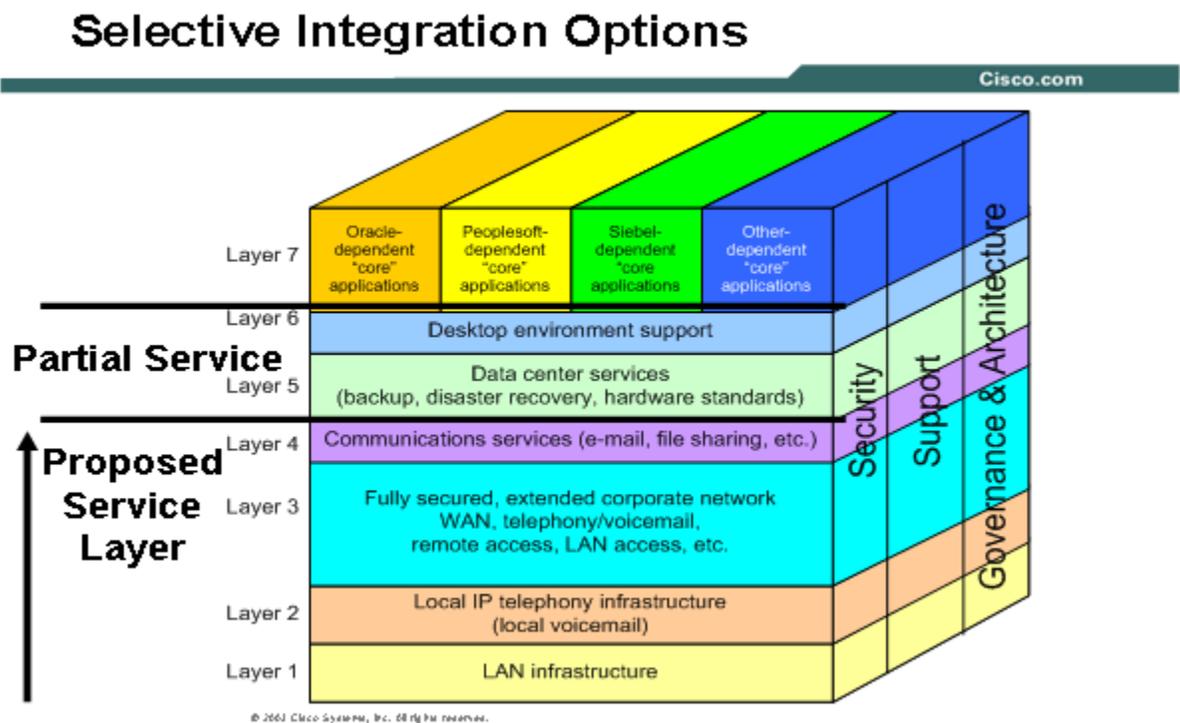
"The challenge is that the division prizes its agility, and the corporate parent prizes standardized processes," says Merrifield. "The trick would be to accommodate both desires in a way that would result in the best overall business growth."

SOLUTION

Selective Integration Model

At the outset of the integration, the intent was for Linksys to remain as separate as possible. “Linksys had 150 employees and experienced a 70 to 80 percent growth rate per quarter, while Cisco had 40,000 employees and grew by 2 percent per quarter,” says Merrifield. “We wanted to avoid overloading Linksys with costs, processes, and procedures that would impede its agility.” Therefore, Cisco IT departed from its typical approach of fully integrating the new division’s IT infrastructure, applications, business processes, and IT governance. Instead, Cisco would selectively integrate the elements in each category that would provide synergy or reduce costs. The Cisco IT integration team considered infrastructure components such as networks, telephones, data centers, PCs, and printers; applications such as enterprise resource planning (ERP), sales, HR, and engineering; governance practices such as development lifecycles and compliance with standards and mandates such as the Sarbanes-Oxley Act and data privacy laws; and funding models (Figure 1).

Figure 1. Selective Integration Options for Linksys Acquisition



The discovery process revealed little overlap between the two companies’ application needs. Cisco and Linksys handle sales and ERP differently, and Linksys outsources engineering and manufacturing. The only applications with significant overlap were finance and HR. Similarly, only a few compliance and governance standards applied to both companies—most of them offshoots of the Sarbanes-Oxley Act. The three major governance areas with overlap were regulatory compliance, vendor management alignment, and security.

Infrastructure was a different story. “Cisco and Linksys realized that by using Cisco’s infrastructure, Linksys would scale to the next level of business performance and position itself to become a \$1 billion company.” The Cisco team discovered numerous infrastructure areas that could be integrated for financial or operational benefits, including:

- The global IP network
- IP telephony and voicemail

- Contact center
- Productivity applications such as e-mail, Active Directory, printing, meeting scheduling, and file sharing
- Data center space
- Core software set on desktop PCs, so that Linksys could take advantage of Cisco software licensing agreements
- The enterprise monitoring system used for monitoring network devices, production applications, and servers, which Linksys could use for reporting, trending, pushing configurations, and automated page and e-mail notifications
- Cisco Enterprise Print System

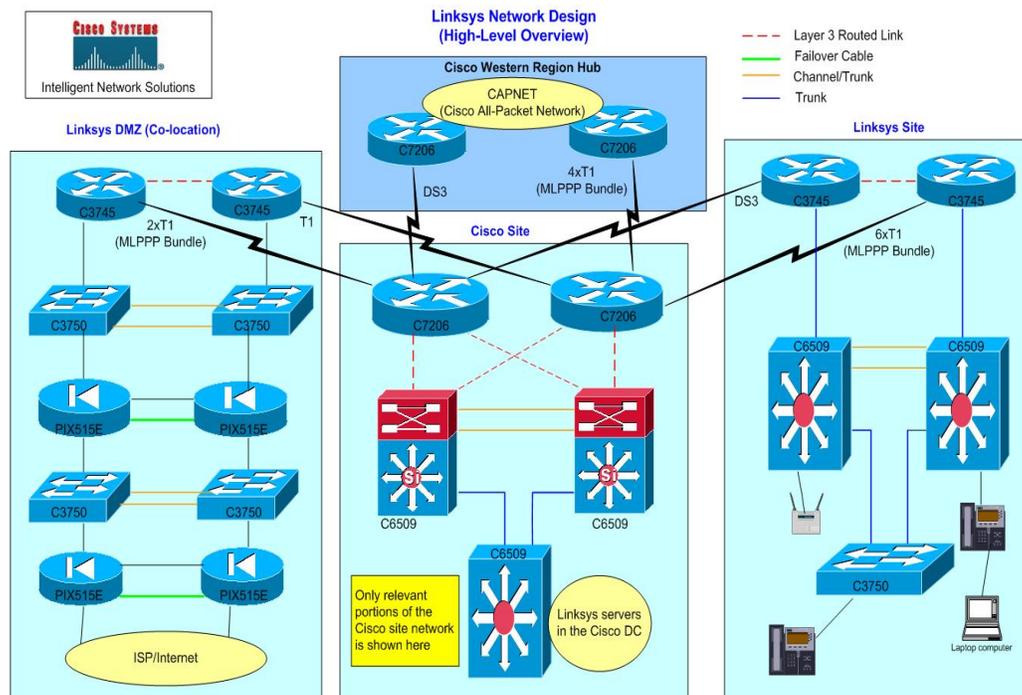
After identifying the areas to integrate, Cisco IT assigned employees to serve as leads for integrating the core network, telephony, client computing, productivity, HR, and finance. Because Linksys would remain a separate legal and financial entity, Cisco IT would charge back for certain IT infrastructure and services.

- Network Infrastructure Integration
- Connecting the Data Center

At the time of acquisition, the Linksys data center in the company's Irvine, California headquarters building lacked the space, power backup, and environmental controls for expansion. Rather than build a new data center, Linksys and Cisco decided to use space in an existing Cisco data center located eight miles away. To connect the two sites, Sanjay Singh, Cisco network engineer for Intelligent Network Solutions, proposed a DS-3 circuit with six T1s as backup. "Normally, Cisco connects all western region sites directly to our Redwood City, California IDC hub and doesn't daisy-chain sites like this," says Singh. "But in this case, the cost savings were significant." A DS-3 connection from Irvine to the local data center would cost just \$3000 a month, plus \$1000 for the backup T1 lines, compared to \$17,000 for a direct connection to Redwood City. The DS-3 connection provides high-speed access to the Linksys servers in Cisco's Irvine data center and also routes Linksys traffic to the Cisco intranet and Internet point of presence.

Linksys Network

Linksys previously relied on hubs for desktop and server connectivity. To increase performance and resiliency, Cisco IT replaced these with two Cisco Catalyst® 6500 Series switches with Layer 3 switching engines, each with dual supervisor modules and power supplies (Figure 2). Two Cisco 3745 multiservice access routers serve as WAN gateways, terminating the DS-3 and T1 connections to the Cisco Irvine data center. To provide access to network devices via their console ports, Cisco IT uses a Cisco 2621XM multiservice router for out-of-band access.

Figure 2. Linksys Network

IP Telephony and Video

Linksys headquarters employees enjoy full use of the IP telephony features of the Cisco CallManager cluster and a centralized voicemail server at the Cisco Irvine data center, accessing them over the DS-3 link via a Cisco Catalyst 6500 Series switch. A Cisco Communications Media Module (CMM) in the Cisco Catalyst 6500 switch provides Primary Rate Interface (PRI) termination, Foreign Exchange Office (FXO) ports for backup to the public switched telephone network (PSTN), transcoding for voice conferencing, and Survivable Remote Site Telephony (SRST). With SRST, if the primary and backup links to the data center become unavailable, all IP telephony devices at the Linksys site fall back and register with the Cisco Catalyst 6500 CMM, which assumes control of call processing. Once the links to the Cisco data center are restored, all IP telephony devices re-register with the Cisco CallManager system, which resumes control of call processing. "Because Linksys required phones in the warehouse, we extended the network to the warehouse using a Cisco Catalyst 3750 Series 48-port inline power switch," Singh explains. "Now warehouse employees can use Cisco IP phones and access the network."

To ensure that time-sensitive voice and video traffic receive higher priority than data traffic, Cisco IT used the Quality of Service (QoS) features in Cisco IOS® Software, such as class-based weighted fair queueing (CBWFQ). Cisco IT also enabled multicast end-to-end at Linksys, enabling Linksys employees to watch real-time video of company meetings and live training from their desktops.

Securing the DMZ

Linksys provides access to its Internet site, linksys.com, through 22 front-end Internet servers housed in several racks at a carrier's co-location site two miles from headquarters. While the previous Linksys DMZ was secure by most companies' standards, it lacked redundancy and was therefore vulnerable to a single point of failure. "If a hub died, customers would be unable to access linksys.com," says Singh. He increased security and availability by redesigning the DMZ network with complete redundancy, adding Cisco PIX® security appliances, replacing the existing hubs with Cisco Catalyst 3750 Series switches, and replacing an existing load balancer with Cisco Local Director. "Now the DMZ is more secure and delivers better performance," Singh reports. Because the co-location facility blocks cell phone signals, Singh also installed a Cisco IP phone as a convenience for Linksys administrators or engineers who

might need assistance.

The front-end Internet servers connect via three T1 lines to 10 back-end servers at the Cisco Irvine data center. “We replaced the hub connecting the back-end servers with a Cisco Catalyst 6500 Series switch, which provides faster performance, greater security, and redundancy—and allows us to deploy new features in the Cisco IOS Software,” says Singh.

Wireless Connectivity

Linksys wanted a wireless network at its headquarters because each cubicle has only one physical cable drop, and conference rooms have just two or three. “If 10 people are attending a meeting, they might all want to connect at some point, so wireless is the answer,” says Singh. Now Cisco Aironet® 1200 Series access points provide wireless connectivity. Employees can use their wireless devices and Cisco 7920 Wireless IP Phones anywhere in the building, and guests have limited access using the Cisco Guest Wireless Hotspots. For a case study on Cisco guest wireless hotspots, see http://www.cisco.com/web/about/ciscoitwork/mobility/guest_networking.html. In the future, Linksys plans to use wireless scanning devices in the warehouse to increase logistics accuracy and improve employee productivity.

Integrating the Linksys Contact Center

The Linksys contact center serves 40,000 callers each day, routing nearly all callers to three outsourced service providers in India and the Philippines. The Indian outsourcers have domestic points of presence. Previously, Linksys paid US\$10,000 monthly for each of two International Private Line (IPL) E1 circuits from Irvine to Manila. Singh eliminated this expense by providing the partner with access to the Cisco extranet hub in Singapore. Now, traffic travels from the hub to San Jose across the Cisco All-Packet Network (CAPnet), a high-speed backbone that supports voice, video, and data. For a case study on the Linksys contact center integration, see http://www.cisco.com/web/about/ciscoitwork/unified_comm/ip_contact_center_call_control.html.

Partner Access

Linksys partners that previously accessed the corporate extranet directly can now connect through Cisco extranet hubs in San Jose and Singapore for redundancy, improved security, and standardized support. Cisco IT worked with the partners to install new circuits into the Cisco extranet hubs to accommodate the additional volume.

RESULTS

Integrating the Linksys network with the Cisco global IP network is widely regarded as a complete success. Linksys experiences higher network performance, greater security, and increased capabilities—all at lower cost. What’s more, the Linksys division has acquired the infrastructure it needs to achieve its most ambitious growth plans. For even greater synergy, Cisco plans to integrate HR and certain other functions more closely than originally planned. “The pendulum can swing between two extremes: ‘Leave us alone’ and ‘Assimilate us completely,’” says Merrifield. “Working out the optimum balance is an ongoing process.”

LESSONS LEARNED

One year after the Linksys integration, the Cisco IT acquisition integration team revisited facts and assumptions and evaluated the success of different aspects of the integration. “Processes and procedures address known items,” says Merrifield. “A strong relationship between the two organizations enables us to jointly respond to unforeseen challenges.”

Be Aware of Each Other’s Vendor Relationships

Cisco and Linksys are working to more closely coordinate their vendor relationships—with support services providers, for example—to prevent replication and avoid upsetting existing relationships. “In the end, it comes down to governance,” says Merrifield. “How do you maintain a relationship with a unique entity like Linksys so that the entity

gets the benefits of a certain amount of independence—agility, quick response, and speed of implementation—as well as the benefits that Cisco provides in terms of services and scalability?”

Fully Understand Governance Issues

After the integration, new issues arose relating to governance, relationships, and the boundaries of what divisions can do without coordinating with the parent. Cisco HR continues to review its approach to running multiple compensation strategies in the same state and managing relationships with multiple payroll entities. Merrifield recommends a thorough discovery process to uncover these issues as early as possible. When integrating new divisions, Cisco IT will provide more explicit guidelines pertaining to IT-related issues such as software procurement, licensing policies, and when it is appropriate for the division to make its own vendor contracts. The goal: to ensure that the company as a whole optimizes its supplier leverage, hardware procurement, and compliance, especially around Sarbanes-Oxley and data privacy.

Fully Integrate New Employees into the HR System

Cisco adds all new employees into its PeopleSoft HR system, which automatically integrates them into every application and business process flow throughout the company. Linksys employees use other applications and a different business flow, so the team opted for a selective HR integration to support the appropriate IT systems and business processes. In hindsight, while the selective approach yielded short-term benefits, it is contributing to longer-term challenges. Therefore, Cisco is re-evaluating the appropriate level of HR integration for the next division it acquires.

NEXT STEPS

When Cisco acquires other companies at the division level, the acquisition integration team will again apply the selective integration approach piloted during the Linksys acquisition. That is, Cisco will pursue opportunities for integration that create value, synergy, cost savings, and productivity, while leaving the other areas intact. “We’ll be especially receptive to types of integration that improve stability and growth capacity,” says Merrifield. “As we integrate other divisions, we’ll foster a team approach and remain receptive to brainstorming to find new areas of leverage, opportunity, and partnership.”

FOR MORE INFORMATION

To read the entire case study or for additional Cisco IT case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT www.cisco.com/go/ciscoit

NOTE

This publication describes how Cisco has benefited from the deployment of its own products. Many factors may have contributed to the results and benefits described; Cisco does not guarantee comparable results elsewhere.

CISCO PROVIDES THIS PUBLICATION AS IS WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Some jurisdictions do not allow disclaimer of express or implied warranties, therefore this disclaimer may not apply to you.



Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Europe Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: +31 0 800 020 0791
Fax: +31 0 20 357 1100

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

©2007 Cisco Systems, Inc. All rights reserved. CCVP, the Cisco logo, and the Cisco Square Bridge logo are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn is a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, Follow Me Browsing, FormShare, GigaDrive, HomeLink, Internet Quotient, IOS, iPhone, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networking Academy, Network Registrar, Packet, PIX, ProConnect, ScriptShare, SMARTnet, StackWise, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0705R)