



# Technology Insider

A Quarterly Digest for Technology Professionals

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## Welcome to a New Quarterly Digest from KPMG *Technology Insider*

Every day, technology industry professionals turn to KPMG's *Technology Insider* to help them stay up to speed with the latest news, insights, and analysis affecting the Technology industry. Here's another way to help you remain current with critical industry issues—our *Technology Insider* Quarterly Digest brings you timely information about industry trends as well as select key articles from KPMG partners and professionals. And like KPMG *Technology Insider*, our Quarterly Digest comes to you at no charge.

We believe our new Digest will provide yet another way to gain in-depth perspective on key industry issues and emerging trends. And find inside insights. In time.

I would appreciate any feedback you may have for *Technology Insider* and our new Quarterly Digest.

Sincerely,

**Gary Matuszak**  
Partner, KPMG LLP  
Global Chair, Information, Communications & Entertainment



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# Special Industry Report

## Emerging Technologies

In mid-March, Intel released a more efficient chip design known as the Core micro-architecture, which the company is already deploying in desktop, mobile, and mainstream server applications. Intel said the new processors would feature lower energy usage and improved performance. Two days earlier, AMD had unveiled new, faster models in its Opteron family of server chips that AMD said were 4 percent to 15 percent faster than current products without consuming more power.

IBM, Sony, and Toshiba said in mid-January they would renew a five-year partnership that resulted in the Cell microprocessor used in Sony's PlayStation 3 gaming console. The companies, which invested \$400 million in the collaboration, plan to develop chip technology for televisions, audio equipment, and video games. In February, IBM introduced a line of blade servers based on the Cell processor. IBM said the processor was suited for customers interested in demanding and graphics-intensive applications.

Several large electronics firms decided in late March to use a new generation of Bluetooth<sup>1</sup> wireless technology to send high-quality video between home devices. The Bluetooth Special Interest Group (SIG) and the WiMedia Alliance<sup>2</sup> said the new devices, expected to reach the market by 2008, would use ultra-wideband radio technology to enable connections of 100 megabits per second by using an unlicensed radio spectrum above 6 GHz.

A group of companies, including Intel, Modeo, Motorola, Nokia, and Texas Instruments, said in late January they had formed the Mobile DTV Alliance, a collaboration designed to promote open standards for TV broadcasts to wireless handsets. The alliance said most leading U.S. markets are expected to have a digital video broadcasting-handheld (DVB-H) infrastructure within the next year.

"Companies are focused on combining the functions of different devices and improving communication between the devices," says Wade Loo, an audit partner in KPMG LLP's Silicon Valley office, and KPMG's Electronics Industry Leader. "Ease of accessibility and ease of use are becoming critically important features for devices, and driving a lot of the industry's innovation and product R&D."

Cingular Wireless said in early January that Lenovo would embed links for a high-speed wireless data service in laptop computers scheduled to reach the market during the second quarter.

Motorola revealed plans in early January for its iRadio subscription music service that would allow U.S. consumers to download digital music files that can be played over wireless handsets or streamed through a car's audio system. It is expected that the service will be sold through an unspecified wireless carrier later this year.

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<sup>1</sup> Bluetooth is named for the tenth-century king of Denmark who convinced warring parties to negotiate with each other. Bluetooth technology allows different devices to talk to each other.

<sup>2</sup> A group that drives the standardization and adoption of ultra-wideband (UWB) for high-speed wireless, multimedia-capable, personal area connectivity.

At the CeBIT trade show in early March, Microsoft unveiled a paperback-sized portable computer the firm hoped would fit a market niche between laptops and wireless handsets. The so-called ultra-mobile devices, formerly known by the code name “origami,” weigh less than two pounds and feature a seven-inch touch screen.

Microsoft in mid-February said it planned a June launch for Windows Live OneCare, a subscription-based security service aimed at consumers that would include anti-virus, firewall, and anti-spyware software along with backup and maintenance tools.

In early March, Oracle announced the release of search software designed for private or corporate networks. The company’s Secure Enterprise Search is aimed at helping companies search through databases, e-mail systems, and other information sources.

## Globalization

Intel said in late February it would invest \$300 million to build a factory in Vietnam to package and test microchips for personal computers and mobile phones. Intel said production would begin in the Ho Chi Minh City plant in late 2007. The company also has an option to build a second phase at the facility’s site, but said nothing would be decided before 2008.

Google said in late January that it would block politically sensitive terms on its new China-based search site in return for access to that nation’s growing Internet market. The move matched voluntary concessions made by a number of domestic and international Internet firms, such as Sohu.com and Baidu.com, along with sites operated by Yahoo and Microsoft.

Unisys said in mid-March it would launch a global sourcing center in Shanghai to provide software development as well as technology and business process outsourcing services. The company said it planned to employ about 1,000 people in China over the next three years.

“Technology companies have long been investing overseas for manufacturing,” says Gary Matuszak, global chair of KPMG’s Information, Communications & Entertainment line of business. “Now more and more of these countries are emerging as research and development centers, as well as attractive markets in their own right.”

Oracle said in early January that it would raise its headcount in India from 8,600 to 10,000 people during 2006, and expand its operations presence in the country from 6 cities to 15. Oracle said it has been active in India for 19 years.

Dell said in late January it would open a fourth call center in India and was scouting for a manufacturing plant site. Dell, which employs more than 10,000 call-center workers and software developers in India, hoped the plant would help develop local market demand for PCs.

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Nortel Networks said in late March it hoped to make services a larger percentage of its revenue mix by simplifying its offerings and focusing on integration, security, managed services, and maintenance. Nortel also said it had signed a five-year deal to provide call-center services for Bharti Tele-Ventures, India's largest mobile phone operator, and set up a customer service center in Buenos Aires designed to help operators design and support their networks.

## Legal

In late March the European Commission announced it had written to Microsoft to express concerns that the company's upcoming Windows Vista operating system might include new search or document formats that could impede competition. Microsoft said its product development efforts respected all laws and competition standards.

South Korea's Fair Trade Commission said in mid-February it had not decided whether Intel broke antitrust regulations with its chip-marketing practices in South Korea. The agency was also investigating similar charges against Samsung and LG.

Microsoft said in late March it had appealed a South Korean ruling that the firm should unbundle its media player and messaging service from the Windows operating system. In December, the Korea Fair Trade Commission ordered Microsoft to make the separation or allow rival products to be embedded in the operating system.

In mid-March the U.S. Department of Justice scaled back a request for Google search records for a study on Internet child pornography. Google had resisted the government's efforts to obtain a random sample of search terms and Web sites in the company's databases, arguing that turning over the information could compromise customer privacy and Google trade secrets.

South Korea said in mid-March it wanted to meet with Japan to trigger World Trade Organization arbitration in a tariff dispute over DRAM (dynamic random access memory) chip exports by Hynix Semiconductor. Japan had imposed a 27 percent duty on DRAM chip imports from Hynix.

In late March three Samsung executives agreed to plead guilty and serve jail time following a U.S. government investigation into allegations of price-fixing in the memory chip sector. The three executives each agreed to jail terms of between seven and eight months, and each will pay a fine of \$250,000, according to the U.S. Justice Department.

Qualcomm said in late March it had filed a patent infringement lawsuit against Broadcom over the W-CDMA high-speed wireless standard. The suit marked Qualcomm's third intellectual property claim against Broadcom. For its part, Broadcom has also sued Qualcomm in the United States and asked the European Commission to investigate Qualcomm's pricing practices.

Elpida Memory agreed in late January to plead guilty and pay a fine of \$84 million for conspiring to fix prices in the memory chip market, according to the U.S. Justice Department. Elpida was charged with attempting to fix the prices of DRAM chips between 1999 and 2002.

In late March, France's lower house of parliament passed a law designed to force Apple to open its iTunes store to portable music players other than the company's iPod. French officials said the law, which would require online music retailers to ensure interoperability by sharing DRM source code, is aimed at preventing any media-playing software from capturing the online music market. In response, Apple said the law would lead to increased music piracy.

Gateway said in early March it had agreed to pay Hewlett-Packard \$47 million to settle patent litigation between the two PC firms. The settlement included three federal court lawsuits and International Trade Commission investigations as well as a state court suit. The patents in question covered a range of functions, such as power management, cursor control, keyboard functions, and peripheral interfaces.

### **Market Conditions and Strategy**

In late March, Microsoft said it would delay the release of the consumer editions of Vista, its upcoming update to the Windows operating system, until early 2007. Microsoft plans to launch a corporate version of Vista in November, but analysts expect a slow uptake of the new OS among cautious enterprise users.

Samsung said in late March it expected flash memory chip prices to stabilize at the end of the second quarter, citing recovering demand for chips used in MP3 music players and digital cameras. Sales of portable consumer gadgets slowed in the first quarter, but Samsung expected demand for high-end mobile phones to join portable music players in leading the recovery.

Toshiba and SanDisk said in early March they would jointly spend about \$4.3 billion to build a new flash memory plant in Japan. Construction of the plant in western Japan was scheduled to begin by the end of the year, with production starting in 2007.

Samsung Electronics said in mid-March it planned to invest \$1.2 billion to expand its DRAM and flash memory chip lines to boost capacity and improve profitability. The company said the upgrade was needed to meet strong market demand for the memory chips.

"Consumers are hungry for portable communications and entertainment devices, and that's fueling strong demand for memory chips," said KPMG's Matuszak. "Chip makers are making the needed capital investments to keep pace with the demand."

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Security challenges are becoming more complicated because, in many ways, they're becoming more customized or personalized.

The Symantec Internet Security Threat Report, Volume IX, March 2006, said cyber-criminals were shifting their hacking efforts toward more targeted attacks designed to steal personal and financial information. Symantec also said hackers were reducing attacks on firewalls and routers toward desktop and Web applications. Scams such as "phishing"<sup>3</sup> attacks designed to obtain confidential identity and financial information continued to increase during the second half of 2005.

"Security challenges are becoming more complicated because, in many ways, they're becoming more customized or personalized," Matuszak says. "Hackers are increasingly launching attacks at specific organizations or users with the motivation of financial gain, instead of the vandalism-type attacks that security vendors have long contended with."

Sony said in mid-March it would delay the scheduled release of its new PlayStation 3 video game console from the spring until early November, saying copy-protection technology associated with the Blu-ray disc (a next-generation optical disc format) was not ready. The PS3 is expected to cost about \$500.

Research firm Gartner said in January that global shipments of personal computers rose more than 15 percent in 2005. Worldwide sales of PCs rose to 219 million units in 2005, up from 190 million in 2004. Dell extended its PC sales lead over Hewlett-Packard, and Europe, the Middle East, and Africa emerged as the largest regional PC market thanks to 17 percent growth to 73 million units. The United States grew 7.5 percent to 67 million units.

In late March the Semiconductor Equipment Association of Japan said orders for Japanese chip-making equipment rose 74 percent in February from a year earlier, the biggest gain posted in the past 20 months. February orders came to \$1.25 billion, and were nearly 7 percent higher than those in January 2006. Orders have risen among chip equipment makers for the past several months because upturns in the semiconductor market have led to higher utilization rates at chip plants.

IBM and Cognos said in mid-March they would collaborate on services-oriented software. The agreement called for IBM to increase its Cognos consultant capabilities, and for Cognos to enhance its business intelligence products for IBM hardware, software, and services. The deal also added Cognos to IBM's list of priority partners.

U.S. consumer electronics sales are expected to grow 8 percent to \$135.4 billion in 2006, according to the Consumer Electronics Association. CEA said most of the industry's growth would come from hot sellers, including wireless devices, flat panel displays, digital music players, and gaming consoles.

<sup>3</sup>Phishing is an attempt to fraudulently acquire sensitive information by masquerading as a trustworthy person or business in an apparently official electronic communication, such as e-mail or instant messaging.

Several major Japanese electronics companies announced plans in mid-January to make investments designed to help them meet continuing demand for their products. Sharp plans to spend about \$1.75 billion to boost output at a liquid crystal display (LCD) plant under construction in western Japan. Matsushita said it would invest about \$1.6 billion to build the world's largest factory for plasma displays, and Fujitsu said it would invest about \$1 billion to build a new semiconductor factory.

Cisco Systems said in mid-January that it planned to move into the consumer electronics market by selling phones, radios, and home theater equipment with the ability to connect to the Internet.

Sanyo said in late March that it planned to spin off its semiconductor division in July. Sanyo said the unit would be more competitive as an independent entity and would be able to raise capital in a public offering. The unit was ranked 26th in the global semiconductor market in 2005, with sales of about \$200 million, but has strong technology in analog-to-digital signal conversion chips.

## Mergers and Acquisitions

Communications equipment maker Alcatel announced in early April it had reached a \$13.4 billion agreement to buy Lucent Technologies. The combined company, to be headquartered in Paris, will have annual sales of \$25 billion, slightly more than rival Cisco Systems. Alcatel said the combined company could save more than \$1.7 billion in costs over the first two years after the deal closes.

Richard Hanley, Global Electronics, Software & Services leader in KPMG's Transaction Services practice, says companies in several technology sectors appear to be refocusing their efforts on areas where they can demonstrate technical or market leadership and benefit from increased economies of scale.

"Consolidation has been common among software companies for the past several years as a way to jump-start revenue growth and take account of software buyers' decisions to consolidate vendors. Now we're starting to see similar transactions among semiconductor companies, equipment suppliers, and other firms as pressures increase to improve profitability," Hanley says. "As the technology sector recovers from the 2001 downturn, companies are identifying the areas they feel strongest in, and shedding any lagging technologies or operating units."

Cisco Systems said in late February that it had completed its \$5.1 billion acquisition of set-top box maker Scientific-Atlanta. The deal was designed to move Cisco further into the home market as cable, satellite, and telecommunications companies compete to be a one-stop shop for consumers' telephone, video, and Internet services.

Texas Instruments said in early January it planned to sell its sensors and controls business to private-equity firm Bain Capital LLC for \$3 billion, to focus on chips for mobile phones and consumer electronics. The division, which reported revenue of just

Consolidation has been common among software companies for the past several years as a way to jump-start revenue growth and take account of software buyers' decisions to consolidate vendors.

more than \$1 billion in 2004, produces switches and sensors for vehicle transmissions and thermostats and other items.

Micron Technology said in mid-March it would buy Lexar Media for about \$675 million in stock to help expand in the flash memory chip market. Micron said the acquisition of Lexar would strengthen its position in the market for NAND flash memory and help it reduce its reliance on the volatile market for DRAM chips.

Oracle CEO Larry Ellison told an investor conference in mid-February that the company remained interested in targeting business intelligence software and middleware companies as part of an aggressive acquisition strategy. Over the last two years, Oracle has spent about \$19 billion acquiring rivals.

Dell said in late March it had agreed to buy Alienware as part of its efforts to move into more profitable, high-end gaming computers. Terms of the transaction weren't disclosed. Dell said Alienware would operate as a separate company and retain its own product development and technical support staffs.

Sony said in late February that it would sell five non-core businesses to a unit of Nikko Cordial Group for \$470 million. The businesses involved a range of retail activities, including the sale of imported goods, mail order, cosmetics, and restaurants.

Facial-recognition software provider Viisage Technology said in early January that it would merge with security software firm Identix in a deal worth about \$770 million.

Imation, a maker of data storage equipment and media, said in mid-January that it would acquire storage provider Memorex International for \$330 million in cash, plus future payments of up to \$45 million.

BMC Software said in late March it had agreed to buy Israeli application resolution software firm Identify Software for about \$150 million. BMC said the purchase would extend the company's presence in the transaction-management market.

Motorola said in mid-January that it would buy Swedish set-top box maker Kreatel Communications to meet growing demand for technologies associated with Internet protocol-based television services. Financial terms were not disclosed.

## Semiconductor Firms Seeing Signs of Consolidation

**By Dave Pelland, Managing Editor, KPMG *Technology Insider***

*March 29, 2006*

The semiconductor industry, long known for making its products ever smaller, may be about to do some shrinking of its own.

Due to the amount of capital spending needed to keep pace with the latest chip-fabrication technologies and shifts in the customer base, semiconductor producers may be prompted to consolidate.

“We’re seeing the broadline companies that [have] tried to be everything for everyone trim off the segments of their business that are underperforming,” says Doug Freedman, senior analyst with American Technology Research. “Some of the companies that have found explosive growth in some [industry markets] find it hard to continue to invest in slower-growth businesses.”

Chip makers are teaming up, through either mergers or joint ventures, or leaving the sector in the face of several challenges. These include the need to invest billions to update fabrication facilities and upgrade to a new generation of larger wafers; a shift from traditional PC-and-server products to more volatile consumer markets; and consolidation among telecom carriers and equipment providers that has reduced demand.

M&A expectations accelerated in December when Royal Philips Electronics announced plans to spin off its semiconductor operation. Frans van Houten, the unit’s chief executive, says the company expected to see considerable consolidation among semiconductor manufacturers over the next five years.

Late last year, Avago Technologies was formed when Aglient, itself a 1999 spinoff from Hewlett-Packard, sold its semiconductor operations to two private equity firms.

Similarly, Freescale Semiconductor was spun off from parent Motorola in July 2004. A year earlier, Hitachi and Mitsubishi Electric merged their semiconductor operations to form Renesas Technology.

The increasing cost of constructing new chip-fabrication facilities, or “fabs,” is a major factor in possible industry consolidation. According to the Semiconductor Industry Association (SIA), the average cost of a new memory fab is more than \$3 billion, while fabs for logic chips (which process specific instructions) cost more than \$1 billion.

“The sheer cost of constructing new manufacturing facilities is increasing at a very strong rate,” says Ron Steger, a partner in KPMG’s Information, Communications & Entertainment practice. “To access the latest in manufacturing technologies, competitors are forced to team up or, as an alternative, pursue M&A activity.”

Other examples of manufacturers teaming up on new fabs include Freescale, Philips, and STMicroelectronics sharing a research facility in Crolles, France, and Hitachi, Toshiba, and Renesas announcing plans in January to build a joint chip-making facility in Japan.

The increasing cost of constructing new chip-fabrication facilities is a major factor in possible industry consolidation.

Chip makers are shifting their focus from enterprise customers toward sophisticated consumer products.

Another factor in consolidation trends is the transition to larger blank silicon wafers from which semiconductor companies make integrated circuits. The industry is making a generational shift from 200-millimeter wafers, about eight inches in diameter, to 300-millimeter wafers, which are about a foot wide.

Because the wider wafers have a larger surface area, the shift to 300 millimeters will improve the overall efficiency of chip production, but will require a substantial capital investment that many companies may not be willing to make.

“In the memory space, you need to spend a lot of money to develop a new technology or partner to license a new technology,” says American Technology Research’s Freedman. “The memory market is undergoing a major transition right now [in which] there are few people spending the money to develop new memory technologies.”

In addition, the size of the transistors and other features within the chips is shrinking. Intel, Texas Instruments, and Xilinx have all started mass production of 65-nanometer chips, and Intel has announced plans to enter large-scale production of 45-nanometer chips next year.

As with larger wafers, the smaller components mean additional functions can be installed on faster chips, but to capture that efficiency, chip makers have to make considerable R&D investments and retool fabs.

Industry consolidation among major customers such as PC and handset makers may also prompt the semiconductor industry to shrink. For instance, as wireless carriers merge, the potential customer base available to support the chip makers’ infrastructure and technology investments is reduced.

Some semiconductor firms also may be tempted to place themselves or specific operating units for sale because chip makers are riding the upper curve of the industry’s traditional boom-and-bust cycle. According to SIA, global chip sales reached a record \$228 billion in 2005, a 6.8 percent increase over 2004’s sales.

“If you look at the historic metrics that drive the industry, gross margins are at the historical peak of the cycle, with several manufacturers reaching 60 percent,” says KPMG’s Steger. “In an industry as volatile as semiconductors, once a peak is achieved historically, it will most likely be followed by a downturn.”

In addition, the chip makers are shifting their customer focus from enterprise customers—with relatively stable demand for servers, desktops, and notebook PCs—toward consumer products such as sophisticated wireless handsets, flat-panel televisions, and digital music players.

The consumer products arena gives semiconductor suppliers a larger number of potential users, but exposes the industry to volatile markets in which the products turn over more rapidly.

“Not only is the technology more expensive to develop, [but] you have to get to the next level of technology in a much shorter time frame,” Steger says. “Companies will either partner to get to that technology, or it will lead companies to merge to pool their resources.”

Despite the volatility, chip makers with expertise in the wireless market in particular are likely to remain in demand among potential partners and investors, says Doug Andrey, principal industry analyst for SIA.

“Generally, anything related to wireless is attractive,” Andrey says. “We’re going to a new generation of wireless technologies around the world, and that leads to a lot of opportunities for new companies. Right now, there’s no opportunity for a startup in the traditional PC space, traditional microprocessors or DRAM [memory chips].”

## Converged Devices Bringing Electronics, Content Producers Together

*January 13, 2006*

As personal computers and entertainment devices integrate each other's functions, the companies that produce microprocessors and other electronic components are collaborating with service providers and content producers on the design of converged products.

"We're seeing a lot of cooperation between companies that in the past never spoke to each other," said Rudy Provoost, chief executive of Philips's consumer electronics division, at the International Consumer Electronics Show in Las Vegas. "Customers want seamless interaction when they're using these products, and that's where we need to come together."

Consumer electronics are presenting lucrative opportunities for technology companies, and instead of concentrating solely on marketing technical improvements to business customers, chip makers are collaborating with companies outside their business on consumer-focused products.

Revenue from traditional PCs is essentially flat because falling prices have largely offset sales growth. Technology companies hope sales of consumer electronics products will play a more important—and more profitable—role in their success.

"Semiconductor companies have to prime the pump with reference designs and finished systems," said Tim Bajarin, president of research firm Creative Strategies. "The old days of being a chip maker and handing finished products to [PC manufacturers] are not here anymore. Semiconductor companies are in a different role today."

Demand for electronics products shows little sign of abating. According to the Consumer Electronics Association, global factory sales of consumer electronics reached an estimated \$126 billion in 2005, up from \$113 billion in 2004 and \$102 billion in 2003.

Some of the hottest product categories include LCD and plasma TVs, which increased to a combined \$7.31 billion last year, compared with \$3.93 billion in 2004. Portable MP3 music players increased from \$1.3 billion in sales during 2004 to \$3.8 billion last year.

In contrast, the \$18.22 billion in factory sales of personal computers last year was a slight decrease from the \$18.23 billion recorded in 2004. The number of units increased from 20 million to 22.2 million, but the average price fell from \$912 in 2004 to \$820 last year.

The technology industry's shift from its traditional focus on business customers toward consumer electronics is also prompting chip makers while in the earliest design stages to evaluate how their products will be used. Paul Otellini, president and CEO of Intel Corp., said his company has abandoned its emphasis on ever-faster processors in favor of smaller dual-core processors that use less power and generate less heat.

Revenue from traditional PCs is essentially flat because falling prices have largely offset sales growth.

Otellini said Intel's consumer products initiative is being led by products using technology the company has named Viiv (which rhymes with five), which integrates a microprocessor, support chips, software, and entertainment content. The dual-core Viiv PCs are designed to be easy to use, with features such as surround sound, and can turn on instantly and distribute high-definition content to different screens in a home.

Intel has collaborated with more than 60 entertainment companies to develop content, such as sports clips and games, that will be formatted specifically to run on dual-core PCs.

"In our mind, it's not a battle between various devices, it's about making all of these devices work together in a very simple fashion," Otellini said.

And as wireless carriers include drives into advanced cell phones, storage manufacturers are working with carriers and handset makers to reduce the thickness and power requirements of one-inch hard drives, according to Fadi Afa Al-Refae, senior manager for business development in semiconductor producer Agere Systems's storage group.

"We're working on system-level design, instead of handing a [finished] drive to a handset manufacturer," he said.

Similarly, producers of PCs and components are shifting how they view prospective markets, according to Rob Pait, director of global consumer electronics marketing for storage manufacturer Seagate Technology LLC.

Instead of concentrating its research efforts on the hard drives it sells to computer manufacturers, Seagate has developed smaller capacity, portable drives with trendy designs that the company is marketing directly to consumers.

"We're serving a different group of customers than we did five years ago," Pait added. "Our customers are not just HP or Dell, but also consumers who want products and services that help them enjoy digital content."

Satjiv Chahil, senior vice president of Hewlett-Packard's personal systems group, said that because consumers want to connect devices to the Internet and to other devices, technology companies are looking for ways to make products easier to use.

For instance, Chahil said, laptops that display calendar information on a smaller screen embedded in the laptop's case. This second screen remains visible when the computer is closed and turned off. Likewise, some new laptops allow consumers to play DVDs without having to boot the computer's operating system.

Another factor driving companies in traditionally separate industries to work together is consumer demand for personalized entertainment such as on-demand television broadcasts or digital recordings that may or may not be watched on a TV screen.

"Behaviors that customers are adopting are changing the needs of service providers," said J.D. Zeeman, director of digital media worldwide for IBM Corp.

Consumers want to connect devices to the Internet and other gadgets, so technology companies want to make products easier to use.

But the shift toward consumer products carries a number of challenges. For example, a hard drive embedded in a cell phone or music player has to tolerate greater swings in temperature and movement than a drive sitting in a PC stored in an air-conditioned office, said Andrei Khurshudov, senior manager of reliability technology for Samsung Information Systems America.

Another challenge is bringing together a number of products without diluting each function or making a device too complicated for consumers.

“Just because you can put everything into one device doesn’t mean you should,” said David Edmondson, president and CEO of retailer RadioShack Corp. “There are a lot of products [that have been] optimized for specific behaviors. The problem with trying to converge everything is that you can wind up with a spork [a cross between a spoon and a fork].”

*Article written by Dave Pelland, Managing Editor, KPMG Technology Insider.*

# Telecom Consolidation Sharpens “Net Neutrality” Debate

March 21, 2006

Consolidation among telecommunications providers is raising concerns that some Internet service providers might use their market share to degrade competing services or favor content providers willing to pay for special treatment.

“If companies want to leverage their market power over the network and extend that to network performance based on content [it would be something] that’s never been done before,” said Paul Misener, vice president, global public policy for Amazon.com, at the Entertainment Technology Policy Summit sponsored by the Consumer Electronics Association. “If companies want to favor their own or affiliated content, that’s problematic.”

Proponents of so-called “open access” or “Net neutrality” principles say they are trying to uphold unwritten rules, in place since the early days of the Internet, that say all traffic will be treated equally and that routers will send data packets on a first-come, first-served basis along the most direct route.

But concern is rising that as network consolidation continues—most recently, when AT&T agreed in early March to purchase BellSouth—and routers are enabled to distinguish the source and content of data packets, some providers may send competing traffic or applications to the back of the queue.

For instance, carriers may block ports used by another company’s Internet phone service, or assign competing voice traffic or other applications a lower priority within the network. Similarly, providers could potentially enter into marketing arrangements with online retailers that call for traffic to one company to receive a higher priority within the network over a competing site.

And as personal computers play a larger role in coordinating digital entertainment content, some manufacturers are concerned that consumer connections may be restricted or degraded unless Web sites or services pay providers to allow such access.

“The power of the Internet has been that we didn’t distinguish among traffic, which is what has led to so much innovation,” said Paul Liao, vice president and chief technology officer of Matsushita Electric Corp. of America and president of Panasonic Technologies Co.

For instance, one of the factors that helped digital camera sales was the creation of Web sites that allowed people to order prints and share image files. Similarly, the ability to connect portable music players to PCs and the Internet is shifting business models in the recording industry.

Concerns about the possible dilution of Net neutrality increased last November when AT&T CEO, Edward Whitacre, was quoted as saying that it was unfair for Web firms such as the major search engines to use AT&T’s network without paying the provider, given the amount of traffic they generate.

Concern is rising that as network consolidation continues, some providers may hinder competing traffic or applications.

Reducing network capacity for competing applications may cause customer frustration.

Jonathan Banks, vice president—federal regulatory for BellSouth, says his company does not want to restrict the Internet. Instead, he says BellSouth is creating services that will promote greater consumer adoption of broadband access beyond the current 40 percent of wired households in the United States.

For instance, BellSouth is about to launch a pilot electronic health-monitoring service in Atlanta that will allow diabetics to test their blood glucose levels and send readings wirelessly to healthcare providers. He said the service is being designed to give outgoing medical data and any response from providers priority over routine data traffic, such as chat sessions or file sharing.

Banks said BellSouth is also interested in working with entertainment and software companies on cobranding initiatives in which payments from content providers would help reduce the cost of consumer access fees.

“If we can work out a way for the content and application providers to subsidize broadband access, that would be a definite win for my company and probably a win for the application provider,” Banks said.

John Godfrey, vice president of government and public affairs for Samsung Electronics, said that while prioritizing traffic for desirable services makes sense at first glance, reducing network capacity for other applications is likely to cause customer frustration.

“You may actually lose customers if the open part of the network gets throttled down,” Godfrey said.

Amazon’s Misener said allowing service providers to segregate network traffic would be bad public policy because many U.S. consumers live in markets with one or two broadband providers, and cannot find access alternatives easily if their provider starts favoring affiliated content.

“If consumers don’t have a choice, we can’t have providers determining what content they’re sending to consumers,” Misener said.

Net neutrality has also been folded into debate around efforts to update the Telecommunications Act of 1996, which was drafted when Internet use was primarily confined to academic and government researchers. Regulators and legislators are examining ways to incorporate the growing role that technology plays in communications into updated laws.

For instance, a Senate telecom reform bill would prohibit port-blocking or restricting consumer access to legal Web sites.

Similarly, Amy Levine, legislative counsel for Representative Rick Boucher (D-VA), said Congress is concerned that allowing providers to charge Web site owners to ensure consumers will have a faster connection to them than to competitors could lead to a “two-lane Internet” that would shut out emerging sites or services.

“There’s a concern that we can see a segregated Internet that’s nothing like the Internet that people have grown to rely upon,” Levine said.

But arguing against the need for regulation, Clyde Wayne Crews Jr., director of technology studies for the Competitive Enterprise Institute, said restricting the ability of providers to distinguish data packets could harm network performance by preventing them from identifying security threats before they can reach consumers.

BellSouth’s Banks said market forces are also preserving Net neutrality because carriers have a vested interest in attracting customers to high-quality access. For instance, he said, competition with cable companies has prompted DSL providers to reduce prices and increase access speeds over the past couple of years.

“We’re not going to get more people to sign up for broadband access if we’re degrading speeds or blocking sites or services,” Banks said.

*Article written by Dave Pelland, Managing Editor, KPMG Technology Insider.*

## New-Media Channels Demand a New Advertising Model

**By Kathleen Kiley, Managing Editor, KPMG Consumer Markets Insider**

*March 15, 2006*

Consumer product manufacturers face the daunting task of dealing with a dazzling array of new-media channels. They're finding out that refitting the message to the medium could be the right strategy.

The Internet, cell phones, portable music players, video on demand, and mobile television have emerged as viable alternatives to traditional print and broadcast media. The variety of new-media channels may provide huge opportunities for consumer products companies, but many are struggling to understand how to approach the ad marketplace—including the companies that are providing the new media.

"Advertisers like me struggle to find the right media mix," said Verizon Wireless chief marketing officer, John Stratton, at a recent *Advertising Age* conference.

"In the last few years, we've been playing 'incrementalism,' where we throw a few points of our [ad] spend at a variety of emerging channels, while the majority of advertising is spent on the [traditional] media plan."

What makes it more difficult is that there's no consensus about how much marketing consumers will tolerate on their cell phones, MP3 players, or even on Web sites.

"If [advertising] is entertaining, that helps," says Mark Galley, vice president, creative director of Modem Media in Norwalk, Connecticut. "But in the end, it has to be interactive and relative to the user."

Galley also sees fundamental weakness in how creative teams interact with each other—traditional broadcast and print teams aren't working closely with the advertising teams that handle online and new media, he says, even on the same account.

There's little doubt that new media is gaining a larger share of the public's attention as a distribution channel. Over 40 percent of American households have broadband Internet access, according to Parks Associates, and spend \$2.4 billion on Internet and on-demand services such as movies, music, and gambling. Parks Associates estimates the amount will reach \$9 billion by 2010.

Companies spent about \$189 billion on advertising in the United States in 2004 and it's projected to reach \$235 billion in 2010, according to Parks Associates. "Advertising is in a transitional period," says Harry Wang, research analyst at Parks Associates.

Some top consumer product advertisers are retrenching. Procter & Gamble Co., which had an advertising budget of \$3.2 billion in 2005, according to *Advertising Age* magazine, cut its TV ad budget 5 percent and its cable budget 25 percent in 2004, devoting more to Internet advertising.

As they rethink how to use new delivery channels, companies are grappling with how to revamp traditional messages, ranging from the 30-second TV spot to newspaper and radio advertising, Wang says.

Many consumer products companies are struggling to understand the new ad marketplace.

But there is an opportunity for those advertisers that can fashion their messages to fit the new distribution channels. The rewards can be immense: advertising tailored to individuals who are willing to absorb the messages.

New-media devices have a major advantage over traditional media devices: they can track customer demographics and report what each viewer is watching, listening to, or downloading.

“When creating the advertising, marketers need to be more creative,” said Bart Feder, CEO and president of the broadband technology consulting firm FeedRoom, at the recent Media Summit conference in New York. “Consumers will mind if the advertising is intrusive, but they won’t [mind] if the advertisement is something they want.”

For example, Verizon Wireless recently sponsored a free outdoor concert in Los Angeles featuring The Fugees, a hip-hop group. Verizon identified users who in the previous 30 days had downloaded Fugees songs and other hip-hop music over its wireless music service. More than 5,000 of these customers were sent a free “ticket” to the event.

Within an hour of sending out the message, the concert sold out, Verizon Wireless’s Stratton said. In addition, Verizon was able to promote music downloads from the concert—at \$1.99 per download—as well as its V Cast music service.

Galley’s Modem Media worked with Heineken on a similar promotion for a hip-hop concert. Heineken sent text messages to prospective concertgoers telling them how to redeem gifts at Heineken’s Web site. In another promotion, Heineken displayed in a 30-second TV commercial a Web site URL where consumers could download free music and pictures.

“We were trying to create an experience and bring consumers deeper in the brand,” Galley says.

Online video has also emerged as a new-media platform for advertisers. DaimlerChrysler division Jeep created an Internet “mini-series” as part of its promotion for the 2006 Jeep Commander. In addition to being broadcast on the Internet, MobiTV, which is delivering branded network and cable content for cell phones, has developed a separate “channel” to air the series. MobiTV says it has access to more than two billion mobile phone users.

“We license content from network and cable stations...we sometimes replace advertising with local advertising that is more relevant,” says Jason Taylor, a MobiTV spokesman.

For the time being, traditional media will still garner the lion’s share of ad revenue. And while emerging technology has been a disruptive force, traditional broadcast and print media own the content that provides a platform for advertising in the first place.

There is an opportunity for advertisers that can fashion their messages to fit new distribution channels.

“No other emerging media model can invest in building branded content [the way networks do],” said Mike Shaw, president of sales and marketing at television network ABC, at the Media Summit conference.

But that doesn’t mean television networks aren’t branching out. Walt Disney Co., which owns ABC, is offering televised programming over Apple Computer’s iTunes music store at \$1.99 per show, including the highly rated “Desperate Housewives.”

Other major networks are also making similar moves. CBS recently announced it would sell individual episodes of its popular “Survivor” reality television series for \$1.99 directly from its CBS Web site. This differs from ABC and other networks that are relying on other companies such as Google or Apple to distribute the service.

The ultimate advertising model for new-media distribution will take some time to shape up, whether that model is free content with ads, paid content without ads, or some combination. In the meantime, content owners may be well advised to resist using traditional ads, Galley says.

# Biometrics Manufacturers I.D. the Consumer Market

*February 3, 2006*

As biometric sensors shrink in size, use of the devices is extending from security and governmental settings to corporate users as well as consumer applications, such as automated teller machines (ATMs), computers, and mobile phones.

“There’s a strong emphasis by manufacturers to embed fingerprint sensors in devices like laptops, cell phones, and PDAs,” says Victor Lee, a consultant with International Biometric Group (IBG), a research and consulting firm. “More companies are incorporating swipe sensors into the bodies of their devices, so the sensor and the device are integrated as one unit.”

The use of biometric devices, which read unique physical characteristics such as fingerprints, voice, patterns in irises, or veins under palms, has been generally limited to government agencies as a way to control access at high-security locations.

But with the size and cost of the technology shrinking and competition growing in a saturated public-sector market, biometric device makers are targeting corporations and consumers as their next markets.

“The government is still the largest source of revenue for the biometrics industry, but with a lot of companies serving that market, there are limited opportunities in the government space,” Lee says. “The largest source for growth for the sector is the consumer market.”

According to IBG, global biometric sales are expected to be about \$2.1 billion in 2006. Fingerprint sensors represent nearly 44 percent of revenue, while facial recognition sensors total 19 percent.

One factor increasing the use of biometric readers is that they continually get smaller and less expensive. For instance, fingerprint sensors have shrunk from about an inch-and-a-half square to about the size of a pencil point, while the cost of a sensor and related software has fallen from \$40 five years ago to less than \$5 today, says Jim Burke, vice president of marketing communications for biometric sensor developer AuthenTec.

Burke says computer-related applications for biometric readers are growing rapidly, with most of the purchases aimed at corporate customers.

“In the past 18 months, we’ve seen a lot of growth in the PC market,” Burke says. “It started with enterprise users, and in the past four months it’s started to transition into consumer devices.”

Fingerprint sensors in computers can help manage passwords needed to access the device, specific files, or Web sites. A user registers his or her finger, commonly by swiping it three times across the sensor, and then software generates an algorithm based on the patterns in the live layer of skin beneath the finger’s surface.

Biometric device makers are targeting corporations and consumers as their next markets.

Consumers are demanding increased security as more people store sensitive business and personal information on portable devices.

Once the finger is registered, future swipes will result in a portion of the fingerprint being used to trigger the algorithm—not the fingerprint itself—that verifies the user’s identity. Once the user is authenticated, software passes along the appropriate password.

“The sensor replaces the need to remember 20 different passwords,” Burke says. “Any function that’s protected by a password can be replaced by a sensor.”

Because the user does not have to enter a password manually, using a biometric sensor enables the use of longer passwords that are harder to crack than shorter combinations.

Biometric password managers are available in a number of formats. Standalone sensors in the \$50 to \$60 range typically plug into a computer’s USB port, and sensors are being embedded into desktop keyboards and peripherals, such as mice, says Don Farnsworth, a product manager at American Power Conversion Corp., which sells a line of biometric password-management products.

“If [the sensor] is embedded in the mouse, that’s one less thing the user has to have on the desk,” Farnsworth says.

A growing number of high-end laptops also have embedded fingerprint readers. Such readers are expected to filter into mainstream consumer laptops over the next 12 to 18 months as the price falls and users seek additional security, Burke says.

Smaller biometric readers are also being installed in mobile phones sold in Asia. Phones with similar capabilities will be released in the United States later this year.

In addition to providing security, fingerprint sensors in cell phones can replace the five-way “rocker” switches used to control camera functions or games, similar to how most laptop functions can be performed with touchpads.

IBG’s Lee says that as more wireless phones and PDAs feature integrated cameras, facial-recognition software can help protect the devices against unauthorized access.

Consumers are demanding increased security, Lee adds, as more people store sensitive business and personal information on portable devices, which can make them attractive targets for industrial espionage or identity theft.

While fingerprint readers are making inroads into PC applications, biometric sensors that read vein patterns in the palm are being used at automated teller machines and to access hospital records in Japan, says Joel Hagberg, vice president of business development for Fujitsu Computer Products of America.

Fujitsu’s palm reader uses a near-infrared light signal to examine blood traveling through the veins within a user’s palm, forming a unique pattern that can be used for identification.

Hagberg says three Japanese banks have installed palm readers at ATMs to provide an additional form of identification, along with a PIN.

“It’s very hard to forge [a vein pattern], but it’s fairly easy at an ATM to pick up someone’s password or code,” Hagberg says. “The reader provides an added level of security.”

Palm readers are also being used in healthcare settings to restrict access to information systems that store medical records, Hagberg says. Palm readers attached to computers may be better suited for healthcare facilities than fingerprint sensors, because veins can be examined through a latex glove.

Japan has privacy laws similar to the U.S. Health Insurance Portability and Accountability Act (HIPAA), designed to protect unauthorized access to medical records, Hagberg says. Palm readers help restrict access to computers and servers being used to store patient information.

Financial institutions are also using palm readers to help authorize wire transfers. Hagberg says that several manufacturers will be releasing products with integrated palm readers in the United States this year.

AuthenTec’s Burke says privacy-related concerns about biometrics in a corporate setting are generally abated once users understand how the technology works. Because the software is using a fingerprint to generate a mathematical algorithm, people don’t have to worry about their fingerprints being stored on a computer.

Because some people may be concerned that fingerprints or other markers may be used for purposes other than passwords, IBG’s Lee says consumer or employee education can be an important part of a successful biometric implementation. Users should understand what information is being stored and how the company plans to use it.

“A lot of companies don’t have to capture the entire image of an iris, face, or fingerprint,” Lee says. “A portion of that image can be stored in a template, which does preserve a degree of privacy because the information only applies to that [company’s] particular use.”

In addition, as equipment manufacturers become more familiar with biometric readers, the desire to add security and convenience tends to outweigh privacy considerations.

“A few years ago, we would talk to customers and explain how biometrics works,” Burke says. “The argument has shifted from selling the concept to the best ways to integrate biometrics into devices.”

*Article written by Dave Pelland, Managing Editor, KPMG Technology Insider.*

## Wireless Carriers Launching Over-the-Air Music Stores

*January 20, 2006*

By the end of the year, at least three new services will deliver music wirelessly to capitalize on the ubiquity of cell phones as well as consumers' purported desire to reduce the number of gadgets they carry.

"Over time, we believe people will carry one device, and a phone will be [the] core device," said Microsoft CEO Steve Ballmer at a press conference announcing Verizon Wireless's new music service.

"The phone is the center of your personal life when you're on the go. In the long run, it's the phone that [becomes] a music player, not the music player that's also a phone," Ballmer said.

Dennis Strigl, president and CEO of Verizon Wireless, said the widespread use of cell phones makes them well suited for serving as music players.

"We're not offering a music service because we've built the capacity, we're offering it because people say they want it," he said. "Two hundred million Americans have cell phones, and most of them listen to music."

But it remains to be seen whether consumers are willing to scrap their portable music players and rely on their phones. In mid-January, Apple Computer CEO Steve Jobs said that the company has sold more than 42 million units of its iPod music player since 2002, and numerous companies are continuing to release dedicated music and video players.

Apple has declined to address speculation that the company is developing its own cell phone. In January 2006, Motorola discontinued the version of the Rokr mobile phone with an iTunes interface. That model, which was not a commercial success, restricted users to 100 song files, regardless of the device's storage capacity.

"The one-device story is convenient and compelling, but there's another camp that says music players are different," says Sanjaya Krishna, a senior manager in KPMG's Risk Advisory Services practice. "They prefer the superior fidelity of a dedicated music player and believe there's less choice when they're relying on the wireless carrier for music, so they don't mind carrying two devices."

According to research firm IDC, the market for music downloads over wireless phones, now in its infancy, could reach \$1.2 billion in the United States over the next three years. Wireless carriers hope the market will help offset cutthroat price competition in basic voice service.

"There is continuing downward price pressure on the cost of wireless minutes," says Krishna. "Essentially, wireless airtime is becoming commoditized. The carriers are looking for value-added services to boost revenue, and they see music as a high-growth area."

It remains to be seen whether consumers are willing to scrap their portable music players in favor of listening to tunes on their phones.

The carriers hope to build on the success of ringtones, which generated between \$300 million and \$500 million in U.S. sales in 2005, and to match the success of similar wireless music stores in Asia and Europe.

Following Sprint, Verizon Wireless in January became the second major U.S. wireless carrier to offer over-the-air music downloads with the launch of a music store. Subscribers of the \$15-per-month V Cast service can purchase full-length song files as well as streaming videos of news, music, and sports highlights.

For \$2, consumers can buy two copies of a song file—a smaller version formatted specifically to play on a wireless handset and a higher-quality copy intended to be played on a PC. They can also buy the PC-formatted versions for 99 cents, and the service allows consumers to transfer their personal music files to their handsets.

The carriers hope the convenience of over-the-air downloads, coupled with being able to store more of the smaller files on a handset, will convince consumers to purchase the dual downloads.

At the time of its launch, Verizon's service offered about 500,000 songs from major labels and independent artists, and the carrier expects to double that number over the next few months. The number of song files a consumer can store on a handset will be limited only by the device's memory.

Sprint unveiled an over-the-air music download service in late October. For \$2.50, users also receive dual copies of a song formatted to play on their handsets and computers. Sprint spokesman Aaron Radelet says the service offers about 300,000 music files in numerous genres.

In a slightly different approach, Motorola plans in October to launch its iRadio service with an undisclosed U.S. wireless carrier. The iRadio service will offer 435 commercial-free music channels as well as news, talk, and sports programming.

The user selects six favorite channels, and content from those channels is downloaded through the user's computer and cached on a cell phone. Users can then listen through earbuds or stream the content through a Bluetooth adapter to a car audio system.

"People will be able to transition their music easily from their mobile phone to their car," says LeSean Smith, senior product manager for Motorola.

Motorola says the service, which will cost about \$7 per month, is an affordable alternative to satellite radio programming, which costs about \$12 per month.

"Radio is about discovering music," Smith says. "The iPod is a different experience—it lets you take music with you, but when you want to find new music, most people rely on radio."

Users renew their music selections by connecting the phone to a computer, which will charge the battery and transfer additional songs to the phone.

Wireless carriers hope the music market will help offset cutthroat price competition in basic voice service.

“The capacity is limited only by the size of your [memory] card,” Smith says. “Most people will have between 10 and 70 hours of music, depending on their card and their mix of talk and music.”

The iRadio service will also let users store their own music on handsets and purchase new music files. If someone hears a song they’d like to learn more about or buy, they’ll be able to add the track to a “wish list” and download the song the next time they connect the phone to their computer.

KPMG’s Krishna says the wireless carriers see the music services being most popular among younger consumers, a view echoed by carriers.

“We see this as a mass market service,” says Verizon Wireless spokesman Jeffrey Nelson. “Most analysts see this serving the 18–34 [year old] market in its earliest adoption, and that’s clearly a focus for us.”

*Article written by Dave Pelland, Managing Editor, KPMG Technology Insider.*

# Network Equipment Gaining Data Fluency

January 4, 2006

To help improve data flow through their information systems and reduce networking costs, large companies are using software that helps routers and switches examine incoming traffic in order to prioritize the flow of data.

New technology known as application-oriented or application-fluent networking builds on metadata such as XML tags that specify the content of data within packets. Application-fluent networking increases efficiency, and potentially can reduce the constant pressure to add servers to increase capacity.

“Devices today are able to look deep into network traffic and make decisions,” said Alistair Croll, cofounder and vice president of product management for Coradiant, a maker of Web applications, at the Interop conference in New York. “Application patterns are changing, and the line between client and server is blending,” Croll said. “[Applications have] XML information that helps derive meaning from the data.”

For example, software can give data packets such as purchase orders higher priority than routine e-mail, or customer account balances can be automatically encrypted. Functions such as authentication and access authorization can be carried out by software embedded into a network’s switches and routers.

This approach is a shift from the traditional approach of segregating application from networking. It has been considered more efficient to have routers and switches examine the origins and destinations of data packets only, and to direct traffic “neutrally.”

But as network traffic grows exponentially, and more data packets contain identifying information such as XML data, industry observers say it makes more sense to have the equipment examine and prioritize network traffic.

“As more applications use XML processing, moving [the] processing to the [network] hardware helps to improve standardization and interoperability,” said Stephan Cho, senior director of product management in Cisco Systems’s application-oriented networking group. “If the network provides a distributed fabric of compute nodes, the integration and security technologies between applications need to be distributed.”

In addition, Gopola Tumuluri, a product line manager at Foundry Networks, said new networking techniques are becoming necessary as Internet protocol (IP) traffic includes an increasing amount of voice and video data, and as applications combine content, communications, and e-commerce services. “As more services converge to IP, there’s going to be more stress and strain on the IP infrastructure,” Tumuluri said. “This strain can make the network less reliable and slow performance, and lead to availability challenges and security challenges.”

For example, Gurdeep Singh Pall, corporate vice president of Microsoft’s real-time collaboration products group, said companies are integrating voice and video functions into communications and scheduling applications. As a result, they need the ability to automatically provide greater bandwidth to applications such as video conference calls.

Functions such as authentication and access authorization can be carried out by software embedded into a network’s switches and routers.

Companies are integrating voice and video functions into communications and scheduling applications.

“Rigid systems do not have a future in the real-time Internet,” Pall said. “Integration is becoming more and more important as applications and networks converge.”

In addition to improving network efficiency, embedding application fluency into the network can improve an organization’s information security, according to Prabakar Sundarajan, chief technology officer at Citrix Systems. Equipment can determine whether a transaction is being requested, compare that request with a firm’s security policies, and decide whether or not to allow the traffic to pass through the network.

Similarly, Sundarajan said that the equipment can look for known attacks and block potentially dangerous traffic without the need for specialized appliances such as dedicated spam or anti-virus filters.

Cisco’s Cho said applications such as customer relationship management systems or order-processing databases often exchange customer data and other information. In many instances, middleware provides security and protocol information needed to facilitate such exchanges. “If application A needs to speak to application B, most traditional systems need an intermediary,” Cho said. “By building that [function] into the network’s capabilities, you provide greater standardization and interoperability and improve the exchange of application messages.”

Another factor promoting network fluency is the growth of Web services in which applications comprise shared components or, in some instances, are assembled automatically for a specific purpose. Web applications are less likely to have embedded security or communication protocols, and must rely on the network to provide them.

“With service-oriented architectures and Web services, you won’t have monolithic applications with code running in one place,” Cho said. “Applications will be cut into functional slices, some of which will reside on your server, and some of which will involve service calls to other domains.”

George Kurian, vice president of Cisco’s applications delivery group, said the use of distributed applications increases the need for the network to share security resources. “Lots of users will be accessing the same data and applications, and enterprises want to keep out the bad [applications],” Kurian said. “As the Internet becomes an application platform, it can try to filter out applications that don’t add value to the network.”

While embedding “application awareness” into the network is in its infancy—with specific routers and switches released commercially in the last year—the approach is a major shift from simply adding more servers to expand capacity.

“Over time, we’ll see the network become smart enough to make applications work,” Kurian said. “New network management and control technologies are being placed in the packet network infrastructure to place policies and controls on the access platforms, routers, and switches.”

*Article written by Dave Pelland, Managing Editor, KPMG Technology Insider.*



