

## Organic IT

FORRESTER®



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## Organic IT

By abstracting networks, storage, processors, and software, Global 3,500 firms will unshackle business processes from rigid technology foundations -- meeting the needs of both business and IT.

### 2 MARKET OVERVIEW

- CIOs report that server utilization is only 60% -- meaning that \$20 billion in new servers was wasted last year.
- IT infrastructure is stuck in the days of hand-cranked car engines, where only specialists can make technology work.

### 7 ANALYSIS

- Abstraction makes technology simple, like the thermostat that drives complex heat pumps to cool a house.

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- It's career decision time for IT administrators -- up or out.

### 18 WHAT IT MEANS

- Organic IT makes the technology depression drag on as buyers gain the upper hand.

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## MARKET OVERVIEW

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### IT Infrastructure Is Due For An Overhaul

From the mainframe to the Internet, each generation of computing technology has improved on the last -- and delivered major new headaches. The result? IT is stuck with rigid, expensive, underutilized infrastructure that locks up business processes in yesterday's applications. We need a new computing revolution to deliver efficient and flexible IT infrastructure.

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#### IN THE BEGINNING, COMPUTING WAS BUILT FOR IT, NOT BUSINESS

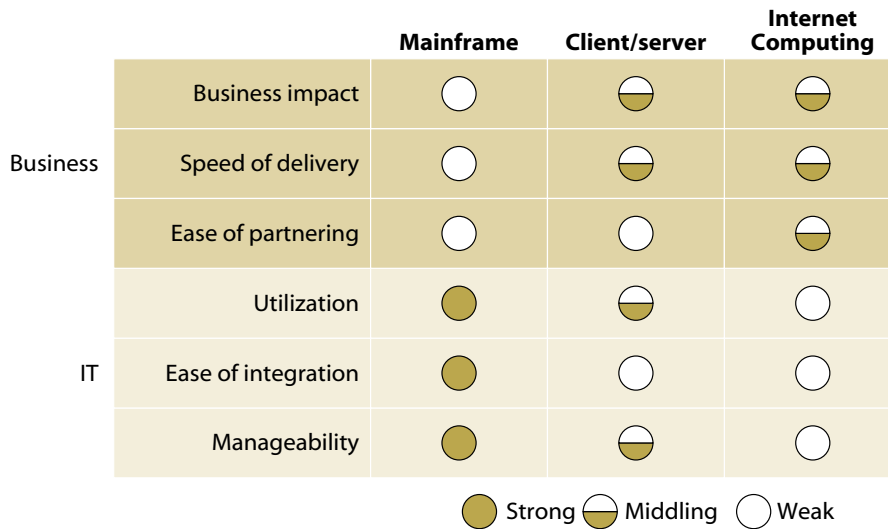
Since the dawn of corporate computing, the IT organization and its users have been locked in constant combat -- with IT battling for control and business users fighting to make the technology work for them. In the earliest days of mainframe computing, IT -- or DP, as it was then known -- strategy emphasized efficiency and manageability of scarce computing power, not business utility (see Figure 1). Not surprisingly, businesspeople found the early infrastructure:

- **Slow and inflexible.** While today's developers can bang out a Visual Basic app in hours, yesterday's software development efforts were measured in months or years. So these systems were focused on simple problems with tight scope -- like automating the payroll -- and not on ad hoc business problem analysis.
- **Exorbitantly expensive.** Mainframes required huge capital commitments, which inevitably led to centralized ownership and control by techs in white coats. The result? Computing power was too costly for departments that needed to tackle smaller problems or fast-changing business situations.
- **Inaccessible to partners.** Designed for internal use only, mainframe applications couldn't be connected easily to partner apps, inside or outside the firm -- for most, moving reels of data tape once a month was the best-case scenario.

#### Client/Server Delivered Business Benefits . . . At IT's Expense

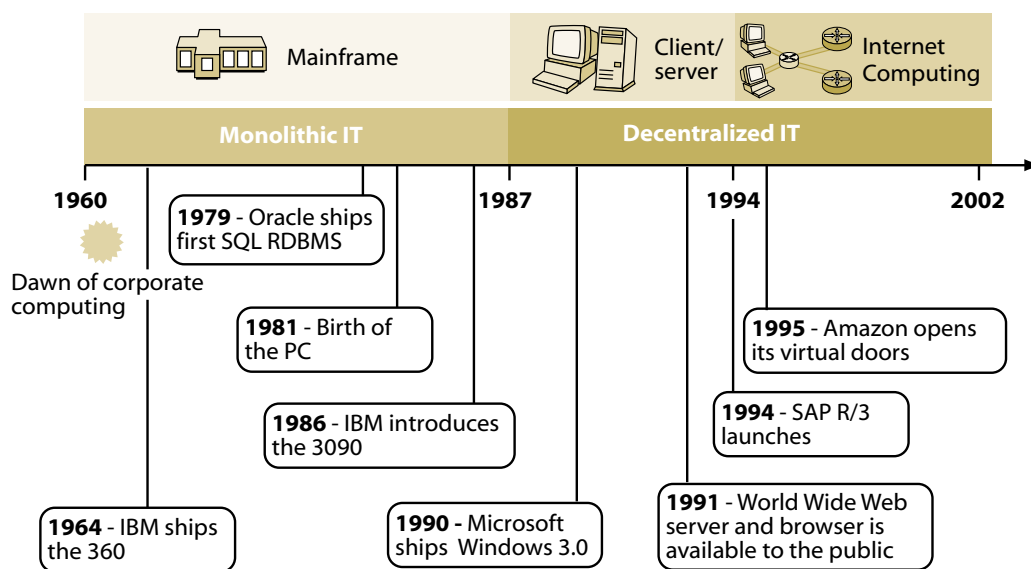
By the late 1980s, personal computers, combined with local area networks and relational databases, liberated businesses from under IT's thumb (see Figure 2). Business units could attack more opportunities, faster, at lower cost. But client/server created new nightmares for IT:

**Figure 1** Through History, Business Has Gained At IT's Expense



Source: Forrester Research, Inc.

**Figure 2** Computing Has Shifted From Monolithic To Decentralized



Source: Forrester Research, Inc.

- **Rampant waste in capacity.** Since a fat client/server app is only as powerful as the PC that it runs on, every user needs a powerful machine and a fast network connection. But for most of the day, these machines sit idle -- with no easy way to apply the wasted power to other business opportunities.
- **Departmental systems that couldn't talk to one another.** The good news: Client/server sprinkled computing power further across the enterprise. The bad news? Different divisions bought incompatible technology, making it impossible to integrate apps for collaboration and common benefit.
- **Management costs that went through the roof.** An explosion of new apps forced IT to visit every PC with update disks over and over again. Moreover, new software demanded the latest powerful PCs -- so IT found itself on a PC upgrade treadmill. And with data becoming readily accessible across the firm, naive users created scary security problems.

### And In the 1990s, Internet Computing Finally Broke IT's Back

The birth of the Web provided a much-needed boost for business capabilities -- technology costs dropped, and firms could finally begin to extend apps to partners. But Internet Computing also brought IT to its knees as:

- **Hardware exploded across the enterprise.** With Linux and cheap Intel-based servers, any manager with \$5,000 could buy a Web server -- and did, showing servers into broom closets and under desks. The problem? Corporate departments duplicated each other's efforts and unwittingly found themselves playing the tech management game, and they're now desperately trying to hand the keys back to IT.
- **Application integration got harder.** Despite the advance of Internet standards like TCP/IP, it's still not easy to integrate disparate applications. In a recent Forrester survey of 50 Global 3,500 firms, we found that the average firm is spending \$6.3 million a year on integration -- and that figure is increasing as a percent of the IT budget (see the December 2001 Forrester Report "Reducing Integration's Cost").<sup>1</sup>
- **Management became a misnomer.** With each new application and hardware box, IT administrators got a new management console -- that was completely incompatible with all the others. So as complexity increased, firms' ability to manage that complexity dwindled -- prompting the EDS Super Bowl ad that famously compared the problem of managing technology chaos to that of herding cats.

## IT'S TIME FOR ANOTHER COMPUTING REVOLUTION

In 2002, firms are waking up after the eBusiness boom with a technology hangover: lots of idle servers, incompatible apps, and dwindling budget dollars -- not to mention the pain of linking today's applications to long-lived legacy technologies. Yet business leaders have just begun to grasp the value of technology-driven strategies like yield management and customer profitability analysis. As they survey the landscape, business execs and CIOs are starting to realize that:

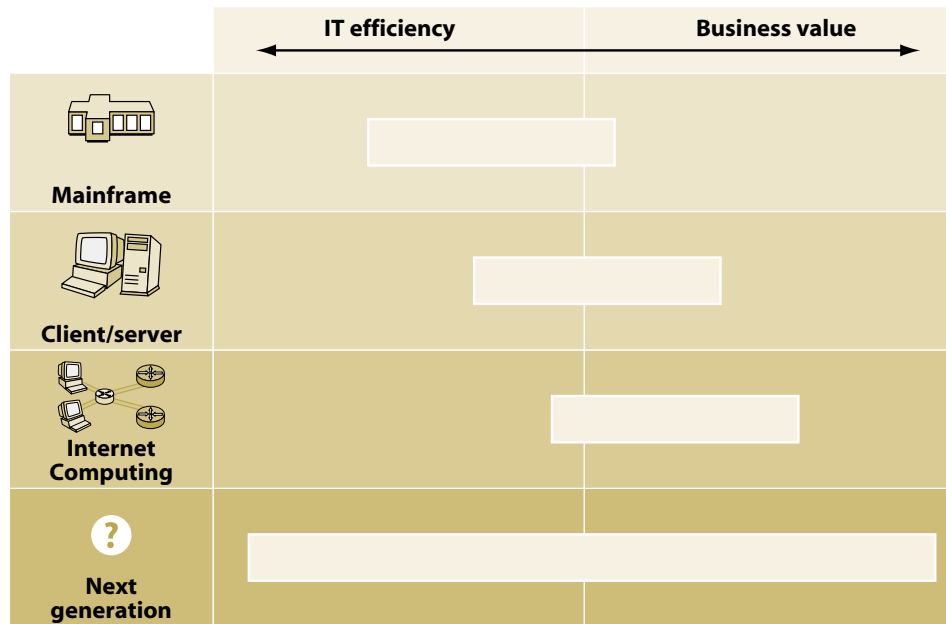
- **The infrastructure costs too much . . .** Globally, firms spend more than \$49 billion a year on servers, and CIOs report that server utilization is 60% or less.<sup>2</sup> The result? Tens of billions of wasted dollars every year -- a story repeated for categories like storage and networks. So utility managers can't afford to build a reliable gas pipeline management system because it requires five servers -- one to run the app, plus extras for standby, development, testing, and disaster recovery.
- **. . . and isn't delivering on its promise.** Despite IT budgets that can exceed \$1 billion a year, Global 3,500 firms still find that their key applications can't talk to one other. Meanwhile, they keep adding hardware and software to their infrastructure brew, making things ever more complex and difficult to integrate. So banks can't easily offer mortgage discounts to their best customers, and phone companies still send out separate bills for phone, DSL, and mobiles.
- **While vendors offer warmed-over technology repeats.** And how are tech vendors responding? By churning out faster, more feature-bloated versions of 1990s technology. But just as better horse-drawn buggies weren't sufficient to fend off the arrival of the automobile, more of yesterday's technologies won't be enough to deliver greater business power and flexibility at lower cost.

### Companies Will Demand Computing Infrastructure That Serves Both Masters

Business leaders want more technology-driven business capabilities -- after all, technology's ability to drive business advantage has become clear in firms as diverse as Capital One, Wal-Mart, and Dell Computer. But with IT stretched to the limit, it's not clear where those innovations will come from (see Figure 3). To pull out of the infrastructure muck and drive new business capabilities, firms will demand that vendors rethink their technology architecture from the ground up. They'll demand:

- **Greater business capabilities from existing technology -- at lower cost.** Companies need a way to increase usage of the technology they already have and make it more flexible and adaptable on short notice. To run technology closer to the redline without outages, firms need an automated way to juggle between production schedule calculations and fulfilling an oversold promotional campaign.

**Figure 3** The Next Computing Revolution Must Satisfy Both Business And IT



**Computing infrastructure must serve two masters**

Source: Forrester Research, Inc.

- **Radically simplified business process coordination.** It's already hard enough to work out coordination agreements between two businesses. To manage just-in-time production across the supply chain, firms need relief from the arcane details and one-off integrations needed to connect dissimilar technologies, such as Microsoft and Java or SAP R/3 and Manugistics.
- **Dramatically improved manageability.** While the number of servers within firms has been rising at an alarming rate, the number of administrators hasn't kept pace. Tools from vendors like IBM Tivoli and BMC help to shrink the gap, but it's a losing battle for most firms. In response, companies need technology that can manage itself -- asking for administrator input only when exceptions arise. The result? Firms like Visa will be able to launch new promotional campaigns without loads of manual IT hassles.

# ANALYSIS

## The Organic IT Infrastructure Revolution

Unlike the preceding computing revolutions, Organic IT will address the needs of both business and IT execs. How? By radically overhauling and automating the four key technology constituents: networks, storage, software, and processors. Freed from static business postures cemented into technology, businesses will compete with vast new agility.

### ORGANIC IT IS THE BIGGEST OVERHAUL SINCE CLIENT/SERVER

Corporate computing is at the dawn of a new revolution that will transform how IT infrastructure is built, what it costs, and how it operates. Fifteen years ago, Forrester coined the term “client/server” to describe the shift from host-based systems to a two-tier architecture.<sup>3</sup> Now, fundamental technology trends already under way will converge by 2006 to create a new corporate technology architecture: Organic IT. Forrester defines Organic IT as:

*Computing infrastructure built on cheap, redundant components that automatically shares and manages enterprise computing resources -- software, processors, storage, and networks -- across all applications within a datacenter.*

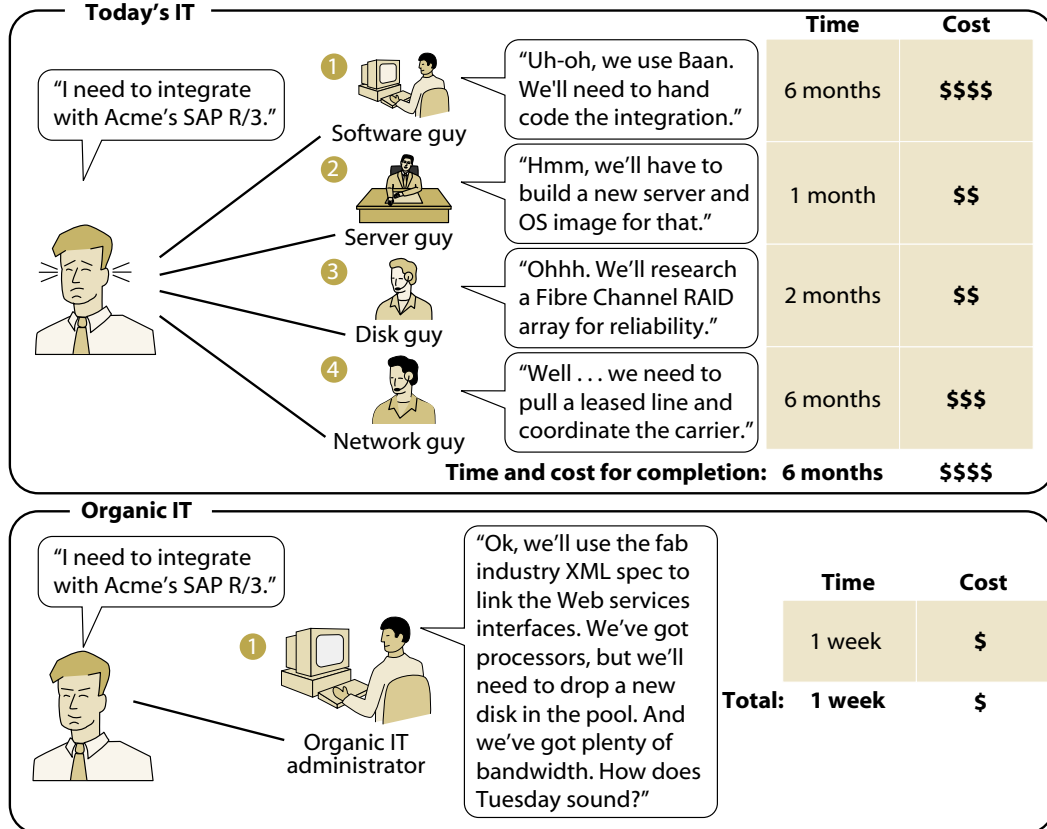
Organic IT will address companies' desperate need to create greater business flexibility, allowing them to tap into advanced supply chains without the rigidity and limitations of today's technology. Specifically, this new architecture attacks the key problems that firms face in deploying technology (see Figure 4):

- **Utilization.** Organic IT scales up and down to match demand, without sudden failures of business capacity. This means matching the reliability and efficiency of the electrical grid or the telephone network.
- **Integration.** Organic IT quickly and easily connects dissimilar technologies, within and between firms, with the ease of sending email or visiting a Web site.
- **Manageability.** Organic IT automates installation, load balancing, failover, and recovery, leaving IT administrators to manage unusual exceptions.

The solution to each of these problems stems from the same idea -- and when applied across all the elements of computing, creates a radically simpler infrastructure.

**Figure 4** The Difference Between Today's IT and Organic IT

Scenario: Manager wants to share production data from inventory system with Acme, a supplier



Source: Forrester Research, Inc.

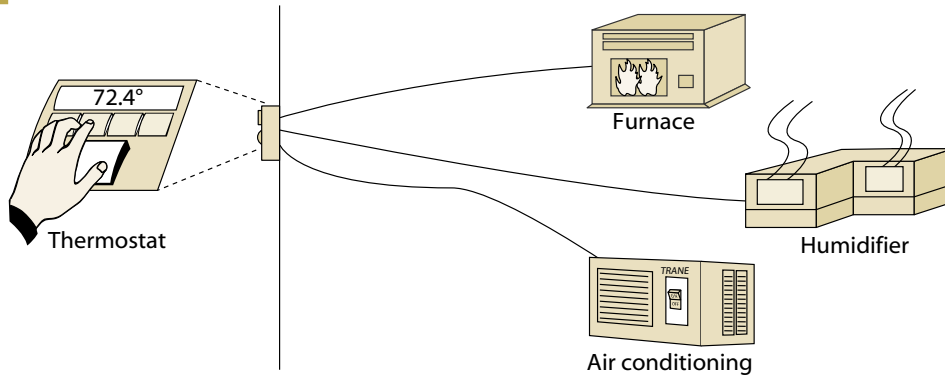
### The Magic Word? Abstraction

History reveals that technologies mature -- and gain universal usage -- only when engineers can simplify controls and conceal complexity. This improvement process, called abstraction, has now reached a tipping point across the infrastructure stack. The idea is powerful because it enables engineers to build on previous technology innovations by (see Figure 5):

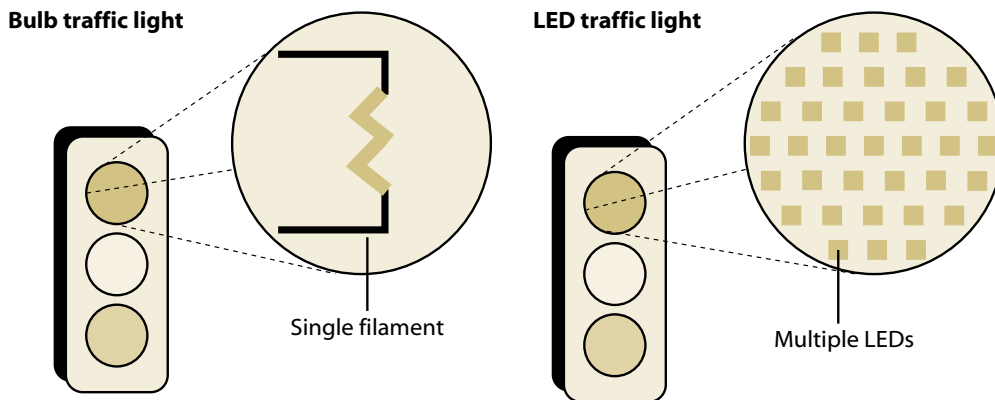
- **Hiding complexity behind a simple interface.** Engineers work very hard to abstract the essence of a technology for simplicity of controls and use. For example, early automobile engines required hand-cranked starts, manual choke adjustments of air/fuel mixture, and constant roadside tweaks. Now drivers just turn the key and hit the gas pedal, and the engine systems manage all the details.

**Figure 5** Abstraction Is The Key To Organic IT

**5-1** Thermostat used to control climate: regulates heater, A/C, and humidifier with one interface



**5-2** A traffic light appears as a single light but contains many small LEDs, yielding redundancy



Source: Forrester Research, Inc.

- **Combining cheap, standardized parts into an improved whole.** By aggregating cheap components in creative ways, smart engineers can deliver advances in performance and reliability. One example? RAID (redundant arrays of inexpensive disks) software, which combines several disks together to function as one larger disk -- if one disk fails, the remaining disks preserve the lost disk's data. Another example? Using dozens of light emitting diodes (LEDs) to replace light bulbs in traffic lights -- even if many LEDs burn out, the signal still works.

**Organic IT Results From Four Abstractions In The IT Infrastructure Stack**

Business agility today is limited by rigid technologies that prevent quick adjustments in response to changing business conditions. IT shops need abstracted infrastructure, so they can manage the datacenter as a whole rather than a collection of parts. They'll get

that capability -- and finally break technology's business rigidity -- as they take advantage of abstraction to synthesize the four key layers of infrastructure (see Figure 6):

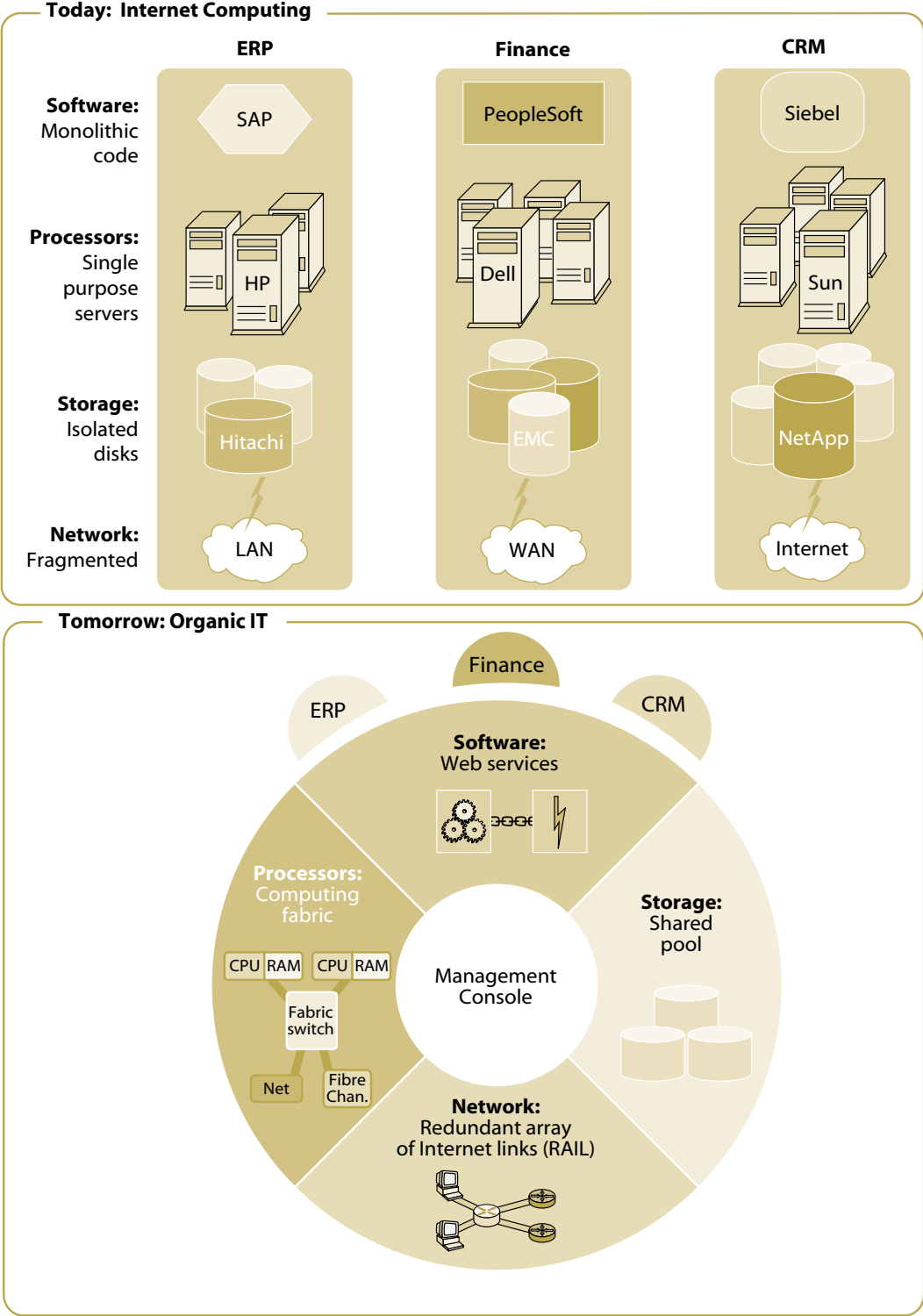
- **Networks.** Innovative vendors like Sockeye Networks and Proficient Networks are now shipping gear that enables firms to safely rip out expensive leased WAN pipes and replace them with flaky Internet links. How? By combining multiple cheap pipes into a redundant array of Internet links (RAIL) (see the March 26, 2002 Forrester Brief "The End Of The Private WAN").<sup>4</sup> The result is astonishing: better performance, with a bandwidth cost reduction of up to 20%.
- **Storage.** Vendors like Network Appliance and EMC will soon deliver networked storage products that make direct attached disks obsolete. Instead of managing disks scattered across the network, firms will move to centralize storage on Fibre Channel or Ethernet networks for access from any server and save nearly 30% in the process (see the March 2001 Forrester Report "Slaying The Storage Beast").<sup>5</sup>
- **Processors.** Server transformation will continue beyond today's 1U rack servers and newfangled blade servers. The next generation of server infrastructure will employ cheap processor/memory nodes easily shared across applications on a network fabric like InfiniBand -- yielding an infrastructure that can adapt to highly variable application demand by 2006 (see the February 2002 Forrester Report "The New Computing Utility").<sup>6</sup>
- **Software.** Yesterday's software applications were islands, unable to talk to other apps easily. But new Web services standards -- like SOAP and WSDL -- will enable software developers to quickly bridge disparate apps into a single cohesive application tapestry (see the December 2001 Forrester Report "Start Using Web Services Now").<sup>7</sup> The resulting infrastructure will take a huge chunk out of today's \$6 million-plus integration budgets over the next four years.

### ORGANIC IT IS MORE THAN THE SUM OF ITS PARTS

Although each of the four abstractions offers distinct benefits, Forrester sees them coalescing into an entirely new enterprise infrastructure. Imagine a person shackled at all four limbs: releasing just three of the locks still leaves him constrained. Similarly, it's only when all four layers of the infrastructure stack are unchained that the organic architecture emerges, characterized by:

- **Dynamic tradeoffs across technology layers.** Because each of the layers of an organic infrastructure can work in conjunction with the others, firms will be able to make technology tradeoffs -- for example, increasing the amount of disk used for caching but reducing the load on the network. Companies will make the best of their assets without needing to constantly purchase new technology up and down the stack.

**Figure 6** Organic IT Re-Architects The Infrastructure Technology Stack



Source: Forrester Research, Inc.

- **A single management console.** By abstracting the components of the IT stack, firms can radically simplify the way they manage those components. They will manage technology through a single console on an exception-driven basis, leaving routine tuning to the automated infrastructure. The result? IT shops will pare down the ranks of IT administrators, saving even more money.
- **Self-healing infrastructure.** Organic IT infrastructures are self-healing. Meaning? When an abstracted component of the architecture -- like a network pipe -- fails, the infrastructure will reorient itself to continue functioning normally while alerting administrators to the failure.

### **Organic Architecture Will Bring IT Back From Chaos . . .**




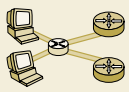
Until now, every advance in business capabilities has driven IT deeper into chaotic management and administration. In contrast, Organic IT delivers benefits by making the IT organization's job easier, not harder. That's because Organic IT not only simplifies the management of each infrastructure layer, it integrates management of the layers together. Through the single Organic IT management console, administrators will be able to:

- **Squeeze maximum use out of the technology.** Organic IT enables IT shops to make the most of their IT buck by increasing utilization and performance at the same time. For example, when the Web site is idle, but the i2 supply chain planning module needs muscle, the processors can be reallocated in minutes.
- **Easily integrate applications and business processes.** With Web services interfaces and computing horsepower available on-demand, Organic IT will drive application integration costs to near zero -- making it possible to orchestrate and easily reorganize business processes between firms (see the May 2001 Forrester Report "Apps For Dynamic Collaboration").<sup>8</sup>
- **Automate manageability.** Organic IT will deliver the centralized manageability of a mainframe across the distributed infrastructure of modern computing. Management and administrative costs will plummet as firms use new management software to code allocation policies for virtualized networks, disks, and processors.


### **. . . And Free Businesspeople From Onerous IT Constraints**

Since the 1960s, IT budgets have continually nibbled out a greater share of the expense pie -- topping out at 5.4% of revenue among North American companies this year (see the March 2002 Forrester Report "Benchmark North America: Business Technographics® Data Overview").<sup>9</sup> Organic IT slows -- and in some cases will reverse -- this trend. But more importantly, it offers strategic business benefits beyond cost savings. When applied holistically, Organic IT offers line managers (see Figure 7):

**Figure 7 Organic IT Is More Than The Sum Of Its Parts**

Infrastructure element	IT benefits	Business benefits
<b>Web services</b> 	<ul style="list-style-type: none"> <li>• Cheaper and faster application integration and development</li> </ul>	<ul style="list-style-type: none"> <li>• Better internal information coordination</li> <li>• End-to-end business automation</li> </ul>
<b>Computing fabric</b> 	<ul style="list-style-type: none"> <li>• Lower cost from higher utilization</li> <li>• Fast, automated processor allocation</li> </ul>	<ul style="list-style-type: none"> <li>• Able to easily adjust compute power for fast-changing business situations</li> </ul>
<b>Shared storage pool</b> 	<ul style="list-style-type: none"> <li>• Lower cost from higher utilization</li> <li>• Fast, automated storage management</li> </ul>	<ul style="list-style-type: none"> <li>• Able to easily adjust storage capacity for fast-changing business situations</li> <li>• Easily store all relevant data</li> </ul>
<b>Redundant array of Internet links (RAIL)</b> 	<ul style="list-style-type: none"> <li>• Cheap, reliable network links</li> </ul>	<ul style="list-style-type: none"> <li>• Flexible connection to business partners and external services</li> <li>• Few business interruptions</li> </ul>

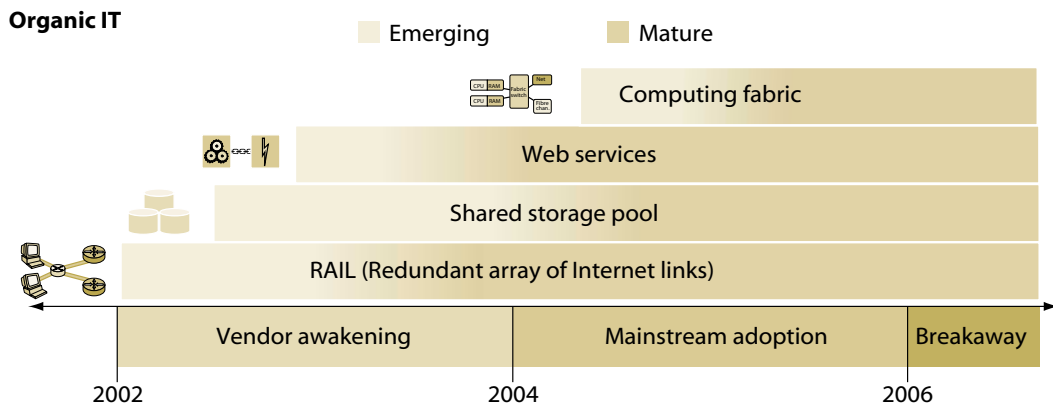
An integrated Organic IT infrastructure provides all of the above benefits, PLUS:

<b>Organic IT</b> 	<ul style="list-style-type: none"> <li>• Management of IT resources by application or business process, not technology</li> <li>• Even lower costs through automated infrastructure management software</li> </ul>	<ul style="list-style-type: none"> <li>• Discrete, cheap, and flexible business capability</li> <li>• Respond to business situations at the speed of software</li> <li>• Fast, flexible partner integration across all apps and locations</li> <li>• One point of contact for IT resources and provisioning</li> </ul>
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Source: Forrester Research, Inc.

- **Infrastructure to handle any business problem.** With extremely flexible and reusable Web services software backed by exactly the right amount of hardware and network capacity, business managers are free to tackle a wide range of opportunities. Techniques like automatic inventory tracking and frequent customer programs become practical for businesses of all sizes, not just the largest enterprises.
- **Faster time-to-impact.** Large-scale software systems and upgrades will no longer require extensive manual configuration and migration of servers, disks, and networks. So firms like Fidelity Investments and AOL Time Warner will be able to respond immediately to spikes in demand or competitor's promotions without delays for manual datacenter overhauls.

**Figure 8 Organic IT Rolls Out Between Now And 2006**



Source: Forrester Research, Inc.

- **Improved partner integration.** It will take more than Web services software and the right network connections to link up with partners. Flexible processors and storage technologies will make it possible to quickly adjust the scale of partner integration -- and instantly add new partners for new situations. (see the April 2000 Forrester Report “eBusiness Networks”).<sup>10</sup>

## HOW ORGANIC IT EVOLVES

Though all the elements of the new abstracted infrastructure won't be in place until 2006, the seedlings of this new architecture have already sprouted (see Figure 8). Organic IT will evolve over three major time phases:

- **2002-2004: Vendor awakening.** During 2002 and 2003, networking, storage, and software vendors will begin to revamp their products to lay the foundation for Organic IT. For example, firms like NetVMG and Proficient Networks are reorienting their route optimization appliances to coexist nicely with VPN gear and create the RAIL abstraction. Meanwhile, IBM and Microsoft are firming up their Web services frameworks to abstract the intricacies of software integration.
- **2004-2005: Mainstream adoption.** By 2004, EMC, Network Appliance, and Veritas will build on this foundation of organic networking and software to deliver heterogeneous organic storage. At the same time, Web services vendors will enhance basic Web services capabilities with new organic-oriented standards for security and reliable messaging. With three of the pieces in place, firms across all industries will begin to grasp the power of the organic architecture.

- **2006 and beyond: Breakaway.** In 2006, IBM and Sun will deliver the fourth and final piece of organic infrastructure -- fabric computing. At the same time, Tivoli and CA will create integrated organic management consoles. The result? Like the shackled man, this will free the entire technology stack, letting business and IT coordinate with new ease and vigor.

### Organic IT Heralds Big Vendor Shifts

Like previous computing revolutions, the shift to Organic IT will drive brutal vendor transformations (see Figure 9). Powerful vendors will collapse as:

- **Internet pipe providers get further commoditized.** RAIL technology and the telecom liquidity crisis will shrink the provider pool to a small number of utility-like providers. Carriers will become prime contractors, like category managers in food retail, where one provider provides route optimization services plus bandwidth and coordinates all the other providers' bandwidth.
- **Storage system vendors shrink to a handful.** EMC and NetApp will use their current market strength to buy or defeat storage innovators like DataCore and FalconStor -- and less innovative enterprise storage vendors, like Compaq, IBM, and Sun. As software becomes the source of differentiation for storage hardware, Veritas will find itself in the catbird's seat -- and will buy NetApp.
- **Compute nodes rule as server boxes fade into the high end.** Most applications will yield to gangs of fabric-based processors, leaving only a handful of apps, such as databases and large-scale data mining, that require large, multiprocessor boxes. Compaq and Fujitsu will prove increasingly irrelevant in the new server market as leaders like IBM and Sun joust with newcomers like Egenera to dominate compute nodes.
- **Infrastructure software vendors dominate Web services.** Independent integration server vendors, such as SeeBeyond, Tibco, Vitria, and webMethods -- will shrink as software heavies like IBM and Microsoft move in and adapter revenues shrivel. With Web services eventually replacing much of their value, integration vendors will refocus on delivering business process management.

**Figure 9** Organic IT Results In A Changing Vendor Landscape

	<b>Components</b>	<b>Notes</b>	<b>Survivors</b>	<b>Stragglers</b>
<b>Web services networks</b>	<ul style="list-style-type: none"> <li>• XML</li> <li>• SOAP</li> <li>• WSDL</li> <li>• UDDI directories</li> </ul>	Big software vendors win, trampling integration vendors and Web services startups	<ul style="list-style-type: none"> <li>• IBM</li> <li>• Microsoft</li> </ul>	<ul style="list-style-type: none"> <li>• SeeBeyond</li> <li>• Tibco</li> <li>• Vitria</li> <li>• WebMethods</li> </ul>
<b>Computing fabric</b>	<ul style="list-style-type: none"> <li>• Compute nodes</li> <li>• High-bandwidth networks</li> <li>• Fabric OS</li> </ul>	Vendors with cheap compute nodes rule, plus leading enterprise innovators	<ul style="list-style-type: none"> <li>• Dell</li> <li>• Egenera</li> <li>• IBM</li> <li>• Intel</li> <li>• Sun</li> </ul>	<ul style="list-style-type: none"> <li>• Compaq</li> <li>• Fujitsu</li> <li>• Unisys</li> </ul>
<b>Shared storage pool</b>	<ul style="list-style-type: none"> <li>• IP/FC-bridging</li> <li>• NAS</li> <li>• TCP offload</li> </ul>	Software drives storage innovation, sidelining average vendors	<ul style="list-style-type: none"> <li>• EMC</li> <li>• Network Appliance</li> <li>• Veritas</li> </ul>	<ul style="list-style-type: none"> <li>• Compaq</li> <li>• IBM</li> <li>• Sun</li> </ul>
<b>Redundant array of Internet links (RAIL)</b>	<ul style="list-style-type: none"> <li>• VPN hardware</li> <li>• Route optimization</li> </ul>	Gear makers win as they use technology to let firms squeeze the most out of carriers	<ul style="list-style-type: none"> <li>• Cisco</li> <li>• NetVMG</li> <li>• Proficient</li> <li>• Route Science</li> <li>• Sockeye</li> </ul>	<ul style="list-style-type: none"> <li>• AT&amp;T</li> <li>• Sprint</li> <li>• WorldCom</li> </ul>

Source: Forrester Research, Inc.

## ACTION

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### **IT administrators should shoot for the top -- or end up in taxis.**

Organic IT gear will cut the need for administrators by half, since firms will no longer need staff to baby-sit server farms full of unique servers and dozens of different management consoles. Salaries for those with low-end skills will plummet. To stay employed, today's administrators must upgrade their skills to manage organic systems -- or seek work in a new career. If they don't, they'll end up driving taxis, just like engineers in the post-Vietnam recession.



### **Focus Organic IT inside the datacenter.**

Some eager converts will misunderstand the geographic limitations of Organic IT and expect it to work beyond the datacenter. But some technology problems -- like the finite speed of light -- can't be solved with innovation. To take advantage of Organic IT outside your facility, offer and look for ASP apps that get a boost from Organic IT, like collaborative supply chain applications.



### **Vendors: Embrace open and extensible management APIs.**

Storage vendors and other hardware vendors have resisted standardizing system management APIs, leaving vendors like Computer Associates and IBM Tivoli to struggle for integration. But Organic IT will drive a new dynamic, and the first credible vendors to open their APIs to Organic IT management software will win big market share. This means that storage vendors must swallow their concerns and join EMC's Wide Sky storage standards initiative, even as they work on other standards efforts.



### **Sun: Split yourself in two to compete at the high and low end.**

Sun's strength has been high-end server performance, but it can't survive that way. It needs the volumes of low-end processor modules to preserve the economies of scale necessary to keep the SPARC architecture alive. But competing against Dell using Linux will be difficult (see the February 27, 2002 Forrester Brief "Thumbs Up For Sun's Linux Experiment").<sup>11</sup> To succeed, Sun must split into separate divisions to gain the right mindsets to simultaneously compete against Dell in compute nodes on the low end and IBM in vertically scalable servers on the high end.

## WHAT IT MEANS



### **Organic IT dampens the tech recovery.**

Organic IT lets companies do more with less. Because they don't have to buy double or triple their actual technology needs, they will ultimately buy less server, storage, and network capacity, even as their usage and dependence on technology-based business processes grows. The result is twofold: a dampening of the cyclical tech spending recovery that we expect to kick in in 2003 and a re-allocation of saved budget dollars to new IT projects like custom app development.



### **EDS and IBM Global Services will get a profit pop.**

Outsourcers like EDS, IBM, and CSC have piles of long-term fixed-price contracts to manage customers' datacenters. Their margins in those deals were predicated on today's high management costs -- but Organic IT will dramatically change the equation. The result? First, profit margins will swell and volume will jump as outsourcers take on previously unprofitable jobs. Second, customers will demand renegotiated contracts to share some of the gains.



### **The flash crowd problem is history.**

Content companies of all types, from The Washington Post Company to CNN.com, face the potential of getting slammed with traffic on short notice. To deal with this problem, firms take drastic measures, such as massively overprovisioning their infrastructure or buying expensive caching services. But in the age of Organic IT, firms will be able to quickly shut down low-importance activities like data scrubbing and shuttle capacity to the Web site.



### **Software pricing models get a radical overhaul.**

Organic IT will destroy server-based software pricing models. And portal technologies are erasing client software and user pricing models by eliminating fat client apps and moving user authentication outside the app (see the August 2001 Forrester Report "Making Enterprise Portals Pay").<sup>12</sup> To adapt, software vendors will have to move to pricing based on usage, such as a count of transactions, features used, or data stored in the product. This will lead cost-conscious firms to implement complex chargeback schemes for departments that ask for new features and data, just like in the old mainframe days.

## RELATED MATERIAL

### Methodology

Forrester spoke with vendors of server hardware, network hardware, management software, and high-performance computing, as well as industry experts on Web services.

### Companies Interviewed For This Report

Agile Storage  
[www.agilestorage.com](http://www.agilestorage.com)

Cisco Systems  
[www.cisco.com](http://www.cisco.com)

EMC  
[www.emc.com](http://www.emc.com)

Hewlett-Packard  
[www.hp.com](http://www.hp.com)

IBM  
[www.ibm.com](http://www.ibm.com)

Jareva Technologies  
[www.jareva.com](http://www.jareva.com)

Microsoft  
[www.microsoft.com](http://www.microsoft.com)

mValent  
[www.mvalent.com](http://www.mvalent.com)

Network Appliance  
[www.networkappliance.com](http://www.networkappliance.com)

NuView  
[www.nuview.com](http://www.nuview.com)

Sun Microsystems  
[www.sun.com](http://www.sun.com)

Systinet  
[www.systinet.com](http://www.systinet.com)

VERITAS Software  
[www.veritas.com](http://www.veritas.com)

Z-force  
[www.zforce.com](http://www.zforce.com)

### Related Research

March 26, 2002 Forrester Brief “The End Of The Private WAN”

March 22, 2002 Forrester Brief “Hardware Help For The Looming XML Blitz”

March 15, 2002 Forrester Brief “Web Services: The Next Technology Thunderstorm”

February 27, 2002 Forrester Report “Thumbs Up For Sun’s Linux Experiment”

February 2002 Forrester Report “The New Computing Utility”

December 20, 2001 Forrester Report “Storage Virtualization: Stick With What You Know”

December 2001 Forrester Report “Start Using Web Services Now”

August 2001 Forrester Report “Making Enterprise Portals Pay”

May 2001 Forrester Report “Apps For Dynamic Collaboration”

March 2001 Forrester Report “Slaying The Storage Beast”

January 2001 Forrester Report “The New Enterprise Network”

## GRAPEVINE

### **And that's no yolk.**

Computers have been used for lots of things over the years, from running weather simulations to putting a man on the moon. But here's a new one: computer as griddle. One enterprising young hobbyist realized that the heatsink in his PC generated enough heat to cook on -- and proceeded to demonstrate the concept by frying an egg. Seems pretty messy to us.

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### **Windows is better than Unix. Really.**

Microsoft and Unisys recently published the Web site [www.wehavethewayout.com](http://www.wehavethewayout.com) as part of a \$25 million marketing push to convince companies to get Unix out of back-end systems. Turns out the site ran on an open-source version of Unix, and on a Unix-based apache server. When the snafu was noticed, Microsoft/Unisys switched to Windows/IIS . . . and promptly brought down the Web site. We think \$25 million might barely repair the damage done.

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### **Dirty backups.**

We recently heard about an oil and gas exploration company with a truly unique backup strategy. Using seismic technology, they run tests to look for new pockets of oil and gas. But after processing, just one .5 TB snapshot of a plot results in up to 6 TB of data. Their backup? The dirt itself -- they've determined the cost of resampling to be cheaper than the extra storage requirements. In fact, keeping the data as dirt provides a compression ratio of up to 1:12 -- not too shabby.

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### **Sometimes truth in advertising isn't quite what we're looking for.**

While browsing to [Netflix.com](http://Netflix.com), a Forrester analyst was recently redirected to a "new users" page for the service. Besides offering two weeks of free services and information about how the service works, the URL gives a clue about the firms' real intentions: "[www.netflix.com/entrytrap](http://www.netflix.com/entrytrap)." How about a more honest URL? Maybe something like "[www.netflix.com/wewantyourmoney](http://www.netflix.com/wewantyourmoney)"?

## ENDNOTES

- 1 Firms need application integration, but integration projects are expensive, lengthy, and late. Firms spend an average of \$6.3 million per year on integration and more often than not, projects do not come in on time or on budget. To cut costs, firms must coordinate enterprise efforts, hire experts, and negotiate with skill. And integration will get cheaper as application adapters are standardized by Web services.
- 2 Merrill Lynch's March 11, 2002 TechStrat Survey of CIOs. Forrester believes the number is actually lower than reported by these CIOs.
- 3 The Forrester Report "Client/Server Computing" predicted this transformation by synthesizing separate trends in server PCs, local area networks, and distributed databases. Relational databases assumed the role the report originally assigned to distributed databases.
- 4 Firms are uncomfortable using Internet VPNs to replace expensive leased lines because of the unpredictable performance of an Internet connection. But network gear with smart software makes it possible to combine Internet links from multiple carriers to one reliable pipe. Like RAID for storage, this architecture delivers both improved performance and greater reliability.
- 5 Companies face growing storage problems but aren't comfortable outsourcing storage. Until Organic IT delivers heterogeneous storage management, companies need to focus new buying on networked storage providers to gain standardization benefits. Eventually, all storage within the enterprise will be both networked and managed from an Organic IT management console.
- 6 Vendors will move today's proprietary blade server designs onto an open high-speed switched fabric that will allow heterogeneous compute nodes -- modules of processor(s) and memory. This enables simplified horizontal scaling of applications that today run on vast server farms. Note that this architecture doesn't reduce the need for some big, vertically scalable boxes at the back of the infrastructure.
- 7 A Web service is software designed to be used by other software via Internet protocols and formats. It's used to abstract and hide the technology specifics of a program so that any other program can be easily connected to it, regardless of the type of technology on each side. Companies don't need to know what's under a Web service's hood -- COM+, J2EE, Windows, Unix, or something else -- to connect to it.
- 8 Forrester believes that a new class of business apps called XRM -- eXtended relationship management -- will provide networked collaboration among multiple firms to manage supply and demand.
- 9 Forrester's Business Technographics North America March 2002 Benchmark Study included responses from 874 senior executives at North American-based companies. Seventy-nine percent of these senior executives are from Global 3,500 firms, while 21% are from companies that have annual revenues between \$500 million and \$1 billion. Global 3,500 executives reported that 4.8% of their companies' revenues are spent on IT; the remaining firms cited that 7.2% of revenue went towards IT expenditures.

- 10 Forrester defines eBusiness networks as “resilient structures of interdependent players cooperating in real time over the Net.” This market structure enables firms to form relationships quickly, share information broadly, and create value by making assets fully available online.
- 11 Sun has broken away from its one processor/one operating system strategy and begun building cheap Linux servers with Intel processors. Sun is using its current strength to pull software partners along and win friends in the open source community. The result is that Solaris will eventually be refocused on the high-end boxes, as Sun goes commodity on the low end.
- 12 Portal servers enable firms to create shared application services across applications, simplifying and supercharging applications across the company. Firms will use portal servers to create simple Web role- and task-based applications that drive new productivity improvements in the enterprise -- and deliver real bottom-line benefits.

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**Forrester Events**

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June 9-11, 2002