

Forrester Consulting

HELPING BUSINESS THRIVE ON TECHNOLOGY CHANGE

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Improving Application Deployments How An Application Delivery Architecture Can Help Businesses Overcome Deployment Challenges

*A commissioned study conducted by Forrester Consulting
on behalf of F5 Networks*

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Executive Summary

Today's businesses must operate in a drastically changing environment. Forrester is seeing firms challenged to efficiently handle difficult compliance requirements like SOX, HIPAA, and mandatory disclosure laws; increase the number of constituencies that have access to applications and data (including contracts, suppliers, vendors, business partners, and mobile employees); and leverage IT to provide competitive advantage. However, we have found that most companies are not well equipped to reorient IT as a critical driver of top line success while removing bottom line costs. The key for companies facing these challenges will be leveraging new application architectures to meet changes in business objectives. This is a challenge because organizations often face requirements that conflict with one another. They are tasked with increasing the application footprint to accommodate new apps, decreasing the infrastructure footprint by consolidating IT assets, and making the apps and infrastructure more robust, disaster-proof, and secure. So how do you reconcile these goals? We believe the keys to success are to:

- **Match application deployments to business objectives.** This study showed that an overwhelming number of organizations are already tasking IT with business responsibilities. IT now drives business agility and relevance by extending applications that engage customers, allowing for new revenue-generating processes and increasing operational efficiency throughout the organization.
- **Hold key IT domains accountable for business issues.** Application developers, network operations, and enterprise architects are all key players in producing business results throughout the application deployment lifecycle. As a result, be sure to include them early and often in application rollouts and hold them accountable for successful deployments.
- **Invest in an application delivery infrastructure.** Enterprises can leverage a suite of network technologies that ease the performance, cost, and security woes that hamper application deployments. Application delivery infrastructure provides a policy-driven framework for effectively resolving issues throughout the deployment lifecycle. Unlike traditional networking gear, it's an overlay to the packet layer and provides the necessary abstraction layer to address application-level acceleration, security, monitoring, and control.

Research Methodology

In April 2007, Forrester Consulting conducted an online survey of 300 IT decision-makers and influencers in North America. In this survey:

- Thirty-five percent of respondents were the senior-most decision-makers in the company, 30% were executives in IT, and 34% were managers or directors of IT that report to an executive in IT. (Please note that the sum of percentages in this paper may not equal 100 due to rounding.)
- Thirty-one percent of respondents had authority over network operations and architecture, 37% had authority over application development, and 32% had authority over enterprise architecture.
- Forty-eight percent of respondents had 1,000 to 4,999 employees, 32% had 5,000 to 19,999 employees, and 20% had 20,000 employees or more.

- Seventeen percent of respondents were from companies with revenues less than \$500 million, 32% were from companies with revenues of \$500 million to \$1 billion, 35% were from companies with revenues of \$1 billion to less than \$10 billion, and 16% were from companies with revenues greater than \$10 billion.
- Respondents represented a broad range of industries.

Application Deployments Are More Critical And Complex Than Ever

Today's enterprises now understand that they must align IT with the business, which requires investing in applications. Businesses depend on applications to not only contribute to the bottom line by streamlining business processes, but also to improve the top line by helping reduce customer churn and enabling differentiation that creates a competitive advantage.

As a result of this awareness, we've seen innovations in application architectures: Web 2.0, Web services, service-oriented architectures (SOA), composite apps, dynamic apps — and the list goes on. All of these architectures are designed to empower more agile businesses. Sounds good, right? Well, it's not that easy. Concurrently, applications are becoming exponentially more complex. In this study, Forrester found that most organizations now have a wide portfolio, with a mix of: 44% packaged apps like SAP, PeopleSoft, and Oracle; 32% homegrown custom apps; and 21% open source. The result of this complexity is that companies are often stymied by poor performance and security issues as they try to innovate and introduce new applications.

Applications Don't Run The Business, They Are The Business

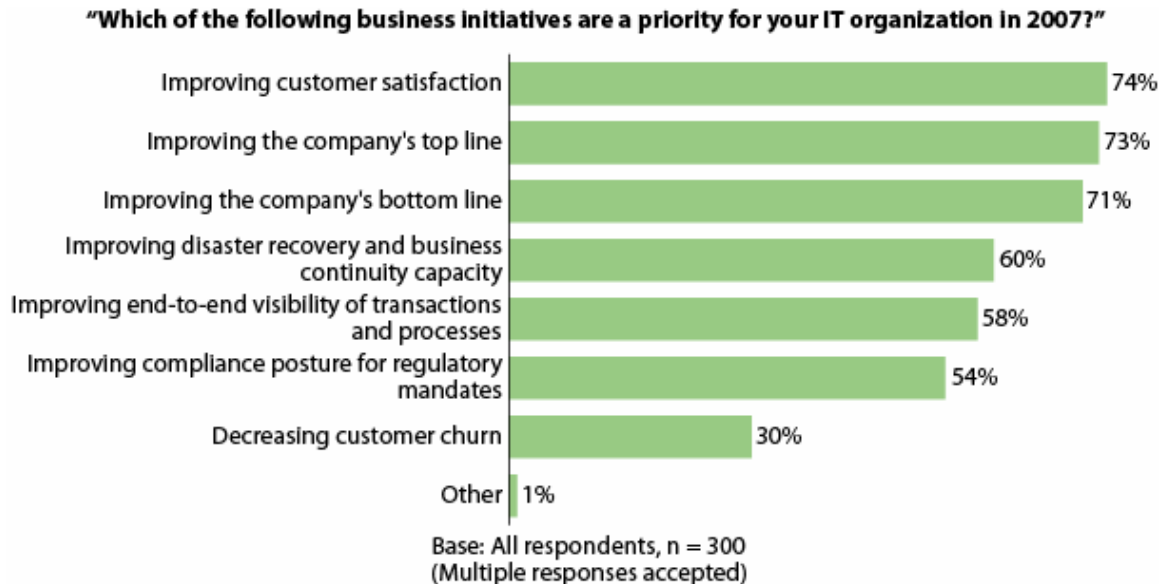
It's not good enough to claim that an ERP application has 99.999% availability and 2 ms transaction times because those metrics aren't meaningful to the business. Instead, the business benefits by knowing that the ERP system shaved \$1 million off operating costs and allowed the business to successfully enter an emerging market with streamlined processes.

This was clearly highlighted when we surveyed IT decision-makers to better understand just how critical IT applications have become. We found that all the top IT priorities were business-focused, with respondents reporting that:

- **Customer satisfaction is the top IT priority.** . . The No. 1 priority is customer satisfaction, as cited by 74% of respondents. Interestingly, the lowest priority listed is decreasing customer churn at 30%. Why the discrepancy? Because firms have moved beyond integrating applications for a "single view of the customer" and are now interested in improving customer experience and differentiating services using IT resources (see Figure 1).
- **. . . With top and bottom line improvements right behind.** Top and bottom line improvements were cited as priorities by 73% and 71% of respondents, respectively. Although not as radical as using IT to improve customer satisfaction, these are still significant trends in IT. Previously, CIOs were responsible for cutting IT costs — now they're also responsible for facilitating sales and driving revenue.
- **At least 75% of all respondents will upgrade apps.** Focusing on business initiatives is one thing — doing something about them is another. Somewhat surprisingly, respondents indicated that high percentages of their IT priorities — ranging from 75% to 94% — are tied

to an application rollout or upgrade. Companies aren't just citing business priorities; they are actively investing in applications to enable technology as a catalyst for change (see Figure 2).

Figure 1: Customer Satisfaction, Revenue, And Profit Lead IT Priorities



Source: Application deployment survey of 300 North American IT decision-makers responsible for network operations/architecture, application development, or enterprise architecture. Conducted by Forrester Consulting and commissioned by F5 Networks, April 2007.

Figure 2: Companies Are Upgrading Apps For All IT Priorities



Source: Application deployment survey of 300 North American IT decision-makers responsible for network operations/architecture, application development, or enterprise architecture. Conducted by Forrester Consulting and commissioned by F5 Networks, April 2007.

Enterprises Are Overcoming Silos

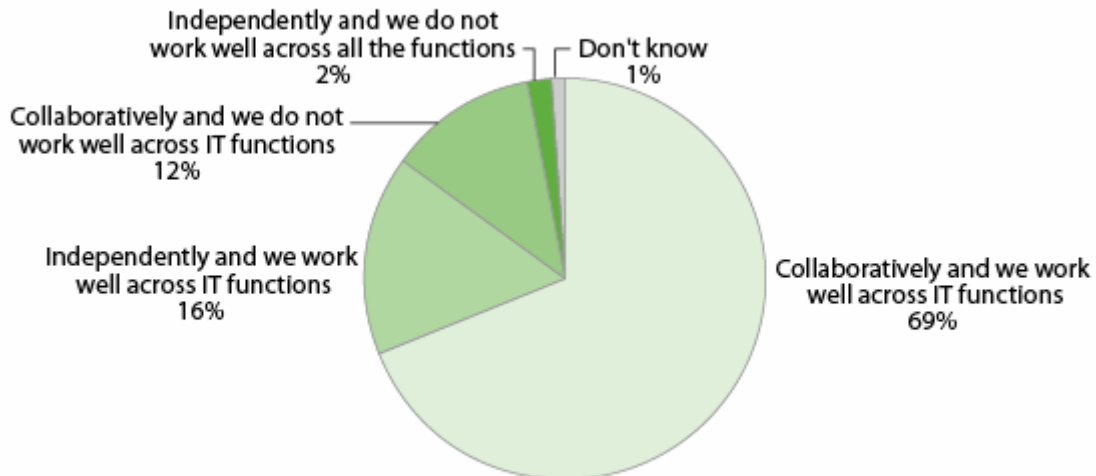
Historically, the biggest inhibitor to successful technology implementations has not been the technology itself, but the people and processes involved. Most large organizations simply suffer from too many silos. Developers don't consult with security teams. Architecture and operations teams often don't talk to one another. Even within a function like Operations, there are server, network, and storage managers who don't always communicate efficiently, if at all. As companies grow, IT departments become fragmented — and often geographically disparate — making it difficult to foster cross-domain collaboration.

But the tide is changing. This study showed that organizations are increasing collaboration and that people and process are no longer the top concern. The consolidation of major infrastructure assets like data centers, servers, and storage networking means that organizations can rally around a more centralized architecture. More importantly, business alignment has allowed companies to reign in department-level budgets and focus efforts on the business issues discussed above. Some more detailed findings of this study include the following:

- **More than two-thirds of respondents claim IT is collaborative.** Overall, a surprising 69% of respondents claim IT is collaborative and works well together (see Figure 3). This compares with only 12% that feel IT domains do not work well together. Interestingly, network professionals are the most optimistic, with 79% claiming to be collaborative, while only 61% of application developers will make the same claim.
- **More than 80% of respondents have centralized IT budgeting.** Part of effective collaboration is a centralized budget so that domains aren't always passing the hat around. At the turn of the century, Forrester found a significant number of decentralized IT budgets as companies struggled with organic growth on a global basis. In this study, an overwhelming percentage of companies reported having a centralized budget: 57% do so with IT in charge of the budget, and 24% have a centralized budget with the business controlling the purse strings (see Figure 4).
- **A third of the application deployment budget goes to underlying infrastructure.** Respondents report that 36% of the application budget is dedicated to underlying infrastructure like network, servers, and storage. Moreover, this cost is actually on the rise. Companies are dedicating even more hardware with redundancy like HA servers, RAID arrays, and virtualization for dynamic spare capacity.

Figure 3: Collaboration Among Roles Dominates, But Some Silos Persist

“Which of the following descriptions best characterizes how different roles in your IT organization — such as those responsible for applications and networking — work together?”

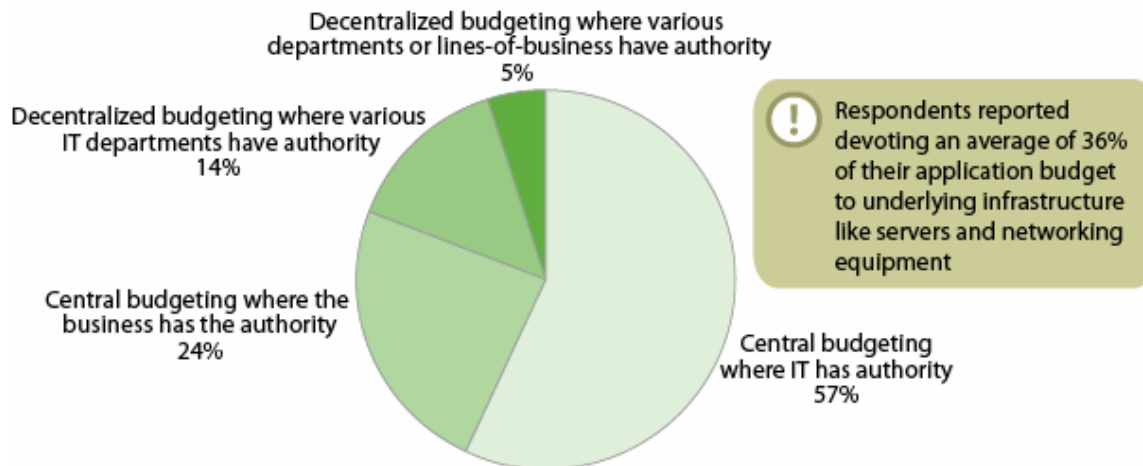


Base: All respondents, n = 300

Source: Application deployment survey of 300 North American IT decision-makers responsible for network operations/architecture, application development, or enterprise architecture. Conducted by Forrester Consulting and commissioned by F5 Networks, April 2007.

Figure 4: Firms Centralize Budgeting With A Third Of App Budgets Going To Infrastructure

“Which of the following best describes who within your company owns budget authority for new application deployments or significant upgrades?”



! Respondents reported devoting an average of 36% of their application budget to underlying infrastructure like servers and networking equipment

Base: All respondents, n = 300

Source: Application deployment survey of 300 North American IT decision-makers responsible for network operations/architecture, application development, or enterprise architecture. Conducted by Forrester Consulting and commissioned by F5 Networks, April 2007.

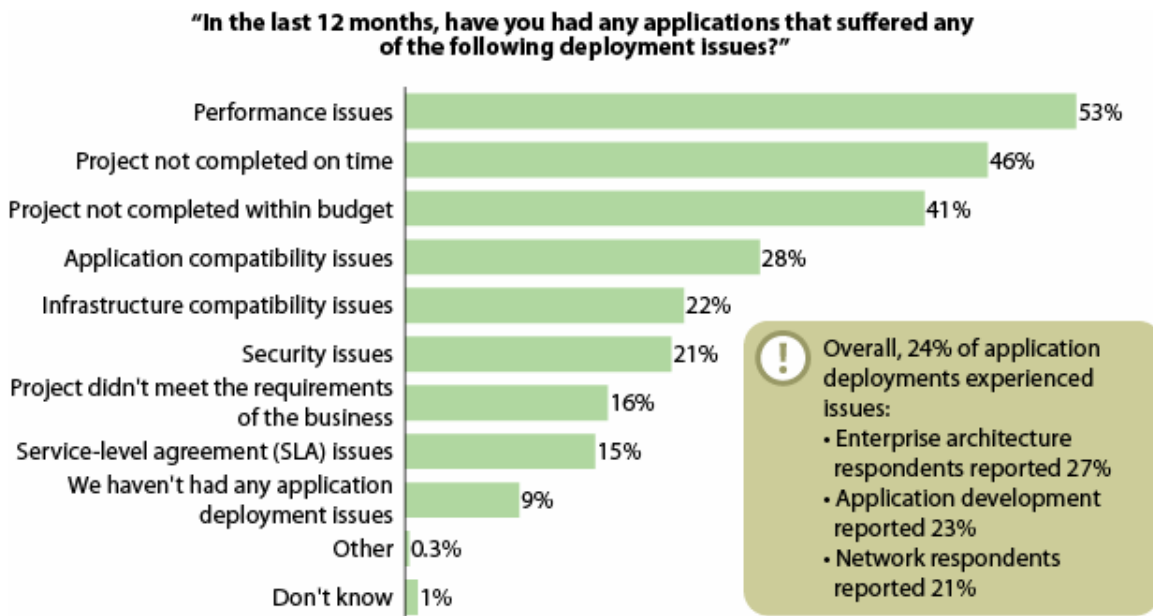
Today’s Applications Still Suffer Significant Deployment Issues

It’s encouraging to see respondents report that their processes work well across domains. However, despite the highly collaborative nature of IT, we still find companies suffering a large

number of application deployment issues — especially around performance. How bad is it? Respondents in this study reported that:

- **A quarter of application deployments suffer issues.** In our survey, 24% of respondents' application deployments suffered a significant problem in the past year (see Figure 5). Looking at this data by IT role, we found that enterprise architects were the most negative, claiming that 27% of applications suffer issues. Application developers claimed 23% and network operations managers claimed 21%.

Figure 5: Performance Issues Are Most Responsible For Deployment Issues



Base: Respondents reporting more than 0% of app deployments as having an issue of some kind, n = 264 (Multiple responses accepted)

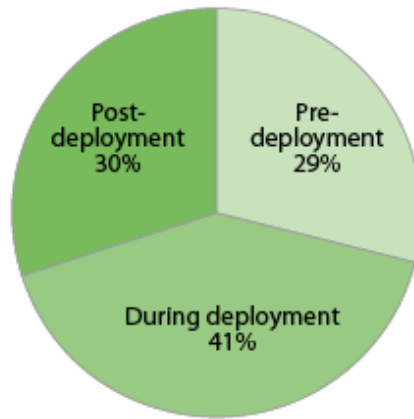
Source: Application deployment survey of 300 North American IT decision-makers responsible for network operations/architecture, application development, or enterprise architecture. Conducted by Forrester Consulting and commissioned by F5 Networks, April 2007.

- **Performance is the most frequent deployment issue.** Fifty-three percent of respondents reported experiencing performance issues during deployments. The second and third most frequently cited problems involved project management, with 46% and 41% noting project timing and budget, respectively, as issues they had experienced. Business alignment issues appeared at the bottom of the list with only 16% of respondents reporting that their application deployment had problems related to not meeting business requirements.
- **The majority of issues are in production environments.** This study showed that, as expected, issues are pervasive throughout the deployment lifecycle. Specifically, 29% of issues occurred pre-deployment (e.g., lack of QA testing); 41% during deployment (e.g., infrastructure compatibility issues); and 30% occurred post-deployment (e.g., unacceptable performance) (see Figure 6). That's a resounding 71% of deployment issues occurring in production environments!

- **Network and server infrastructure are often the culprits.** Respondents reported that the root causes of performance issues are fairly evenly distributed across people, process, and technology. However, the top two causes were network infrastructure and backend infrastructure such as servers, middleware, and storage (see Figure 7). Interestingly, it's not always the network's fault. Twenty-seven percent of application developers claimed that backend infrastructure was the worst offender, as opposed to only 21% citing networks.

Figure 6: Seventy-One Percent Of Issues Occur During Or After Application Deployment

"Approximately what percent of overall application deployment issues occurred pre-deployment, during deployment, and post deployment?"

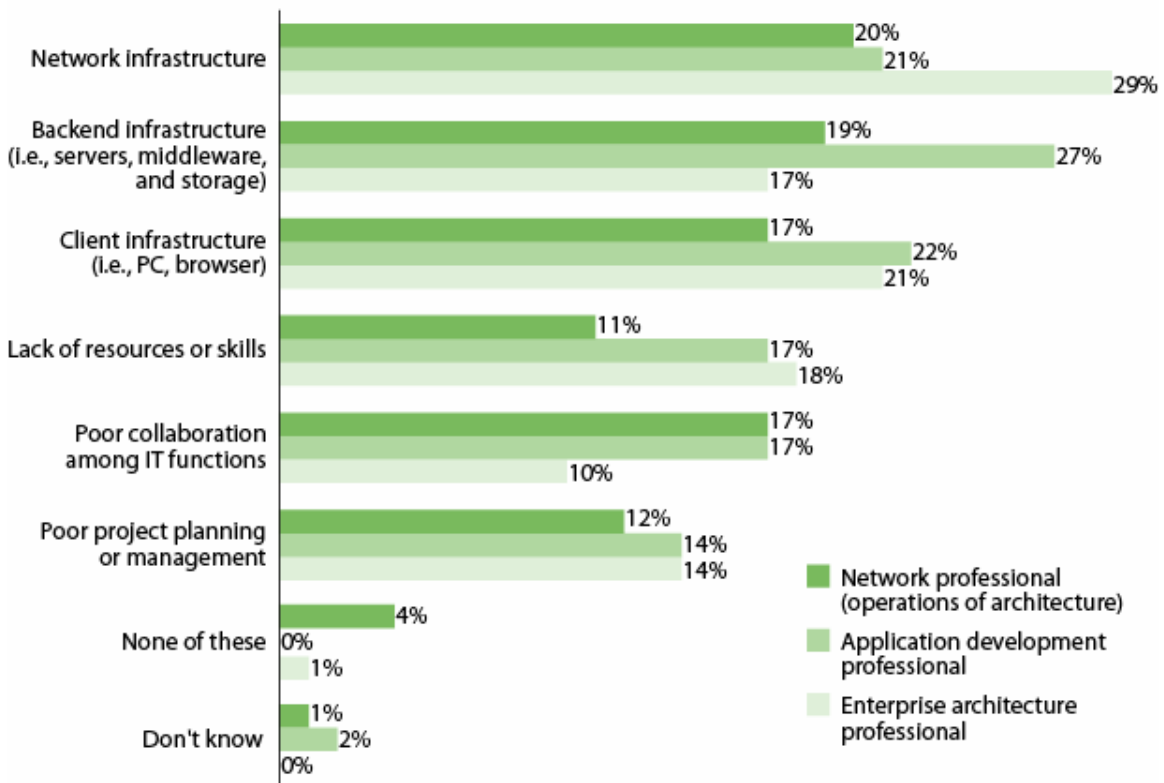


Base: All respondents, n = 300

Source: Application deployment survey of 300 North American IT decision-makers responsible for network operations/architecture, application development, or enterprise architecture. Conducted by Forrester Consulting and commissioned by F5 Networks, April 2007.

Figure 7: Infrastructure Technology Tops People And Process For Performance Woes

“Which of the following do you consider to have contributed to the performance issues?”



Base: Respondents reporting app deployments suffering performance issues in the last 12 months, n = 158

Source: Application deployment survey of 300 North American IT decision-makers responsible for network operations/architecture, application development, or enterprise architecture. Conducted by Forrester Consulting and commissioned by F5 Networks, April 2007.

Enterprises Look To The Network And Application Delivery Infrastructure To Solve Deployment Woes

How can you solve deployment issues like performance? Many enterprises are looking to overlay a technology solution. In fact, 68% of respondents agreed they are seeking new technology to solve deployment issues. Moreover, an astounding 72% of respondents claim they will accommodate organizational change to leverage these new technologies.

Forrester has observed that many companies want a tactical technology solution that provides ease-of-use and ease-of-implementation while others are looking to take a more architectural approach and are seeking technology that provides a foundation for ironing out systematic problems like security and performance concerns.

Regardless of the approach, Forrester believes there’s an emerging solution, which we refer to as application delivery infrastructure, that helps ease deployment-related challenges. We define this as:

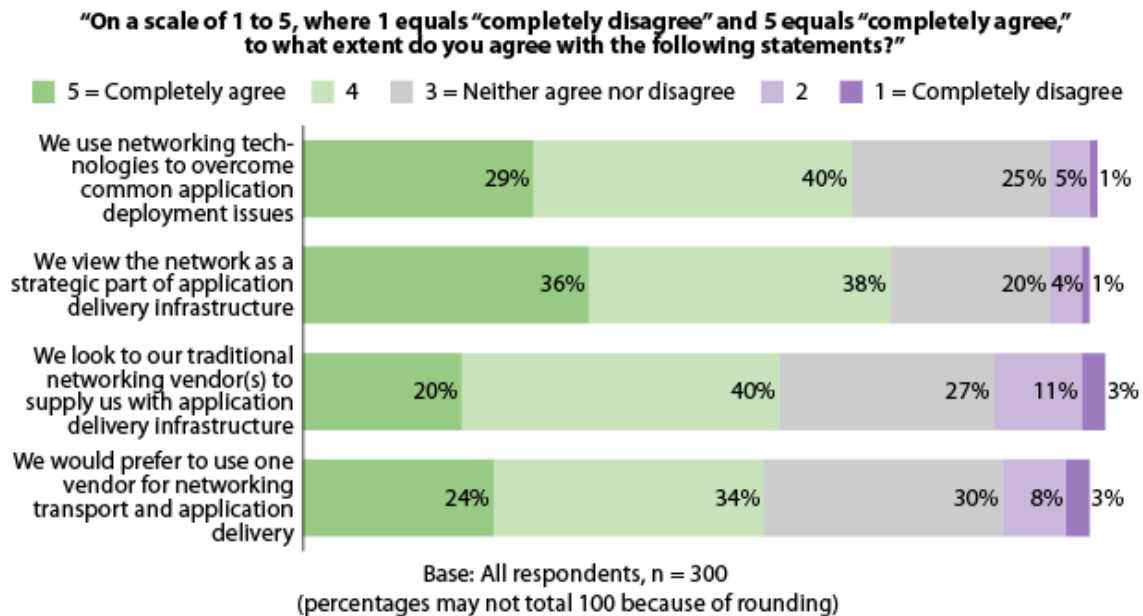
Moving IT From Application Deployment To Application Delivery

Technologies that streamline the connection of any user to any application by minimizing deployment burdens, reducing management costs, optimizing performance, and increasing security.

So, what's the current demand for application delivery solutions? The study showed that:

- More than two-thirds of respondents agree the network can help solve problems . . .**
 The network is not just for transport any more. This is what Forrester refers to as packets versus policy. There is transport gear (i.e., packet plumbing) that pushes bits around, and then there's more sophisticated infrastructure aimed at application delivery. Respondents confirmed this, reporting that 69% use the network as a way to overcome application deployment issues. Even more — 74% — agree that the network is a strategic asset for delivering applications (see Figure 8).
- . . . But very few look to traditional switch and router networking vendors to do so.**
 Despite thinking of the network as a critical asset, few respondents felt their incumbent network provider could help. In fact, a mere 20% completely agreed that a traditional networking vendor could help with application delivery and only 24% strongly agreed that a vendor responsible for packet processing should also be responsible for application delivery technologies.
- Security is critical, but few have the tools to handle it.** Nearly 60% of respondents completely agreed that security is an important factor of application deployments, but only 39% felt they do a good job of actually securing those applications. This indicates a pent-up demand for better application security. Why? Because few firms — even those with a good handle on network-level security — can make the transition to application-level security. A layered defense model is necessary to defend against an evolving landscape of threats fueled by application-specific exploits.

Figure 8: Companies Cite The Network As An Enabler, But Seek New Vendors



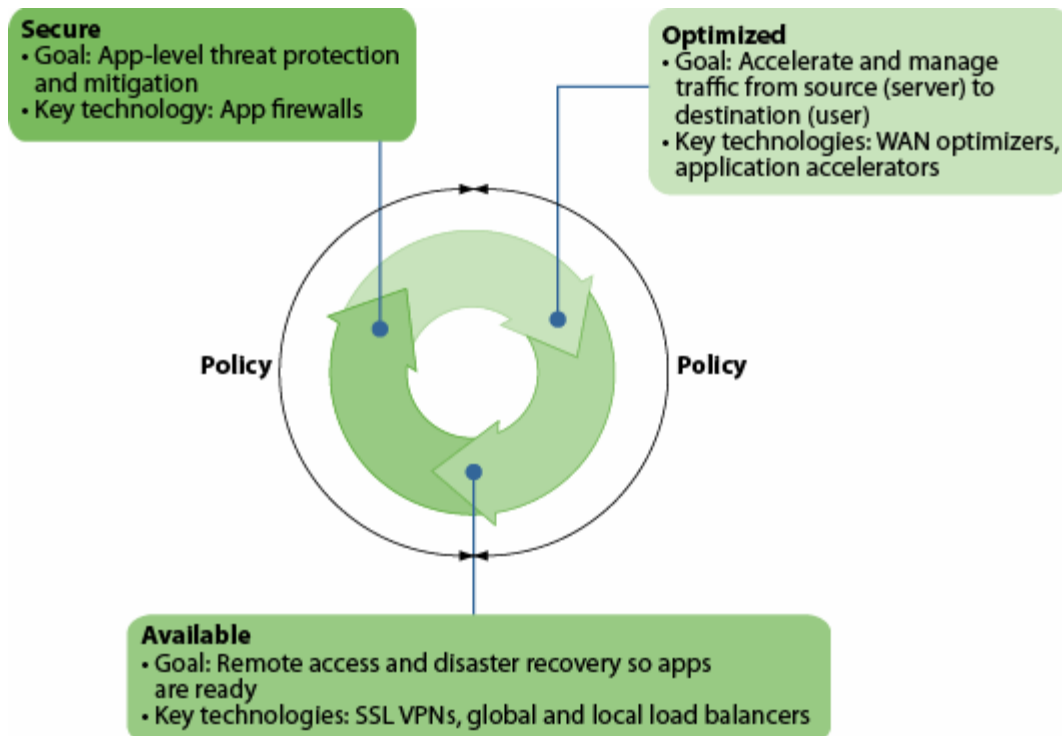
Source: Application deployment survey of 300 North American IT decision-makers responsible for network operations/architecture, application development, or enterprise architecture. Conducted by Forrester Consulting and commissioned by F5 Networks, April 2007.

Application Delivery Infrastructure Is A Critical Bridge Between IT And The Business

An application delivery infrastructure streamlines application deployments and delivery. In turn, organizations can more rapidly deliver results from legacy apps as well as ease transitions to evolving application architectures. This provides a policy-driven platform that creates an abstraction layer between basic network transport and the application middleware. Forrester considers application delivery to be built on three tenets (see Figure 9):

- **Optimization.** Application delivery must first overcome performance issues by overlaying acceleration and traffic management technologies. This includes technology components like WAN optimization and application switches with built-in acceleration.
- **Availability.** Next, application delivery must provide enhanced reliability to ensure apps are always available on a global basis. This includes technology components like SSL VPNs, so that employees can access apps from anywhere, as well as load balancers for geographic resiliency.
- **Security.** Finally, application delivery architectures must protect sensitive data and ensure compliance. This includes technology such as application access controllers, XML security appliances, and app firewalls.

Figure 9: Application Delivery Is Built On Optimization, Availability, And Security

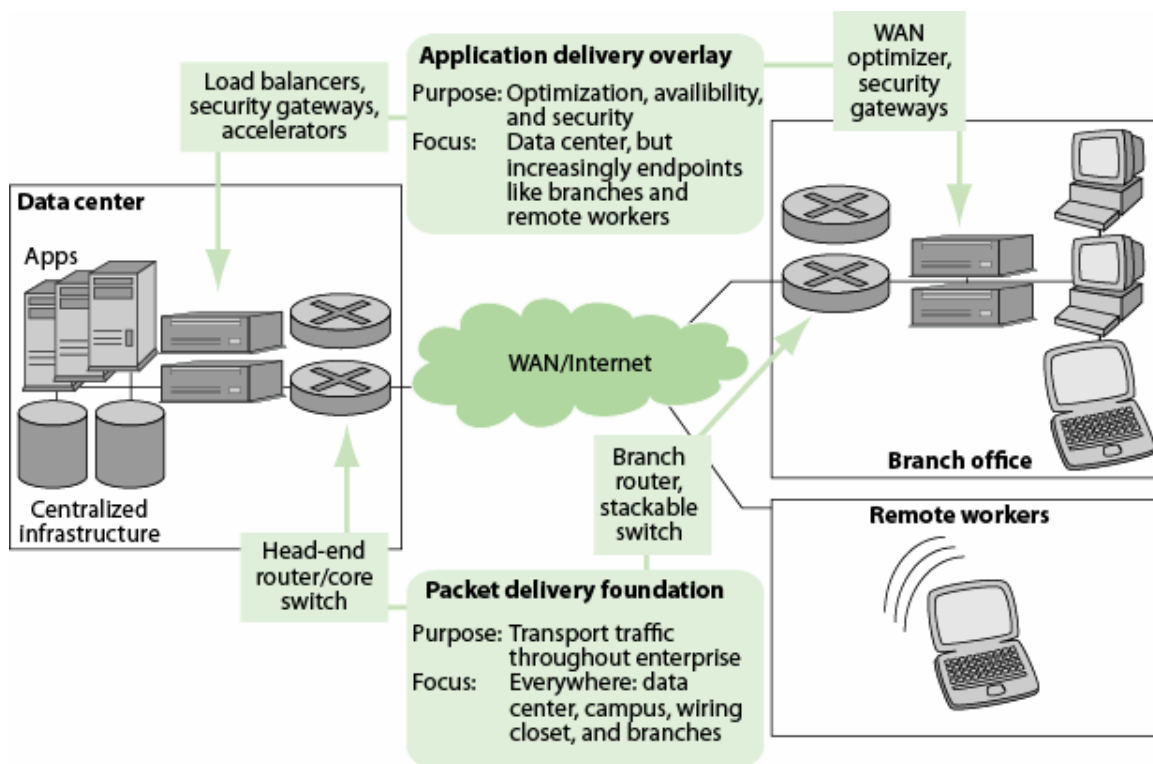


It's important to highlight that application delivery is an architecture that overlays the existing packet network. These technologies are functional components, and not necessarily separate devices. In fact, the benefits of a unified platform approach can prove crucial to application deployments, as well as the infrastructure supporting them. And there can be significant interplay between the

application delivery tenets of security, availability, and optimization, particularly when considering IT objectives that are at odds. Simply put, optimization, availability, and security all impact one another. For example, it can be difficult to lock down your applications and data from a security perspective if another component in the infrastructure is trying to accelerate it, and yet another is trying to provide access for globally distributed users.

Forrester sees a trend in the industry of integrating many of these elements into a single appliance. From an implementation standpoint, we see the majority of the infrastructure located in the data center where it can sit as close to the application and data as possible. However, we increasingly see organizations deploying application delivery technology at branch offices as well (see Figure 10).

Figure 10: An Application Delivery Architecture Is An Overlay To Your Existing Network



Having an application delivery infrastructure in place helps to:

- **Shift the emphasis of technology from packets to policy.** Application delivery depends on a combination of solutions that bridge the gap between the network's packet-processing layers — layers 1 through 3 in the traditional OSI stack — and the application layers, thus providing the necessary abstraction layer to make the shift from packets to policy. Policies for users and applications — the two things networks are intended to connect — translate the binary world of the network into more relevant business objectives for application security, performance, and availability.
- **Mitigate the top application deployment issues today . . .** Respondents identified performance as the top deployment issue. Application delivery infrastructures are specifically designed not only to improve application performance through acceleration technologies, but also to provide a scalable foundation for quickly adding on-demand

capacity for applications. Moreover, application delivery impacts the top line by smoothing the migration to evolving architectures like SOA and Web 2.0, which help support user productivity and revenue generating processes. Finally, it protects the bottom line by creating a unified platform that's more resilient and enables applications that seamlessly failover on a global basis, decreasing the cost of maintaining apps, and increasing availability (see Figure 11).

- **... Provide a unified approach to solve issues that arise tomorrow.** A unified approach not only scales to meet the issues above, but it also provides a flexible architecture to more easily accommodate change. A policy-driven approach means you can quickly change your application topology without having to work on expensive hard-coding or rewiring of the underlying infrastructure. If business demands a new application or a change in process, the entire deployment doesn't need to be restarted from the ground up. The result is decreased costs, but, more importantly, this approach helps limit the scope of deployment issues, decreases deployment budgets, and improves project timeliness.
- **Leverage a common platform for application deployment collaboration.** We know that IT organizations are becoming less siloed, but still lack the technology to solve deployment woes. Application delivery — as a shared asset in the network — provides a single platform that's "fluent" among developers, architects, and operations teams. It provides role-based access control (RBAC) so that each audience views the relevant policies and templates to tweak their piece of the deployment lifecycle. In addition to addressing performance and security issues, a consistent platform also provides a single console to manage real-time application traffic.

Figure 11: Application Delivery Helps With Today's Top Five Deployment Issues

Top deployment issues	How application delivery helps
Performance Issues	Provides acceleration functionality to increase performance for all end users
Project not completed on time	Eases implementation of new application architectures and migration of legacy apps
Project not completed within budget	Reduces the cost of testing, maintaining, and security applications
Application compatibility issues	Delivers on-demand apps to reduce "moving parts" that cause interoperability woes
Infrastructure compatibility issues	Unifies functions that were previously app-specific devices and middleware

Conclusion

The velocity of change in today's organizations is outpacing IT's ability to adapt. IT is tasked with accommodating rapid changes in business requirements, causing a constant realignment of applications with business priorities. Organizations are driven to address emerging requirements around compliance and global, complex workforces, all while executing against growth initiatives such as improving customer satisfaction, generating revenue, and decreasing overall operating costs. Most companies are turning to evolving application architectures such as SOA, Web services, and Web 2.0 in order to create more agile, business-relevant services. But there's a catch: application deployments are still plagued with cost, performance, availability, and security issues.

Moving IT From Application Deployment To Application Delivery

The good news is that there's an emerging solution — which Forrester refers to as an application delivery infrastructure — that addresses these deployment issues. How? By creating a flexible architecture that bridges the gap between infrastructure and applications. The result is an architecture that addresses technology problems — such as performance issues from networks and servers — as well as people and process requirements by enabling increased collaboration between application developers, network operations, and enterprise architects. And finally, a unified, policy-driven platform provides the flexibility to accommodate changes in business requirements without recoding apps or deploying additional backend resources.

The key to success is selecting an application-savvy vendor. The results of this study show that organizations don't believe incumbent packet-focused vendors have the requisite expertise and skill set to solve application issues, which often takes close relationships with app vendors as well as the ability to effectively serve the needs of non-networking professionals. A successful solution streamlines application deployments and mitigates risk throughout the deployment lifecycle.