F5 White Paper

Optimizing Application Delivery in Support of Data Center Consolidation

Data center consolidation means more than simply reducing the number of servers, routers, and switches your company has in outlying offices and data centers. Data center virtualization is more than multiple images mapped to physical devices. Efforts to reduce both capital and operating expenditures by consolidating data centers can fail if the applications and the network are not optimized.

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Contents

Introduction

Client-server, distributed content, and ERP applications all promise to improve organizations' productivity, and their bottom line. However, the costs associated with supporting multiple data centers can quickly negate these benefits. CIOs and IT departments that are combating economic stress by focusing attention on reducing operational costs know that maintaining a piece of hardware is four to five times more costly than actually acquiring it.

Saving money and keeping operations running are reasonable business objectives. However, the true value of an IT department lies in its ability to make the wider business better by providing innovative applications and services that deliver real benefits for both the business and the individuals who work there. Truly effective IT departments use technology to make their businesses more responsive, and ultimately, more competitive.

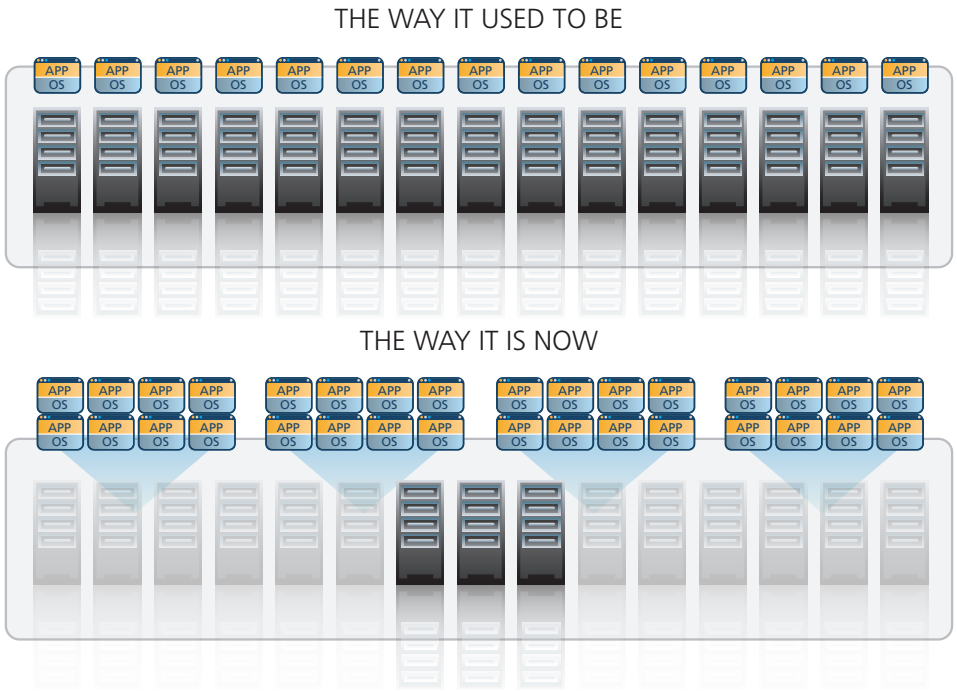
For a business to become more competitive, IT must become more agile. Architectures must be flexible enough to support the rapid integration and delivery of new applications and services. At the same time, IT must enable the business to be more resilient, more secure, and more efficient—a tall order in today's "more with less" climate. This is why consolidation—stripping out hardware and consolidating software to eliminate single-purpose applications and virtualization and to unlock applications from hardware—has become such a priority.

Consolidation Demands a Holistic Approach

Data center consolidation does not immediately solve the problem of needing to become more flexible and agile, nor does it necessarily reduce capital or operating expenditures.

Consolidating a host of application servers from branch offices is a huge undertaking that could cause application performance to suffer. If performance suffered, remedial action would be required, such as a new WAN optimization tool or a "quick" re-architect of the network to bring performance back up to scratch. Similarly, it's easy to reduce the number of servers, but it's also easy to forget about the middle layer in the network (proxy, caching, and SSL), which could create an environment just as complex as the one it is meant to replace. Security can

also suffer. How do businesses ensure data integrity, cost-effective mirrors, and geographic redundancy? Enterprises may also have applications that cannot be consolidated centrally, and for those that can, IT must address the challenge of providing accessibility for hundreds or even thousands of remote employees who need to use those applications daily. Altogether, this can be an unruly environment to control.



VIRTUALIZATION AXIOM:

Fewer physical servers may not equal fewer servers to manage.

If a plan to consolidate through virtualization is not designed, deployed, and managed correctly, it can bring at least as many challenges as it solves. The issue of added complexity can push expected return on investment (ROI) dates back, which requires businesses to embark on a more strategic journey to consolidation—one that begins with the outcome and travels backward. IBM and F5 Networks® believe that outcome must include user experience and the accessibility of the application, irrespective of its hosted location. A truly successful consolidation program should have no negative effects on the user experience; rather it should enable users to do their jobs more effectively, and at a lower infrastructure cost.

To achieve this, organizations need more than a detailed plan. They also need a fundamental shift in emphasis from the network to the application. The network,

while critical as a delivery mechanism, is the *how* in this challenge. More important is the *why*—and the answer begins and ends with the value that accessing a particular application delivers to the business.

The speed with which you must consolidate data centers and the new threats and challenges that come with consolidation present formidable challenges. An F5® Application Delivery Controller can address these challenges; it is a strategic point of control that increases application awareness and intelligence within the network. IBM can contribute broad analysis and assessment, planning, design, and implementation services that organizations can leverage to apply the right solution for their business needs. Together, F5 and the IBM Integrated Communications Services and Server Services team deliver methodologies, designs, and technologies that help you build an infrastructure that enables your applications to run efficiently and effectively in an ever-changing environment.

Virtualizing the Data Center

Effect on the Network

The *why* of any IT department comes from the value that applications bring to the business. The scope and complexity of infrastructure make it easy to forget that the ultimate goal of the network is to serve as a conduit for these important applications. Therefore it is imperative that this underlying infrastructure is intelligent enough to recognize the health of a virtualized environment and to manage access to the best-performing servers and data centers: How are applications performing? Where are bottlenecks? What happens during an outage? More important, can the network respond automatically to these issues to minimize negative effects?

On a granular level, virtualization enables you to more flexibly manage your server and application portfolio. However, the applications and the networking stack need to work together to provide high availability, security, and performance. In an intelligent application delivery model, users get directed to the best-performing virtual image, improving user experience and reliability. At the same time, compute-intense functions can be offloaded to the network to improve scalability and increase the density of virtual machine images on a physical server. Many of these functions can also be automated to reduce downtime, increase flexibility, and reduce costs.

Business continuity, paired with high availability through geographic redundancy, is also critical. Today, many enterprises build redundant sites as a backup and manually manage data replication and failover to the secondary site when needed. It is, in essence, an insurance policy. It's also a non-performing asset—and in an era of tenacious cost control and the constant demand to do more with less, this is not a feasible scenario. By virtualizing data center resources at both sites, businesses can turn these non-performers into ongoing available assets that will function in a distributed scenario to achieve maximum reliability and performance, regardless of location. For example, in an active-active data center configuration, you can carry out data replication, upgrades, and maintenance more frequently to increase overall uptime and time-to-market for services.

How IBM Can Help with Data Center Optimization

IBM Global Technology Services

IBM Global Technology Services professionals can help organizations realize the full benefits of a consolidated and virtualized computing environment with:

- Decades of virtualization experience, extensive research and development activities, and active involvement with industry-standards organizations.
- Experience with a range of IT environments and operating multiple computing centers.
- A global pool of skilled networking, server, storage, and virtualization professionals with in-depth technical expertise and a deep understanding of the evolving demands of network, server, storage, and desktop virtualization.
- A technology-independent approach using best-of-breed technologies like F5 Application Delivery Controllers.
- Proven methods and approaches to network infrastructure optimization.

IBM Integrated Communications Services

Networking Strategy and Optimization Services: Network Application Optimization

Network Application Optimization is a set of services that helps organizations understand how their business-critical applications are affected by the network infrastructure. It can also help them predict the performance of a new or changed application; optimize end-to-end application performance over their network; determine alternative solutions using WAN and/or application acceleration technologies; and assist with selection of applications for migration to cloud computing.

Network Integration Services: Application and Network Performance Optimization

Application and Network Performance Optimization (ANPO) is a set of design and implementation services that focuses on specific applications to provide industry-leading solutions such as F5 BIG-IP® Application Delivery Controllers that can lower your infrastructure bandwidth and server costs while significantly improving application performance across even large geographical areas.

IBM addresses these challenges at the infrastructure's core—where network, storage, servers, and security come together—to create a tightly linked, application-fluent infrastructure that's specifically optimized to run applications. IBM network consultants address real-time business demands and help optimize infrastructure with key technology partners like F5.

IBM Server Optimization and Integration Services

VMware Server Virtualization is a consulting-based solution that can help organizations determine the optimal placement of workloads within a VMware vSphere infrastructure deployment. IBM's structured approach and proven methodology are designed to help you evaluate existing workloads, technology options, and business constraints.

IBM provides a business plan, evaluates current virtualization initiatives, and makes recommendations to help justify changes that can optimize existing server resources and help reduce operational costs.

Value of IBM and F5

As global business partners, IBM and F5 have joined forces to deliver best-of-breed solutions that deliver IT agility to their customers. By using a dynamic infrastructure model, IBM and F5 joint solutions virtualize, optimize, and secure application and network resources and enable organizations to customize and automate IT. This provides support for user SLAs, reduced capital and operating expenditures, and a superior experience for global users.

With F5 products such as BIG-IP Global Traffic Manager™ (GTM), BIG-IP Edge Gateway™, and BIG-IP Access Policy Manager™ (APM) as key components, IBM and F5 offer IT organizations solutions for data center consolidation and optimization while allowing them to retain total control over their entire data center infrastructure. These tools allow enterprises to dynamically route to the best application in the best location at the right time, while also providing an optimized and secure path to the appropriate data center resource.

Conclusion

A consolidation strategy must focus on how a centralized solution can provide a unified way to deliver applications efficiently to all users—whether they are working from a remote office, home office, or on the move. Taking this wider view of the consolidation effort provides unique measures of success and ROI for the business as a whole to solve multiple problems within an organization that go far beyond just centralizing your servers, routers, software, and switches.

The new data center must leverage a dynamic networking infrastructure and make decisions based on data provided by other components and services inside the network. When a new virtual machine or application is deployed, the switch network must automatically know how to route to it; the application delivery infrastructure needs to know how to secure and optimize it for delivery; and firewalls and remote devices need to apply proper policy for access. By using products and services from IBM and F5 to consolidate data centers, an organization

can create a more intelligent network that will deliver increased value to the users and the business, locally and globally.

By architecting data center infrastructure to be as nimble and agile as possible, IBM and F5 enable enterprises to better react in real time to customer requirements and to position the customer for success. The combined strength of IBM and F5 tackles these challenges at the core of the infrastructure by creating a strategic point of control where the network, servers, storage, and security come together to create customized solutions that add significant business value.

For more information about IBM and F5 optimization solutions, please visit www.f5.com/ibm.

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