F5 & VMware Solutions Guide

Virtualization solutions that optimize performance, improve availability and reduce complexity

The benefits of virtualized IT environments are anything but virtual

This proven approach to managing IT infrastructure can reduce costs from the desktop to the data center and the 'cloud' beyond.

By maximizing the use of all available server capacity and sharing it across all applications, virtualization allows organizations to consolidate the hardware in their data centers or IT departments and reduce IT operating costs. But to work successfully, virtualized environments need more than just the infrastructure of VMware vSphere. They need a network that is intelligent and flexible enough to handle the advanced features of that new infrastructure.

Virtual machines also place an increased strain on the network, affect application performance, create risks of new storage bottlenecks and increase management complexity. F5 solutions address these challenges and enable virtualized environments to achieve their full potential for performance, availability and cost savings.

F5 solutions can improve:
- **Architecture availability**
- **User experience**
- **Business continuity**
- **Security**
- **Cost efficiency**

Server & Data Center Consolidation

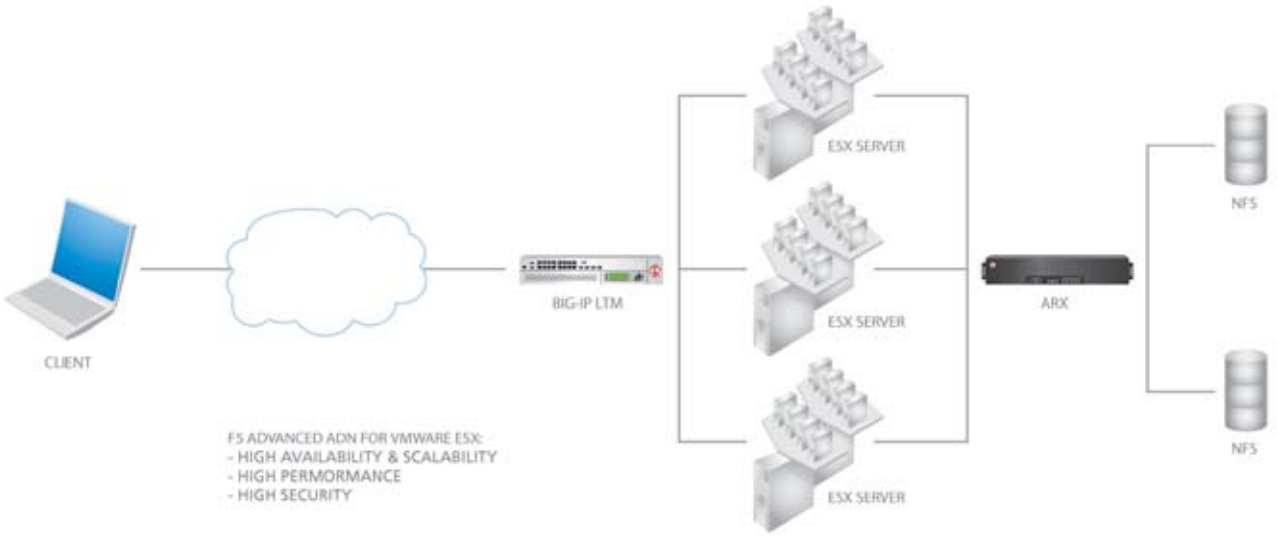
Reduce hardware, power and facility costs

THE CHALLENGE

Virtualization has emerged with almost perfect timing to respond to organizations' need for greater efficiency in the current economic climate. Within data centers of all sizes, there are vast numbers of servers that are under-utilized. By making this extra capacity available for more than one application at a time, companies can scale down their hardware infrastructure, consolidate their operations in smaller or fewer data centers and consequently save on space
and power costs. The advantages of consolidating data center services are very attractive, but organizations will only truly benefit from a virtualization strategy if attempts to reduce costs do not also inadvertently lead to reductions in performance or availability. Organizations will need to make sure that they have the necessary load balancing and traffic management solutions in place to maintain application performance and availability. As virtualized environments expand, organizations often face additional challenges relating to VMDK (Virtual Machine Disk Format) file storage. The number of files increases, as does the size of the shared storage pool. As a result, file management becomes more complex, storage bottlenecks often appear and storage costs increase.

THE SOLUTION

F5 solutions effectively sit in front of application servers on virtual machines and optimize connections, route traffic and balance loads when resources become constrained. F5 BIG-IP® Local Traffic Manager™ offloads many of the functions that place a CPU and memory strain of virtual machines, such as secure sockets layer (SSL) transactions, caching



and compression. Offloading these functions on to a purpose-built appliance can free up to 50% of general server resources, allowing servers to operate more efficiently and making available more server capacity.

By taking advantage of F5's ARX® product, organizations can also address the challenges that they face relating to storage. ARX enables intelligent file virtualization by abstracting the virtual file location from the physical storage location. This enables transparent and automated policy-based allocation across different storage tiers. The files that need high performance sit on tier-1 and the files that don't sit on tier-2. This can reduce the requirement for expensive tier-1 storage by up to 80%.

THE BENEFITS

- Maximize the performance of existing hardware resources and stave off additional investments in physical servers - Improve application performance by offloading CPU intensive tasks
- Increase availability through advanced load balancing between and within data centers - Optimize file storage infrastructure and reduce costs

Data Center Automation

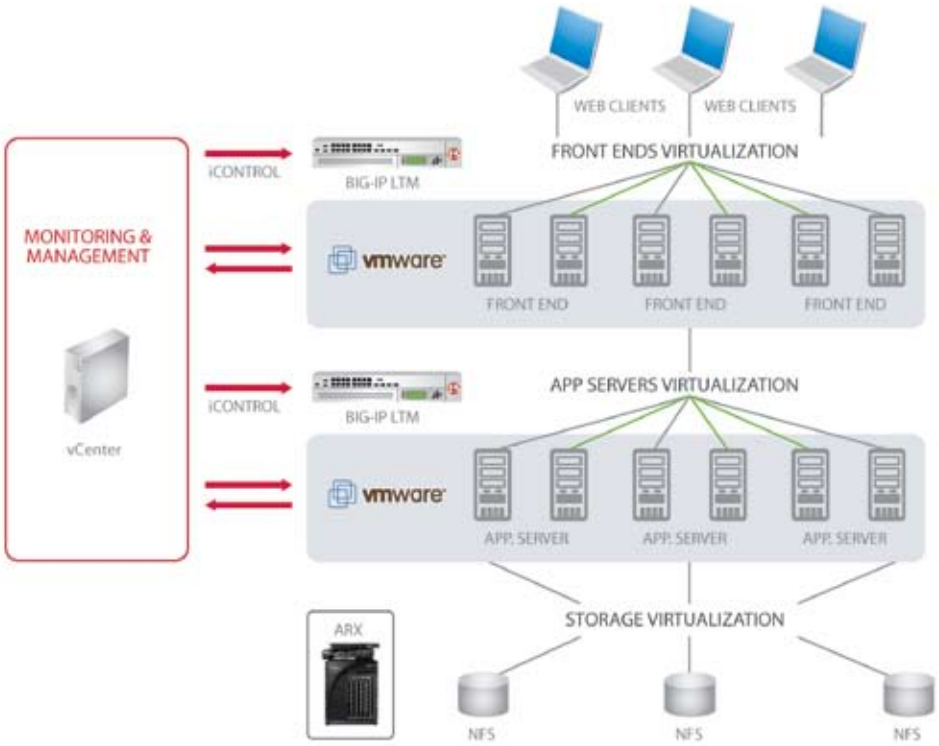
Automate the application delivery network

THE CHALLENGE

IT service providers, data center operators and other large organizations that have deployed virtual machines will know that unexpected spikes in application traffic volumes can wreak havoc on availability Service Level Agreements. Conversely, they can require an excess of over-provisioned infrastructure. In a ddition, as the number of virtual machines increases, so too can the amount of time required to manage them. IT staff often waste time unnecessarily, performing routine management and maintenance tasks that can be effectively automated. The provisioning of new virtual servers is not entirely handled by virtualization solutions, because most network reconfigurations are still manual. As a result, it can take IT staff quite some time to expand their virtual environment, and manual errors can lead to system failures and avoidable performance issues.

THE SOLUTION

F5 solutions greatly simplify network deployment, management and maintenance tasks through automation. For example, F5 BIG-IP can communicate directly with VMware's vCenter management console via its iControl API to take instruction on how to adjust the network to changing application conditions, both within a data center and across data centers. For example, when new virtual machines are provisioned by vCenter,\ BIG-IP Local Traffic Manager can be automatically instructed to add those new servers to its load balancing pool and begin directing traffic to them. BIG-IP is intelligent enough to wait until the virtual machines are responsive before beginning to send traffic. Equally BIG-IP



knows when virtual machines or entire data centers are overloaded or unavailable and reroutes traffic accordingly. With its in-built intelligence, BIG-IP can respond to fluctuating traffic loads without the need for manual intervention.

As another example, F5's BIG-IP Global Traffic Manager solution can automatically detect the geographic location of users when requests come into a virtualized environment operated across multiple data centers. It then serves up the applications from the data center closest in location to the user, to ensure that the highest possible performance levels are delivered. It can also serve up traffic from the most cost-effective location, depending on different Service Level Agreements. Similarly, BIG-IP Local Traffic Manager can identify and distinguish between different 'classes' of users. For example, requests from high-priority users can be served up from a higher performance server pool than standard users. This and other similar functions enable optimal use of application resources and make life easier for network managers.

THE BENEFITS

- Improve the speed at which the network can respond to the needs of the virtualized environment
- Reduce management complexity in the virtualized environment
- Reduce costs and improve IT staff efficiency with automated tasks and simplified management
- Minimize manual configuration errors

Business Continuity

Protect your business and minimize application downtime

THE CHALLENGE

Businesses simply cannot afford to be without their core applications and web-based services. When an application goes down – whether it is a simple hardware failure or a catastrophic fire or flood – organizations need to know that the application will remain up and running no matter what.

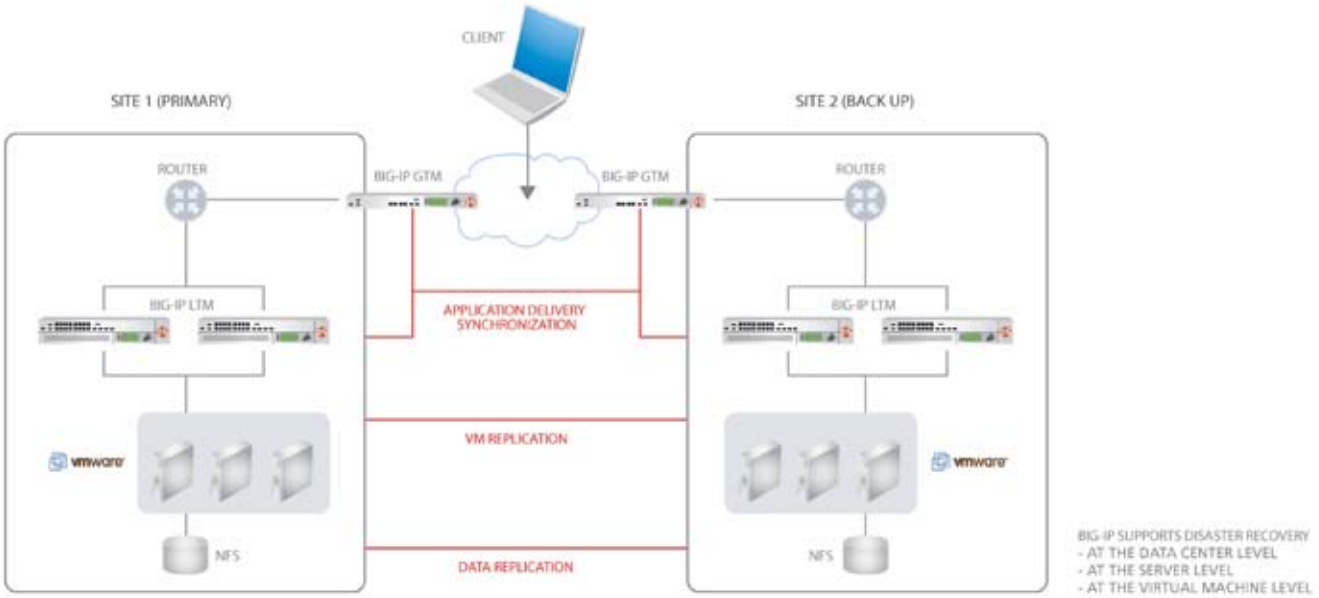
In traditional IT environments, it is very difficult to move an application from one data center to another or even from one server to another. To overcome this, many companies overprovision, but twice the hardware creates twice the cost.

Virtualized environments offer the ability to package applications into a single file and reboot that file on another server in a matter of seconds. Virtualization also allows organizations to easily create and test their disaster recovery plans without taking down their production environments. As a result, virtualization provides a more cost-effective, flexible and reliable alternative to traditional disaster recovery solutions.

There are, however, a number of network challenges that organizations still need to address to ensure the continued availability of their applications in the event of disaster.

THE SOLUTION

F5's BIG-IP Global Traffic Manager solution can be deployed as part of a virtualized environment to effectively balance loads between data centers. Depending on application load and performance, it can automatically redirect traffic to an alternative data center when a site-wide incident occurs. Where a second data center is not available, BIG-IP Global Traffic Manager can divert core applications to external, third party servers. Sometimes referred to as 'the cloud', this shared virtualized server facility can provide a cost



effective and flexible option for disaster recovery.

To improve the transfer of data between data centers, organizations can also take advantage of F5's WAN Optimization solution.

It enables large volumes of data to be transferred from a source to a target data center more quickly. F5's solution performs compression data and de-duplication on data transfers, reducing the overall volume of data that needs to be sent across the WAN. The need to transfer less data decreases bandwidth requirements, as well as decreases effective transfer latency.

Within data centers or IT departments, organizations can deploy F5's BIG-IP Local Traffic Manager solution to prevent core applications from becoming unavailable due to hardware failure.

The solution constantly measures application response time and seamlessly and immediately redirects traffic from the faulty device to other virtualized servers in the environment with no interruption in application availability.

THE BENEFITS

- Load balance across data centers (taking into account Service Level Agreements and cloud computing charges)
- Facilitate disaster recovery within a data center, to a secondary data center or to the cloud
- Maximize application availability and minimize the impact of any downtime
- Increase the speed of large data back-ups across the WAN

Virtual Desktops

Provide a consistent, secure user experience with high availability of applications

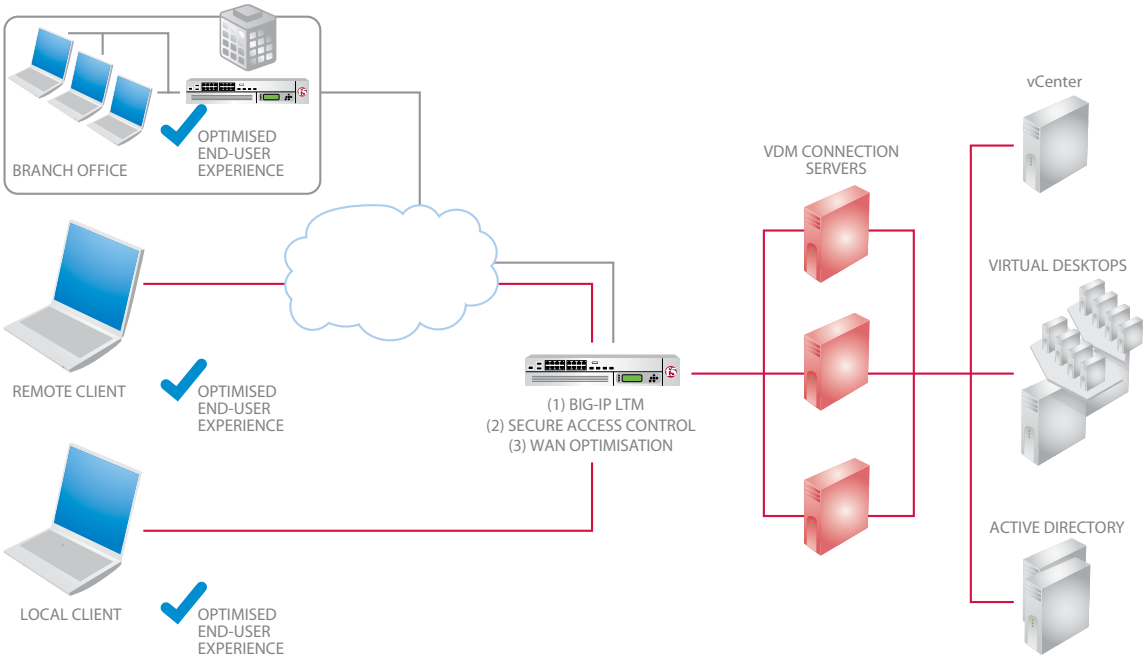
THE CHALLENGE

Over recent years, many organizations have elected to replace their desktop PCs with simple client terminals and give users access to centrally stored applications and services over the LAN or WAN. In addition to the hardware cost savings, these virtual desktops are easier and more cost effective to manage and secure. For a solution such as VMware View to succeed, however, users expect the same performance from virtual PCs as traditional PCs. If high network latency exists (which is often does in remote client deployments), users will experience sluggish performance. In addition, scaling the centralized connection servers can be expensive. Finally organizations need ensure that the connections are secure, but without imposing too much CPU load on the connection servers.

THE SOLUTION

F5 solutions are designed to accelerate up WAN connections and can therefore improve the performance of virtual desktop machines. The F5 WAN Optimization feature maximizes available bandwidth and accelerates the transmission of protocols such as Remote Desktop Protocol (RDP) to ensure consistently high performance for users. Within the data center, BIG-IP's ability to serve as a connection broker and provide very high performance SSL termination and compression can offload a large percentage of the load from the desktop servers. This improves the overall system's scalability at a fraction of the cost.

In addition, F5 solutions address the omnipresent security challenge by ensuring high end-point security prior to login. F5 Secure Access Manager performs pre-logon checks on the end-



point device prior to allowing the logon sequence to begin, as well as providing a broad range of authentication mechanisms, including two-factor schemes and various back-end directory services. This solution also enforces Active Directory Group policies on any remote device and improves availability.

THE BENEFITS

- Ensure a high quality of service for end-users
- Maximize WAN bandwidth
- Reduce the cost for large deployments of virtual desktops by minimizing the number of servers required
- Ensure tight, end-to-end network and application security

Application Virtualization

Ensure the high performance of enterprise applications

THE CHALLENGE

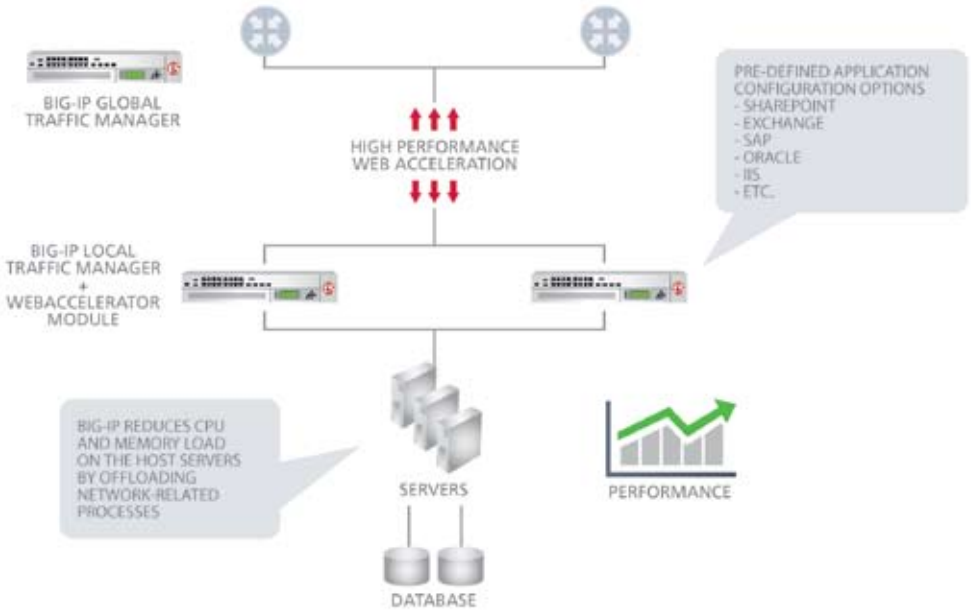
Enterprise applications, such as SAP, Oracle, Microsoft Exchange and Microsoft SharePoint, support and integrate multiple different parts of a business and are therefore critical for day-to-day operations. But they can also be a source of inefficiency. In traditional IT environments, these applications can require vast numbers of servers, not all of which are fully employed. By migrating enterprise applications to a virtualized or partially virtualized environment, organizations have the opportunity to consolidate their hardware requirements and reduce the associated power, management and maintenance costs.

Virtualization technologies are, however, primarily focused on the operating systems layer – not the layer applications. Therefore, when organizations decide to pursue a virtualization strategy, they need to take steps to ensure that the new environment does not adversely impact their application performance.

THE SOLUTION

F5 minimizes application specific network risks when moving to a virtualized platform, by providing solutions that are pre-optimized for specific applications and accompanied by comprehensive predefined profiles within BIG-IP (e.g. Microsoft, SAP, Oracle, etc.). Often deployed in traditional IT infrastructures, these pre-defined profiles are just as beneficial in virtualized environments. Use of these application templates can lead to a 90% reduction in inputs, thereby reducing configuration time and errors.

One of the pre-defined application profiles provided in BIG-IP is a VMware View (virtual desktop)



profile. Providing a 'best-practice' configuration model, this template encapsulates all of our experience in designing optimal VMware View systems and dramatically simplifies installation. Furthermore, BIG-IP Local Traffic Manager maximizes application performance for users. It offloads CPUintensive functions, such as SSL processing, caching and compression and intelligently directs traffic to the best available virtual machine, depending on actual response time. Finally, organizations that rely heavily on web-based applications can take advantage of F5's BIGIP WebAccelerator. This solution increases access speeds and load times for users and drastically reduces the CPU load on web application servers in virtualized environments though a combination of intelligent caching, connection pipelining and exploitation of browser behaviour. (Specific performance improvement benchmarking data is available at F5.com)

THE BENEFITS

Reduce the risks associated with implementing an application virtualization strategy
- Minimize hardware and power costs by maximizing the density of virtual machines
- Optimize performance and application availability for users
- Maximize the return on investment of a virtualization strategy

Cloud Computing

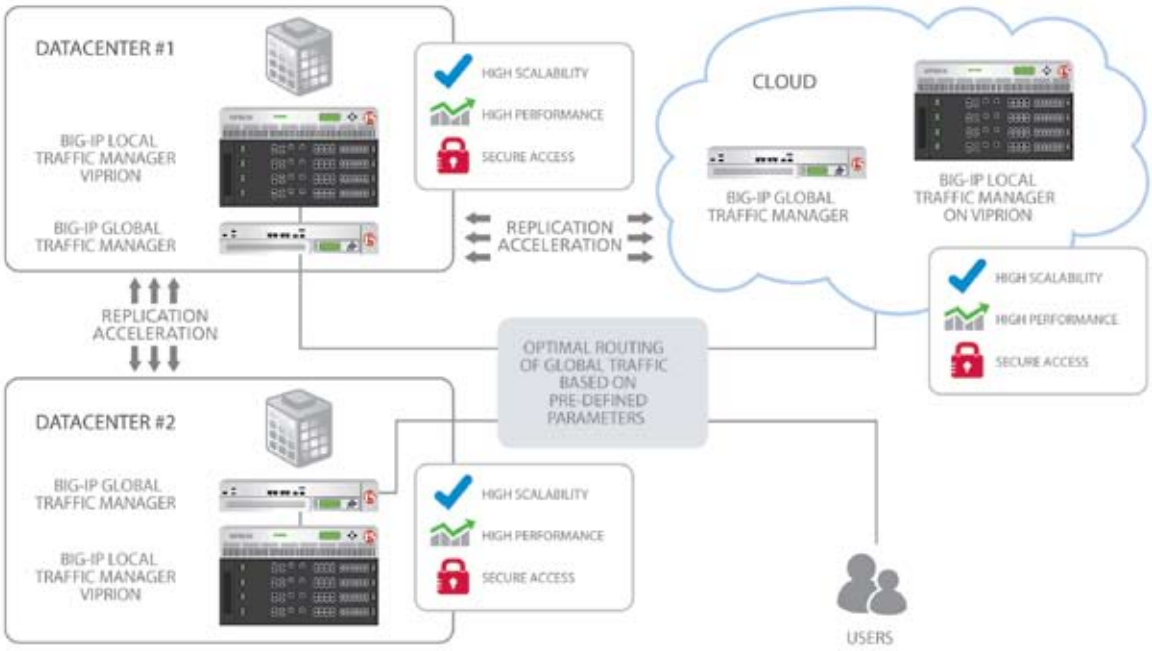
Deliver reliable web-based services

THE CHALLENGE

At a time when data volumes are increasing at unprecedented rates and application traffic can spike unpredictably, many organizations are looking for new solutions that will give them flexible access to added capacity. 'Cloud computing' is one such solution. Offered by a growing number of IT service providers, cloud computing is a virtualized IT environment that companies of all sizes can subscribe to, to give them access to additional server capacity, on demand. As is often the case with new IT services, however, there are a few concerns in the market place about cloud computing. A recent survey conducted by IDC Enterprise Panel (August 2008) revealed that, in this area, organizations are most apprehensive about the implications for security, performance and availability. IT service providers that offer cloud computing must address these concerns and, in particular, ensure consistently high service levels to satisfy Service Level Agreements with customers.

THE SOLUTION

Service providers and endusers can take advantage of F5 BIG-IP Global Traffic Manager to improve application performance across internal and external shared cloud services. The solution determines how well a particular data center is operating before sending traffic to it. Use of F5's BIG-IP Secure Access Manager can authenticate and authorizes user access and provides SSL termination. This product can be used in conjunction with F5 WAN Optimization feature, which performs additional encryption over the WAN and accelerates WAN performance. For very large, demanding cloud environments, F5's VIPRION product is a robust



and flexible choice. It provides true network traffic management capacity on demand by allowing additional blades to be added without any manual configuration or interruption in application performance. VIPRION is ideal for service providers as it offers a multitenancy feature that allows administrators to easily slice up VIPRION capacity to manage different customers' traffic separately on a single VIPRION unit.

THE BENEFITS

- Meet Service Level Agreements for customers by ensuring consistently high performance and availability
- Protect internal business systems and those of customers with tight application and network security
- Improve the ability to scale up and deliver added capacity on demand
- Improve WAN performance between data centers

F5 Solutions for Virtualized Environments Include:

F5 BIG-IP LOCAL TRAFFIC MANAGER (LTM)

- Balances traffic to virtual servers or from virtual desktops
- Offloads processing intensive activities like SSL termination, caching or compression to reduce the strain on virtual machines and increase their capacity
- Includes a suite of security services that bolster network and application security
- Offers industry-leading layer 7 intelligence and many automated features for easier management

F5 BIG-IP GLOBAL TRAFFIC MANAGER (GTM)

- Directs traffic intelligently among virtual machines located at multiple data centers
- Redirects traffic automatically in the event of a disaster at one data center
- Provides a single framework for managing all application services across multiple sites
- Routes global traffic to the closest and most logical global data center to maximize speed

F5 ARX SERIES

- Provides a single storage solution for virtualized environments
- Provisions new storage for virtualized environments quickly and easily
- Removes the need to preallocate large amounts of storage and distributes virtual machine files across multiple physical devices
- Allows non-disruptive data migrations, automated storage tiering and optimal backup

F5 WAN OPTIMIZATION SOLUTION

- Accelerates the transfer of files and speeds up data replication between data centers
- Reduces bandwidth usage by compressing and caching files
- Expands WAN capacity to improve application throughput

- Provides configurable site-to-site encryption using SSL

F5 BIG-IP SECURE ACCESS MANAGER (SAM)

- Provides policy-based, secure access to virtualized applications
- Ensures end-to-end data protection
- Performs pre-logon inspections, end user/ machine authentications and other measures to ensure secure user access from any location
- Supports up to 25,000 concurrent users on a single appliance

F5 BIG-IP WEB ACCELERATOR

- Optimizes the performance of virtualized web applications for remote desktops operating over a wide area network
- Addresses performance issues commonly associated with browsers and web application platforms
- Improves WAN content delivery by locating content closer to users
- Increases the speed and reduces the cost of web applications in virtualized environments

F5 BIG-IP VIPRION

- Provides massive performance to meet the needs of the most demanding virtualized environments
- Scales on demand
- Allows blades to be removed and added without disrupting applications
- Includes multi-layered redundancy to reduce the likelihood of downtime

F5 is the leading provider of advanced platform Application Delivery Controllers (ADCs) with 57.9% market share according to the Gartner Group. Our solutions are used by over 16,000 organizations worldwide.

Find out more at:
www.f5.com/solutions
www.f5.com/vmware

*Gartner ADC Market Share report for Q3 2008, 12/2008

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