White Paper

Improving VDI with Scalable Infrastructure

As virtual desktop infrastructure (VDI) has become more prevalent, point solutions have emerged to address associated delivery issues. These solutions burden IT infrastructure, but with little benefit. Organizations need a solution that can offer added security, network performance improvements, and vendor-specific optimizations, all while improving architecture for non-VDI systems.

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Introduction

Virtual desktop infrastructure (VDI) is the next stage of virtualization. It is appealing to many different constituencies because it combines the benefits of anywhere access with desktop support improvements. But desktop virtualization is more complex than server virtualization—it requires more of the network infrastructure, servers, server administrators, authentication systems, and storage. VDI's effect on the network is significant; it necessitates infrastructure changes to accommodate the large volume of client information that will be traversing the network.

VDI also carries security implications, particularly if organizations plan to allow remote logins. Exposing a VDI authentication server to the public Internet presents yet another attack vector to be exploited. These AAA and security issues must be dealt with directly, either through the chosen VDI vendor or through a third party.

Many organizations will likely choose a different vendor for desktop virtualization than for server virtualization—so these organizations' IT shops have two different vendors running in parallel. To manage this and meet the challenge of VDI, organizations need an all-encompassing solution that provides IT staff with the capabilities of a world-class Application Delivery Controller (ADC), plus application-specific enhancements and configuration options that support each of the major virtualization vendors.

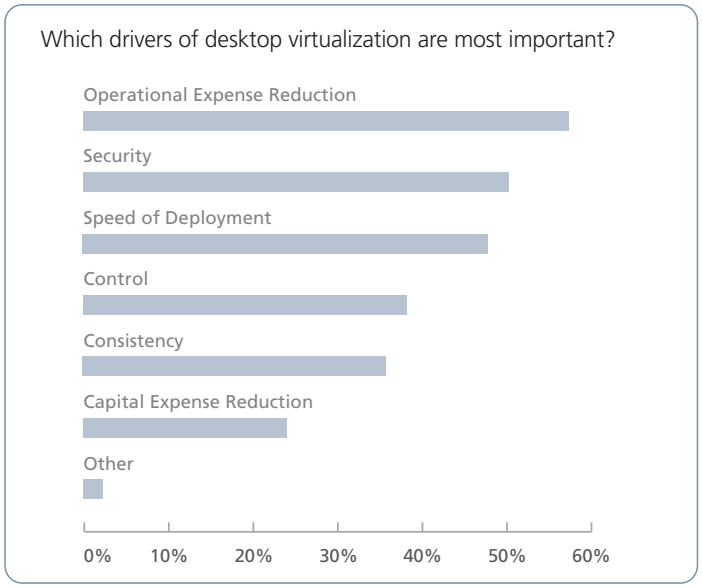

Figure 1: Desktop virtualization drivers as reported by The 451 Group in "The Desktop Virtualization Ecosystem Overview" (https://451research.com/report-long?icid=1735).

Meeting the Challenges of VDI

All major VDI products share certain shortcomings: they are network-usage heavy, they require certain architectural elements like connection servers, and they suffer from performance and security issues. This is largely a function of the overall problem—when applications move to servers, the application must communicate with the client computer frequently, which exceeds the normal network traffic generated by the application. Opening connections to the outside world means organizations must protect the communications between the dumb client and the virtualized desktop, while also protecting the authentication point from a variety of attacks. Incoming connections must be managed and load balanced to give users access to the correct desktop without over-burdening a given server or network segment. And VDI vendors are focused on the quality of the user experience and IT's ability to manage the installation infrastructure, which often means that performance optimizations become a secondary concern. Finally, organizations often choose a solution because it can operate within a vendor's locked-in architecture, not because it's the best that IT can find.

F5 has years of optimizing and securing network traffic under its belt, and by leveraging strategic partnerships with VMware and Microsoft, F5 can provide ADC services to each with application templates specific to VMware View, Microsoft desktop virtualization, and Citrix Xen.

In addition to including these templates, called iApps™ Templates, that focus on how vendor-specific VDI protocols and authentication tools use the network, F5 products offer many benefits to all VDI deployments, including:

- Improved delivery with TCP optimizations that mitigate the effects of latency and dropped packets on the network.
- Load balanced traffic to connection servers to maximize response times and minimize the number of connection servers required.
- Optimized traffic between virtual desktop servers and target machines.
- Enhanced security with single sign-on, Active Directory integration, and a hardened, external-facing IP address.
- Offloaded SSL encryption from individual virtual machines to customized hardware via a full SSL terminating proxy.

These benefits accrue to VDI because they are part of the normal function of an F5® BIG-IP® Application Delivery Controller. They are built into F5 products and apply not only to a VDI deployment, but to all networked application deployments.

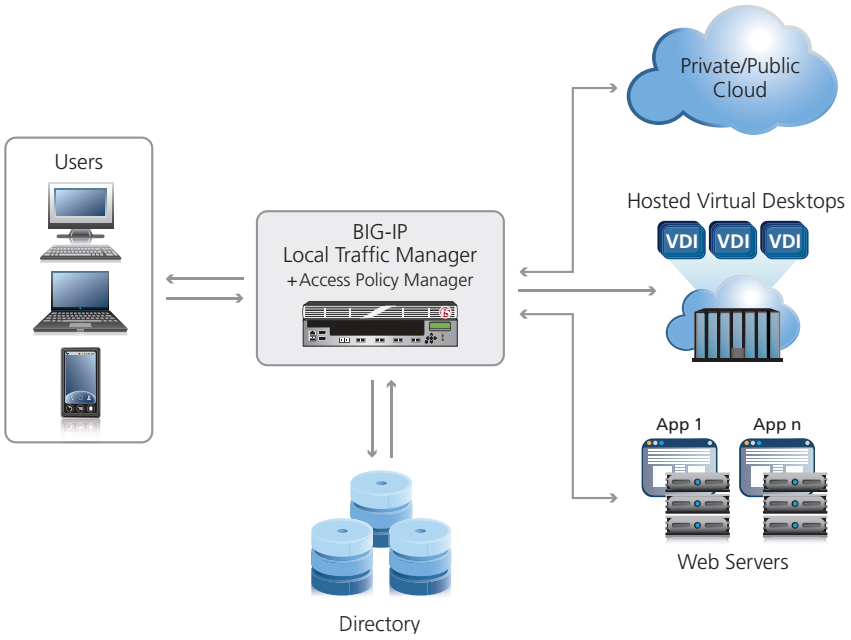

Figure 2: F5 products solve problems rather than just adding infrastructure.

F5 products are adaptable, and can support each vendor with a customized iApps Template. If an organization needs to support Citrix for VDI and VMware for server virtualization, F5 products will readily support both platforms from the same set of hardware. Solutions purchased from VDI vendors are highly unlikely to offer the same level of multi-vendor support.

The BIG-IP system works seamlessly in the environment of each of the major VDI vendors.

VMware

VMware View is VMware's desktop virtualization environment. By using connection servers to manage connections between clients and desktops and to offer connection security, VMware View users can manage thousands of desktops through the building block and pod architectural elements.

Like many other VDI offerings, VMware View is first a desktop delivery scheme, and only secondarily worries about network performance. Through a strategic partnership with F5 however, VMware can offer solutions that include F5's advanced Application

Delivery Controller functionality. Specifically, F5 enhances VMware View deployments by offering:

- **Optimized network performance.** F5 offers TCP optimizations, compression, and, for office-to-office VDI, IP tunneling and deduplication, increasing perceived VDI performance no matter where the client may be.
- **Application performance and availability.** F5 products manage connections, perform load balancing, and optimize access to VMware View Manager Connection Brokers to increase perceived performance, while improving uptime through load shifting.
- **Enhanced security and access control.** The BIG-IP system performs pre-login checks of clients against IT policies so non-compliant users can be shunted away from critical resources to a remediation system. Back-end integration with a variety of authentication systems, including two-factor schemes, along with encryption and optimization of PCoIP communications gives IT maximum flexibility when deploying public VDI services.

In short, F5 offers high-speed SSL to any device from any location, and the ability to manage incoming user security by both user and device. Offloading encryption and load balancing connection server traffic both result in reduced infrastructure costs through the elimination of physical servers and VM licenses.

Finally, the BIG-IP system can handle DoS attacks against public-facing IP addresses that allow remote users to access their virtual desktops, increasing security and potentially increasing uptime percentages.

Microsoft

Microsoft and F5 have a long-standing strategic partnership that has been leveraged by both organizations to make VDI deployments—be they application virtualization or desktop virtualization—more resilient and reliable.

Coupling F5 technology with Microsoft's VDI offerings enhances the Microsoft environment by offering:

- **Unified management.** The F5 PRO-enabled Management Pack for Microsoft System Center puts management and provisioning of ADC resources into the System Center UI.

- **Optimized connections.** Through both TCP optimizations and RDP-specific optimizations, F5 products improve the perceived performance of Microsoft virtualization technologies.
- **Memory intensive offload.** BIG-IP® Local Traffic Manager™ (LTM) offloads encryption, caching, and compression from servers, freeing up valuable CPU time for VDI processes.
- **Storage allocation.** F5 ARX® inserts intelligent file virtualization between the VDI servers and corporate NAS devices, enabling administrators to automate storage tiering to improve performance of the clients/applications that require Tier 1 storage—without necessitating more storage purchases.

F5 technologies work hand-in-hand with Microsoft technologies, from RDP to Microsoft Exchange and SharePoint, to optimize the entire network, not just a VDI deployment. By improving the performance of essential Microsoft applications and Microsoft VDI deployments, F5 offers exponential returns from a single investment. Considering F5's strategic partnerships with other major software vendors such as Oracle and IBM, the benefits flow much further than just VDI.

And as Microsoft rolls out new versions of its VDI environment, F5 will be there with customized solutions on standard F5 gear. F5 is already working with Microsoft to build Windows 8 support into its products.

Citrix

Citrix has a commanding lead in the VDI market space, which F5 supports with iApps Templates. While Citrix XenApp and XenDesktop are market leaders in app and desktop delivery respectively, neither product optimizes the user experience. Depending on a user's device and location, authentication may be fragmented, performance may suffer, and infrastructure requirements can be significant. F5 addresses these issues and more with:

- **Unified authentication.** Working on the BIG-IP platform, which has resisted some of the worst DDoS attacks ever attempted, BIG-IP® Access Policy Manager™ (APM) unifies all access control into a single device with a unified UI.
- **Network optimization.** The BIG-IP system combines TCP optimizations with compression, and in some cases deduplication, to improve performance of Independent Computing Architecture (ICA) communications over the LAN and WAN.

- **Pre-built deployment templates and solution guides.** These guides can help administrators through the configuration process and improve success of upgrades.
- **Infrastructure reduction.** Through efficient offload of functionality such as encryption and compression, and unification of authentication mechanisms, the BIG-IP system reduces the number of servers required to deploy Citrix Xen products.
- **Improved internal/remote user interface.** The BIG-IP system eliminates the need for separate Secure Ticket Authority and Citrix Access Gateway instances, while accelerating ICA delivery over WAN links.

BIG-IP LTM also accelerates other virtualization solutions, such as VMware ESXi, from the same box at the same time. And the general benefits that the BIG-IP system brings to VDI also apply to other networked applications, offering a well-rounded solution that makes Xen and all other networked applications secure, fast, and available.

Conclusion

VDI offers many benefits to IT in terms of licensing simplification and ease of deployment. At the same time it offers new levels of desktop mobility. Users can log in to their desktop and run applications from a tablet, personal computer, work computer, or even phone.

But the shift to VDI has produced a new burden on the network. With VDI, the communication of GUI elements and user input adds to the network load. At the same time, VDI means that users are more subject to network vagaries than ever before.

Organizations need a wide-ranging, best-of-breed solution to help alleviate VDI's effect on IT infrastructure—one that can accelerate and secure not only VDI, but server virtualization and other networked applications as well. One that can support multiple virtualization environments simultaneously, with specialized configurations readily available for each of the major virtualization vendors.

F5 not only delivers on all of these needs, but enhances performance of high-latency, low bandwidth connections and offloads CPU-intensive work from servers so that fewer total servers are required for a virtualization effort—whether it's VDI or server virtualization.

IT can no longer afford to invest in infrastructure that does only one thing. IT environments are getting too complex, and the cost of point solutions for a single subset of applications is too high. The F5 BIG-IP platform is not only the leader in application delivery, but also in virtualization delivery because it offers highly adaptable, highly tunable, highly reusable solutions in one compact package.

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