Certeon's *aCelera* Virtual Appliance for Acceleration

Product Brief

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I. Introduction: The Increasing Complexity of the Distributed Enterprise

A number of critical market drivers in the business environment are adding complexity to both the corporate and branch office IT infrastructure. Subsequently, these shifts are driving the need for increased levels of intelligence across that infrastructure, which includes the systems, applications, and networks used to connect remote users to data centers.

These shifts include:

- Centralization of enterprise applications and data in consolidated data centers, coupled with the increased need for high performance access to these same enterprise applications and data resources. This consolidation is resulting in rapidly growing deployments of proprietary point solution WAN Optimization Controllers (WOCs) and application acceleration appliances (AAA) at both central and remote sites. Unfortunately, the expense and complexity of deploying these proprietary devices to multiple branch offices makes it prohibitive for many enterprises to deploy these devices to all of the users who require it.
- Regulatory compliance is forcing a greater emphasis on assuring the accuracy, security and confidentiality of data. This is forcing the deployment of more security devices, such as firewall and IDS/IPS appliances at branch offices, which increases the management requirements at the branch.
- The wider distribution of the work force among regional and branch office locations elevates the need for unified communications and collaborative tools. In addition, real-time applications and multi-media applications are driving the deployment of more communications and performance monitoring/management servers and appliances, and increasing costs from the maintenance of those devices.

With this increased complexity and cost is the added difficulty of managing and maintaining the expanded enterprise infrastructure. Deploying numerous proprietary WOC and AAA appliances to maintain the performance of the infrastructure can be burdensome on IT organizations that are supporting both data centers and remote sites. These additional devices require additional rack space, energy (heating and cooling), physical management, increased network connectivity, and bring with them disparate management interfaces. VMware estimates that these costs total $12,000 over a period of 3 years for each server that is added to the data center.

Providing the required functionality for controlled, secure, and accelerated access to centralized applications without increasing IT staff levels requires an infrastructure framework that centralizes and automates as many day-to-day IT tasks as possible. The combined requirements of management, security, and performance within centralized data centers and remote offices drive a growing need for embedding more intelligence into that IT Infrastructure.

Merging Virtualization and Network Intelligence into a Virtual Appliance

Virtualization enables the consolidation of a large number of systems and applications under a single and unified management structure. Virtualization allows servers, applications, and management to be centrally pooled and remotely accessed. As a result, IT costs can be dramatically reduced and overall manageability greatly improved. However, consolidation of these resources increases the amount of remote users accessing servers and applications over the WAN, which can have negative effects on remote access performance. The full financial return of virtualization

cannot be realized unless the network is efficiently and effectively supporting this increased WAN usage.

Virtualization technology provides the ability to improve WAN performance by leveraging the concept of a "virtual appliance" (VA) for network optimization and application acceleration. This VA can be implemented in software and deployed on a virtual machine (VM). The VA, along with its embedded network intelligence, can then be integrated within the virtual machine infrastructure, rather than external to it, making it easier to deploy and manage within virtualized data centers and remote sites.

Managing Virtual Application Acceleration Appliances

With network intelligence for application acceleration becoming a part of the overall virtualized infrastructure, centralized management tools can now be applied to better manage remote access and performance. For example, a centralized management team can now automate the provisioning of virtual appliances; perform automated software updates; implement high availability configurations of virtual appliances; and re-distribute server resources to meet fluctuations in workloads. With these capabilities, the VA can be a key enabler allowing application acceleration over the WAN and other high value network-intelligent functions (e.g., security, network services, etc.) needed at remote office sites to be deployed by central IT staff with minimal impact on workloads.

Certeon's *aCelera* Virtual Appliance for Application Acceleration

With the introduction of the *aCelera* Virtual Appliance, Certeon is the first vendor in the application acceleration space to deliver the functionality of a standalone, dedicated physical appliance as a virtual appliance that runs on the VMware Virtual Infrastructure 3. *aCelera* s oftware is fully integrated with the VMware suite of performance, monitoring, and management tools for the Virtual Infrastructure and, at the time of this writing, is the only application acceleration software to gain certification as a VMware Certified Virtual Appliance for ESX and ESXi. VMware Certified Virtual Appliances are subjected to a comprehensive set of tests to verify optimization of the solution on VI3, to ensure documentation quality, and to certify consistency of support/maintenance practices with VMware standards. *aCelera* will also support Microsoft's Hyper-V hypervisor and the management features incorporated within Microsoft's System Center Virtual Machine Manager (SCVMM) when production versions of these products become available.

II. Certeon Company Overview

Certeon is a private company focused on "Application Intelligent" acceleration over WANs. Certeon began shipping Application Acceleration Appliances in 2006, and has a number of customers among the Fortune 500. Certeon was the first vendor to introduce acceleration of secure access to applications via the incorporation of HTTPS acceleration functionality within an application acceleration device. Certeon was also the first vendor to deliver application-specific acceleration techniques via Application Acceleration Blueprints. Certeon Application Acceleration Blueprints are based on patented techniques of leveraging detailed analysis of application data objects to maximize compression ratios and minimize application response times. Although Certeon accelerates all traffic, the Application Acceleration Blueprints enable Certeon to achieve optimum acceleration for key business applications.

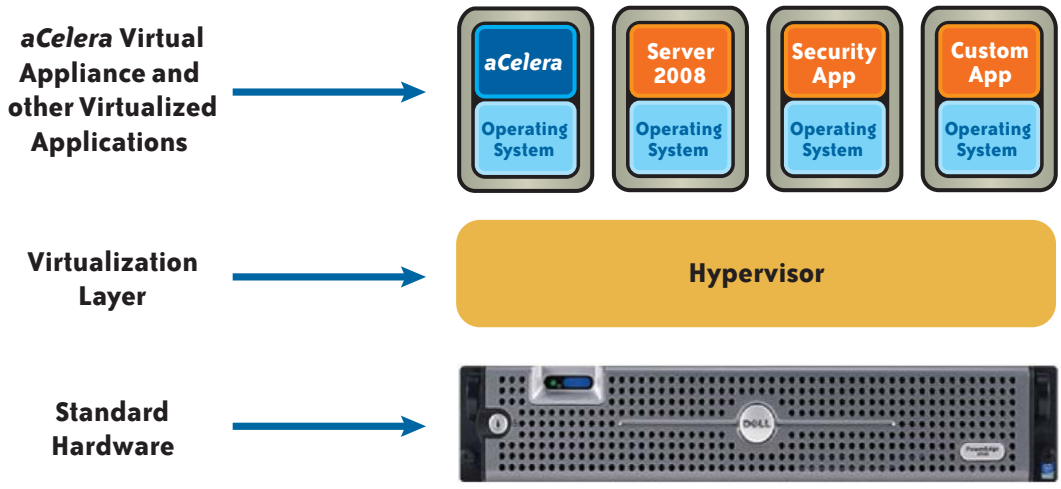
aCelera supports a wide range of Application Acceleration Blueprints which optimize specific applications for acceleration over the WAN. These Blueprints include support for Microsoft Office and SharePoint and EMC Documentum to name a few. For more information about Certeon's Application Acceleration Blueprints and the full suite of *aCelera* acceleration techniques please visit the Certeon web site's resource center at www.certeon.com.

III. *aCelera* Virtual Appliance for Application Acceleration

Certeon Virtual Appliance software is symmetrically deployed at the data center and in remote offices. Its integration with VMware VirtualCenter enables centralized provisioning from the data center out to the branch offices. Certeon offers the *aCelera* Virtual Appliance both as a software-only product to be installed on a customer's virtual server and as a Physical Appliance solution which is a hardware/software bundle consisting of *aCelera* software, a complete suite of virtual server software (e.g., VI3, VMTools, VirtualCenter), and industry standard server hardware. Among the *aCelera* Physical Appliance options will be servers with sufficient resources to host as many additional virtual machines as needed, including certified VAs from other vendors.

Figure 1 shows how *aCelera* Virtual Appliance software is deployed on a virtual machine system using standard server hardware and a virtual machine platform.

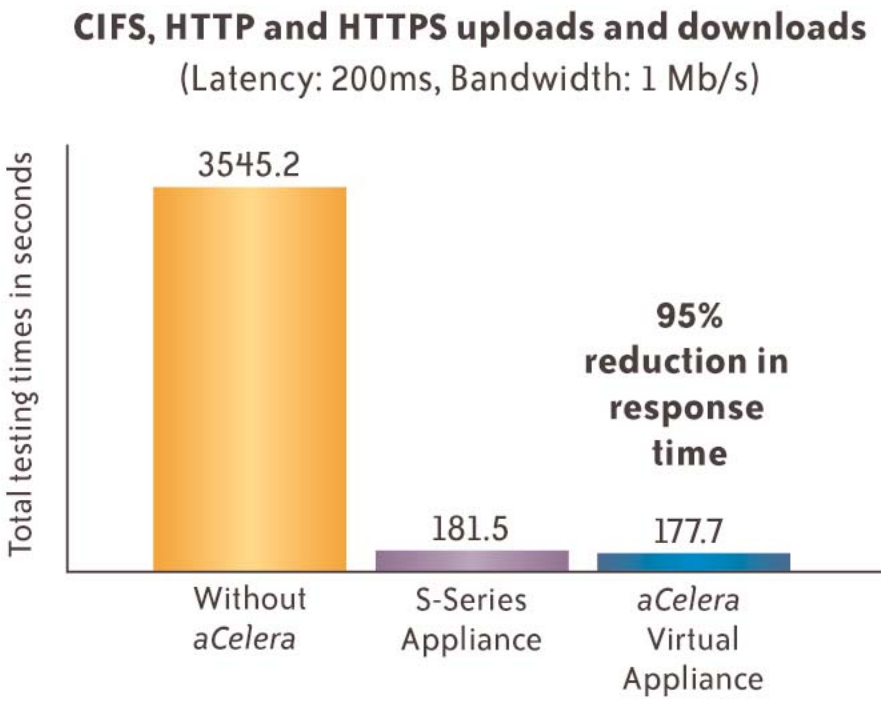
Figure 1. *aCelera* Software Deployed within a Virtual Machine.



aCelera Performance

Certeon's *aCelera* Virtual Appliance software optimizes application performance without the need of proprietary special-purpose hardware. Test results provided to us by Certeon illustrate how *aCelera* software running on industry standard servers demonstrates the same performance as its S-Series hardware appliance. As shown in Figure 2, *aCelera* Virtual Appliance software delivers the same 95% reduction in application response time over the WAN as Certeon's S-Series appliance. *aCelera* Virtual Appliance software also delivers this level of performance while using 50% less system resources (i.e., CPU utilization and memory).

Figure 2: Virtual Appliance versus Physical Appliance Performance



The Benefits of Integrating *aCelera* and VMware

Certeon's *aCelera* was developed to be a VMware Certified Virtual Appliance and to be integrated with VMware Infrastructure 3 (VI3) and the hypervisors ESX and ESXi. Integration with VI3 means that every *aCelera* software image includes VMTools. VMTools is the key integration component that allows the *aCelera* Virtual Appliance to take advantage of many of the VM Infrastructure 3 virtual machine management capabilities offered in VMware VirtualCenter.

There are a number of management and automation benefits that may be gained through aCelera's support for VMware VirtualCenter and VMTools. These benefits facilitate the deployment of high performance application acceleration technology even to smaller remote sites that have very limited on-site management resources, as well as encourage the deployment of virtualization to those branch sites which have yet to adopt it. This tight integration between *aCelera* and VMware enables IT managers to deploy, manage, and maintain a flexible, secure, reliable, and scalable set of high performance application acceleration services to unlimited remote users.

The VMware management features supported by *aCelera* and their benefits include:

VirtualCenter: The *aCelera* software image can be deployed and provisioned via VirtualCenter from a central data center storage location to a virtual server anywhere within the VMware infrastructure. Therefore, VirtualCenter significantly enhances and expedites the deployment and provisioning of *aCelera* Virtual Appliances to remote offices.

VMotion: With VMotion, a running image of the *aCelera* Virtual Appliance can be moved from one virtual machine to another without disrupting operations or traffic flow. VMotion benefits include ease of remote maintenance and software upgrades without interrupting application acceleration services.

Dynamic Resource Scheduling (DRS): DRS provides the ability to manage CPU and memory resource allocation across virtual machines and virtual appliances. This allows the system manager to increase the resources available to an *aCelera* Virtual Appliance to meet periodic surges in application traffic over the WAN. Resource changes can be made manually or automated to be triggered by changes in performance levels. DRS enhances the flexibility and automation of resource allocation and facilitates higher degrees of virtual server and virtual appliance consolidation in both the data center and the remote branch office.

Virtual Machine File System (VMFS): VMFS lets IT managers deploy *aCelera* Virtual Appliance software images on any networked or directly attached storage device within the VMware Infrastructure (e.g., SCSI, iSCSI, FC SAN, SATA, etc.) without being concerned about needing a specific storage device in the branch.

High Availability (HA): VMware High Availability can be used to maximize the availability of the *aCelera* Virtual Appliance. HA can automatically restart a stalled *aCelera* VA virtual machine on the same server. In the event of a hard failure, HA can move the VA to a designated backup server (with appropriate network connectivity) via VMotion. This feature ensures reliable performance in the event of a failure.

Support for other VMware Certified Virtual Appliances and ISVs

Certeon is working with other vendors of VMware Certified Virtual Appliances (e.g., virtual firewall appliances, business continuity, disaster recovery, and virtual IDS/IPS appliances) and ISVs (Microsoft, IBM, and SAP) to certify compatibility and develop bundled software solutions which further simplify the deployment of these critical services to multiple branch offices over the WAN.

IV. Certeon's Vision for Virtualization

Certeon believes that virtualization is well on its way to becoming a pervasive component of enterprise network infrastructures based on server virtualization in the data center, followed by appliance virtualization, and then desktop and application virtualization. But to gain the full ROI from virtualization, a truly efficient and effective enterprise network must be in place. Virtualized application acceleration helps to increase virtualization ROI by embedding network intelligence into the virtualized infrastructure. As a result, it improves cost-effectiveness, ease of deployment and management and can greatly facilitate the implementation of application acceleration functionality wherever and whenever it is needed throughout a distributed virtual enterprise.

As desktop and application virtualization become mature technologies, they can potentially be deployed over the WAN as well as the LAN, driving the need for even greater dependence on application acceleration functionality for VMware VDI and ACE[1] as desktop data structures and/or application segments are streamed to the end user PC. *aCelera* is well positioned with its integration within VMware to support these developments.

aCelera's virtualization can also be leveraged to provide "acceleration as a service" to facilitate the deployments and improve performance of service-oriented environments (i.e., SOA) and managed services (i.e., SaaS). In the case of SOA, *aCelera* software can be easily deployed to be co-resident on the virtual servers within geographically-distributed data centers that host the various components of an SOA application. In the SaaS space, *aCelera* can be provided as a standalone managed

[1]Virtual Desktop Infrastructure (VDI) and Assured Computing Environment (ACE)

software service or bundled with other managed software services to increase their performance. The flexibility and scalability provided by a virtual appliance allows for the easy addition of acceleration into an SOA or SaaS environment and greatly enhances the user satisfaction and productivity when accessing applications remotely.

V. Conclusion

There is a strong degree of synergy among Certeon's *aCelera* virtualization strategy, its Application Acceleration Blueprint approach to accelerating applications, and the management of virtualized environments. For example, a single multi-core physical server could include one or more virtualized application servers, an *aCelera* VA with embedded Application Acceleration Blueprints, and other VAs dedicated to securing/controlling the applications hosted on that server. The manageability and performance of this virtualized infrastructure is greatly enhanced by a strong set of VM management tools along with VAs that are tightly integrated into the VM management infrastructure.

As enterprises become increasingly virtualized, IT managers will have the flexibility to consolidate and manage a wide range of functionality on virtualized servers, including network intelligence, and increase the performance and manageability (as well as the security, reliability, and scalability) of the application environment. Certeon's *aCelera* Virtual Appliance software reflects the first major step in the movement to merge network intelligence into virtualized infrastructures to enable flexible, high performance, and manageable distributed enterprises.

For more information, go to www.certeon.com.

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