Application Delivery Network Platform Management

Application Delivery Networks (ADNs) are critical, yet sophisticated parts of the data center. F5 Networks provides a breadth of physical and virtual solutions to manage your ADN.

White Paper

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Introduction

Over the past few years Application Delivery Networking has matured in the data center and changed the way applications are managed and delivered to users. Rather than building out an infrastructure of networking pipes for speeds and feeds, the ADN aims to intelligently push application services out of the data center in an on-demand fashion and address how the application is being accessed and requested. Due to tremendous increases in application traffic in virtually every part of every organization, enterprise ADN deployments are growing throughout the enterprise and spanning multiple data centers-even over international boundaries.

ADNs, however, are not made up of simple networking devices and servers. To function reliably, a strong management back end needs to control all parts of the ADN, including every aspect of application delivery from application awareness through hardware and network management. As these deployments expand, gaining visibility and manageability over multiple devices is critical to efficiently and cost-effectively managing the ADN infrastructure.

Four Types of ADN Management

To address the management needs of an application delivery environment along with managing each individual component of the ADN holistically, F5 offers four types of solutions: F5 Enterprise Manager, virtual platform integration, on-box management, and solutions that work via programmatic API. Although each solution is designed to address a particular need, all of the solutions work together to provide limitless options for managing a full-featured ADN.

Enterprise Manager

Running on TMOS, F5's unique operating system, Enterprise Manager is a completely integrated ADN management platform. Enterprise Manager manages the configuration, day-to-day operation, and reporting of multiple F5 devices to provide a single point of view into the entire F5 application delivery infrastructure. Enterprise Manager offers the tools enterprises need to automate configuration tasks, ensure optimized application performance, and improve budgeting and forecasting to meet changing business needs.

Enterprise Manager offers multiple benefits for managing F5 BIG-IP appliances as part of the ADN infrastructure:

Reduction in total cost of ownership: Most of the time spent administering an appliance is on configuration: setting it up to function as needed. By giving administrators the ability to select, stage, and automate common tasks such as configuration and certificate management, software updates, and policy control, Enterprise Manager minimizes the cost of administration and operating expenses.

Performance monitoring: Advanced monitoring capabilities provide a current and comprehensive view of application traffic and F5 device performance. Thresholds and alerts can be set and monitored to enable quick responses to changing network conditions and user demands, ensuring continuously optimized application performance. In addition, historical data can be captured from BIG-IP products, providing complete visibility into the ADN. By analyzing this performance data for trending and forecasting, organizations can improve planning and budgeting for future virtualization, optimization, and consolidation efforts.

Troubleshooting: Full visibility into the application delivery infrastructure helps quickly isolate current application performance and traffic management problems as well as those that have grown systemically over time. Because Enterprise Manager monitors F5 devices that are strategically deployed in front of mission-critical applications, it has access to the essential data needed to effectively troubleshoot and minimize the business impact of application, server, and other infrastructure performance issues.

Enterprise Manager is available in two versions: a physical version running on purpose-built hardware and a virtual edition running on VMware ESX. Each version is optimized for a different environment. Enterprise Manager hardware is designed for customers who manage large numbers of BIG-IP appliances or instances as part of their ADN-those who manage multiple configurations, administration polices and profiles, version control, and performance data of large-scale F5 deployments-and for customers who utilize hardware as part of an on-premise, fixed rack data center.

Enterprise Manager has provided a much cleaner view of our F5 environment for monitoring, management and operations, which has reduced our operating costs and staff effort. We can now focus more on optimization and performance improvements.

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Enterprise Manager Virtual Edition (VE) is designed for virtual data centers, for customers who have deployed BIG-IP products as part of their virtual infrastructure, and for those who manage BIG-IP appliances or instances off-premise as part of a managed service or cloud solution. Enterprise Manager VE includes all the features of the hardware version but is a more mobile instance of Enterprise Manager, and can decrease deployment times and help save CapEx while increasing flexibility.

Regardless of version, Enterprise Manager enables the ADN infrastructure to scale to meet new application service needs.

Partner Platform Integration

While a specific management platform is advantageous in some situations, not everyone has a need for or the infrastructure to support a completely branded, feature-specific solution. Many customers opt to use broader management platform software such as VMware vSphere-especially when managing virtual environments.

VMware vSphere Plug-in

For VMware customers, F5 devices can be integrated into the VMware vSphere management console, allowing administrators to configure BIG-IP Application Delivery Controller appliances simultaneously with virtual machines (VMs). BIG-IP products appear in the vSphere management console as inventory items; this allows vSphere to treat BIG-IP devices and instances as part of the virtual platform, reusing information that is shared throughout the infrastructure such as IP addresses, VLAN information, and virtual clusters. When an administrator creates a new VM and assigns it a virtual network, they can also assign that virtual machine to an application pool on the BIG-IP product, associating a VM with a specific application group of virtual servers. For example, if a new SharePoint VM is configured and spun up in vSphere, that same VM can be dynamically added to the existing SharePoint application pool on the BIG-IP product and be associated with the appropriate application delivery template, application health checks, and security policy.

With the F5 vSphere plug-in, users will be able to extend their current data center management view into the ADN infrastructure using tools such as the advanced health modeling engine and sophisticated reporting capabilities. F5 virtual platform management solutions are best suited for customers who currently use or are considering deploying vSphere to manage server, network, and application platform resources in the data center.

On-Box Console Management

Even with the most sophisticated and feature-rich management platforms, there will always be a need for reliable on-box management. F5 has a long history of delivering rich on-box management solutions by providing multiple management portals for any type of environment. One key element of on-box management of an Application Delivery Controller (ADC) is separating the management plane (the parts of the appliance not responsible for directly managing application traffic) from the data plane (the parts that are responsible for application traffic). This enables the appliance to be managed in-line and online without affecting live traffic. This separation of device and traffic management is a core architectural component of TMOS.

Using an isolated management plane, the BIG-IP system extends the typical on-box management platform to include three unique management portals:

- **GUI:** A standard on-box web-based GUI for managing, configuring, and reporting on the appliance.
- **CLI:** A command line interface available both remotely and locally at the console for direct access to configuration and reporting objects on all BIG-IP products.
- **Dedicated modular shell:** The BIG-IP product family also includes a specialized, dedicated shell, called TMSH, which provides a standards-based unified command line environment. This creates a secure portal for administrators to access command-driven tools on BIG-IP devices in a context-aware and hierarchical manner without having a wide-open CLI or direct console access.

The F5 BIG-IP on-box management tools are designed to provide "always on" management access to any individual BIG-IP device or instance. These on-box tools are designed for individual appliance management or single high-availability pairs, enabling management of devices that are not part of a large-scale cluster or application traffic infrastructure.

Programmatic API

One of the most common methods for managing BIG-IP devices and instances is via a programmatic remote management interface called iControl. F5 iControl is an open SOAP/XML-based interface designed to enable remote management, configuration, reporting, and integration of the BIG-IP platform in heterogeneous environments-BIG-IP management can be integrated into any environment or existing management platform that supports SOAP. iControl can be used to manage application delivery as part of a larger systems management portfolio, such as directly interfacing with virtual platforms like VMware vCloud Director or other third-party or home-grown management platforms. The iControl interface enables access to all configuration and monitoring components of BIG-IP products. F5 has developed iControl interface templates for other languages and libraries such as Perl, Python, .NET, and Java, enabling developers comfortable in any number of languages to easily plug BIG-IP management options into their existing applications.[1]

iControl is best suited for customers who use a third-party management platform or one that has been written in-house. All F5 products also support off-box management via market standards such as SNMP; however iControl also enables the BIG-IP platform to be managed by non-traditional management solutions, providing a number of options for subscribing and pushing data to and from BIG-IP devices. iControl provides granular management that can be tuned for very specific operational environments and needs.

Conclusion

Application Delivery Network management of ADCs, the network, and applications doesn't adhere to a "one size fits all" scenario. F5 provides multiple tools that solve unique, customer-specific needs and that are designed to fit into customers' existing environments. F5 management tools can be adapted to function in and support any existing management infrastructure, even where there is no existing management. Whether an enterprise is managing a unified ADN holistically as part of their entire data center or just looking for a quick way to dump statistics from the ADC, F5 provides multiple solutions to solve management needs.

ADNs are large, sophisticated networks that must be managed throughout the data lifecycle to guarantee successful application delivery that is optimized for every delivery scenario. With tools such as F5 Enterprise Manager, Enterprise Manager VE, VMware vSphere plug-in, on-box management, and iControl, F5 provides management solutions to guarantee applications are always secure, fast, and available as they are pushed out beyond the data center perimeter.

[1] For more information on iControl, see the F5 iControl white paper.

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