

TECHNOLOGY AUDIT

BIG-IP v10.0







F5 Networks

BUTLER GROUP VIEW

ABSTRACT

F5 Networks' BIG-IP is an application delivery optimisation appliance, comprising WAN optimisation, load balancing, and application layer firewall capabilities. The solution is based on F5's TMOS platform, which is a purpose-built, real-time OS for traffic inspection and manipulation that provides a number of core cryptographic and acceleration functions. BIG-IP solutions are deployed as a proxy between servers and the users, and all the services can be managed through the same console and by using iRules, a purpose-built scripting language for traffic manipulation and security services. The increasing importance of the Web channel, globally distributed customers and employees, latency-sensitive applications, and more focus on user experience all necessitate an application-delivery optimisation solution that allows integrated policy-based utilisation of load balancing and WAN optimisation techniques by exploiting application layer information. Butler Group believes that BIG-IP is among the best Application Delivery Controller (ADC) solutions and is impressed with the TMOS architecture, as well as the policy granularity provided through the iRules capability. The nature of the solution makes it very applicable to the requirements of certain industries, such as data-intensive sectors and content providers. The BIG-IP solution is aimed at the mid-sized to large organisation.

KEY FINDINGS

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|  Combines multiple capabilities, with integrated policy formulation. |  Very application aware; specific templates are provided. |
|  Built on TMOS, a hardened real-time OS designed for deep packet inspection. |  Offers a high level of policy granularity, with a purpose-built development language. |
|  Provides a comprehensive application-layer firewall. |  BIG-IP is aimed at the mid-sized to large organisation. |

Key:  Product Strength  Product Weakness  Point of Information

LOOK AHEAD

The BIG-IP roadmap is focused on integrating additional application-delivery features to provide a platform for a unified infrastructure.

FUNCTIONALITY

The prominence of the Web channel has led to a number of problems for the network administrator, the security administrator, and the business stakeholder. The Internet now accounts for a good percentage of revenues, as well as being an important component of product and corporate branding, in many organisations. The number of real-time applications (those that tolerate no latency) has also increased, such as Voice over IP (VoIP), necessitating careful user experience management. The user experience is being continuously being redefined by the Business to Consumer (B2C) companies, with globally distributed data centres, purpose built processing grids, and applications that are designed to offer a desktop-like experience. In this scenario, enterprises need a scalable solution that accelerates Web application delivery for internal users, customers, and suppliers. On a related note, malware that targets application layer vulnerabilities is also growing, and traditional firewalls need to be supplemented with Deep Packet Inspection (DPI) capabilities to offer the appropriate kind of protection. Also, DPI needs to be offered in a way that is transparent to the user.

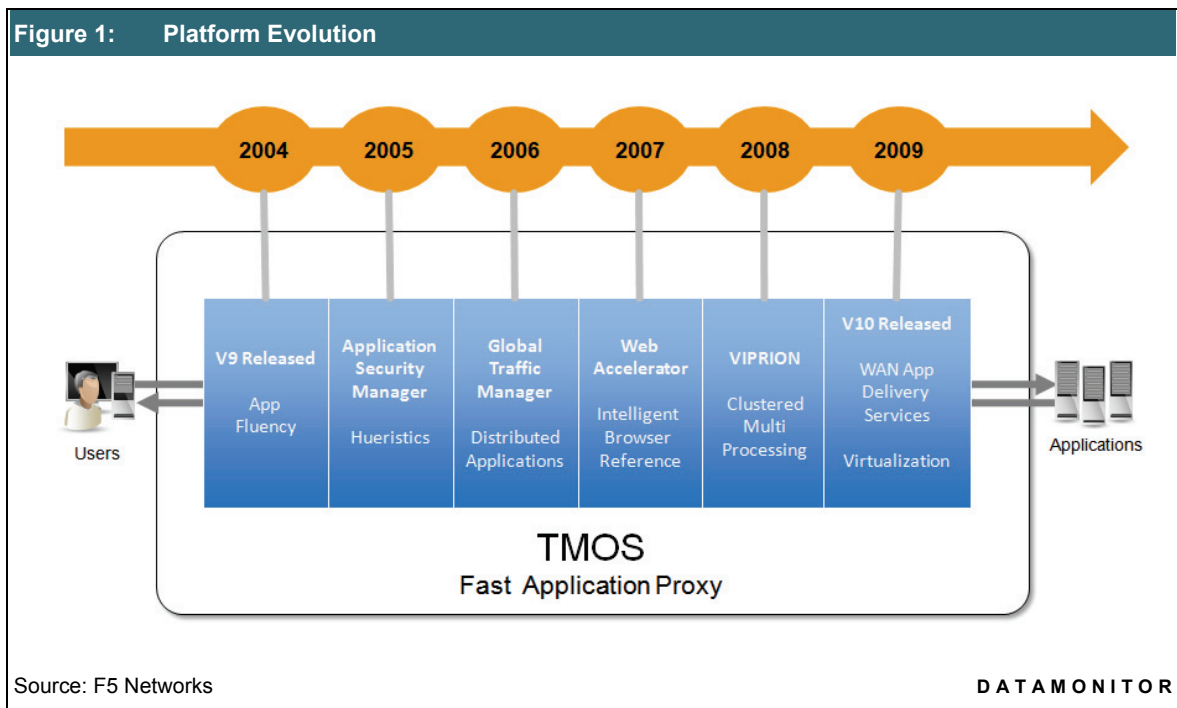
Product Analysis

BIG-IP is a suite of load balancing, application security, and WAN acceleration modules that are delivered in an appliance. F5 is a leading vendor in the ADC market, and the BIG-IP solution is currently at version 10. BIG-IP is deployed as a proxy between the Web servers and the users, and performs three categories of task to enhance the user experience of WAN delivered applications: offloading resource-intensive tasks from the servers, such as TCP/IP management and SSL termination; optimising protocols, including optimisation based on the behavioural patterns of common applications; and tasks such as compression and caching. BIG-IP also provides an application layer firewall.

All of the aforementioned capabilities are delivered as components of F5's TMOS platform (like all F5 products). The TMOS platform is a purpose-built, real-time OS designed for high-volume packet payload processing. All the BIG-IP modules are offered as components of TMOS, which performs a number of services that the modules can utilise, such as acceleration, traffic management, server task offloading, address translation, and application behaviour monitoring functions. The solution can also provide key delivery optimisation capabilities, such as Quality-of-Service (QoS), compression, Single Sockets Layer (SSL) acceleration, and HTTP compression. The following aspects of the BIG-IP solution merit special mention:

BIG-IP is application aware, and F5 has a long history of partnerships with prominent application providers: The importance of application awareness in the improvement of application delivery is increasing. Payload inspection with a good depth of understanding of a specific application's architecture and behaviour, even at the module level is essential. F5 has partnerships with the prominent enterprise application vendors, and provides templates for many common enterprise applications enabling easy deployment in conjunction with the Local Traffic Manager. The list of software supported includes, but is not limited to, VMware VDI, Microsoft SharePoint 2007, Oracle Application Server 10G, and SAP ERP 6.

A custom scripting language provides a high level of policy management granularity: The TMOS is equipped with iRules, a scripting language developed on the Tool Command Language that allows policy formulation at a very granular level, using the data that TMOS makes available across the protocol stack, and manipulates the many functions that TMOS' components provide. A high level of operational control can be achieved through the integration of WAN optimisation, load balancing, and application layer security components – particularly when all of these components exploit a common set of traffic inspection and management services – and with the iRules development capability. For example, composite rules can be developed which distribute tasks across the load balancer and the WAN accelerator depending on the context of the user request and the state of servers.



Virtualisation: Another noteworthy feature of BIG-IP is virtualisation, the appliance can be partitioned into a number of logical units, and applications can be mapped to one of these logical units.

The application layer firewall: F5’s proxy strategy, together with its in-depth understanding of applications, allows the solutions to address the many application layer threats. The Application Security Manager could be an important component of a comprehensive defence-in-depth strategy.

Butler Group believes that BIG-IP is a very competent ADC solution that is well aligned with the requirements of any enterprise aiming to optimise and secure application delivery over the WAN. F5 is definitely among the most well known, innovative, and successful vendors in the application delivery optimisation market.

Product Operation

Enterprises can start BIG-IP installations with just the Local Traffic Manager and add, as required, other optional product modules, including WebAccelerator, Global Traffic Manager, Application Security Manager, Link Security, and Secure Access Manager. Other functionality, such as Advanced Client Authentication, Advanced Routing, Fast Cache, Intelligent Compression, IPv6 Gateway, L7 Rate Shaping, Message Security Module, Protocol Security Module, and SSL Acceleration can also be optionally included in the appliance.

Local Traffic Manager (LTM): acts as a proxy between the Web server and the users, consolidating requests and load balancing across many physical and virtual servers using the standard algorithms, such as Dynamic Ratio and Least Connections, caching repetitive content, and offloading tasks, such as SSL encryption and termination, from the servers. Other tasks performed by the LTM include optimising TCP/IP traffic, traffic shaping based on application delivery priority considerations, and security services such as client authentication, prevention of network-based attacks such as Denial-of-Service (DoS) and SYN flood, messaging security based on McAfee TrustedSource reputation service, and protection against attacks that manipulate Internet protocols. Consistent with BIG-IP’s theme of being application aware, the LTM incorporates application-specific data to effectively load balance and perform delivery acceleration tasks.

WebAccelerator (WA): combines a number of technologies and approaches to accelerate delivery of Web applications. Multiple techniques are performed both at the client side and the server side, and the list includes caching, protocol optimisation, eliminating transmission of duplicate and repetitive data, enabling the browser to have multiple connections with the server, offloading processor-intensive tasks from the server (such as SSL encryption and decryption), compression, protocol optimisation (HTTP and Microsoft NT LAN Manager), and optimisation techniques (and policies) specific to applications, such as for SAP ERP 6 (previously known as mySAP), Microsoft SharePoint, Oracle Portal, Microsoft Outlook Web Access, and PeopleSoft. The WebAccelerator can be deployed both in the asymmetric (only at one point in the network) and the symmetric (at the corporate data centre and at least one remote location) mode, and F5 claims acceleration rates improvement of two times to five times with the former and ten times for the latter. The WebAccelerator solution is available stand alone, or as an add-on to the Local Traffic Manager, and F5's iRules can be used to define policies within WebAccelerator.

Application Security Manager (ASM): is the application firewall component, and technology was brought into the F5 fold through the 2004 acquisition of Magnifire. ASM ships with a number of pre-configured policy templates, including those for Outlook Web Access, Lotus Domino Mail Server, Oracle E-Business Financials, SharePoint, SAP NetWeaver, and Oracle Application 11i. The ASM provides protection against application-level attacks such as cross site scripting, SQL attacks, Layer 7 DoS, and Buffer Overflows. The solution exploits the F5 signature database, partners with a number of companies for vulnerability assessment, protects against the Open Web Application Security Project (OWASP) top ten vulnerabilities, and also has a statistical engine that detects abnormal traffic over time and proactively tweaks policy.

Global Traffic Manager (GTM): is a load balancing and traffic management solution at the multiple data centre level. The GTM enables routing of traffic based on data centre conditions, business policy, the origin of the request (at the country level and in the case of Intranet application, the relevant group), and application performance information (which is aggregated from servers, caches, and ISP connections). As with all Big-IP solutions, the GTM is application aware and optimised to work with applications such as those from SAP and Oracle, and policy can be formulated with iRules as well. The solution can be effective in disaster recovery situations, by diverting traffic in the case of a data-centre-level failure. Another noteworthy feature of the GTM is the ability to manage based on custom objects grouped by interdependency considerations.

Link Controller: optimises traffic allocation across multiple ISP connections, based on link health (availability, congestion, etc.), QoS specifications, application priority parameters, request origin location, least-cost routing considerations, user experience (assessed through metrics such as round-trip time) ,and can perform services such as compression (through an optional module). The iRules capability can be used for programming Link Controller policy.

Secure Access Manager (SAM): provides unified identity access, which allows validation of identity verification and secure connectivity to enterprise applications from any access network.

A differentiator is the management capabilities of BIG-IP. All of the aforementioned modules can be managed through the Enterprise Manager, which enables administration of multiple BIG-IP appliances. F5 reports that easier management has been a focus of development, as well as capabilities such as integration with authentication systems, an enhanced dashboard, and application-specific templates. In terms of scalability, F5 offers a range of appliances with throughput ranging from one to 40 GBps. The TMOS architecture allows processing intensive tasks, such as SSL encryption and decryption tasks, to be done by a specialised Application-Specific Integrated Circuit (ASIC).

Product Emphasis

The solution provides integrated application layer security and Web application delivery optimisation, along with unified policy management across both these functions. It is designed to support large-scale operations, utilising a number of constructs for provisioning more capacity within an appliance and deploying additional appliances. In addition to its multi-core architecture and multiple classes of appliances, as well as application-aware optimisation and traffic management, BIG-IP is optimised for enterprise applications, such as Oracle PeopleSoft, SAP ERP 6, and Microsoft SharePoint. In terms of functional capabilities, the inherent versatility of the underlying platform, the deployment history, and the direct and indirect presence, F5 is certainly among the best in the ADC market.

DEPLOYMENT

F5 indicates that BIG-IP installation would require basic networking knowledge and expertise in routing and switching, in addition to basic knowledge about the BIG-IP product. F5 provides implementation services both through its professional services arm and through systems integrator partners. As would be expected from a solution of this nature, designed to support very large and complex networks and a licensing pattern that involves optional services, implementation time varies tremendously with the scale of operations at the deployment site. Also, F5 reports that implementation ease has been a focus area of the latest version 10 release, and templates significantly ease provisioning applications through the BIG-IP. The solution is modular in design.

Training is provided both through F5's facilities worldwide, and online. In addition, F5 maintains an online knowledgebase called Ask F5 and a community of over 40,000 users at devcentral.f5.com. F5's support services include online tools, access to the support engineers, and Web-based technical information.

F5 offers BIG-IP version 10 on four platforms: 1600, 3600, 6900, and 8900. The solution is also offered on the recently released modular chassis system, VIPRION. BIG-IP will integrate with both previous and current generation platforms from F5.

PRODUCT STRATEGY

The target market for BIG-IP is sector agnostic, and F5's clients span all industry verticals. However, the very nature of the solution makes it very applicable to the requirements of certain industries, such as IT-intensive sectors, and content providers. In terms of scale of operations, BIG-IP is aimed at mid-sized to large organisation, although in the 'sweet spot' sectors BIG-IP could be relevant to much smaller companies.

The route to market is entirely channel based. F5 has a two-tier distribution model, and a partner accreditation programme is in place. ROI accrues from both tangible and intangible sources. Hardware acquisition cost avoidance through consolidation of multiple gateway devices and server offloading offer direct monetary benefits, and less tangible benefits accrue through enhanced administrative flexibility, improved customer satisfaction, and employee productivity through improved application performance. F5 has an impressive list of technology partners, including Microsoft, Oracle, SAP, IBM, EMC, HP, VMware, and McAfee.

In terms of licensing, the BIG-IP solution is licensed in the usual appliance way. The cost of the basic software is included in the price of the hardware, as are the maintenance and support costs for one year. A number of additional F5-owned and partner-provided applications can be licensed along with the base software. The most common mode of implementation is deploying two appliances in an active standby mode. The cost can include premium services, which provides 24x7 technical support for one year, Ask F5 online database, software updates and hardware replacement. Additional service options include four-hour, next-day, and five-day hardware replacement services. BIG-IP version 10 is the most recent release (8 April 2009). BIG-IP's roadmap centres around integration of application-delivery features, as well as integrating with other authentication and access technologies.

COMPANY PROFILE

F5 Networks is engaged in providing application-delivery networking products which improve the performance, availability, and security of applications running on IP networks, and manage IP traffic between network servers, clients, and other devices. The company operates worldwide and is headquartered in Seattle, Washington, US, with international operations in Europe, Japan, the Middle East, and Asia Pacific. The company employs around 1,600 people and is publicly owned, and listed on the NASDAQ (NASDAQ:FFIV).

The company's products monitor and manage local and geographically dispersed servers and intelligently direct traffic to the server best able to handle a user's request. The company sells five product families: VIPRION, BIG-IP, WANJet, ARX, and FirePass. In addition, the company offers professional services such as technical support, basic to advanced training, auditing/customisation services, and network monitoring and performance analysis reporting for future capacity planning.

Table 1: Financial Details			
	2008	2007	2006
Revenue (US\$ Million)	650.2	525.7	394.0
Change on Previous Year (%)	23.6	33.4	40.0
Total Net Income/(Loss) (US\$ Million)	74.3	77.0	66.0
Source: F5 Networks			DATAMONITOR

As of December 2008, F5 had approximately 1,700 employees, with distribution across functions being Research and Development – 27%; Sales and Marketing – 40%; Support and Services – 20%; Administration – 12%; and Manufacturing – 1%. Region-wide distribution of revenues, for the quarter ending 31 December 2008 are 54% Americas, 24% EMEA, 13% APAC, and 9% Japan. Over 16,000 organisations and service providers worldwide use F5 to keep their applications running.

SUMMARY

The ADC market is an interesting space to watch and populated with a handful of suppliers, including Cisco, Citrix, and a number of focused ADC vendors. F5 also competes with a number of WAN optimisation providers that are roughly in the same revenue bracket. F5 is certainly among one of the leading companies in this market, and Butler Group believes that, given its scalable TMOS platform, a strong record of competing successfully, recent advances in hardware, and the focus on being a comprehensive proxy-based delivery optimisation solution for some of the most widely deployed packaged software solutions, BIG-IP and F5 will continue to be successful.

Table 2: Contact Details	
<p>Corporate HQ F5 Networks, Inc. 401 Elliott Ave W Seattle WA 98119 USA Tel: +1 (888) 882 4477</p> <p>E-mail: info@f5.com www.f5.com</p>	<p>EMEA HQ F5 Networks Chertsey Gate West 43-47 London Street Chertsey, Surrey KT16 8AP, UK Tel: +44 (0)1932 582 000 Fax: +44 (0)1932 582 001 E-mail: emeainfo@F5.com www.f5networks.co.uk</p>
<p>Asia Pacific HQ F5 Networks 5 Temasek Boulevard #08-01/02 Suntec Tower Five Singapore 038985 Tel: +65 6533 6103 Fax: +65 6533 6106 E-mail: sginfo@f5.com www.f5apac.com</p>	
<p>Source: F5 Networks</p>	<p>DATAMONITOR</p>

