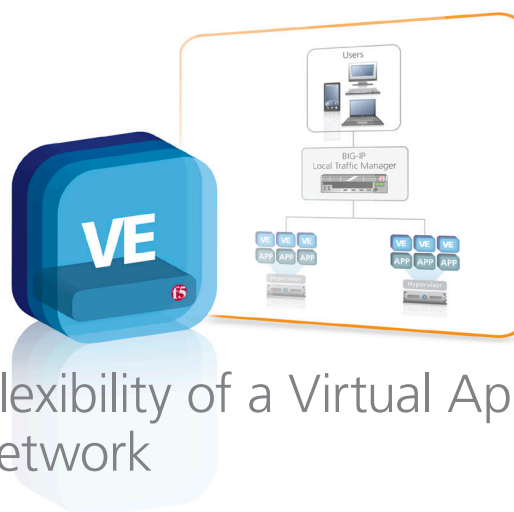




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## Gain the Flexibility of a Virtual Application Delivery Network

As server virtualization becomes more prevalent within data centers, you need to be able to apply the functionality of your physical Application Delivery Network in a virtualized environment. This frees you from prescriptive data center architectures and enables you to design an architecture based on the unique needs of your environment and applications.

BIG-IP® Local Traffic Manager™ (LTM) Virtual Edition (VE) takes your Application Delivery Network virtual. You get the agility you need to create a mobile, scalable, and adaptable infrastructure for virtualized applications. And like physical BIG-IP devices, BIG-IP LTM VE is a full proxy between users and application servers, providing a layer of abstraction that secures, optimizes, and load balances application traffic.

### Key benefits

#### Easily deploy apps and ensure availability

Easily deploy and manage applications and get complete visibility into related statistics.

#### Gain ultimate flexibility

Deploy both virtual and physical BIG-IP LTM components to create a fully flexible and adaptable Application Delivery Network.

#### Take control over application delivery

Control your application connection, traffic, configuration, and management with F5's unique OS, which includes an open API, event-driven scripting language, and device group scalability.

#### Reduce servers, bandwidth, and management costs

Optimize your existing infrastructure and consolidate application delivery on a unified, simple to manage platform.

#### Secure your applications, network, and data

Protect the apps that run your business with powerful network-level and protocol-level security and attack filtering.



## Always Available Applications

BIG-IP LTM VE removes single points of failure and virtualizes the network and applications. This ensures that all applications are always on, simple to manage, and easy to scale.

### Comprehensive load balancing

BIG-IP LTM VE includes static and dynamic load balancing methods, including Dynamic Ratio, Least Connections, and Observed Load Balancing, which track dynamic performance levels of servers in a group. This ensures that the best resources are always selected for improved performance and scale.

### Application health monitoring

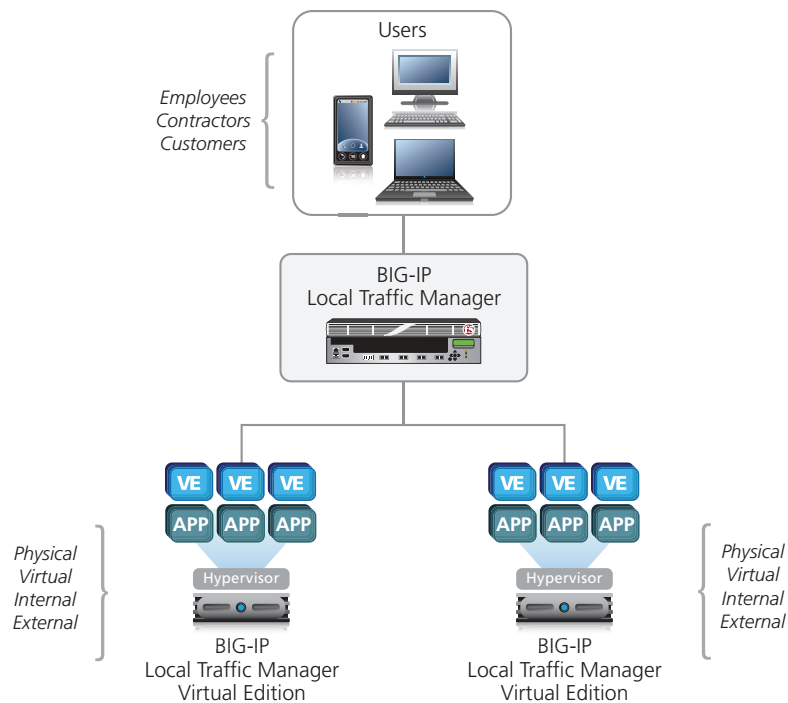
BIG-IP LTM VE provides sophisticated monitors to check device, application, and content availability, including specialized monitors for many applications (including various application servers, SQL, SIP, LDAP, RADIUS, Diameter, XML/SOAP, RTSP, SASP, SMB, and many more), as well as customized monitors to check content and simulate application calls.

### High availability and transaction assurance

Device Service Clustering provides flexible high availability scaling and configuration syncing of active and live application traffic among active or standby virtual devices. This breaks the 1:1 notion of active/standby to N:1, where as many active devices as needed can share the application load, depending on resource constraints and availability, enabling true horizontal scaling.

BIG-IP LTM VE delivers sub-second system failover and comprehensive connection mirroring, resulting in a highly available solution regardless of system, server, or application failure. BIG-IP LTM VE can proactively inspect and respond to any server or application error.

BIG-IP LTM VE is a full proxy between users and application servers that secures, optimizes, and load balances application traffic.



## BIG-IP LTM VE Partner Applications

BIG-IP LTM VE can intelligently intercept, inspect, transform and direct any IP application, whether it is from a major vendor, custom built, or open source. BIG-IP LTM VE manages hundreds of partner applications:

### Microsoft

.NET Framework  
Active Directory Federation Services  
Application Virtualization  
BizTalk Server  
Commerce Server  
Exchange Server  
Forefront family

- Forefront management products
- Forefront platform technologies
- Forefront protection and access products

Lync Server  
Opalis  
Outlook Web App  
Project Server  
Search Server  
SharePoint Server  
SQL Azure  
SQL Server  
System Center family

- System Center Configuration Manager
- System Center Data Protection Manager
- System Center Essentials
- System Center Mobile Device Manager
- System Center Operations Manager
- System Center Service Manager
- System Center Virtual Machine Manager

Team Foundation Server  
Visual Studio  
Virtual Server  
Windows Azure  
Windows Server family

- Windows Server Hyper-V
- Windows Server Remote Desktop Services
- Windows Server Update Services

Windows Storage Server

### IBM

FileNet  
Lotus Domino, iNotes  
Lotus Sametime  
Tivoli Monitoring  
Tivoli OMNibus  
Tivoli Orchestrator  
Tivoli Service Automation Manager  
WebSphere Server

### Oracle

Applications

- Beehive
- E-Business Suite
- Enterprise Manager
- Fusion Applications
- Hyperion
- JD Edwards EnterpriseOne
- PeopleSoft Enterprise
- Siebel

Middleware

- Access Manager
- Coherence
- Identity Management
- SOA
- WebCenter
- WebLogic Server

Database

- Database Firewall
- Data Guard
- GoldenGate
- Streams
- Real Application Clusters (RAC)
- Recovery Manager

### SAP

ERP  
NetWeaver  
Portal

### Adobe

Acrobat Connect Pro  
Flash Media Server  
InDesign  
ColdFusion

### Other

CA eHealth  
E-Business Suite  
ANGEL Learning  
Blackboard  
SunGard IntelliSUITE  
SunGard Higher Education  
...and more.

## Reduced Server Load

BIG-IP LTM VE provides extensive connection management as well as TCP and content offloading capabilities that optimize server performance and dramatically speed page load times.

### Content transformation

BIG-IP LTM VE provides a comprehensive solution to offload many burdensome or repetitious functions onto a centralized and high-powered network device. SSL, compression, and many other BIG-IP LTM VE functions provide a complete content transformation gateway to redirect, insert, or holistically transform application content for effective and efficient application integration.

### OneConnect

F5 OneConnect™ aggregates millions of requests into hundreds of server-side connections, ensuring they are handled efficiently by the back-end system increasing server capacity by up to 60 percent.

### Fast cache

Intelligent caching functionality provides tremendous cost savings by offloading repetitive traffic from web and application servers, increasing server capacity up to 9x. It's also the only solution that offers multi-store caching to manage distinct cache repositories per application or department, delivering precise and intelligent control for priority applications.

### TCP connection queuing

BIG-IP LTM VE provides the ability to queue connection requests that exceed the capacity of the connection limit for a pool, pool member, or node. Consequently, instead of connection requests being dropped, they reside within a queue in accordance with defined conditions until capacity becomes available.

## Optimized Applications

BIG-IP LTM VE provides a highly targeted, centralized, and efficient means for reducing traffic volumes and minimizing the effect of Internet latency and client connection bottlenecks on application performance. Application-centric configuration and analytics ensure optimized application performance.

### Intelligent application switching

Because BIG-IP LTM VE has the unique ability to read all IP applications, it can switch and persist on information unique to a specific vendor's application server (Microsoft, IBM, Oracle, SUN, and more); XML data for web services applications; or custom values indicative to mobile/wireless applications. Your organization can achieve greater reliability and scalability thanks to the ability of BIG-IP LTM VE to switch, log, and persist in the payload or stream. You also have extraordinary flexibility to solve your organization's application delivery challenges using the F5 iRules® control language.

### Intelligent compression

Compression accelerates application performance as much as 3x while reducing bandwidth utilization by up to 80 percent. BIG-IP LTM VE condenses HTTP traffic using industry-standard gzip and DEFLATE compression algorithms, reducing bandwidth consumption and user download times over slower/low bandwidth connections. This provides rich support for compressing a variety of file types, including HTTP, XML, JavaScript, J2EE applications, and many others.

### Flexible L7 QoS Rate Shaping

You can ensure optimal application performance by allocating bandwidth for higher-priority applications, controlling traffic spikes, and prioritizing traffic based on any L4 or L7 parameter.

### TCP Express

The highly optimized TCP/IP stack in BIG-IP LTM VE, called TCP Express,<sup>™</sup> combines cutting-edge TCP/IP techniques and improvements in the latest RFCs with numerous improvements and extensions developed by F5 to minimize the effects of congestion, packet loss, and recovery. Since BIG-IP LTM VE is a full proxy, TCP Express can shield and transparently optimize older or non-compliant TCP stacks that may be running on servers or clients. This then delivers up to a 2x performance gain for users and a 4x improvement in bandwidth efficiency, while reducing the connection load on your servers.

### iSessions

As the foundation for data center-to-data center communication, iSessions secure and accelerate data traveling over the WAN. Any two BIG-IP LTM VE instances can be deployed symmetrically to create a site-to-site secure connection to improve transfer rates and bandwidth efficiency and prioritize business-critical traffic.

## Secure Applications

With a suite of network firewall and protocol-level security services, BIG-IP LTM VE protects the applications that run your business.

### Network firewall

BIG-IP LTM VE provides native network firewall services to deliver stateful packet inspection to protect data center resources. It is built on F5's TMOS full proxy architecture, which offers tremendous performance, scalability, and customization. Using F5's event-driven iRules, application, security, and network teams can quickly build new services that inspect, transform, and direct application traffic. BIG-IP LTM VE is certified by ICSA as a network firewall.

### DDoS protection

BIG-IP LTM VE acts as an advanced Distributed Denial of Service (DDoS) defense, offering protection from more than 30 attack types, including DoS attacks, TCP, SYN, ICMP, UDP floods, SSL renegotiation, Slowloris, botnets, and other advanced attacks. Features such as SYN Check<sup>™</sup> provide comprehensive SYN flood protection for the servers that sit behind BIG-IP LTM VE. BIG-IP LTM VE uses Dynamic Reaping, an adaptive method for reaping idle connections, to filter out the heaviest attacks while simultaneously delivering uninterrupted service for legitimate connections.

### Insulation from protocol attacks

BIG-IP LTM VE provides Protocol Sanitization and a Full TCP Termination point that independently manages client and server-side connections, protecting all back-end systems and applications from malicious attacks.

### Customized application attack filtering

Full inspection and event-based policies deliver a greatly enhanced ability to search for, detect, and apply numerous rules to block known L7 attacks. BIG-IP LTM VE also applies secure application templates to block unknown attacks and attacks targeted at the business logic of the application. Additional layers of security protect against attackers, viruses, and worms, while enabling continuous service to legitimate traffic.

### Selective encryption

BIG-IP LTM VE delivers the industry's most selective encryption to holistically, partially, or conditionally encrypt data, enabling secure and optimized communications with a variety of different constituencies.

### Advanced encryption standard and longer key length support for SSL

BIG-IP LTM VE supports higher-standard AES algorithms with the most secure SSL encryption available on the market, at no additional processing cost. In addition, BIG-IP LTM can handle bit encryption and certificates encrypted with a 4096 length key.

### Cookie encryption

Cookies and other tokens transparently distributed to legitimate users are encrypted. You gain superior security for all stateful applications (e-commerce, CRP, ERP, and other business-critical applications) and a higher level of user identity trust.

### Resource cloaking and content security

BIG-IP LTM VE virtualizes and hides all application, server error codes, and real URL references that may provide attackers with clues about infrastructure, services, and their associated vulnerabilities. Sensitive documents or content are prevented from leaving your site.

### BIG-IP device security

F5 ensures BIG-IP device security through various features and a rigorous development process.

The optional appliance mode feature "hardens" BIG-IP devices by removing advanced shell (bash) and root level access. Administrative access is available through the F5 command-line interface (tmsh) and GUI.

The Secure Vault feature provides encryption of certificate passwords for enhanced certificate and key protection in environments where hardware FIPS 140-2 support is not required, but additional physical and role-based protection is desired.

The F5 design process starts with threat modeling and assessment before a single line of code is developed. The process then includes multiple code reviews, both internal and external penetration testing using industry recognized methods, and full production testing.

## Simple Configuration and Management

BIG-IP LTM VE provides advanced tools that make it easy to deploy and manage while maintaining flexibility and control of your infrastructure.

### iApp Templates

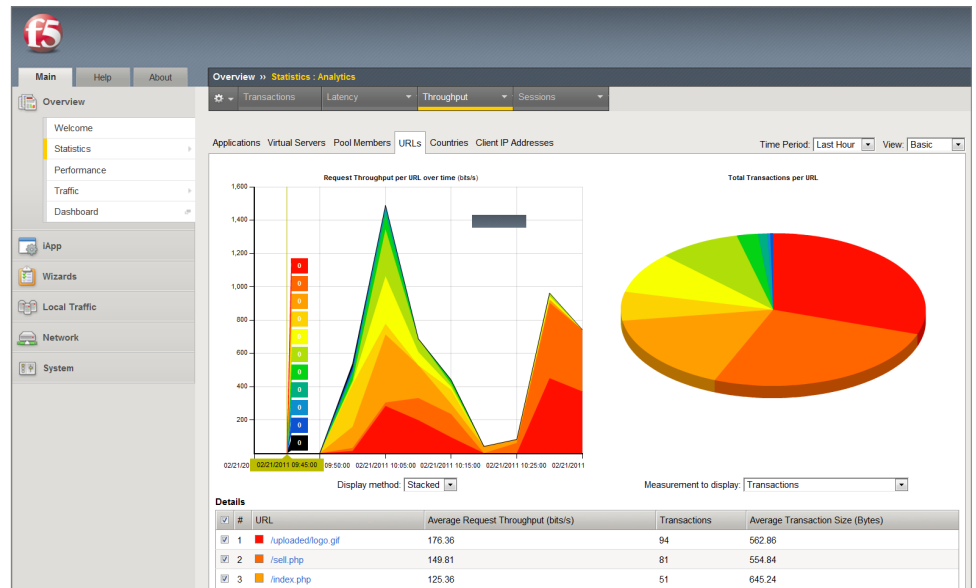
BIG-IP iApp™ Templates are used to define and tie all related application services and resources to the specific application being deployed. The application service object created provides a contextual view and advanced statistics of those services. These flexible templates enable you to deploy BIG-IP LTM with optimum application-specific configurations in only a few minutes.

Through extensive testing with application vendors, F5 has built a vast knowledge base of best-practice deployments for most popular applications. You can use them by answering a few simple questions about your application. They can also be modified and used for ongoing management through the lifecycle of the application as your business needs change. Advice, sharing, and official F5-developed iApp Templates can be found on DevCentral™, the F5 community site for administrators and developers.

### App Analytics

F5 iApp Analytics captures application-specific statistics reported at different levels of the service, with views per virtual servers, pools, and nodes. This provides more efficient troubleshooting, application visibility for capacity planning, and performance tuning and optimization by monitoring exactly how the application is performing for real users based on application response time, network conditions, and user context.

iApp Analytics provides real time application-level statistics, such as throughput per URL, that enable efficient troubleshooting, capacity planning, and performance optimization.



Thresholds can be set for some of the statistics, and an alert can be delivered via syslog, SNMP, or email when the threshold is exceeded. Analytics are configurable through the templates, with the option to export the data off-box to a third-party remote logging/reporting engine.

### Powerful command line shell

The TMOS® shell, TMSH, reduces training time and simplifies device management with tab completion, in-line help, and a tree-based structure. Automated tasks can be scripted with tool command language (Tcl). BIG-IP system users who are more familiar with other network devices' commands and syntax can use aliases to translate the shell, enabling administrators to use the syntax they prefer.

### System management and high availability

BIG-IP LTM VE improves system management through critical features such as multi-boot and warm upgrades. As a high availability (HA) solution, BIG-IP LTM VE also provides visibility into the status of all processes running under the "HA table."

### Device Service Clustering—configuration syncing

Administrators can optionally enable automatic syncing to keep applicable application and networking configuration information of all devices in a device group up to date. Shared resources (for example, iRules, profiles, and certificates) are kept up to date and consistent across all devices.

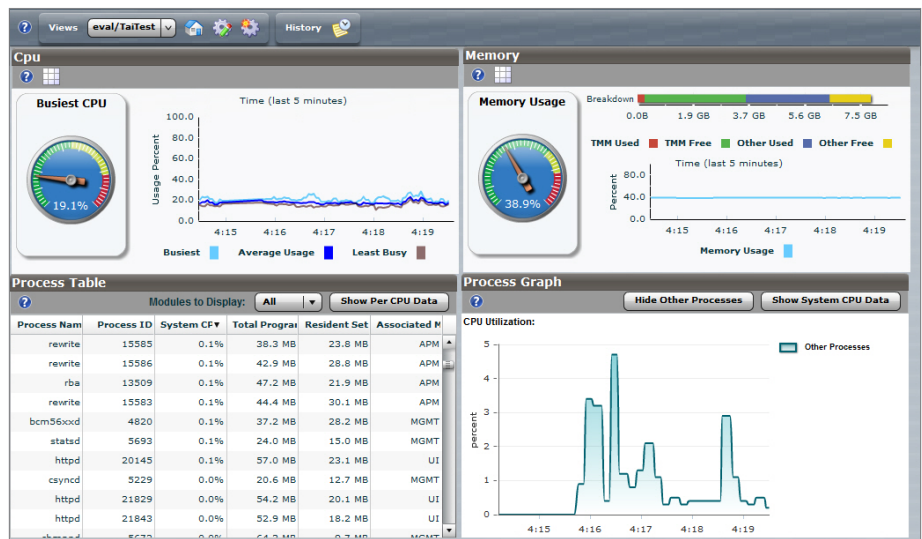
### Administrative domains

Administrative domains enable you to design customized partitions and assign varying degrees of administrative rights and views of BIG-IP LTM VE functions. Administrators can design customized views by service, application owners, or other segmentation scheme, providing management scale and organizational efficiency.

### Dashboard

BIG-IP LTM VE provides detailed device and traffic statistics to help you better monitor all activities and resources. These statistics include global, per object, per module, TMM CPU utilization for virtual server, profile statistics per virtual server, and CPU and memory statistics per process.

The BIG-IP Dashboard provides real-time granular and historical system performance.



## Centralized Management

F5 offers an additional product to gain control and visibility of your entire deployment of multiple BIG-IP products.

### Enterprise Manager Virtual Edition

Enterprise Manager™ Virtual Edition (VE) can help you significantly reduce the cost and complexity of managing multiple F5 products. You gain a single-pane view of your entire application delivery infrastructure and the tools you need to reduce deployment times, eliminate redundant tasks, and efficiently scale your infrastructure to meet your business needs. Also, Enterprise Manager VE collects device and traffic statistics from BIG-IP LTM VE to provide comprehensive visibility into system health and application traffic.

## Architecture

The unified architecture of the BIG-IP system gives you application intelligence and flexibility to control application delivery without creating traffic bottlenecks.

### TMOS

At the heart of BIG-IP LTM VE is the TMOS operating system that provides a unified system for optimal application delivery, giving you total visibility, scalability, and control across all services.

Device Service Clustering (DSC) provides the ability to group devices and services across an array of virtual editions to create a horizontal cluster. Virtual devices can be added or removed to a Device Service Cluster without disrupting application services. Similarly, application services can be independently managed within the cluster to provide superior system and application maintenance.

### Fast application proxy

With TMOS, BIG-IP LTM VE efficiently isolates clients from the server-side flows and independently maintains optimal performance for each connecting device, translating communications between systems for improved system or IP application performance.

### iRules and Universal Inspection Engine

TMOS incorporates F5's customizable iRules, a Tcl-based scripting language to control the behavior of BIG-IP devices, and Universal Inspection Engine to provide unprecedented control over how to handle application traffic within the application transaction or flow. With complete payload inspection and transformation capabilities, event-driven iRules, and session-aware switching, BIG-IP LTM VE offers you the most intelligent control point to address diverse application delivery issues at network speeds.

### iControl

The F5 iControl® API and SDK help automate communications between third-party applications and BIG-IP LTM VE, removing the need for manual intervention. iControl supports a true publish/subscribe model, which reduces network overhead and improves the performance of applications that integrate with BIG-IP LTM VE through the iControl interface. For most applications, this can reduce network bandwidth and processing time on both the client and the server.

### IPv6 Gateway (NAT64 support)

This feature provides complete IP transformation and load balancing capabilities between v4 and v6 networks. In addition to working with native IPv6 networks, F5 also supports the DNS64 and NAT64 standards for effective IPv4 to IPv6 translation. It can help you make user migration and the pooling of mixed IPv4 and IPv6 host resources manageable, cost-effective, and possible.

### Layer 2 protocols

BIG-IP LTM VE supports basic layer 2 protocols:

- STP, MSTP, RSTP
- Link aggregation
- VLAN tagging
- QoS/ToS
- Third-party MIB support: all default Net-SNMP

### High speed logging

BIG-IP LTM VE has the ability to pass TCP or UDP log traffic at extremely high rates. Support for both local and external (off-box) logging enables you to centralize the data in third-party logging engines and meet security and compliance requirements. High speed logging (HSL) is configurable using the GUI and supports the W3C extended log format.

## System Requirements

BIG-IP Local Traffic Manager Virtual Edition (VE) offers the flexibility of a virtual software LTM optimization controller. Running on your choice of hypervisor, BIG-IP LTM VE can help you meet the needs of your virtualized environment.



BIG-IP LTM Virtual Edition

Hypervisor:	VMware vSphere Hypervisor 4.0, 4.1, and 5.0 Citrix XenServer 5.6 Microsoft Hyper-V for Windows Server 2008 R2 (lab only)
Processor:	2 CPU cores
Memory:	4 GB RAM
Network Adapters:	3 virtual network adapters
Disk Space:	One 40 GB LSI logic disk

## F5 Services

F5 Services offers world-class support, training, and consulting to help you get the most from your F5 investment. Whether it's providing fast answers to questions, training internal teams, or handling entire implementations from design to deployment, F5 Services can help you achieve IT agility. For more information about F5 Services, contact [consulting@f5.com](mailto:consulting@f5.com) or visit [f5.com/services](http://f5.com/services).

## More Information

To learn more about BIG-IP LTM VE, use the search function on [f5.com](http://f5.com) to find these and other resources.

### Product overview

[BIG-IP Local Traffic Manager VE](#)

### White paper

[Creating a Hybrid ADN Architecture with Both Virtual and Physical ADCs](#)

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