



BIG-IP Link Controller

High availability and intelligent routing for multi-homed networks

As enterprises increase their use of the Internet to deliver their business-critical applications, maintaining only one link to the public network represents a single point of failure and serious network vulnerability. The BIG-IP® Link Controller seamlessly monitors availability and performance of multiple WAN connections to intelligently manage bi-directional traffic flows to a site - providing fault tolerant, optimized Internet access.

- *Enables reliable WAN connections for business grade Internet connectivity*
- *Ensures traffic is directed over the best possible link and ISP, maintaining the highest quality of service and speed for users*
- *Maximizes ROI for corporate connectivity by allowing enterprises to aggregate inexpensive links*
- *Eliminates the deployment barriers and dramatically reduces the costs of multi-homing via Border Gateway Protocol (BGP)*

Key Benefits

- Virtual links allow for seamless line aggregation, transparent to users and ISPs
- Full link monitoring provides fast, instantaneous ISP failover
- Comprehensive static and dynamic load balancing algorithms to distribute traffic over the best possible link
- Policy based traffic control allows you to direct and prioritize traffic based on targeted user groups or application types
- Secure Network Address Translation (SNAT) and intelligent DNS provide bi-directional and per connection traffic control
- Integrated security layer to protect against DoS, SYN floods and other common site attacks
- Detailed real-time and historical reporting to evaluate link and ISP performance
- Integrated firewall and basic server load balancing for all-in-one DMZ traffic management
- Supports link load balancing for all TCP, UDP, and other IP-based traffic
- Secure & remote management via web browser & CLI
- iControl enabled - The industry's first open application program interface (API) for F5's comprehensive suite of traffic management products

ENSURES RELIABLE NETWORK CONNECTIVITY

High Availability

BIG-IP Link Controller can detect errors across an entire link to provide end-to-end, reliable WAN connectivity. It monitors the health and availability of each connection, detecting outages to a link or ISP. In the event of a failure, traffic is transparently and dynamically directed across other available links. By monitoring and managing bi-directional traffic to the data center, both corporate users and external customers always remain connected.

Comprehensive Link Monitoring

BIG-IP Link Controller provides a comprehensive view into the health and throughput of links through the gateway router, ensuring availability and providing insight into the bandwidth and capacity of any given link. The Link Controller also detects failures caused by ISP mis-configuration or other manual errors that might otherwise be missed.



MAXIMIZES BANDWIDTH, INCREASES ROI

Bandwidth Scalability

Regardless of link type or provider, the BIG-IP Link Controller allows you to aggregate smaller, less expensive lines to provide lower cost bandwidth redundancy while minimizing the amount of money spent on dark fiber or unused standby lines.

Transparent Traffic Distribution

Round Robin Load Balancing allows you to evenly distribute traffic to maximize bandwidth across similar size connections, turning smaller lines in reliable higher bandwidth offerings. Ratio Load Balancing allows you to evenly balance load distribution based on differing link bandwidth, giving you the capability to match bandwidth needs with various connection types.

Link Capacity and Throughput

BIG-IP Link Controller allows you to define and control how traffic is distributed across links, or between bandwidth segments. This increases performance and available bandwidth (with line redundancy), and removes the risk of saturating any one link. When a link nears its capacity, traffic is shifted to less congested links - boosting overall site performance.

Link Cost Load Balancing

Link Cost Load Balancing allows you to choose the lowest cost connection for all traffic to a data center:

- Traffic is directed over least expensive link, minimizing bandwidth investments
- Provides flexibility to maximize bandwidth across different connections, including variable cost and prepaid lines. This removes bottlenecks while minimizing inefficient bandwidth utilization and associated costs.
- Supports various ISP billing models including set, fractional, burstable or 95-percentile billing. Supports half or full duplex billing.

ADVANCED TRAFFIC CONTROL

Granular Traffic Switching

BIG-IP Link Controller provides efficient traffic distribution and control. Through intelligent switching technology, the BIG-IP Link Controller provides superior per-connection based traffic decisions, ensuring fast response time and fine grain traffic control capabilities. This provides customers the control and flexibility they need to best manage traffic across their connections.

Best Performing Link

Using Round Trip Time and line quality calculations, BIG-IP Link Controller tests which connection will provide the best service for each user, then directs the user to that link - ensuring they receive the fastest possible service and the highest quality connections.

Customized Load Balancing

BIG-IP Link Controller provides customizable traffic control over link capacity (Kbps of router, number of connections, packets per second), link cost (cost per MBPS) and best link (based on round trip time, completion rate, and hops). This provides customers with the ability to weight

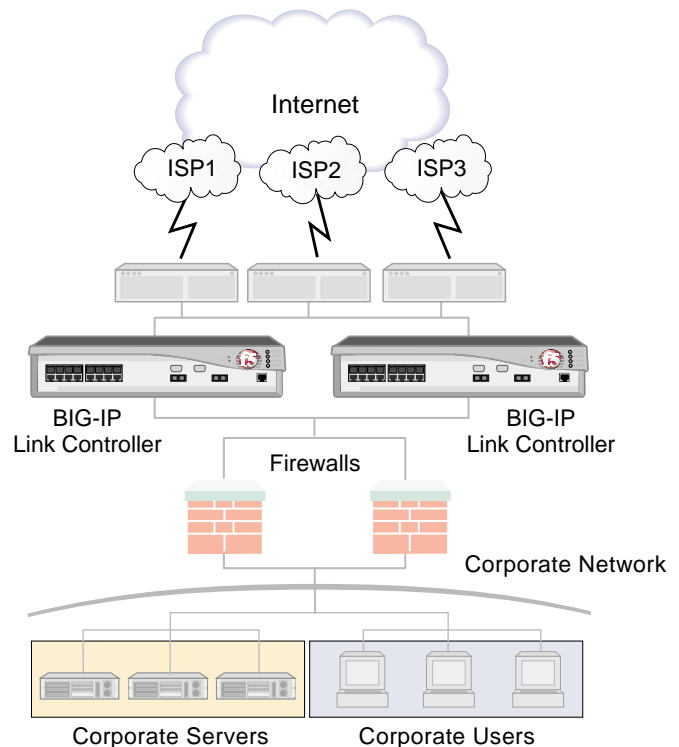
the importance of different load balancing factors, and optimally manage traffic according to individual business needs.

Policy Based Traffic Direction: Source, Destination, and Application Switching

BIG-IP Link Controller enables customers to direct portions of traffic over designated links. For example, high priority traffic such as FTP or email can be routed over a single preferred connection, leaving lower priority traffic to an alternate link.

Traffic Prioritization: QoS and ToS

The BIG-IP Link Controller also supports various traffic prioritization features. With QoS and ToS, organizations can mark their critical traffic or applications for special handling and priority for upstream routers. This ensures that high priority traffic is identified and routed first.



Redundant BIG-IP Link Controllers are positioned between the routers and firewalls for full redundancy and sub-second failover protection.



Average Round Trip Time (in seconds)

bold type = best user group served by the link underlined type = best link for the user group

Data Center	North America	Europe	Asia	Australia	South America	Africa
ISP1	0.36956	0.46790	0.36490	0.40180	0.39256	0.48320
ISP2	0.12849	0.35031	0.32384	0.40550	0.25992	<u>0.40415</u>
ISP3	<u>0.10260</u>	<u>0.31026</u>	<u>0.30311</u>	<u>0.28013</u>	<u>0.24678</u>	0.44850

Internet Link Evaluator

SUPERIOR CONFIGURATION & MGMT

Eliminates Barriers of Multi-homing with BGP

The BIG-IP Link Controller dramatically simplifies and improves the functionality provided by Border Gateway Protocol. Traffic is directed over the best route without the need to purchase larger routers, coordinate with ISPs, or obtain specialized staff and IP addressing to run BGP. The BIG-IP Link Controller improves on traffic direction for multi-homed environments by providing:

- Bi-directional traffic control for both external and internal users
- Automated, instant ISP and link failover – no waiting for routing changes to propagate
- Traffic routing down the best path to optimize bandwidth usage and cost
- Traffic distribution based on line capacity resulting in greater bandwidth scalability

Simple, Secure Administration

BIG-IP Link Controller includes an intuitive and easy-to-use web-based GUI, reducing the cost of implementation and the ongoing maintenance of a multi-homed infrastructure.

Statistics and Reporting

BIG-IP Link Controller Includes detailed real-time and historical reports to evaluate site traffic patterns, relative ISP performance, and estimated bandwidth billing cycles. Comprehensive reporting gives administrators visibility into bandwidth resources, enabling organizations to make informed business decisions.

Internet Link Evaluator

The exclusive Internet Link Evaluator provides a unique view of the overall performance that an ISP passes along to your users. Administrators can now easily:

- Spot slow links and troubleshoot performance issues over an ISP
- Evaluate an ISP's ability to quickly serve targeted segments of Internet users
- Evaluate an ISP's connection quality from your network to your users

ADVANCED SECURITY

The BIG-IP Link Controller has a number of inherent security features designed to protect against common attacks and provide added protection for your servers and network devices:

Network Address Translation (NAT) and Secure Network Address Translation (SNAT)

Maps well-known ports to any ports on the servers (Port-mapping). Ports such as 80, 443, 20, 21 can be mapped to any port number on the actual servers. This provides greater security by making it difficult for intruders to identify what services are running on which port.

Enables you to use non-publicly routed addresses for servers. This protects the IP addresses of internal devices from public view and allows for tight control by denying ports on a Virtual IP.

The BIG-IP Link Controller is a default deny device that resists common attacks by adding another layer of security to any site. BIG-IP Link Controller:

- Uses Secure Remote administration based on secure shell (SSH) for command line or SSL for browser-based management
- Can reap idle connections (thwarts Denial of Service attacks)
- Can perform source route tracing (thwarts IP spoofing)
- Resists unacknowledged SYN without ACK buffers (thwarts SYN floods)
- Thwarts teardrop and land attacks
- Protects itself and servers from ICMP attack
- Does not run SMTPd, FTPd, Telnetd, or any other attackable daemons
- Uses a security tool that identifies any services and ports that receive illegal access attempts
 - Frequency: amount of attempts
 - Port: what port(s) were hit
 - IP Address: the source IP address of attacker

Interface Security and Flexibility

You can control access to BIG-IP Link Controller on any interface. By default, it denies access unless types of specific traffic are enabled. This allows it to be a good addition to a site's overall security while reducing the load on firewalls.



BIG-IP • LINK CONTROLLER

INTEGRATED TRAFFIC MANAGEMENT / EXTENSIBILITY

The BIG-IP Link Controller can be expanded to meet a broad array of traffic management needs within the DMZ. By delivering integrated functionality and an upgradeable platform, the BIG-IP Link Controller is the only product on the market to provide an extensible solution including:

- Integrated firewall load balancing for high availability to redundant firewall deployments
- Integrated L4/basic server load balancing to distribute traffic over an array of servers
- Integrated security for added site protection against common attacks
- Port dense, high performance platform that scales with an organization's needs – platforms support multi-gigabit throughput
- Upgradeable to include multi-site global load balancing and disaster recovery (full F5 3-DNS product capability)
- Upgradeable to include enhanced L4-L7 local load balancing of servers, caches and intrusion detection devices (full F5 BIG-IP product capability)
- Upgradeable to include advanced security filtering capabilities for Code Red, Nimba, Slammer and other common attacks



ORDERING INFORMATION

The BIG-IP Link Controller delivers high availability and intelligent routing for multi-homed networks.

BIG-IP Link Controller functionality is available as a stand-alone switch (BIG-IP Link Controller 1000, or 2400) or as a software module that can be added to any full BIG-IP product. By adding the "Link Control Module" to a BIG-IP platform, customers receive fully functional layer 4-7 application traffic management and multi-homing support.



BIG-IP Link Controller 2400

High performance solution including the industry's fastest routing for multi-homed networks, supported by F5's new Packet Velocity ASIC.



BIG-IP Link Controller 1000

The ultimate price/performance solution, delivering complete BIG-IP Link Controller software functionality for mid-size organizations.

BIG-IP Link Control Module

Add this module to a BIG-IP platform to receive full multi-homing and link optimization support. Available for BIG-IP application traffic management switches (1000, 2000, 5000 series) and BIG-IP application traffic management appliances (520 and 540 series). Hardware must meet minimum manufacturer's requirements.



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Link Controller

BIG-IP® Link Controller 2400, 1000 and Link Controller Software Module

The BIG-IP Link Controller delivers high availability and intelligent routing for multi-homed networks. BIG-IP Link Controller functionality is available as a stand-alone switch on the following platforms or as a software module that can be added to any full BIG-IP product. By adding the "Link Controller Module" to a BIG-IP platform, customers receive fully functional layer 4-7 application traffic management and multi-homing support.



Platform: BIG-IP LC 2400 (D44)

Processor:
(1) 1.26 GHz PIII
Packet Velocity ASIC

Network Interface:
16x10/100 Mbps + 1 10/100 Mbps
management port
2-GB fiber

Hard Drive Capacity:
No spinning media. 512MB flash

RAM:
512 MB (expandable to 2 GB)



Platform: BIG-IP LC 1000 (D39)

Processor:
(1) 1GHz PIII

Network Interface:
8x10/100 Mbps + 1 10/100 Mbps
management port
1-GB fiber

Hard Drive Capacity:
No spinning media. 512MB flash

RAM:
512 MB (expandable to 2 GB)

BIG-IP Link Controller Module

Available for BIG-IP application traffic management switches and BIG-IP application traffic management appliances (520 and 540 series) that include the following:

Software:
Version 4.5 or greater.

Hard Drive:
512MB flash

Processor:
550 Mhz or greater

Common To All BIG-IP Link Controller Platforms:

Dimensions:
17" (w/o mounting ears - 19" w/) x 21.7" x 3.44"

Weight:
26 lbs (per unit, not including shipping materials)

Operating Temperature:
23° to 122° F (-5° to 50° C) per Telcordia GR-63
CORE 5.1.1 and 5.1.2

Relative Humidity:
10 to 90% @ 40° C, per Telcordia GR-63-CORE
5.1.1 and 5.1.2

Power Supply:
350W 110/220 VAC AUTO Switching

Options:
Single 48V DC (All IP Application Switch
platforms)
Redundant 48V DC (D51c, D51f, D44)
Redundant AC Power Supply (D51c, D51f, D44)

Safety Agency Approval:
UL 60950 (UL1950-3)
CSA-C22.2 No. 60950-00 (Bi-national
standard with UL 60950)
CB TEST CERTIFICATION TO IEC 950
EN 60950

Electromagnetic Emissions Certifications:
EN55022 1998 Class A
EN55024 1998 Class A
FCC Part 15B Class A

SPECIFICATIONS SUBJECT TO CHANGE
WITHOUT NOTIFICATION



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