F5 BIG-IP DNS FOR SERVICE PROVIDERS

A carrier-grade DNS-resolving solution with hyperscaling and security services that enable faster web browsing with low latency
SCALING DNS SERVICES WITH BIG-IP DNS

With network traffic growing dramatically to support new mobile users and applications, service providers need a scalable, secure DNS (Domain Name System) solution that enables faster web browsing and low latency. F5® BIG-IP® DNS provides an intelligent way to respond to DNS queries by enabling an optimized LDNS (Local Domain Name Server) infrastructure and a better-quality user experience to increase revenue and reduce subscriber churn.

SCALING, SECURING, AND OPTIMIZING DNS

DNS, a core Internet technology, enables subscribers to access services making it one of the most important components in the network infrastructure. If DNS is unavailable, subscriber services will fail to function properly.

Service providers need to build an optimized and secure DNS infrastructure to better serve their subscribers today and in the future. Creating this infrastructure requires a tremendous amount of real-time management, stability and room to grow. Scaling DNS becomes a critical issue quickly with millions of service names and IP addresses. As providers scale the control plane and look to automate the mobile core, they must ensure the security of the subscriber and billing data as well as the capacity to withstand attacks. The first step to protect the network from attacks is to understand the DNS environment and actively monitor DNS traffic, not only for uptime but for load and resource usage in real time.

While an efficient and secure DNS infrastructure remains a vital part of a service provider’s offering, it presents serious implementation and management challenges. BIG-IP DNS addresses these with hyperscaling and security services.

F5 BIG-IP DNS–A SCALABLE DNS SOLUTION

The F5 BIG-IP DNS solution helps service providers optimize and secure their DNS infrastructures and traffic flows with a carrier-grade, secure, high-performance and authoritative DNS-resolving solution that also includes caching and resolving capabilities. BIG-IP DNS delivers an intelligent and scalable DNS infrastructure that gives mobile users faster access to services. BIG-IP DNS load balances local and recursive DNS services and enables a DNS64 environment creating a fault-tolerant architecture that optimizes network traffic and improves user experiences.

To support subscriber growth while reducing DNS server count, BIG-IP DNS hyperscales DNS services and responds authoritatively to DNS queries up to 100 million query responses per second (RPS). The caching and resolving functions in BIG-IP DNS offload your LDNS infrastructure and backend DNS services with a much faster response to subscriber queries while dramatically reducing latency. These efficiencies increase average revenue per unit (ARPU) improving monetization of services.

KEY FEATURES

- Improved Performance, Reduced Network Latency—IP Anycast integration distributes the DNS request load and directs single IP requests to multiple local devices
- Authoritative DNS—hyperscales responses up to 100 million RPS with DNS Express enabled in RRM
- Service Availability for Best Performance—with advanced traffic distribution capabilities, geographic load balancing identifies location at the continent, country or state level and connects users to the closest app
- Lower LDNS Latency—enables caching and resolving by offloading your LDNS and backend DNS infrastructure
- DNS Inline Services—manages network traffic with high availability to DNS and caching ENUM services
- IPv6 and DNS64 Support—translates traffic for consumption by either IPv4 or IPv6 endpoints
- Logging, Reporting, and Analytics—uses detailed DNS and GSLB data, statistics and graphs for in-depth analysis
- Real-Time DNSSEC—protects LDNS servers from cache poisoning and man-in-the-middle attacks
- Attack mitigation—shields DNS from attacks such as reflection or amplification DDoS attacks with BIG-IP Advanced Firewall Manager, an ICSA network firewall certified platform
BIG-IP DNS works with other F5 service delivery solutions for NAT64 translation, subscriber and application awareness with policy enforcement, and high-performance service delivery. This integration creates a complete service-delivery infrastructure that optimizes and secures DNS infrastructure while boosting subscriber satisfaction.

COMPREHENSIVE DNS SECURITY

To protect your DNS infrastructure from common DNS Distributed Denial-of-Service (DDoS) attacks, BIG-IP DNS includes a comprehensive security solution that mitigates attacks by hyperscaling up to 100 million query RPS in rapid response mode (RRM). Combined with BIG-IP® Advanced Firewall Manager® (AFM), BIG-IP DNS shields DNSs from volumetric attacks—such as UDP floods, reflection or amplification DDoS attacks—while providing the ability to inspect, validate and control DNS through protocol validation and rate-limiting for NXDOMAIN floods and malformed packets. Service providers can mitigate DNS threats by blocking access to malicious IP domains with outbound domain filtering using BIG-IP DNS response policy zones.

BIG-IP DNS helps service providers understand attacks with monitoring, alerting, logging, and analytics. These tools provide a global view of the infrastructure with the means to manage the network and add polices to ensure the highest availability for your business-critical applications.

The need for real-time visibility into DNS DDoS is critical. F5 BIG-IQ® Centralized Management can be used to measure device health and investigate DDoS attacks. DNS DDoS attack details can be observed by all managed F5 BIG-IP products, providing a high-level, at-a-glance view of DNS and DDoS traffic details from which service providers can review current traffic trends or drill down into a specific attacks with criteria like attack type, size, flow history, source and destination IP address etc.
The need for visibility into DNS DDoS is critical. As shown in Figure 1, the DNS DDoS summary page allows you to see both DNS activity analytics, along with DDoS metrics. This gives both SOC and DNS NOC engineers the tools to accurately determine what is happening in their DNS infrastructure at a glance with drill down into detail. A Data Center Activity Map displays load at each location. The bigger or redder the circle, the more activity each location is experiencing. A queries-per-second line graph gives you a view of the overall view of DNS queries across all BIG-IP systems in your environment. The attack heat map provides an extremely quick view of the top attacks on the infrastructure, sorted and color coded by size and severity. For networks that experience 10s of 1000s of DNS attacks a day, this is the most efficient way to zero in on the attacks that matter most.

**THE BIG-IP PLATFORM PROVIDES THE FOLLOWING DNS SERVICES:**

- Authoritative DNS hyperscalability, handling millions of global name requests per second
- Consolidation and offloading of LDNS with high-performance DNS caching and resolving
- DNS delivery performance for both inline and recursive DNS
- DNS DDoS mitigation, query validation, traffic inspection and manipulation, and malicious IP blocking
- Consolidation at the heart of the network—firewall, load balancing, URL filtering, policy enforcement, NAT64 and DNS64 translation and iRules—enables a significant reduction in the number of servers reducing capex and opex costs
- Automation of packet gateway selection using DNS and global-server-load-balancing services (GSLB) for optimized service experiences

**HARDWARE OR VIRTUAL DEPLOYMENT OPTIONS**

The BIG-IP DNS solution is available as a physical or a virtual solution. BIG-IP DNS with F5® DNS Express® enabled in rapid response mode (RRM) in a fully loaded chassis hyperscales up to 100 million RPS. Each Virtual Edition (VE) can provide 250k RPS. The DNS NFV packaged solution is available in 500k and 2m query response per second (QPS) increments and the DNS security NFV packaged solution is available in 250k, 500k and 2m QPS increments. NFV packaged solutions include the VNF Manager for self-configuration and lifecycle management. All solutions are available to purchase with a perpetual license or a subscription license.