

High-performance DNS Caching for Service Providers



Summary: Excessive network delay or latency can have a profound effect on subscriber experience where both Internet-based businesses and subscribers expect close-to-instantaneous network response. Response delays have been shown to negatively impact revenue for service providers' enterprise customers such as web-services companies and financial institutions; and slow-responding legacy DNS cache servers can cause significant latency in a network connection. Infoblox high-performance DNS caching for service providers sustains sub-millisecond latency, providing fast response to queries and maintaining service availability.

Sub-millisecond Performance for Fast Response and Service Availability

Service degradation and outages are significant causes of subscriber dissatisfaction. Sudden surges in transaction traffic have been known to create so much volume that they overwhelm DNS or other network resources, preventing legitimate traffic from being processed.

Sources of service-impacting surges include misconfigured mobile devices or cable set-top boxes, improper software updates for network infrastructure, poorly designed device applications, emergency conditions, local network outages, and, of course, malicious attacks. These conditions create sudden massive increases in transactions and DNS queries. The Infoblox high-performance DNS caching solution maintains critical DNS service availability during disruptive network conditions, unpredictable traffic surges, and even distributed denial of service (DDoS) attacks.

Attack-resilient Service Continuity

Denial of service (DoS) attacks and volumetric floods or DDoS attacks that target DNS network infrastructure can cause service degradation, slow DNS response, and impede subscriber ability to access domains. DNS is the most targeted service of application-layer DDoS attacks, and such attacks increase annually in frequency, volume, and complexity. Nearly all service providers have experienced these threats.

Advanced features of the Infoblox high-performance Secure DNS solution enable service continuity by optimizing software and hardware performance and identifying and dropping malicious packets.

Power and Space Efficiency

The Infoblox platform is designed to deliver higher volumes of valid transactions per second. This higher performance means more queries and more users can be served with fewer appliances. With the escalating cost of rack space, power, and cooling, the higher efficiency of Infoblox solutions also helps service providers control operating expenses.

Why Infoblox?

Advanced Caching Functions

Ready availability of the most relevant IP records makes a significant difference in the responsiveness of DNS infrastructure. The more recursion (i.e., records that are not stored in cache and that require queries to other DNS servers), the more latency is added to the response. The Infoblox solution is designed to provide a cache-hit ratio (percent of queries stored in cache) of 95 percent or higher through a number of advanced functions not provided in most legacy solutions:

- **Prefetching** monitors the natural life cycle of domains in the cache and pre-fetches them before they expire. This ensures that users get accurate and real-time updates while still enjoying sub-millisecond response times.
- **Hot caching** continues serving records near expiration for widely used records, because subscribers have patterns that benefit from hot-cached responses.
- **Adaptive 1-million-domain indexing** learns the preferred domains and gives preference to the top million destinations for any given network environment.
- **Negative cache flushing** prevents negative actions from affecting the cache by preferring valid domain responses over non-existent domain names. Infoblox adaptive algorithms flush non-existent domains to ensure that valid destinations get the best service for the most users.

The advanced caching functions in the Infoblox solution ensure that the best and most-used responses are always available for subscribers.

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Infoblox Carrier-grade DNS Appliances

Infoblox builds hardware-based DNS attack detection and protection into the Infoblox 4030 and PT-series appliances. This specialized hardware drops attack traffic and passes legitimate traffic, offloading the DNS server engine from DDoS protection and from processing malicious DNS traffic, preserving a low-latency web experience for subscribers. The IB-4030 is one of several classes of appliances for service providers. For a full listing of Infoblox appliances, see the *Infoblox Appliance Guide*.

Create a Superior Subscriber Experience

Infoblox solutions for service providers deliver the reliability, manageability, performance, and proactive protection service providers need to safeguard their networks, subscribers, and brand—enabling them to create the best first-connection experience for their subscribers.

When combined with patented Infoblox Grid™ technology, Secure DNS high-performance caching further ensures optimal operator visibility and control across all DNS infrastructure, including automated kill chain during security incidents. This enables quick detection of any service-threatening attacks while easing operational costs and increasing manageability.

Contact us today to find out more about high-performance DNS caching solutions for service providers.

About Infoblox

Infoblox delivers critical network services that protect Domain Name System (DNS) infrastructure, automate cloud deployments, and increase the reliability of enterprise and service provider networks around the world. As the industry leader in DNS, DHCP, and IP address management, the category known as DDI, Infoblox (www.infoblox.com) reduces the risk and complexity of networking.