

Infoblox DNS for 5G

Fifth Generation wireless (5G) signifies a vast improvement over current cellular wireless technology in terms of speed, response time, reliability, number of supported device types and device density per square kilometer. The technology has the potential to transform cell phone usability. 5G's potential applications go beyond cell phones to the Internet of Things (IoT) and sensors, enabling innovations in mobile health, telesurgery, automated manufacturing, smart cities, e-sports, VR/AR gaming and connected vehicles.

NETWORK OPERATOR REQUIREMENTS AND CHALLENGES

The transition to 5G and accompanying industry impact will create numerous technical challenges for network operators and service providers, especially with the core network services vital to 5G connectivity: DNS, DHCP and IP address management (DDI). Among the most pressing challenges are:

- Ultra-low DNS latency to enable real-time applications
- Auto-scaling DDI for network slicing
- Distributing DDI services to the network edge for multi-access edge computing (MEC) in the smallest possible footprint

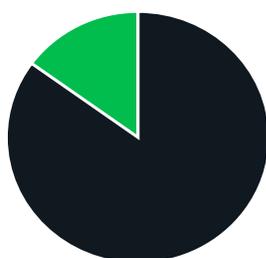
WITH 5G—LATENCY MATTERS MORE THAN EVER

At 5 milliseconds, current DNS latency is too high to support many 5G applications. For example, in 5G deployments, AR/ VR, gaming, connected cars, and telesurgery will require end-to-end latency of 1-10 milliseconds. Clearly, current DNS latency is unacceptable. The pervasive connectivity of 5G will increase reliance on edge computing, which brings cloud resources compute, storage, and networking—closer to applications, devices, and users. 5G implementations will require greater use of small cell stations at the very edge of the network, so data need not travel long distances to a cloud or data center. To ensure unhindered traffic flow at the edge, DNS services must also be positioned at the edge.

KEY CAPABILITIES

- Sub-millisecond response and advanced threat protection maintains a low latency and a secure subscriber experience.
- Reduces the cost of ownership—do more with the same headcount by eliminating repetitive and labor-intensive server administrative tasks and eliminating generic server support costs.
- Improves reliability with automated HA/DR— reduce downtime by eliminating slow, manual, error-prone upgrade processes.
- Become more responsive to changing business needs—our distributed approach enables rapid upgrades via Infoblox Grid and enables a more flexible response to network architecture/topology changes.
- Supports encrypted DNS protocols, including DNS over TLS (DoT) and DNS over HTTPS (DoH).

LTE Latency Budget



5G Latency Budget



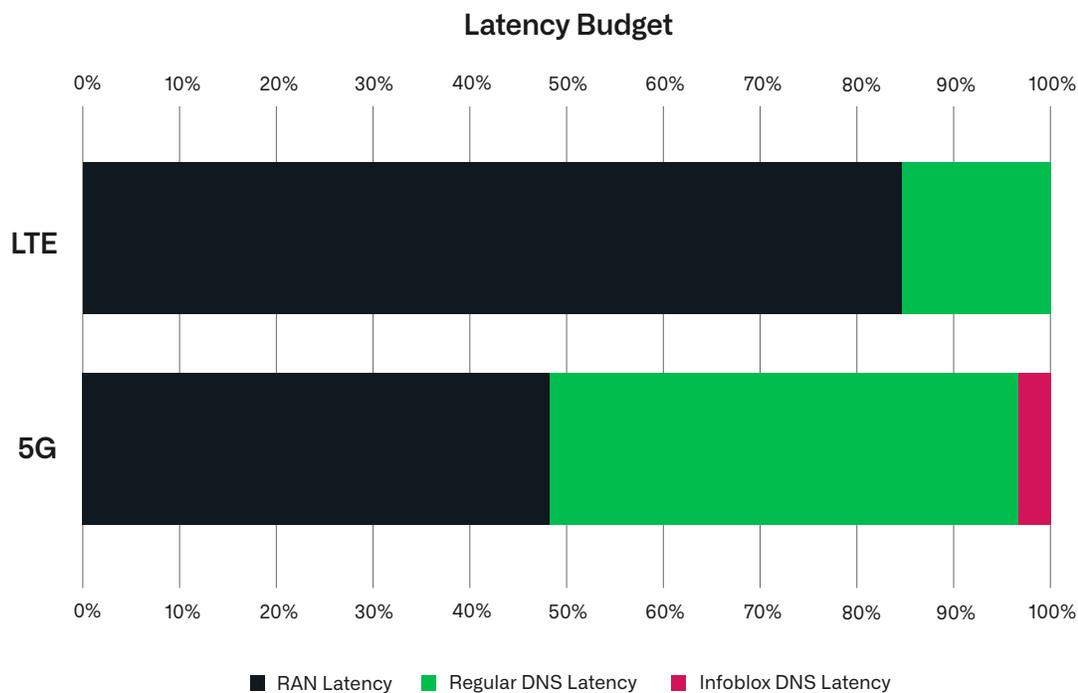
■ RAN Latency ■ Regular DNS Latency

A NEW VARIABLE: ENCRYPTED DNS

New encrypted DNS standards have emerged that, while protecting the privacy of DNS requests and the integrity of responses, Communications Service Providers (CSPs) can lose some of the control needed to govern DNS usage within their networks unless they provide their encrypted DNS services. DNS over TLS (transport layer security) or DoT, and DNS over HTTPS or DoH, work by encrypting the DNS communication between your operating system’s stub resolver or a local application and your recursive DNS resolver. Both technologies ensure data privacy and authentication by encrypting communications between DNS clients and servers. However, in doing so, many solutions are changed to point to external DNS resolvers, allowing client devices to access DNS services outside of the provider’s control and exposing the subscriber to potential security risks and negative customer experiences. Providers need to reduce the risks these technologies pose. Implementing encryption through the DNS resolver on your network allows you to remain in control of your subscriber’s network experience. It will enable providers to continue to provide security, content filtering and other critical on-net services.

THE INFOBLOX ADVANTAGE—ULTRA-LOW LATENCY FOR 5G

DDI is foundational to deploying large scale 5G network and services. Infoblox solutions for service providers offer ultra-low latency of 50 microseconds on average, scaling to millions of devices with ultra-high five-9s reliability. By combining highly optimized DNS caching software with software-based packet processing acceleration technologies like Data Plane Development Kit (DPDK), Infoblox enables service providers to build highly scalable DNS caching solutions with accelerated packet processing performance and throughput that meet the rapidly growing demands from their customers.



INFOBLOX DNS CACHE ACCELERATION

Designed for service provider environments requiring scalable edge deployments and available in multiple form factors including virtualized NFV options and carrier-grade appliances, Infoblox DNS Cache Acceleration solutions are designed to handle the “perfect storm” of future 5G and edge- based applications that require ultra-low latency – supporting DNS query rates up to five million queries per second as a standalone appliance. Through centralized management, network operators can quickly instantiate, implement, and auto-scale network services and manage those services more efficiently through a unified family of devices. Infoblox virtual appliance software leverages x86 hardware virtualization technology to provide ultra-low latency of 50 microseconds on average.

By leveraging multiple DNS Cache Acceleration appliances in a distributed Infoblox Grid™ configuration, billions of queries per second can be processed. Besides raw DNS transaction capability, Infoblox DNS Cache Acceleration delivers unprecedented low levels of DNS query latency. This enables traffic from the latest applications such as Internet gaming, virtual reality/augmented reality, content sharing, and social media to be handled, giving customers a rapid Internet response time that ultimately ensures a high level of user satisfaction. In addition to providing flexibility and operational control, Infoblox provides labor scalability, enabling ISPs to grow their infrastructures without adding operations support staff. The Infoblox Grid™ architecture enables distributed appliances to be effectively managed from a central location or several regional locations, ensuring that configurations can scale without operational limits.

To learn more, visit www.infoblox.com/sp or contact your local Infoblox representative today.

SUPPORTS ENCRYPTED DNS STANDARDS

Infoblox Network Identity Operating System (NIOS) is the OS that powers Infoblox core network services, ensuring the network infrastructure's continuous operation. Infoblox Encrypted DNS for Service Providers is a NIOS feature that provides efficient encryption while delivering Infoblox best-in-class DNS and value-added subscriber services. With support for DoT and DoH, Infoblox Encrypted DNS delivers a unique approach to encrypting your DNS traffic. Unlike methods that rely on load balancers or over-provisioning, Infoblox Encrypted DNS runs as a single service for all of your DNS needs. Infoblox Encrypted DNS enables Infoblox to encrypt last-mile DNS communications between their endpoints and DNS servers regardless of which protocol the endpoint supports. It supports this capability while also solving performance concerns associated with the additional overhead related to encrypted DNS communications. From the same service, we allow CSPs to accommodate encrypted DNS with microsecond latency when the connection is already established while all other DNS features are running.

FLEXIBLE DEPLOYMENT OPTIONS

Infoblox DNS Cache Acceleration is designed for CSP environments requiring scalable edge deployments. It is available in multiple carrier-grade options, including orchestrated Virtualized Network Function (VNF) and cloud-native solutions.

- **Infoblox Trinzic Flex:** a scalable virtual platform based on the resources allocated to the virtual machine. The Infoblox Network Identity Operating System (NIOS) automatically detects the virtual machine's capacity and scales it to the appropriate platform. Additionally, Trinzic Flex is covered under the Service Provider License Agreement Program (SPLA).
- **Available on Physical and Virtual Platforms:** Software DCA is a software subscription add-on to Trinzic X5, X6 and Trinzic Flex appliance models.



Infoblox unites networking and security to deliver unmatched performance and protection. Trusted by Fortune 100 companies and emerging innovators, we provide real-time visibility and control over who and what connects to your network, so your organization runs faster and stops threats earlier.

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