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.

LTE Latency Budget | 5G Latency Budget
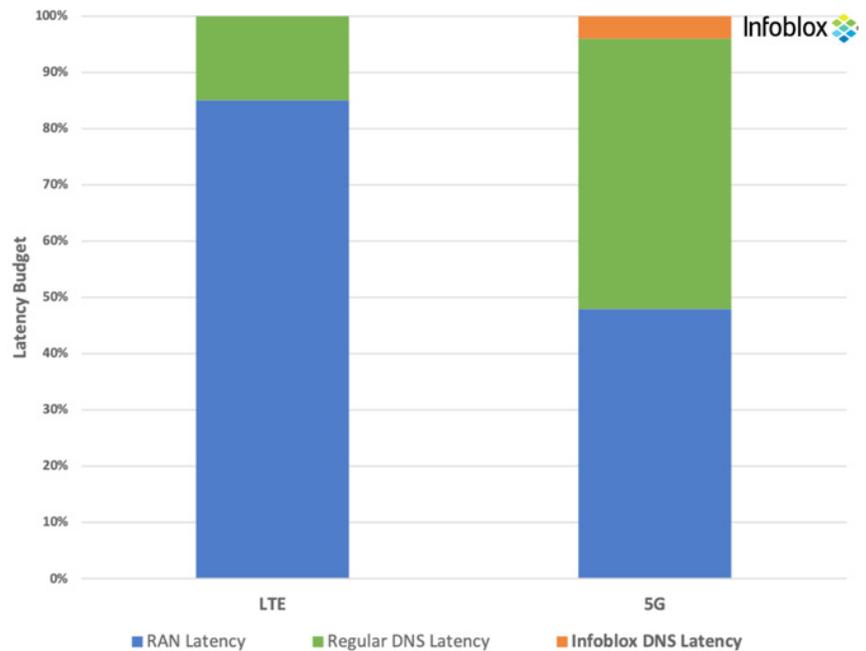
■ RAN Latency   ■ Regular DNS Latency
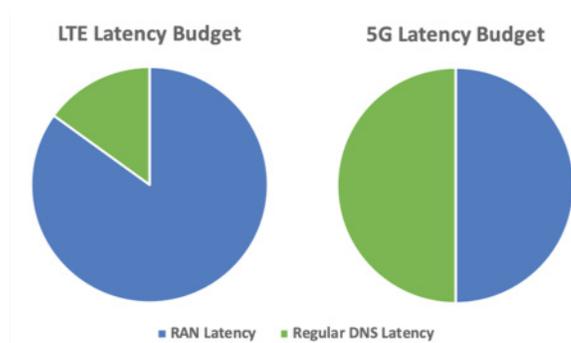
The Infoblox Advantage—Ultra-Low Latency for 5G

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.