

CASE STUDY

Software Development Tools
Performance Profiling



Profiling for Success

F5 Networks amps up its BIG-IP DNS* solution for developers with help from Intel® Parallel Studio and Intel® VTune™ Amplifier

“Intel® VTune™ Amplifier helped us identify potential performance bottlenecks in the design and engineering of our high-performance networking systems.”

—James Hendergart

Strategic Initiatives Director

F5 Networks, Inc.

Business users expect their applications to be fast, secure, and always available. Anything less is unacceptable. That's why Seattle-based **F5 Networks, Inc.**, gives the developers who build those applications the tools they need to deliver maximum speed, security, and availability.

The company's **BIG-IP DNS*** improves the performance and availability of applications by sending users to the closest or best-performing physical, virtual, or cloud environment. It also hyperscales and secures developers' domain name service (DNS) infrastructure from distributed denial of service (DDoS) attacks and delivers a real-time domain name system security extensions (DNSSEC) solution that protects against hijacking.

Advanced Profiling Addresses Complexity

Intel® products have been integral ingredients as F5 designs and builds its hardware and software solutions—including [Intel® Xeon® processors](#), [Intel® FPGA solutions](#), and [Intel® QuickAssist Technology](#).

Another key tool from Intel that helped with the development of BIG-IP DNS was [Intel® VTune™ Amplifier](#), a part of [Intel® Parallel Studio](#), a software development suite to improve performance, productivity, and scalability for HPC, enterprise, and cloud software developers and domain specialists who need to maximize performance on Intel® Xeon® and Intel® Xeon Phi™ processors.

Intel VTune Amplifier provides advanced profiling capabilities with a single, friendly analysis interface. It provides accurate profiling data—collected with very low overhead—plus tools to mine it and interpret it.

“Intel VTune Amplifier helped us identify potential performance bottlenecks in the design and engineering of our high-performance networking systems,” explained James Hendergart, strategic initiatives director for F5 Networks. “We're able to ensure sound technical design and solid programming with the enhanced visibility of tools like Intel VTune Amplifier. This lets us tune the end product to a finer degree than possible without the visibility Intel provides.”

“We worked with the Intel VTune Amplifier team for about a month,” explained Hendergart. “They were very responsive to our needs, adding the capability to run Intel vTune Amplifier remotely and in headless environments. It was a great collaboration between Intel and F5.”

Intel VTune Amplifier analyzes [Intel® QuickPath Interconnect](#) technology, which provides high-speed, point-to-point links inside and outside of the processor. In contrast to parallel buses, these links speed up data transfers by connecting distributed shared memory, the internal cores, the I/O hub, and other Intel® processors. This enabled F5 to watch the transaction between two computer chips and figure out why the traffic was not moving as expected so they could correct it.



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F5 develops very powerful systems, both in terms of hardware (Intel Xeon processors, FPGA, multiple accelerators) as well as software. It is essential to understand the dynamics of the whole software stack. Working with Intel, F5's system architecture team was able to deliver a solution for stack unwinding for the Huge Pages mode used in the F5 BIG-IP system. This helped them to understand dynamics of system calls and was valuable for performance tuning.

Maximizing Speed, Security, and Availability

With collaboration from Intel and the help of tools like Intel VTune Amplifier, F5 was able to ensure BIG-IP DNS can deliver maximum speed, security, and availability for customers—ensuring their applications will be fast, secure, and always available.

The BIG-IP DNS system is a perfect example of modern hardware—a unique mix of CPU, FPGA, and various accelerators and peripherals combined with F5's custom networking software layer. Ensuring optimal performance in such a complicated environment requires understanding a huge number of factors including CPU performance, transactions via QPI and PCIe buses, interrupt handling, and more. Intel and its unique set of tools helped F5 deal with such a complex situation, giving it what it needed to tune its solutions to deliver maximum performance for its developer customers.

Learn More

- [BIG-IP DNS](#)
- [Intel Parallel Studio — Create Faster Code...Faster](#)
- [Intel VTune Amplifier — Performance Profiler](#)



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Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer, or learn more at www.intel.com.

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