Hewlett Packard Enterprise

Key takeaways
- Up to 10X faster turnaround on genomic analyses
- High accuracy results
- Flexible configuration and use

Configurations
HPE ProLiant DL360 Gen10 server with Intel® Xeon® Gold 6130 @ 2.10 GHz processors, 2 sockets/32 cores/64 threads, Intel Arria 10 GT 1150 FPGA, 384 GB memory; Falcon Best Practices 2.1.1 based on BWA 0.7.13, Samtools 1.3.0, Picard 1.141.0, GATK 4.0.6.0, minimap2 v2.13-79-local.

HPE Apollo 2000 system consists of an HPE ProLiant XL170r Gen10 server with Intel Xeon Gold 6130 @ 2.10 GHz processors, 2 sockets/32 cores/64 threads, 384 GB memory; BWA 0.7.13, Samtools 1.3.0, Picard 1.141.0, GATK 4.0.6.0.

Resources
HPE ProLiant DL360 Gen10 server

Falcon Computing

Learn more at
hpe.com/us/en/solutions/ hpc-high-performance-computing.html

[1] Based on HPE internal testing, 2019.

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HPE ProLiant DL360 Gen10 server with Intel Arria 10 FPGA accelerates genomic analyses by 10X
HPE and Falcon Computing FPGA solutions boost next-generation sequencing

Executive summary

The **HPE ProLiant DL360 Gen10 server** with Intel® Arria 10 FPGA can speed up the execution of secondary genomic analyses by up to 10X when using **Falcon Accelerated Genomic Pipelines (FAGP)**. Without sacrificing accuracy, the FAGP implements the Broad Institute's original GATK Best Practices pipeline (Falcon Best Practices) as well as an optimized aligner and variant caller implementation (Falcon Germline and Somatic) for even faster performance.

Customer value with HPE

The HPE ProLiant DL360 Gen10 server is fully adaptable to handle diverse production workloads. The secure 2S, 1U server delivers world-class performance with the right balance of expandability and scalability, with support for up to 3 TB of memory and 11 small form factor (SFF), 4 large form factor (LFF), or 10 direct attached NVMe drives.

The Intel Arria 10 GT Field Programmable Gate Array (FPGA) accelerator reduces time to solution of specific workloads in a flexible and reprogrammable environment.

Falcon Best Practices software
The Falcon Best Practices software accelerates the original Broad Institute's GATK Best Practices pipeline using the Intel Arria 10 FPGA, with results that are greater than 99.9% accurate in precision and sensitivity.[1]

Falcon Germline and Somatic software
The Falcon Germline and Somatic software speeds up genomic analyses even further with FPGA-optimized implementations of the minimap2 aligner and GATK variant caller.

Bottom line
Performance benchmarks are indicators of the transformative power of HPE servers, through HPE partnerships that aim to reduce time to solution and fast-forward customer success.
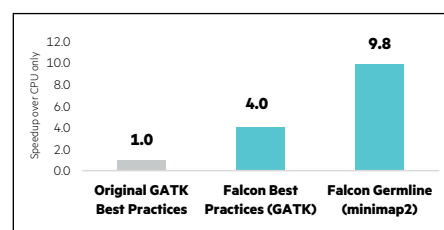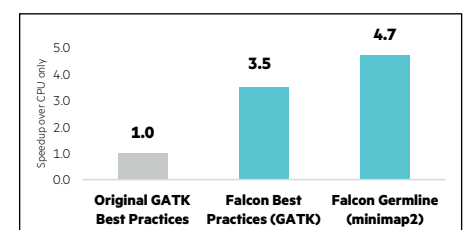
Figure 1. WGS performance

Figure 2. WES performance

Figures 1 and 2. Speedup of 2S HPE ProLiant DL360 Gen10 with Intel Arria 10 GT FPGA using Falcon Best Practices (GATK) and Falcon Germline (minimap2) FPGA software, compared to using original GATK Best Practices CPU-only software on similarly configured 2S HPE ProLiant XL170r Gen10 server. Figure 1 analyzes a 50X whole genome sequencing (WGS) human genome data set, and Figure 2 analyzes a whole exome sequencing (WES) human genome data set.

a50000288ENW, October 2019