Software Overview

NVIDIA Parabricks is a software suite for genomic analysis. It delivers major improvements in throughput time for common analytical tasks in genomics, including germline and somatic analysis. The core of the Parabricks software is its tight integration with the GPU, which takes raw data and transforms it according to the users requirements.

Parabricks has been tested on Dell, HPE, IBM, and NVIDIA servers at Amazon Web Services, Google Cloud, Oracle Cloud Infrastructure, and Microsoft Azure.

Parabricks supports the tools shown below:

ALIGNMENT	PREPROCESSING	VARIANT CALLING	QUALITY CHECKS	GVCF PROCESSING
fq2bam (bwa-mem)	applybqsr	deepvariant	bammetrics	indexgvcf
fq2bam_meth	bam2fq	deepsomatic	collectmultiple metrics	dbsnp
STAR (rna_fq2bam)	bqsr	haplotypecaller		genotypegvcf
MiniMap2	bamsort	mutectcaller		prepon
	markdup	starfusion		postpon

The somatic (Somatic Variant Caller), germline (GATK Germline Pipeline), pacbio_germline (Beta), and deepvariant_germline tools are actually a collection of several individual tools that are frequently run together, each grouped as a single command for the users convenience. For example, deepvariant_germline takes FASTA and FASTQ files as input and produces a VCF and BAM file as output. Internally, it runs BWA mem alignment, performs coordinate sorting, marks duplicates, and then runs DeepVariant.

The Tool Reference page lists all the individual tools. The Parabricks WDL/Nextflow Workflows page discusses the use of Parabricks with WDL and Nextflow. The Compatible CPU Software Versions page lists the open-source CPU tools Parabricks is compatible with.

- Software Tools
- NVIDIA Parabricks WDL/Nextflow Workflows
- Compatible CPU Software Versions