DRAGEN v3.3.11
Software Release Notes

June 19, 2019

Introduction

This release note details the key changes to software components for the Illumina® DRAGEN™ Bio-IT Platform since the package containing DRAGEN™ v3.3.7

If you are upgrading from a version prior to DRAGEN™ v3.3.7, please review the release notes for DRAGEN™ v3.3.7 for a list of features and bug fixes introduced in that version.

DRAGEN™ v3.3.7 Installers and Release Notes are available here:
https://support.illumina.com/downloads/illumina-dragen-bio-it-platform-v3-3-7.html

The 3.3.11 software package includes:
- DRAGEN™ SW Intel Centos 6 - dragen-3.3.11.el6.x86_64
- DRAGEN™ SW Intel Centos 7 - dragen-3.3.11.el7.x86_64
- DRAGEN™ SW IBM PPC Centos 7 - dragen-3.3.11.el7.ppc64le.run

Contents

Overview

- This release is made to address the following key issues, as well as several bug fixes:
  - An issue where the FPGA DRAM ends up in a bad state when the DRAGEN software halts unexpectedly and is not able to recover without a power cycle.
    - This is only applicable to the Xilinx U200 FPGA boards that are included with DRAGEN Phase2 servers. The issue is not present on the Phase1 servers.
      - Phase 2 servers: SW version starts with "07", e.g. **O7**.011.308.3.3.7
      - Phase 1 servers: SW version starts with "01", e.g. **O1**.011.308.3.3.7
  - After Linux kernel upgrades, the DRAGEN kernel driver (dragen_drv.ko) is added to initramfs.img which prevents future software updates

Fixes and Improvements

- DRAGEN Phase2 server fixes
  - Fixed an issue where the FPGA DRAM ends up in a bad state when the DRAGEN software halts unexpectedly, due to the reset signals not being connected to all DRAM memory banks.
    - Updated FPGA bitstreams
    - Updated firmware reset procedure
  - Fixed an issue in the package installer that prevented an updated FPGA shell version to be flashed to the card.
  - Update the *program_flash* utility to erase the upper half of the flash memory on the FPGA board before flashing the shell, to improve boot-up robustness.
- Germline
  - Fixed the handling of some medium-length indels that were not properly left-aligned
  - Fix for loss of sensitivity when using 1bp wide regions in the target bed
  - Fix for VCF GT field containing allele id that is out of range
  - Fix for non-deterministic GVCF generation in chrX for male subjects
- Somatic
  - Fix for Somatic VCF filter tags not matching descriptions in the header
- Force GT
  - Fixed missing DeNovo calls when Force GT VCF is used
- Combined/Joint caller
  - Fixed an issue where mitochondrial calls are not genotyped correctly in the joint caller in some cases: The genotypes from the combined gVCF were just copied as-is to the Joint Caller output. If there are different alt alleles in the input gVCFs for a mito variant, the genotype could be incorrect. With the switch to the continuous allele frequency mitochondrial caller in DRAGEN 3.2 this became a potential issue
  - Fixed an issue where an incorrect base can potentially get recorded in the REF column of the combined gVCF, which also propagates to through the Joint Caller to the multi-sample VCF output
  - Fixed issue where CombineGVCF reports incorrect PL values in MT
  - Added a check to make sure PL field is valid before trying to parse it during joint calling
  - Moved the status of phased calls to be per sample, instead of per variant, during joint calling
  - Fixed a buffer exhaustion crash when reading very large lines from a multi-sample VCF
  - Fixed an issue where CombineGVCF lines can be generated out of order
  - Stability fixes to VCF tabix generation
  - Changed the joint calling hard filter QUAL threshold to be the same as in single sample mode
  - Do not allow vc-emit-ref-confidence to be set during combineGVCFs or joint calling

- o Check/update sample sex for all samples listed in the pedigree file. Allow pedigree file with zero or more trios
- CNV
  - o Add support for single tn.tsv input to CNV DeNovo
- SV
  - o SV fails when Dragen is run in tumor-only mode
- BCL
  - o Fix for a crash due to memory fragmentation on Phase2 Hardware
- Other
  - o Updated liftover files for the Hash Table building of hg19_alt_aware, to address low coverage in chr17 around KANSL1 gene
  - o Fix issue with the installer that caused the existing kernel driver (dragen_drv.ko) to be added to initramfs.img when Centos 7 system or kernel updates are made
  - o Update dzip/dunzip tool to avoid memory depletion on Phase2 servers

SW Installation Procedure

- Install the appropriate release based on your Linux OS with the command: `sudo sh <DRAGEN 3.3.11 .run file>`
- Cold boot (hard reset or power cycle) is required after installation. The updated FPGA shell image needs to load from flash, this is only achieved with cold boot.
- Installing prior releases after 3.3.11 was installed:
  - o Installing a prior release such as 3.3.7 will require the following two steps. The prior .mcs file needs to be flashed manually:
    - Install the prior release: `sudo sh <DRAGEN 3.3.7 .run file>`
    - `program_flash /opt/edico/bitstream/07*/*.mcs`
    - Power cycle

```
md5checksum:

a5f1f0901179480b6845375a56bb5629 dragen-3.3.11.el6.x86_64.run
b0bfd7247e84b329442eaa86268d69a7 dragen-3.3.11.el7.x86_64.run
6204516238b688c54f64efdd0e332aee dragen-3.3.11.el7.ppc64le.run
```