Time Evaluation - Updates

Wiener Filter Reconstruction

Testing Machines

Provided by SCI Institute

Testing Machines – Kraken

- 8 Intel(R) Xeon(R) CPU E7-4850 v4 @ 2.10GHz (16 core)
- 1024 GB of RAM
- Redhat Enterprise 7.5
- gcc 4.8.5

Testing Machines – Lakota

- 80 Intel(R) Xeon(R) CPU E-7-4870 2.40GHz(160 with HT)
- 750 GB of RAM
- OpenSUSE 42.3 (x86_64)
- gcc (SUSE Linux) 4.8.5

Testing Machines – Chiron

- 64 Intel Xeon x7560 2.27GHz cores (128 with HT)
- 504GB of RAM
- openSUSE 42.1 (x86_64)
- gcc (SUSE Linux) 4.8.5

Testing Machines – High Performance Cluster

- **64 HP DL160 G6 computation nodes**
  2x Xeon X5550 2.67GHz 4 core processors with Hyperthreading (16 threads per node)
  24GB of RAM
  HP InfiniBand 4X DDR Conn-X PCI-E G2 Dual Port HCA
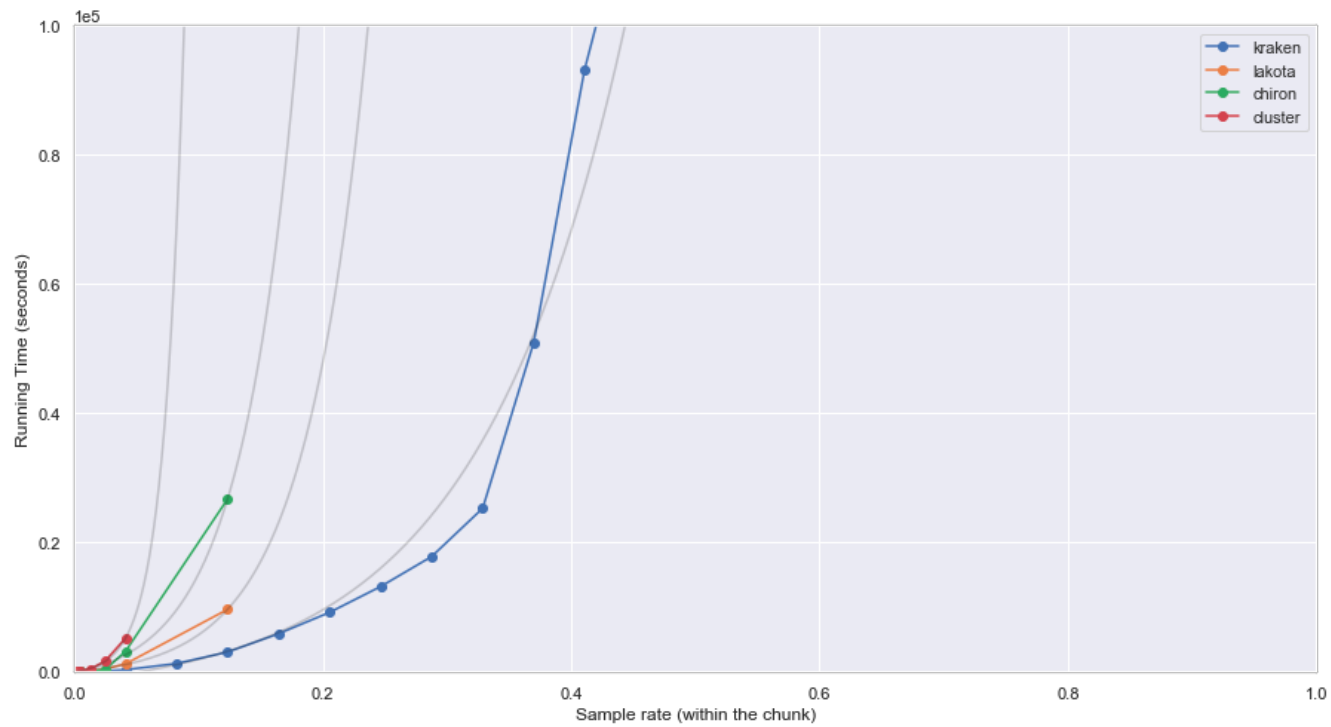 CentOS release 7.3

- Used only one node!

Time by Rate (fixed sampling rate)

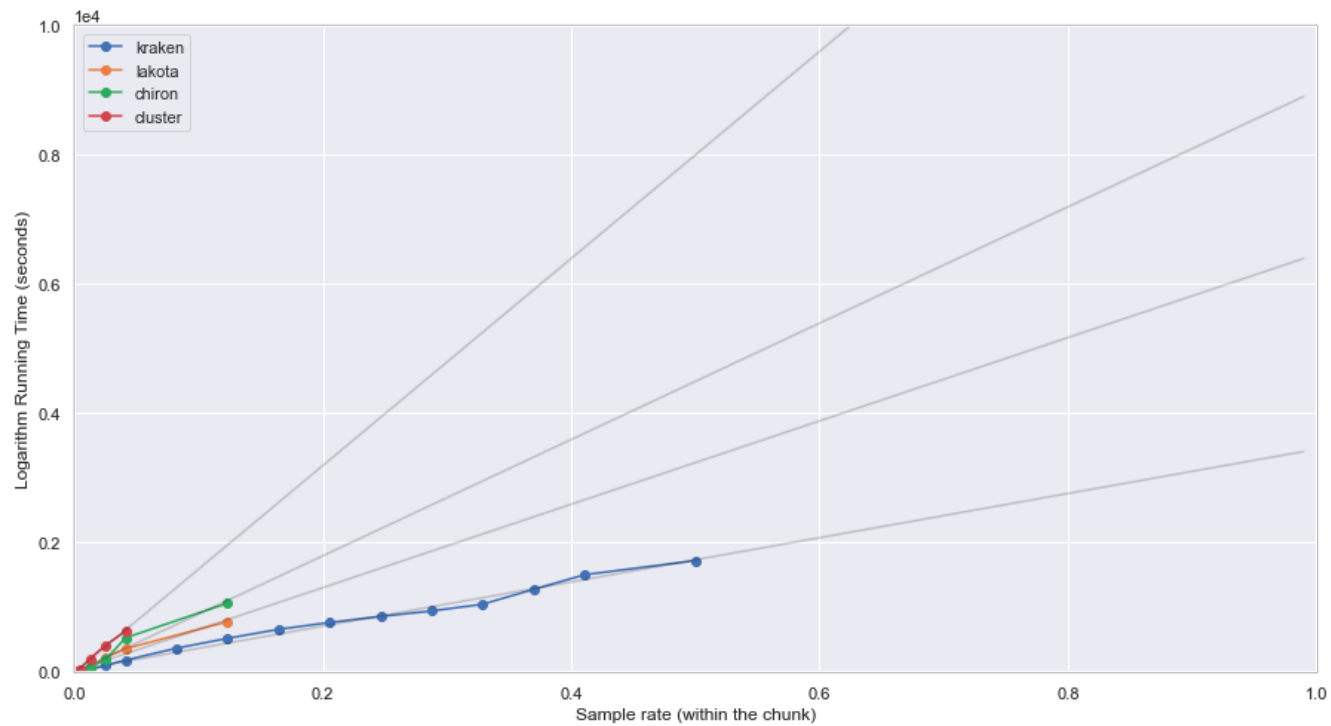# Time by Chunk (rate=1) – Plotting
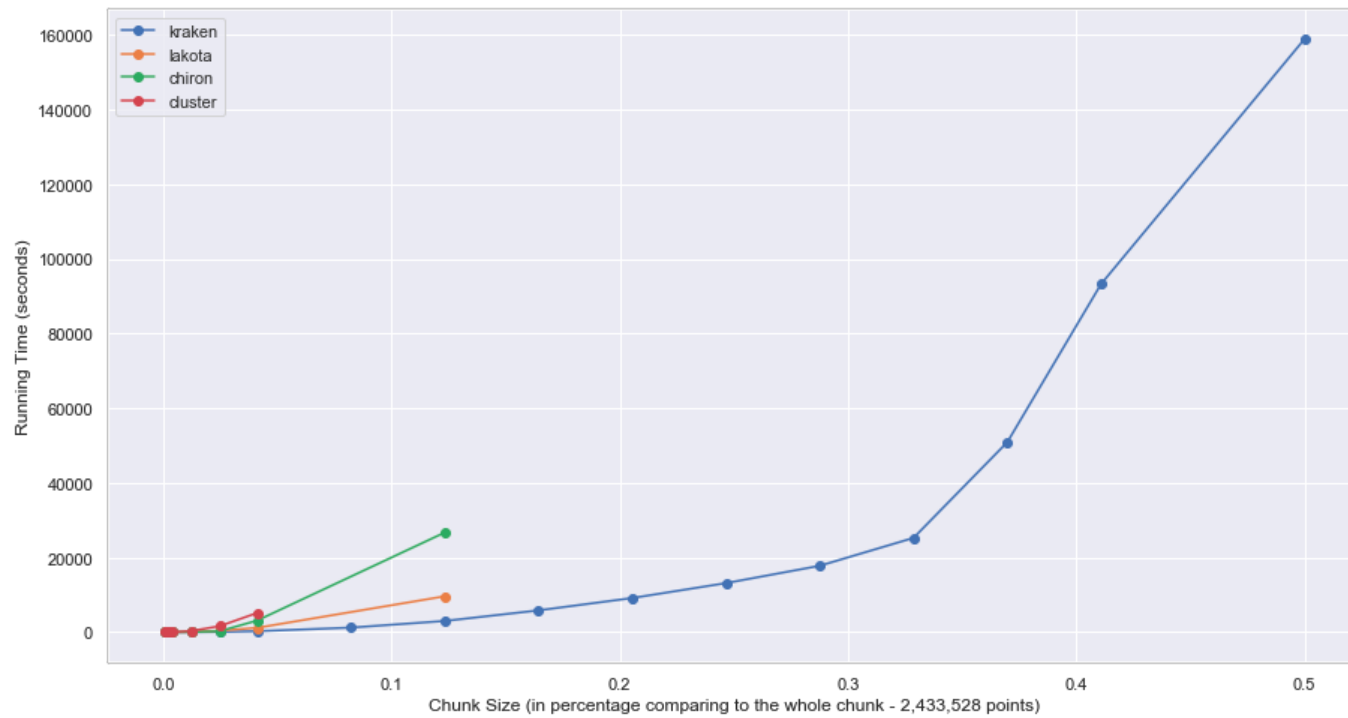
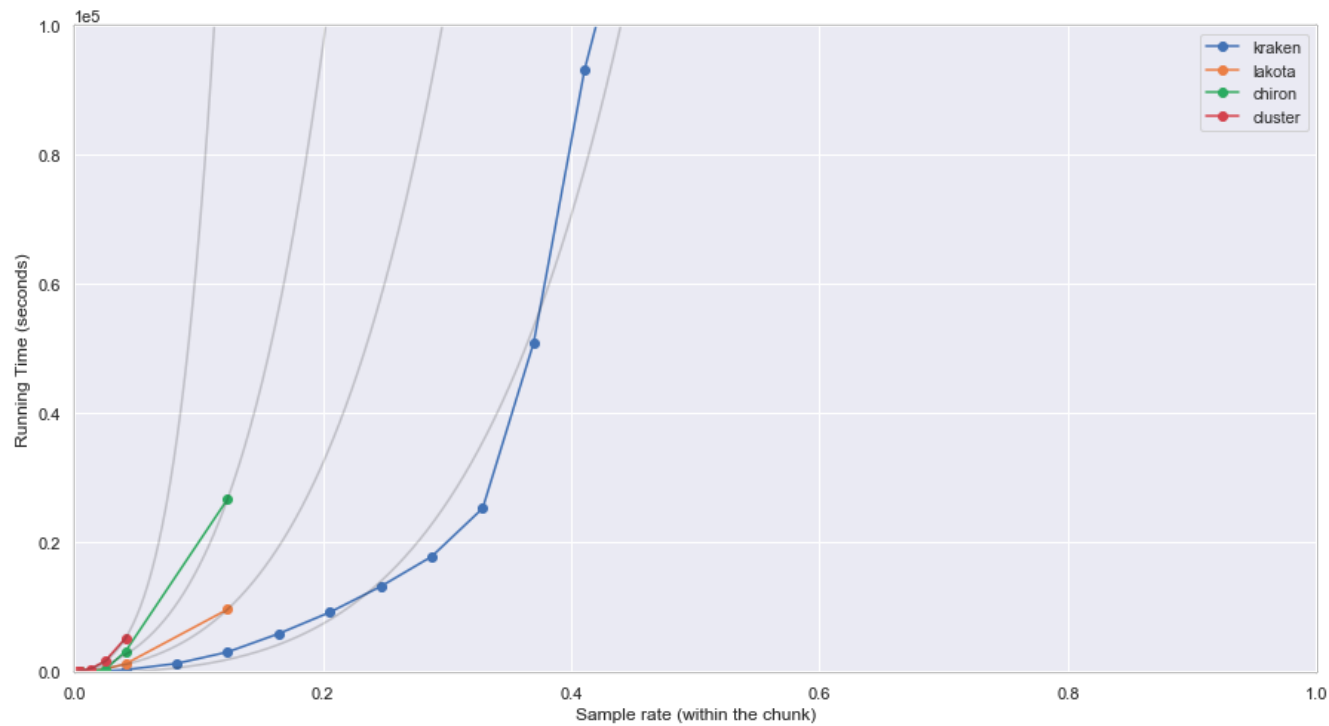# Time by Chunk (rate=1) – Fitting (exp)

Time by Chunk (rate=1) – Log-fitting (linear)

$$y = (\log_e x)^3$$

Time by Chunk (rate=1) – Fitting (cube root exp)

$$y = e^{\sqrt[3]{x}}$$

Prediction1 for Kraken

- With 1% (24,335) points, the interpolation will take -1224 seconds.

- With 10% (243,353) points, the interpolation will take 0.52 hours.

- With 20% (486,706) points, the interpolation will take 2.65 hours.

- With 50% (1,216,764) points, the interpolation will take 1.89 days.

- For the whole data cube (2,433,528) points, the interpolation will take 127.59.

Prediction2 for Kraken

- With 1% (24,335) points, the interpolation will take -266.51 seconds.

- With 10% (243,353) points, the interpolation will take 0.28 hours.

- With 20% (486,706) points, the interpolation will take 2.05 hours.

- With 50% (1,216,764) points, the interpolation will take 1.88 days.

- For the whole data cube (2,433,528) points, the interpolation will take 38.46 days.

Suggestion

- Wiener Filter Reconstruction on the whole data cube might be doable. The process should take one to several months.

- Running Wiener Filter Reconstruction on small chunks and concatenate them back together is a compromise. (less than 4 days for 2 * 50% chunks)

- Linear Interpolation is also very time consuming.