A Comparison of VSIPL++ Performance to VSIPL and Mercury SAL

Objective

- Determine the suitability CodeSourcery's VSIPL++ implementation for real-time signal processing
  - In the context of a Mercury PowerStream 7000 and a targeted signal processing application
  - In comparison to vendor tuned VSIPL Core Lite and Vendor native math call (Mercury's Scientific Algorithm Library)

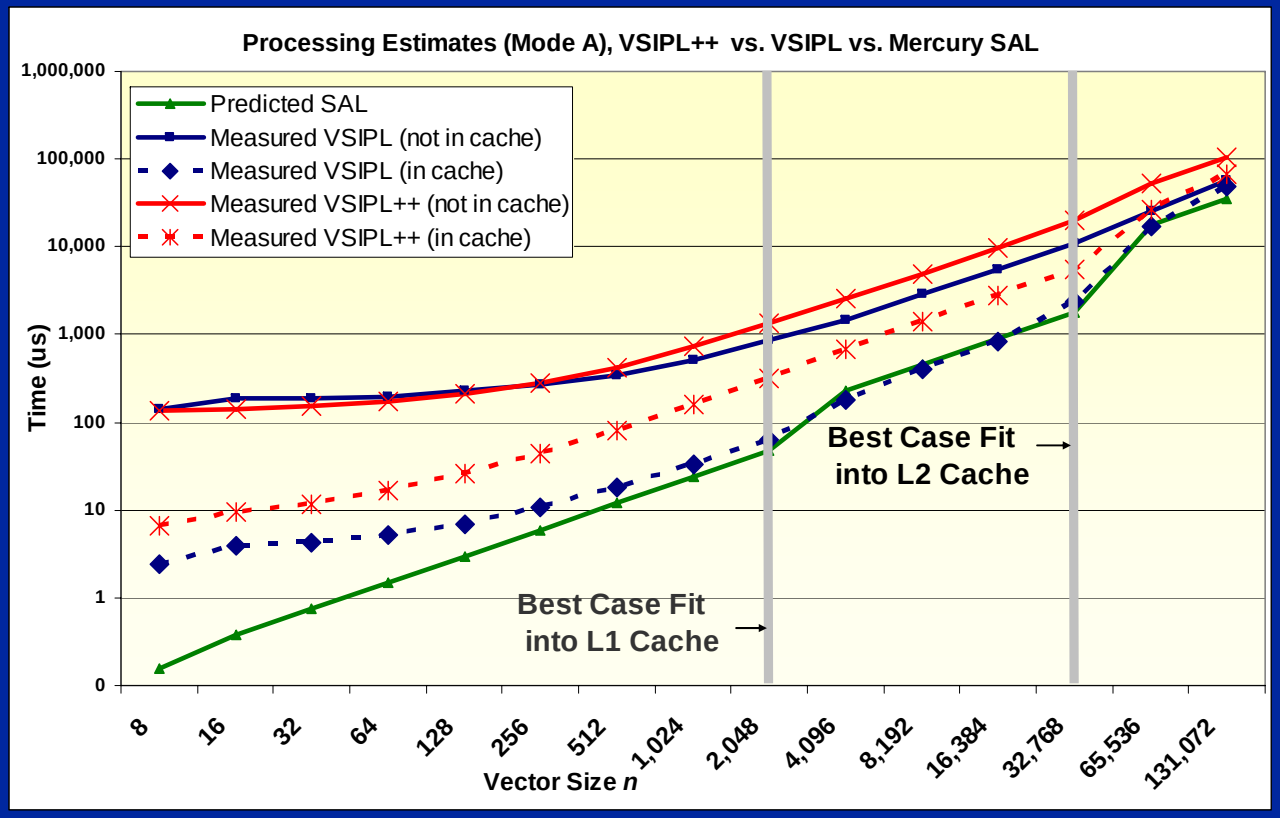
Executive Summary

- The current VSIPL++ implementation is rapidly evolving into a legitimate real-time software programming tool
  - improves software development productivity
  - CodeSourcery is rapidly and aggressively tuning code
  - several operations do not yet meet the performance of VSIPL Core Lite or Mercury SAL
  - basic parallel computation obtains improved performance using sound principles
    - users need to ensure communication overhead is properly managed

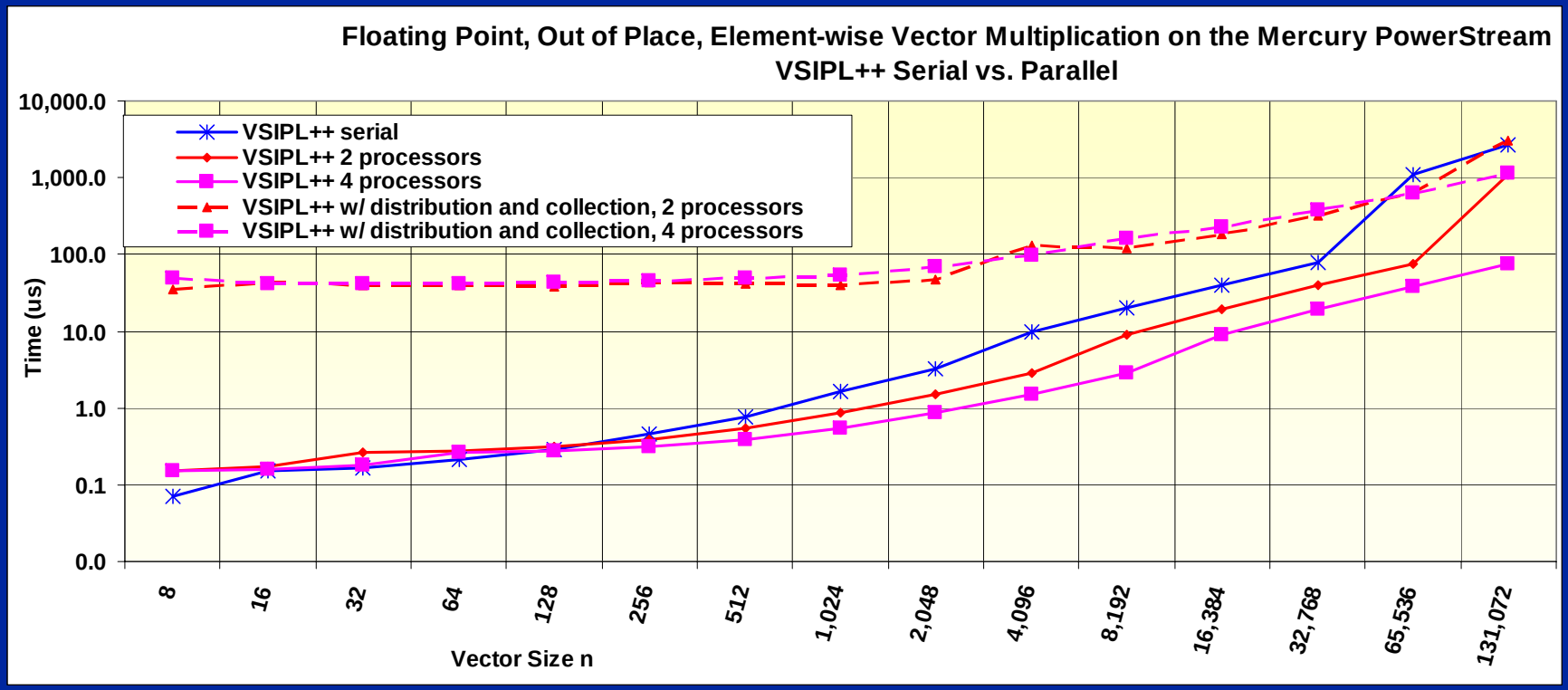
Application Mode "A" Performance Model Results

- *Performance model built by timing individual vector operations*
- *Using n elements per vector,*
  - *$T(f_x(n))$ represents the time to perform a vector operation "x"*
  - *$T_A(F(n))$ represents the time to complete Application Mode "A"*
- *The models in this study use seven basic vector operations, so*

$$T(F(n)) = aT(f_1(n)) + bT(f_2(n)) + cT(f_3(n)) + \ldots + gT(f_7(n))$$



Parallel Performance



- Using VSIPL++ Parallel Maps to handle data distribution and collection
  - Developers still need to ensure there is sufficient computation to offset additional overhead of distribution data and collecting results