



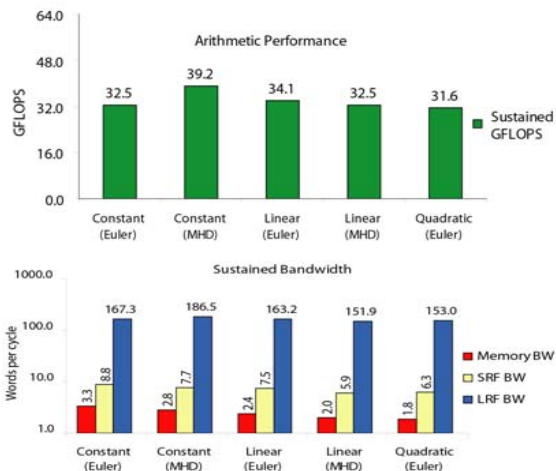
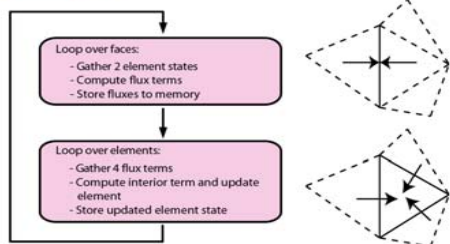
Merrimac Applications

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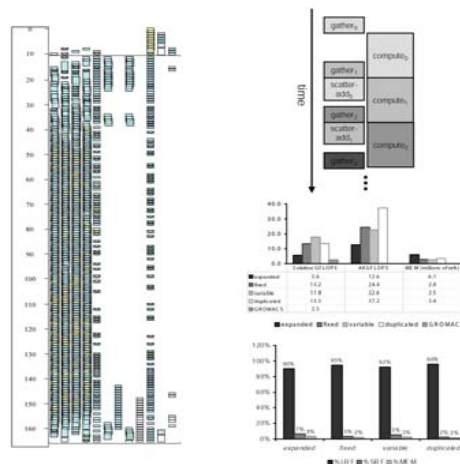
StreamFEM

StreamFEM implements the Discontinuous Galerkin (DG) finite element method for systems of nonlinear conservation laws in divergence form in 2-D or 3-D.

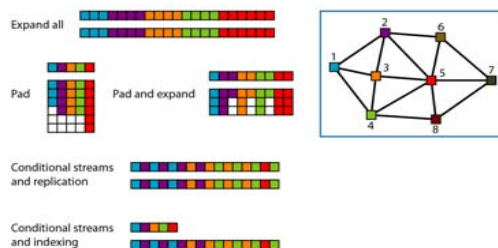


StreamMD

Molecular Dynamics was chosen as it compute intensive while requiring relatively low memory bandwidth. GROMACS is the most efficient MD simulation code available today. We implement the force calculation portion of GROMACS on a cycle-accurate Merrimac chip simulator. Our system consists of 900 water molecules.

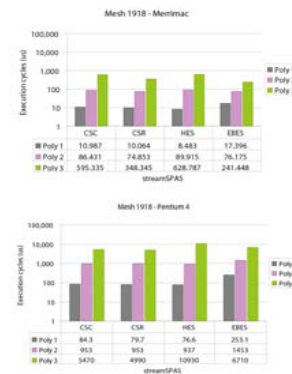
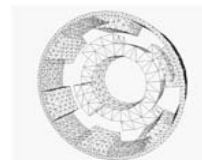


Variable rate streaming

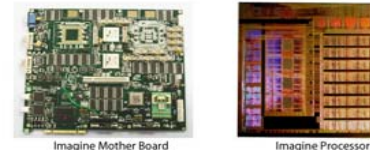


StreamSPAS

StreamSPAS implements the computation of $Y = AX$ where A : sparse matrix, X, Y : dense vector. StreamSPAS also provides a test suite of sparse matrices corresponding to p-order finite element discretization using continuous Lagrange elements.



Imagine



- Performance on Imagine:
- Run -time = 18 ms
 - Clock speed: 200MHz
 - Number of Gflops (sustained) = 1.62
 - Percent of peak performance = 20.25%
 - Cycles / interaction = 14 cycles
 - Bandwidth from Mem/SRF/LRF = 0.8/1.264/31.92 (GB/s)