Performance Results

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Executive Summary

● Generally speaking, performance has improved with 1.16

● Previous slide decks have shown performance changes:
  …due to array improvements
  …due to compiler and library optimizations
  …due to runtime optimizations

● These slides contain additional v1.16 performance results
  ● not tied to any specific effort, just comparisons across releases
Outline

- Single-Locale Performance Trends
- Multi-Locale Performance Trends
- Scalability Trends
Single-Locale Performance Trends
Single-Locale Performance

- No major --local performance changes
- Minor improvements and regressions
Single-Locale Performance

- Some significant --no-local performance improvements
- No known regressions
Multi-Locale Performance Trends
Multi-Locale Performance

- Significant multi-locale performance improvements
- No known regressions
Multi-Locale Performance

- Significant multi-locale performance improvements
- Improvements for ugni from dynamic registration

Graphs showing performance improvements for different benchmarks.
Multi-Locale Performance

- Significant multi-locale performance improvements
- Improvements for gasnet-aries from GASNet's multi-domain feature
Scalability Trends
Scalability

- Significant improvements for numa-sensitive benchmarks
  - Result of dynamic registration leading to affinity improvements
Scalability

- Significant improvements for numa-sensitive benchmarks
  - Result of dynamic registration leading to affinity improvements
  - stream global not scaling as well as EP yet (still need to investigate)
Performance Priorities and Next Steps
Performance Priorities and Next Steps

- **Continue benchmark-driven improvements**
  - single-locale:
    - improve performance for shootouts (requires better vectorization)
  - multi-locale:
    - reduce unnecessary communication code
    - improve task-affinity between consecutive foralls
    - optimize scalability of core algorithms (task spawning, reductions, barriers)
    - focus on ISx, PRKs, MiniMD/CoMD, LULESH, and other DOE proxy apps
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