Proposed Priorities for Chapel 1.21

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Proposed Priorities for Chapel 1.21

- **Language Stability**: continue working toward 2.0 readiness (see next slide)
- **Shasta**: tune and optimize implementation
- **User Support**
- **LLVM Back-end**: enabled by default, explore vectorization
- **GPUs**: start exploring support via libraries and/or code generation
- **Performance**: multi-locale scalability and performance optimizations
- **Compilation Time**: reduce it
- **Interoperability**: improved support for multi-locale libraries, bytes, arrays
- **Memory Leaks**: reduce to zero
Language Stability Priorities for Chapel 1.21

- **Modules and Namespaces**: better support for programming “in the large”
- **Switch to Zero-based Indexing by Default (?)**: if sufficient support
  - note: would only affect automatically-indexed types, not arrays
- **Prototype Modules**: commit to feature or replace with an alternative
- **Constrained Generics**: refine design and implement
- **Point-of-Instantiation Rules**: address current problematic points
- **Expiring Value Semantics**: refine design and implement
- **Deprecate .size Synonyms (?)**: if sufficient support
Performance Priorities for Chapel 1.21

• Unordered Operations:
  • flesh out unordered atomic API
  • extend to POD types
  • tune implementation
  • explore aggregation library or optimizations

• Performance Portability: improve performance for non-Aries networks

• Slicing: complete optimization effort

• Distributed arrays: improve creation cost, privatization, field access overheads

• Locale mapping: explore process-per NUMA domain implementation
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