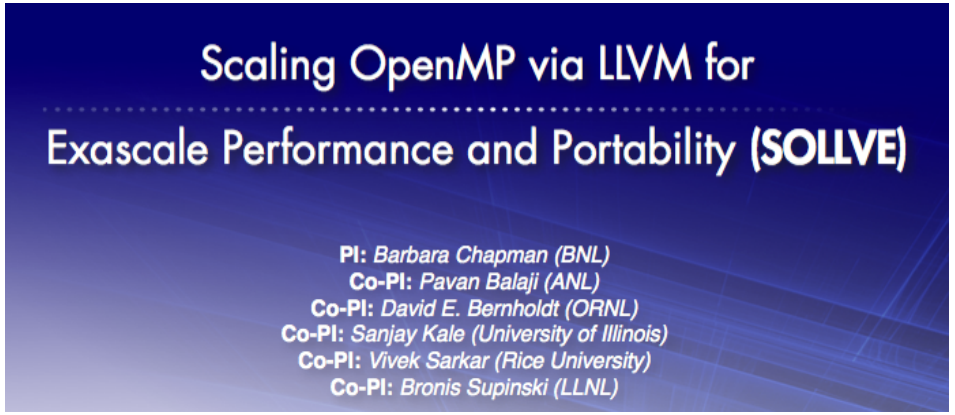
OpenMP 4.5 and Beyond – Webinar part 3
Memory management - TR5

- Wednesday, June 28th , 2017



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EXASCALE COMPUTING PROJECT

National Nuclear Security Administration
U.S. DEPARTMENT OF ENERGY | Office of Science

Overview --- Memory Management TR5

- Memory spaces and allocators
- C/C++ Allocation API
- Allocation directive
- Data-sharing modifier
- Remote device allocation
- Resource querying
- Default allocator
- Additional traits
- Specific code generation support
- C++ & Fortran support, Nested Memory Spaces, Named Allocators

Memory space

- Represents a memory resource
- Selected by a number a traits
  - Traits are characteristics that define the memory space
  - Traits can be manipulated through some opaque sets
- Handle “where allocations should happen”
- Standard predifined trait sets being defined • For now just: omp_default_memtraits

Memory Traits

Name	Values	Matching	
Location	core, package, node, remote	=	Location of memory
Distance	far, middle,near	~	Distance of memory to current thread
Optimized	latency, bandwidth, capacity, none	=	What the memory is optimized for
Bandwidth	Highest, median, lowest	~	Relative bandwidth of memory
Latency	Highest, median, lowest	~	Relative latency of memory
Persistence	True, false	=	
Capacity	Positive integer	>=	Physical size of memory
Available	Positive integer	>=	Instaneous available memory (between 0 and capacity)
Permission	r,w,rw	=	
Pagesize	Positive integer	=	

Questions? For more information:

- TR-5: OpenMP Technical Report 5: Memory Management Support for OpenMP 5.0
- http://www.openmp.org/wp-content/uploads/openmp-TR5-final.pdf

- Work in Progress
- We need your input!