OpenMPIR
Implementing OpenMP tasks with Tapir

George Stelle ¹ William S. Moses ²
Stephen L. Olivier ³ Patrick McCormick ¹

¹Los Alamos National Laboratory
²MIT CSAIL
³Sandia National Laboratories

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Outline

- OpenMP
- Motivation
- Tapir
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int fib(int n) {
    if (n < 2)
        return n;
    else {
        int x, y;
        #pragma omp task
        x = fib(n-1);
        #pragma omp task
        y = fib(n-2);
        #pragma omp taskwait
        return x+y;
    }
}
OpenMP LLVM IR

...%19 = call i32 __kmpc_omp_task(%ident_t* nonnull @0, i32 %5)
%20 = call i8* __kmpc_omp_task_alloc(%ident_t* nonnull @0, i32 %5, i32 1, i64 48, i64 16, i32 (i32, i8*)* bitcast (i32 (i32, %struct.kmp_task_t_with_privates.1*)* @.omp_task_entry..3 to i32 (i32, i8*)*))
%21 = bitcast i8* %20 to i8**
%22 = load i8*, i8** %21, align 8, !tbaa !8
...
%28 = load i32, i32* %2, align 4, !tbaa !4
store i32 %28, i32* %27, align 4, !tbaa !13
%29 = call i32 __kmpc_omp_task(%ident_t* nonnull @0, i32 %5)
%30 = call i32 __kmpc_omp_taskwait(%ident_t* nonnull @0, i32 %5)
...
Tapir

detach
reattach
sync
int fib(int n) {
    ... #pragma omp task
    x = fib(n-1);
    #pragma omp task
    y = fib(n-2);
    #pragma omp taskwait
    ...
}
Results

![Bar chart showing Fibonacci results for different compilers and libraries.](attachment:image.png)

- Tapir
- ICC
- Clang
- Tapir-omp

Time (Seconds, lower is better)
Results

![FFT Time Chart]

Time (Seconds, lower is better)

- tapir
- icc
- clang
- tapir-omp
Results

The bar chart shows the comparison of execution times for different compilers on the NQueens problem. The x-axis represents the compilers: tapir, icc, clang, and tapir-omp. The y-axis represents the time in seconds, with lower times being better. The chart indicates that the clang compiler performs significantly better than the others.
The other 355 pages?
Questions?
Acknowledgements

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