Calls between Go & C/C++

& Calling Go from dynamic langs

About

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Talk code snippets: github.com/draffensperger/go-interlang

Performance of cross-language calls

- Go to C call is ~50x slower (160ns) than a Go call (3ns) as a stack switch is needed
- A Ruby FFI call is ~30x slower than pure Ruby call
- But one Ruby to Go call for compute intensive work made overall benchmark 9x faster than pure Ruby
- Don’t be afraid of cross-language calls, but don’t call them in a tight loop!

Concurrency considerations

- Go multiplexes goroutines to GOMAXPROCS threads
- “once a goroutine enters cgo [for 20μs], it's considered blocking, so not counted in $GOMAXPROCS limit and ... scheduler might need to **create new OS thread** to host other ready goroutines.” (minux on glang-nuts)
- 8 goroutines & GOMAXPROCS=1, Go to C used all cores
- 800K goroutines of Go to C got “pthread_create failed” (pure Go no problem)

Questions?

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Calling a Linear Solver C lib from Go

- Set of continuous variables
- <=, =, >= linear constraints (e.g. x >= 2)
- Objective (e.g. “minimize 2x - y”) gives a direction
- Fast algorithm in practice, existing C libraries
- Existing C/C++ libs e.g. LPSolve