

Porting MINOS to VFX

why source inlining sucks

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Motivation

- Stephen kindly asked me to port MINOS to VFX
- Making MINOS more portable is in my intention, too
- VFX is sufficiently different from bigFORTH and I can't easily add everything I need → gives more benefit than porting to Gforth first
- Potential customers with dual-license (closed source customers have to pay)
- Lessons to learn about more optimizing Forth systems

What has to be done?

- Port OOF to VFX — there's an ANS version of OOF, but it is quite slow, because it uses a lot of CREATE DOES>
- Change the X lib calls to conventional parameter order
- Supporting libraries missing in VFX Forth

Porting OOF

- Create method invocation and instance variables with code that looks like this:


```

: (method, ( offset -- ) >r
  : r> o@+,
    postpone @ postpone execute postpone ; ;

```
- Problem: Source inliner sees no source, and compiles nothing
- Solution: Add discard-sinline before postpone ;

Alias vs. Synonym

- Problem: OOF declares early binding methods before definition
- Solution in bigFORTH: Special header bit for aliases that can be changed later
- Solution with Synonym (ugly dirty hack) is not possible
- Better attempt: Call dummy word, and replace call offset later
- Side effect: One more item on the return stack
- Future solution: Jump to dummy word instead

Porting MINOS

- Convert MINOS source from block to files
- Lot of MINOS code is backend-specific, i.e. lots of [IFDEF] x11 and [IFDEF] win32
- Replace with [defined] x11 [IF] [part of Forth200x], because VFX has no [IFDEF]
- Change base-specified numbers to Forth200x proposal

Iterators

- MINOS uses some iterators in the following form:

```

: ALLCHILDS ( .. -- ..' )
  child's self
  BEGIN dup 'nil <> WHILE
    r@ swap >o execute widgets self o>
  REPEAT drop rdrop ;

```

- Preventing ALLCHILDS to be inlined is easy
- Problem: ALLCHILDS poisons source inliner:

```

: >hg1ue ( -- min glue ) 0 0 ALLCHILDS hg1ue@ p+ ;

```

Inlining >hg1ue will not work!!!

- Solution: Disable source inliner for most of the time (iterators are used too often)

Event Loop

- In bigFORTH: Cooperative background task — works well, no locking necessary
- VFX Forth has a preemptive multitasker (native thread): This doesn't work
- Adding the event loop to keyboard event check didn't work so far
- Interim solution: Have a special event-loop word

Status

- The calculator example works
- Some complex classes (e.g. OpenGL) not yet ported
- Theseus needs porting, too
- More talk with Stephen needed to resolve some problems