Porting MINOS to VFX

why source inlining sucks

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EuroForth 2008

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

Outline

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 ;`

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

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

Iterators

- MINOS uses some iterators in the following form:

```
: ALLCHILDS ( .. -- ..' )
  childs 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:

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

Inlining `>hglue` 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