Win32Forth
Vocabulary

SVFIG
June 24, 2023
Bill Ragsdale

Today

We will examine the use and structure of vocabularies with Win32Forth examples.

The introduction of ONLY ALSO.

Support words.

I'll offer a couple of cautions on use.

Why?

The dictionary is segmented into word-sets called Vocabularies.

At the least: FORTH, EDITOR, ASSEMBLER or their equivalents in your system.

Win32Forth has 14 vocabularies.

These segment groups of word by usage.

Vocabularies facilitate the compiler's search.

Vocabularies aid in recalling words.

They hide unnessary detail.

What?

A vocabulary is a linked list of words in the dictionary identified by name.

Word searches by name take place in one or more vocabularies organized following a specific syntax.

That syntax also specifies the vocabulary into which new words will be added.
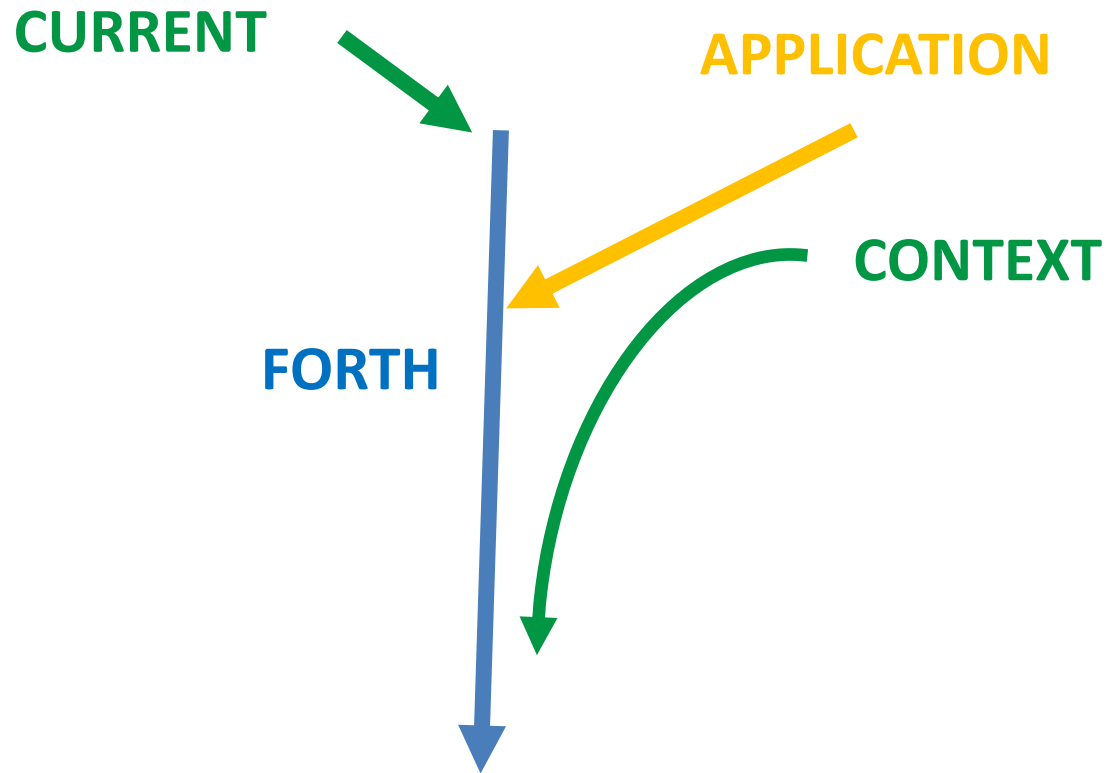
History: 1960s

The form created by Charles Moore in the 1960s and carried through until 1982.

FORTH

EDITOR

APPLICATION

ASSEMBLER
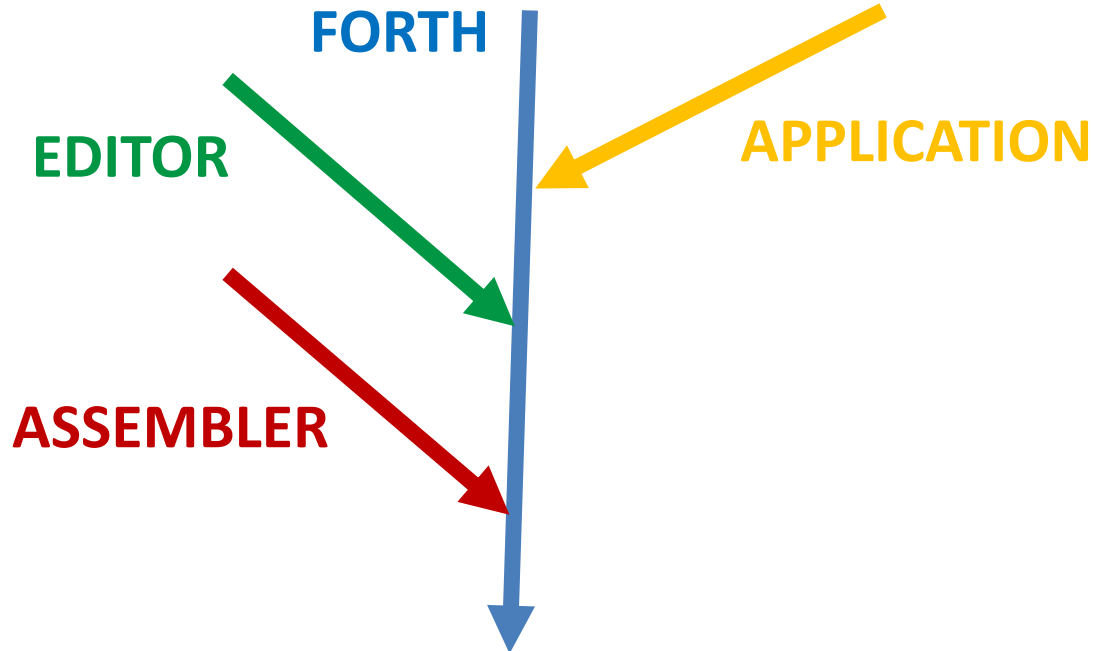
The vocabulary linkage is fixed when a vocabulary name is defined.

History: Usage

CURRENT for additions.
CONTEXT for searches.

Limitations

Vocabularies link at the time of creation.

Can't change that linkage.

Forgetting may have side effects across vocabularies.

More than about five vocabularies added difficulty.

I was common to reboot to create new linkages.

History: 1982 onward

I proposed ONLY ALSO at the 1982 FORML Conference.

The vocabulary search order/linkage is not determined at compile time.

It is determined at any time by words to specify the search order.

History: 1982 onward

Each vocabulary is an independent word list.

FORTH

EDITOR

ASSEMBLER

APPLICATION

W32F Threads

A vocabulary in divided into sub-lists called threads.

Purpose is to speed up searching.

The cost of a thread is one memory cell. Trivial.

The default is 19.

Creating

Create a vocabulary with 19 threads by:

`VOCABULARY    A-VOCAB`

Or set the number of threads by:

`3 #VOCABULARY B-VOCAB`


Thread quantity should be odd and, preferably, prime.

Listing A Vocabulary

Enter: VOCS   [W32F has 14]

Vocabulary	Threads	Words	Words/Thread
FORTH	331	2447	7
HASHED	79	629	8
ASSEMBLER	43	694	16
DISASSEMBLER	19	314	16
EDITOR	13	0	0
FILES	1	84	84
LOCALS	1	0	0
ROOT	1	3	3

The Search Order

ONLY FORTH ALSO EDITOR ALSO APPLICATION

ROOT
FORTH
EDITOR
APPLICATION

The CONTEXT array

APPLICATION   EDITOR   FORTH
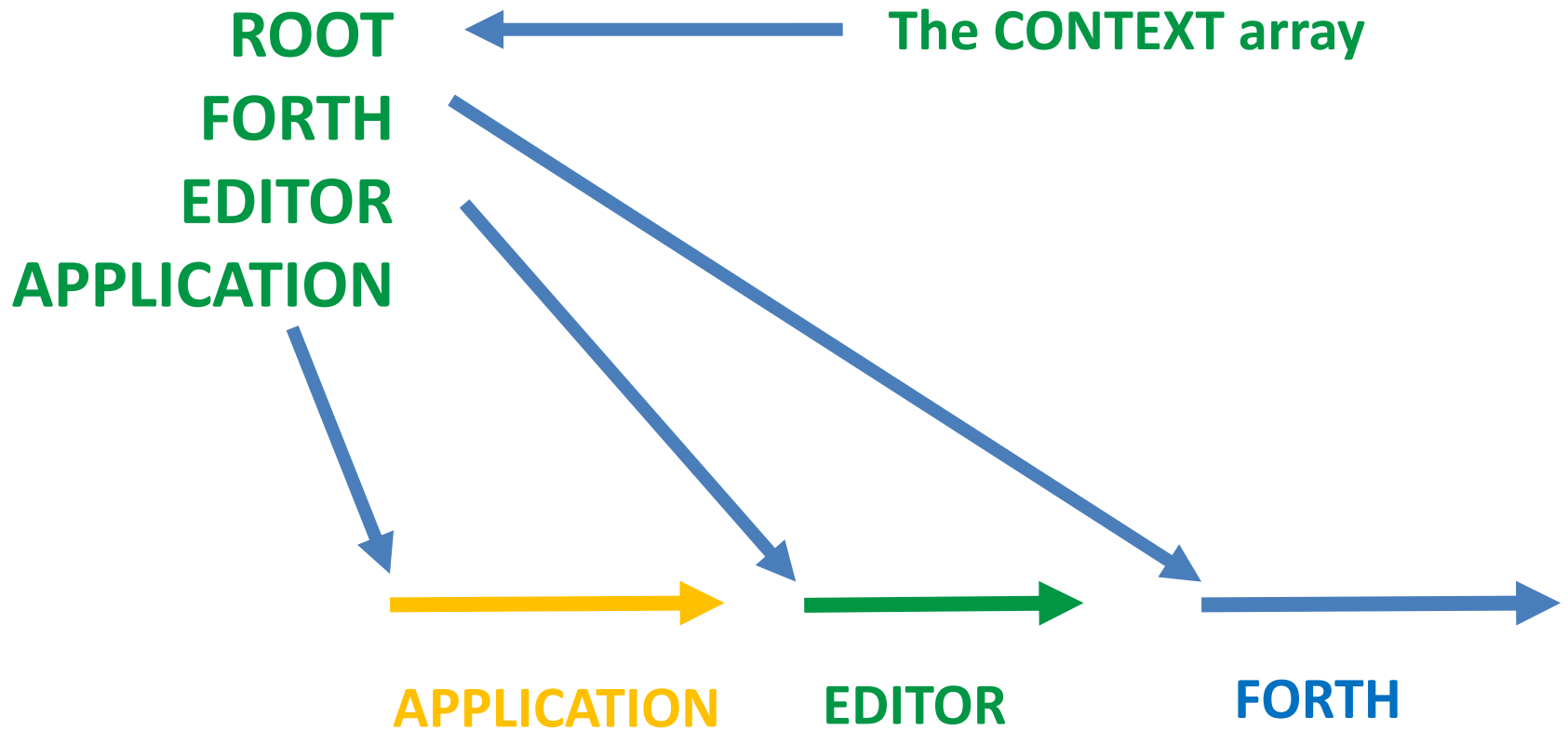
The Sticky Array

CONTEXT is a 'sticky array'.

ONLY clears the array and places ROOT.

Executing a vocabulary name replaces the most recent CONTEXT entry.

ALSO duplicates the most recent CONTEXT entry making room for an addition.

PREVIOUS drops the most recent entry.

DEFINITIONS Sets the vocabulary for new words.

ROOT

The ROOT vocabulary contains only

SET-ORDER FORTH-WORDLIST   FORTH

Upon executing ONLY, a word search will only find those three words.

Search Order Setup

Interpreting, usually ONLY is followed by FORTH.

ONLY FORTH ALSO APPLICATION DEFINITIONS

Or compile into a setup word.

: SETUP ONLY FORTH

         ALSO APPLICATION DEFINITIONS   ;

Another Use

You may seal an application; only the words in MENU will be found.

```
: SETUP   ONLY MENU ;
```

Best to include an 'escape' word. Otherwise you must reboot the system. [Actually FORTH is in ROOT].

A Caution

PREVIOUS can be hazardous to your programming health.

 Imagine PREVIOUS is executed within another file. It may be very hard to determine the continuing search order.

I intentionally did not propose PREVIOUS.

FORGET can also produce uncertain results regarding the search order.

The Solution

1. A file should exit with the same search order as existed upon entry.

2. An adjustment by PREVIOUS only should be used within a page or two.

3. The safest is to compile the search-order as a colon definition.

4. This facilitates clarity and re-use.

Metacompiler Example

```
: IN-FORTH   ONLY FORTH DEFINITIONS ;

: IN-META    ONLY FORTH
             ALSO VIMAGE
             ALSO META DEFINITIONS ;

: IN-TRANSITION   ONLY FORWARD
                  ALSO TARGET
                  ALSO TRANSITION ;
```

Preserving The Search Order

If you wish to alter the search order and yet return
 to the prior search order:

GET-ORDER copies the full search order to the data
            stack.

SET-ORDER restores the search order from the
            data stack.

Summary

ONLY ALSO caught on immediately. An Aha! moment.

Presented at the memorable 1982 FORML conference at which Chuck revealed the magical CREATE DOES> form.

ONLY ALSO are beneficial for large applications and for clarity.

Essential for meta-compiling.

Win32Forth Cosmology

The Complete Forth Textbook

By
Bill Ragsdale