OVERVIEW

1. Sacramento Municipal Utility District (SMUD) using Forth, Inc. products for real-time applications at SMUD since early 1990's – give examples such as Hydromet, ACLM, email Alerts, protocol implementation and conversion, TCP/IP, serial comm., photovoltaic & hydro plants, security, etc. – very positive experience
2. Swift Forth used with success for several recent real-time applications (ACLM, Hydromet) Describe extent of ACLM project to thoroughly impress everyone.
3. Purpose of presentation: hand out detailed info (this document), but concentrate on demos, trying to cover key points such as editing, turnkeying, interactive development, help, etc. during the course of showing the demos.
4. Briefly discuss contents of these notes, including: Windows programming, features, advantages/disadvantages and alternatives before launching into demos.

VENDOR OVERVIEW

1. Stable, in business since 1973 – important to business such as a Utility
2. Contract programming available, fast, reliable (cite several examples, including RVN bailing me out from his hotel room after hours while on another job)
3. Low rates compared to other comparable S/W shops
4. Have provided external contract resources for special work or crunch situations (e.g., Gary Sprung)
5. Fast turnaround
6. Total cost is relatively cheap (< $20K for all ACLM apps, including serial port, database, special protocols, TCP/IP socket client/server, etc.). Contract rates not the issue anyway: staff programmers are very efficient (low number of hours, fast turnaround – less than one week is routine even for fairly sophisticated problem).
7. Consistent approach that carries over to other parts of the Forth, Inc. product line (e.g., SwiftX).
8. SwiftX tools, Mac Forth, contract programming all supplement Windows offering, thus helping keep the company viable.
9. Not just Windows programming: can build mixed systems with Windows and embedded processors. Good experience with real-time and embedded systems – not your typical software shop.

FEATURES

1. SF provides full access to Windows API in a Forth programming environment
2. Easy to generate turnkey, few restrictions on distribution (standard or Pro only)
3. Easy access to extensive library routines (provided with system), DLLs
4. Many demos & sample apps (most to be shown today)
   - Examples for many common sub-tasks such as use of libraries, WAV file playing, sound card, JPEG display, drop-down dialogs, status bar, progress bar, DDE, ODBC, COM, TCP/IP, etc.
   - Tutorial apps from RVN (e.g., object oriented programming, skeleton apps)
   - Full-blown apps also (e.g., cardfile)
   - Serial Port support is particularly nice (e.g., SWOOP support, comconfig dialog, com port selector, runs in separate thread, support for com ports above com4 for TCP/IP based serial I/O)
5. SFTalk User Group is excellent (best I have ever seen)
   - Many heavy hitters, fast response time (one day typically, several hours common), few questions left unresolved for long.
   - Searchable archive of past queries
   - RVN, Elizabeth Rather and full-time developers (e.g., Charles Melice, Mike Ghan) monitor daily
   - Support at an hourly rate seldom needed for most questions.
   - Show sample queries, responses, dates
6. Web-based user FAQ with many significant contributions – have never had one not work (unusual)
7. Excellent on-line Windows GUI help via third party ".hlp" file
8. On-line user and application manuals (basics are excellent, some Windows info outdated, but mostly usable)
9. Relatively low cost (low cost for business/professional development)
   - Free unlimited term evaluation version can be downloaded from http:// www.forth.com
   - Standard product is only $400
10. Pro version with full source code (kernel down to bare metal) for $1,500

PROGRAMMING ENVIRONMENT

1. Interactive development of Windows applications using ANS Forth
2. No problems using ANS Forth code (e.g., utilities from Wil Baden's site
3. Console cut and paste
4. Custom info in status bar
5. Good debug, variable watch tools. DEBUG possible within spawned window
6. Can use DOS-like commands from console (e.g., DIR, CD)
7. Repeat commands using up arrow
8. Can link in your favorite editor (e.g., GVIM, PFE, Notepad)
9. Can link in editors to a turnkeyed app (e.g., Notepad and GVIM examples avail.)
10. Many mini-apps available such as calendar, color palette, status bar, many custom dialogs
11. Graphics
    - Custom (some examples delivered with system)
    - Fastgraph DLL
    - Open-GL
    - GNUPLOT
11. Good CATCH/THROW implementation (can use user or system error recovery, even within a background tasks)
12. Multi-tasking, threading, semaphores, pipes, etc. very straightforward (many examples available)
13. VIEW, WHERE and Vocabulary search tools
14. EVALUATE and shell out to DOS or other Windows app
15. Lots of useful examples on things such as random numbers (world class), CRC16 for MODBUS, etc.
16. Examples on how to do direct I/O (e.g., parallel port for real-timers)
17. Excellent serial port support: serial tasks run as separate threads managed by Windows, SWOOP interface, direct control of I/O (e.g., RTS, CTS, DTR) for bit-banging. Many tools for generating comconfig dialog, drop-down com port selector. Can access com ports above COM4, many ports (8, 16, 32 or more). Other Windows alternatives tend to be weak in this area (e.g., TKL/TK).

ALTERNATIVES

1. Gforth with TCL/TK (ask AM Research) provides app. Transportability between Windows and Linux (some limitations, but pretty cool -- might discuss if time permits)
2. Linux and Gforth with APACH and HTTP clients for GUI
3. Win32 Forth
4. Ting's now system
5. Change platforms (e.g., to Linux or Mac)

DISADVANTAGES

1. Some cost for entry level with turnkey capability, but discounts are available (contact Forth, Inc.)
2. Must play in Microsoft sandbox (no option for most business apps)
3. Nor Linux or Mac transportability (don't know about Forth Inc. products for Mac)
4. Big learning curve – get a copy of Petzold and curl up on the couch for a rainy afternoon or two (not Swift Forth's fault)

CONCLUSION

Not outlined yet, but mention that it appears to be an optimal solution for Windows programming, notwithstanding the entry price for turnkey-able version (only significant negative that I can see other than the Bill Gates factor).

Not many disadvantages and few comparable alternatives available. Haven't heard of anyone using MPE lately. Other DOS Box Forths such as Gforth with interface to TCL/TK or used as CGI to generate browser-based GUI.