Plan9 in a Windows enviroment,
or, Making friends with uncle Bill.

Steve Simon
steve@quintile.net

The Problem

- **My situation**
  - **Adrift in a sea of Microsoft Windows**
    A Win32 API virgin

- **The scope of the problem**
  - **Native tools**
  - **File access**
  - **File formats**
  - **Command line**
  - **Also DNS, Microsoft Authentication, Debugging etc.**

Part 1 - Conventional tools

- ps & kill - by windows thread
- prio - shared "compile" machines
- who - all attached servers
- whois - ldap client
- ls & chown - attributes, file owner/group
- cp & mv - CopyFile() if aproporiate
- ln - NTFS Redirections
- env - environment in registry

File access

- u9fs & cygwin
- ncpfs - Netware client - no directory services
- cvsfs - cvs repository as a dump filesystem
- cifs - Windows neighbourhood
  - still single threaded
  - MAC - still fails
  - RAP - limitations
  - RCP - needed - COM
  - passwd change - not yet
  - Win 95, 98, NT, 2k, XP, OSX, Samba, (Netapp broken)
  - DFS - will not cross servers, ‘‘bodge’’

File formats

- **xls2txt - works**
- **doc2txt ok, antiword helps**
- **ppt2fs**
  handy but diminishing returns
- *The implementation is broken*
- *New xml based formats*
  Too new

Command line

- *ssh - good, but no server access*
- *listen1 and rxd - quick bodge, but fewer problems*
- *u9cpu - what I really want*
  - **Track current dir on server**
  - **NTservice**
  - **Map my network drives**
  - **/dev/wdir - for the plumber and completion**
  - **export environment**

And don’t forget...

- **/mnt/term**
- **interrupts (/dev/cpunote)**
- **what about:**

```
ls | P
```

How does p(1) read the keyboard?

Part 2 - 9win (extreme measures)

- **A Plan9 *kernel* in a Windows DLL.**

- **rfork(REFPROC) ˜ CreateThread()**
- **rfork(˜REFPROC) ˜ CreateProcess()**
- **postnote(2)**
- **Application startup & shutdown**
- **alarm(2)**

rfork(RFPROC)

- **CreateThread()**
- **trampoline copy and relocate stack**
  - **stack addresses in non stack space?**
- **register exception handler**
- **TOS is a problem**

rfork(~RFPROC)

- **CreateProcess()**
- **TID changes on exec()**
- **BSD vfork() like implementation**
  getpid(2) not alowed
- **Take care, HANDLES are inherited**
- **Passing more than 3 HANDLES the MS way**

postnote(2)

- **Two Routes**
  - **Exceptions**
  - **Ctrl-C Handler**
- **Asynchronous Proceedure Calls**
  - **Requires** *alertable* **state**
- **Kernel Driver to force** *alertable*
- **The hard way:**
  - **caller: suspend thread, push call on stack, resume thread, wait on event**
  - **callee: call exception handler, signal event, suspend self**
  - **caller: tidy up, resume thread**

Application startup and shutdown

- **Startup**
  - **_attach(main);**
  - **never returns**
  - **main()'s address can change!**
  - **may pass note handler too.**
- **Shutdown**
  - **rfproc(RFWAIT) - user waits**
  - **rfork(~RFWAIT) - reaper waits**
  - **Win32 - 64 waits max**
  - **maybe a hierarchy of reapers?**

Related work

- **p9p**
- **9vx**
- **Russ's p9p alpha for windows**
  - **Plan9 namespace not seen by windows apps**
  - *Kernel* **DLL is a central point of failure**
- **Glendix**

The Future

- **cifs(1) needs more work**
- **Needs mount driver, thus real kernel**
- **IFS driver - from Rangboom ?**
- **Relocating loader for executables**
- **TOS**