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Feature Remover



Debugging Tips from the DTS Masters

Debugging Introduction

Debugging Truths

“When you have eliminated the impossible,
whatever remains, *however improbable*,
must be the truth.”

– The Sign of Four [1890]

More Debugging Truths

- Everything you *know* is wrong
- Incremental changes are easier to debug
- If a bug appears after making a change, no matter how unrelated it seems, it was probably that change that caused the bug
- The system may have a bug

Some Common Debugging Myths

- Crashes occur where the bug is
- “Out of Memory” means make a larger partition
- DTS knows all—sees all
- This fake handle couldn't possibly be the problem

More Common Debugging Myths

- Because of the Memory Manager, the Macintosh is non-deterministic
- It worked on the last system—it *must* be a bug in this system
- The user test went fine—no debugging is required

More Common Debugging Myths

- A high-level debugger is all I need
- If a change makes a bug unexpectedly go away, all is well
- If a bug is “only” cosmetic, it couldn’t possibly hurt anything else
- Changing this code here couldn’t affect that code over there

Debugging Advice

- Use a low-level debugger (or two)
 - Learn 68000
 - Learn and use the debugger tools
- Learn the art
 - Read the books (Knaster)
 - Watch a pro
 - Do it yourself

More Debugging Advice

- Make it easy on yourself up front
 - Use high-level languages
 - Keep code modular
 - Use Signals/Failure Handlers
(Technical Note 88/Sample Code 12)
 - Use OOP
- Use a Discipline

Debugging Strategy

- If possible, explain bug to another person
- Decide what is really wrong
- Distill steps to reproduce
- Read and understand the object code
- Divide and conquer

Debugging Strategy

- Track anomalies completely
- Perform reality checks throughout
- Experiment only under control

Debugging Tips

- Error checking
 - Assertions in debugging version
 - Situations in production version
 - Check all File Manager calls
 - Check NewHandle, NewPtr, GetResource, SetHandleSize, SetPtrSize
- Use SetPort and use it correctly

More Debugging Tips

- Set memory location \$00000000 to \$50FFC003
- If PC is low at crash, it probably jumped to \$00000000 from purged resource/handle or NIL pointer
- When mixing assembly and high-level languages, check stack balance using assertions



The power to be a pest