

Praise for The Old New Thing

"Raymond Chen is the original raconteur of Windows."

—Scott Hanselman, ComputerZen.com

"Raymond has been at Microsoft for many years and has seen many nuances of Windows that others could only ever hope to get a glimpse of. With this book, Raymond shares his knowledge, experience, and anecdotal stories, allowing all of us to get a better understanding of the operating system that affects millions of people every day. This book has something for everyone, is a casual read, and I highly recommend it!"

—Jeffrey Richter, Author/Consultant, Cofounder of Wintellect

"Very interesting read. Raymond tells the inside story of why Windows is the way it is."

-Eric Gunnerson, Program Manager, Microsoft Corporation

"Absolutely essential reading for understanding the history of Windows, its intricacies and quirks, and why they came about."

—Matt Pietrek, MSDN Magazine's Under the Hood Columnist

"Raymond Chen has become something of a legend in the software industry, and in this book you'll discover why. From his high-level reminiscences on the design of the Windows Start button to his low-level discussions of GlobalAlloc that only your inner-geek could love, *The Old New Thing* is a captivating collection of anecdotes that will help you to truly appreciate the difficulty inherent in designing and writing quality software."

-Stephen Toub, Technical Editor, MSDN Magazine

Old New Thing: Practical Development Throughout the Evolution of Windows, The

Table of Contents

Contents

Preface

Acknowledgments

About the Author

CHAPTER ONE: Initial Forays into User Interface

Design

Why do you have to click the Start button to shut down?

Why doesnt Windows have an expert mode?

The default answer to every dialog box is Cancel

The best setting is the one you dont even sense, but its there, and it works the way you expect

In order to demonstrate our superior intellect, we will now ask you a question you cannot answer

Why doesnt Setup ask you if you want to keep newer versions of operating system files?

Thinking through a feature

When do you disable an option, and when do you remove it?

When do you put after a button or menu?

User interface design for vending machines

User interface design for interior door locks



The evolution of mascara in Windows UI

CHAPTER TWO: Selected Reminiscences on Windows 95

Why isnt my time zone highlighted on the world map?

Why didnt Windows 95 boot with more than 1GB of memory?

Why did Windows 95 have functions called BEAR, BUNNY, and PIGLET?

What about BOZOSLIVEHERE and TABTHETEXTOUTFORWIMPS?

What was in the Windows 95 Special Edition box?

Windows brings out the Rorschach test in everyone

The martial arts logon picture

Why a really large dictionary is not a good thing

An insight into the Windows 95 startup sound

Its a lot easier to write a column if you dont care about accuracy

Why does the System Properties page round the memory size?

Why does my hard drive light flash every few seconds?

The hunt for a faster syscall trap

One byte used to cost a dollar

Each product-support call costs a sale

Why isnt Tweak UI included on the Windows CD?

Turns out that you cant install Windows via xcopy

Buying an entire Egghead Software store

The history of the Windows PowerToys

How did Windows choose its final build numbers?

Why doesnt the build number increment for service packs?

CHAPTER THREE: The Secret Life of GetWindowText



How windows manage their text

Enter GetWindowText

What if I dont like these rules?

Can you give an example where this makes a difference?

Why are the rules for GetWindowText so weird?

CHAPTER FOUR: The Taskbar and Notification Area

Why do some people call the taskbar the tray?

Why does the taskbar default to the bottom of the screen?

Why doesnt the clock in the taskbar display seconds?

Why doesnt the taskbar show an analog clock?

When I dock my taskbar vertically, why does the word Start disappear?

Why dont notification icons get a message when the user clicks the X button?

CHAPTER FIVE: Puzzling Interface Issues

What are those little overlay icons?

Why are these unwanted files/folders opening when I log on?

What do the text label colors mean for files?

Why does my advanced options dialog say ON and OFF after every option?

What determines the order in which icons appear in the Alt+Tab list?

Why is the read-only property for folders so strange?

Whats with those blank taskbar buttons that go away when I click on them?

What is the difference between Minimize All and Show Desktop?



What does boldface on a menu mean?

Where do those customized Web site icons come from?

Where did my task manager tabs and buttons go?

Will dragging a file result in a move or a copy?

Why does the Links folder keep re-creating itself?

Why are documents printed out of order when you multiselect and choose Print?

Raymond spends the day doing product support

Blow the dust out of the connector

How much is that gigabyte in the window?

Why can't I remove the For test/evaluation purposes only tag?

CHAPTER SIX: A History of the GlobalAlloc Function

The early years

Selectors

Transitioning to Win32

A peek at the implementation

CHAPTER SEVEN: Short Topics in Windows Programming

The scratch program

Getting a custom right-click menu for the caption icon

Whats the difference between CreateMenu and CreatePopupMenu?

When does the window manager destroy menus automatically?

Painting only when your window is visible onscreen

Determining whether your window is covered

Using bitmap brushes for tiling effects

What is the DC brush good for?



Using ExtTextOut to draw solid rectangles

Using StretchBlt to draw solid rectangles

Displaying a string without those ugly boxes

Semaphores dont have owners

An auto-reset event is just a stupid semaphore

CHAPTER EIGHT: Window Management

Why do I get spurious WM_MOUSEMOVE messages?

Why is there no WM_MOUSEENTER message?

The white flash

What is the hollow brush for?

Whats so special about the desktop window?

The correct order for disabling and enabling windows

A subtlety in restoring the previous window position

UI-modality versus code-modality

The WM QUIT message and modality

The importance of setting the correct owner for modal UI

Interacting with a program that has gone modal

A timed MessageBox, the cheap version

The scratch window

The bonus window bytes at GWLP USERDATA

A timed MessageBox, the better version

A timed context menu

Why does my window receive messages after it has been destroyed?

CHAPTER NINE: Reminiscences on Hardware

Hardware backward compatibility



The ghost CD-ROM drives

The Microsoft corporate network: 1.7 times worse than hell

When vendors insult themselves

Defrauding the WHQL driver certification process

A twenty-foot-long computer

The USB cart of death

New device detected: Boeing 747

Theres an awful lot of overclocking out there

CHAPTER TEN: The Inner Workings of the Dialog Manager

On the dialog procedure

The evolution of dialog templates

Why dialog templates, anyway?

How dialogs are created

The modal dialog loop

Nested dialogs and DS_CONTROL

Why do we need a dialog loop, anyway?

Why do dialog editors start assigning control IDs with 100?

What happens inside DefDlgProc?

Never leave focus on a disabled control

What happens inside IsDialogMessage?

Why is the X button disabled on my message box?

CHAPTER ELEVEN: General Software Issues

Why daylight saving time is nonintuitive

Why do timestamps change when I copy files to a floppy?

Dont trust the return address

Writing a sort comparison function



You can read a contract from the other side

The battle between pragmatism and purity

Optimization is often counterintuitive

On a server, paging = death

Dont save anything you can recalculate

Performance gains at the cost of other components

Performances consequences of polling

The poor mans way of identifying memory leaks

A cache with a bad policy is another name for a memory leak

CHAPTER TWELVE: Digging into the Visual C++ Compiler

Do you know when your destructors run?

The layout of a COM object

Adjustor thunks

Pointers to member functions are very strange animals

What is purecall?

CHAPTER THIRTEEN: Backward Compatibility

Sometimes an app just wants to crash

When programs grovel into undocumented structures

Why not just block the applications that rely on undocumented behavior?

Why 16-bit DOS and Windows are still with us

Whats the deal with those reserved filenames such as NUL and CON?

Why is a drive letter permitted in front of UNC paths (sometimes)?

Do not underestimate the power of the game Deer Hunter

Sometimes the bug isnt apparent until late in the game



The long and sad story of the Shell Folders key

The importance of error code backward compatibility

Sure, we do that

When programs patch the operating system and mess up

The compatibility constraints of even your internal bookkeeping

Why does Windows keep your BIOS clock on local time?

Bad version number checks

The ways people mess up IUnknown::QueryInterface

When programs assume that the system will never change,

Episode 1

When programs assume that the system will never change, Episode 2

The decoy Display Control Panel

The decoy visual style

CHAPTER FOURTEEN: Etymology and History

What do the letters W and L stand for in WPARAM and LPARAM?

Why was nine the maximum number of monitors in Windows 98?

Why is a registry file called a hive?

The management of memory for resources in 16-bit Windows

What is the difference between HINSTANCE and HMODULE?

What was the purpose of the hPrevInstance parameter to WinMain?

Why is the GlobalWire function called GlobalWire?

What was the difference between LocalAlloc and GlobalAlloc?

What was the point of the GMEM_SHARE flag?

Why do I sometimes see redundant casts before casting to



LPARAM?

Why do the names of the registry functions randomly end in Ex?

Whats the difference between SHGetMalloc, SHAlloc,

CoGetMalloc, and CoTaskMemAlloc?

Why is Windows Error Reporting nicknamed Dr. Watson?

What happened to DirectX 4?

Why are HANDLE return values so inconsistent?

Why do text files end in Ctrl+Z?

Why is the line terminator CR+LF?

TEXT vs. _TEXT vs. _T, and UNICODE vs. _UNICODE

Why are dialog boxes initially created hidden?

When you change the insides, nobody notices

If FlushInstructionCache doesnt do anything, why do you have to call it?

If InitCommonControls doesnt do anything, why do you have to call it?

Why did InterlockedIncrement/Decrement only return the sign of the result?

Why does the function WSASetLastError exist?

Why are there broadcast-based mechanisms in Windows?

Where did windows minimize to before the taskbar was invented?

Why didnt the desktop window shrink to exclude the taskbar?

Why does the caret stop blinking when I tap the Alt key?

What is the deal with the ES_OEMCONVERT flag?

The story behind file system tunneling

Why do NTFS and Explorer disagree on filename sorting?



The Date/Time Control Panel is not a calendar

How did Windows 95 rebase DLLs?

What are SYSTEM_FONT and DEFAULT_GUI_FONT?

Why do up-down controls have the arrows backward?

A ticket to the Windows 95 launch

CHAPTER FIFTEEN: How Window Messages Are Delivered and Retrieved

Sent and posted messages

The life of a sent message

The life of a posted message

Generated posted messages

When does SendMessageCallback call you back?

What happens in SendMessageTimeout when a message times out?

Applying what youve learned to some message processing myths

How can you tell who sent or posted you a message?

You cant simulate keyboard input with PostMessage

CHAPTER SIXTEEN: International Programming

Case mapping on Unicode is hard

An anecdote about improper case mapping

Why you cant rotate text

What are these directories called 0409 and 1033?

Keep your eye on the code page

Why is the default 8-bit codepage called ANSI?

Why is the default console codepage called OEM?

Why is the OEM code page often called ANSI?



Logical but perhaps surprising consequences of converting between Unicode and ANSI

CHAPTER SEVENTEEN: Security

World-writable files

Hiding files from Explorer

Stealing passwords

Silent install of uncertified drivers

Your debugging code can be a security hole

Why shared sections are a security hole

Internet Explorers Enhanced Security Configuration doesnt trust the intranet

CHAPTER EIGHTEEN: Windows 2000 and Windows XP

Why doesnt the new Start menu use Intellimenus in the All Programs list?

Why is there no programmatic access to the Start menu pin list?

Why does Windows XP Service Pack 2 sometimes forget my CD autoplay settings?

The unsafe device removal dialog

Two brief reminiscences on the Windows XP Comments? button

Why does Explorer eject the CD after you finish burning it?

Why does Windows setup lay down a new boot sector?

Psychic debugging: Why your expensive four-processor machine is ignoring three of its processors

Psychic debugging: Why your CPU usage is hovering at 50%

Whats the deal with the DS SHELLFONT flag?

Why does DS_SHELLFONT = DS_FIXEDSYS | DS_SETFONT?



What other effects does DS_SHELLFONT have on property sheet pages?

CHAPTER NINETEEN: Win32 Design Issues

Why does Win32 fail a module load if an import could not be resolved?

Why are structure sizes checked strictly?

Why do I have to return this goofy value for WM DEVICECHANGE?

The arms race between programs and users

Why cant you trap TerminateProcess?

Why do some processes stay in Task Manager after theyve been killed?

Understanding the consequences of WAIT ABANDONED

Why cant I put hyperlinks in notification icon balloon tips?

Why cant I use the same tree item multiple times?

The kooky STRRET structure

Why cant you set UTF-8 as your ANSI code page?

When should you use a sunken client area?

Why is there no all-encompassing superset version of Windows?

Why is it even possible to disable the desktop, anyway?

What are the window and menu nesting limits?

Whats the difference between HWND_TOP and HWND TOPMOST?

CHAPTER TWENTY: Taxes

Hierarchical Storage Management Geopolitics



Remote Desktop Connection and Painting

Fast User Switching and Terminal Services

Multiple users

Roaming user profiles

Redirected folders

My Documents vs. Application Data

Large address spaces

Power management and detecting battery power

Intermittent network connectivity

Anti-aliased fonts and ClearType

High DPI displays

Multiple monitors

The work area

Displaying your pop-up windows in the right place

Accessibility

CHAPTER TWENTY-ONE: Silliness

The much-misunderstood nop action

Dont let Marketing mess with your slides

Whimsical bug reports

Watch out for those sample URLs

No code is an island

But I have Visual Basic Professional

Its all about the translucent plastic

My first death threat

You cant escape those AOL CDs

Giving fair warning before plugging in your computer



Spider Solitaire unseats the reigning champion
Theres something about Rat Poker
Be careful what you name your product group
The psychology of naming your internal distribution lists
Differences between managers and programmers
Using floppy disks as semaphore tokens
When a token changes its meaning midstream
Whimsical embarrassment as a gentle form of reprimand
Using a physical object as a reminder
The office disco party
The Halloween-themed lobby

Index