UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

UNITED STATES OF AMERICA, PLAINTIFF, V. MICROSOFT CORPORATION, DEFENDANT.	C.A. NO. 98-1232
STATE OF NEW YORK, ET AL., PLAINTIFFS, V. MICROSOFT CORPORATION, DEFENDANT.	C.A. NO. 98-1223
MICROSOFT CORPORATION, COUNTERCLAIM-PLAINTIFF, V. DENNIS C. VACCO, ET AL., COUNTERCLAIM-DEFENDANTS.	JANUARY 13, 1999 WASHINGTON, D.C.

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TRANSCRIBED DEPOSITION EXCERPTS

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PENGAD-Bayonne, N.J.
GOVERNMENT EXHIBIT
1472

1 (DEPOSITION EXCERPTS OF HADI PARTOVI.)

2 Q. WHAT IS A DLL?

3 A. A DLL IS A DYNAMICALLY LINKED LIBRARY.

4 IT IS A PACKAGE OF CODE THAT CONTAINS SUBROUTINES

5 PERFORMING PARTICULAR FUNCTIONS. AND IT CAN BE

6 USED BY OTHER CODE AND OTHER APPLICANTS OR OTHER

7 DLL'S OR OPERATING SYSTEM FUNCTIONS.

8 Q. IT CONTAINS SUBROUTINES THAT EXECUTE

9 VARIOUS FUNCTIONS; IS THAT CORRECT?

10 A. CORRECT.

11 Q. AND DO THOSE SUBROUTINES HAVE A NAME?

12 ARE THEY GENERICALLY DESCRIBED IN SOME WAY?

13 BASICALLY, I'M JUST TRYING TO--I'M GOING TO ASK

14 SOME MORE SPECIFIC QUESTIONS. I JUST WANT TO

15 MAKE SURE THAT WE'RE ALL USING THE SAME

16 TERMINOLOGY SO THAT THERE IS NO CONFUSION.

17 A. THEY'RE OFTEN KNOWN AS "FUNCTIONS."

18 Q. IS THERE MORE THAN ONE LAYER? IS THERE

19 A HIERARCHICAL STRUCTURE WITHIN A DLL? OR ARE

20 THEY JUST A SERIES OF FUNCTIONS GROUPED INTO THIS

21 FILE CALLED A DLL?

22 A. WITHIN A DLL THERE IS NO RULE ON HOW TO

23 ORGANIZE A SET OF FUNCTIONS. THEY ARE OFTEN A

24 STRAIGHT LIST OF FUNCTIONS. THE UNDERLYING

25 IMPLEMENTATION MAY BE HIERARCHICAL.

1 Q. AND HOW--FOR EXAMPLE, IS WININET A DLL?
2 A. YES.
3 Q. AND SO, FOR EXAMPLE, WITH WININET--YOU
4 TESTIFIED THAT YOU WORKED ON THE DEVELOPMENT OF
5 WININET; IS THAT CORRECT?
6 A. I WORKED AS A PROGRAM MANAGER, NOT AS A
7 DEVELOPER.
8 Q. OKAY. WERE YOU AT ALL INVOLVED WITH
9 DECIDING WHICH FUNCTIONS OR WHICH SUBROUTINES
10 WERE CONTAINED WITHIN THE WININET.DLL?
11 A. TO SOME EXTENT, YES.
12 Q. AND TO THE EXTENT THAT YOU'RE FAMILIAR,
13 CAN YOU DESCRIBE TO ME HOW THE DECISION IS MADE
14 AS TO--HOW THE DECISION WAS MADE AS TO WHICH
15 FUNCTIONS ARE INCLUDED IN WININET.DLL.
16 A. THE DECISION WAS BASED ON BOTH WHICH
17 FUNCTIONALITY WAS NEEDED BY OTHER COMPONENTS OF
18 THE OPERATING SYSTEM. FOR EXAMPLE, IF THE URL
19 MONIKER.DLL REQUIRED SOME FUNCTIONALITY OF THE
20 WININET.DLL, THAT WAS ONE WAY THE DECISION WAS
21 MADE.
22 THE OTHER WAY WAS BASED ON
23 FUNCTIONALITY THAT WAS DESIRED BY THIRD-PARTY
24 APPLICATION VENDORS THAT DESIRED TO USE THE
25 WININET.DLL WITHIN THEIR OWN APPLICATIONS.

1 Q. AND WHILE YOU WERE WORKING ON
2 WININET.DLL, DID YOU COMMUNICATE WITH THIRD
3 PARTIES ABOUT WHAT FUNCTIONALITY THEY DESIRED TO
4 BE INCLUDED INSIDE THAT DLL?
5 A. YES.
6 (EXCERPT.)
7 Q. WHAT FUNCTIONALITY IS CONTAINED IN
8 BROWSEUI.DLL?
9 A. BROWSEUI.DLL ONLY EXISTS IN IE 5.0, AND
10 IT CONTAINS AREAS OF FUNCTIONALITY WITH USER
11 INTERFACE AFFORDANCES THAT WERE PREVIOUSLY
12 ORGANIZED UNDER SHDOCVW.DLL.
13 Q. OKAY. SO, PREVIOUS--WHEN YOU SAY
14 PREVIOUS FUNCTIONS THAT WERE IN SHDOCVW.DLL, IS
15 THAT--THOSE FUNCTIONS WERE CONTAINED IN
16 SHDOCVW.DLL IN VERSION 4.0 OF IE?
17 A. CORRECT.
18 Q. AND FOR VERSION 5.0 OF IE, THEY'RE NOW
19 CONTAINED IN BROWSEUI.DLL; IS THAT CORRECT?
20 A. FOR SOME SET OF FUNCTIONS INCLUDED IN
21 INTERNET EXPLORER 4.0 SHDOCVW.DLL, SOME SET HAVE
22 BEEN TRANSFERRED TO BROWSEUI.DLL, AND ADDITIONAL
23 FUNCTIONS HAVE BEEN ADDED AS WELL.
24 (EXCERPT.)
25 Q. OKAY. AND HOW ABOUT ADVAPI.DLL? WHAT

1 FUNCTIONALITY DOES THAT PROVIDE WITH REGARD TO
2 ACCESS METHOD NUMBER ONE OF GOVERNMENT EXHIBIT
3 686?
4 A. ADVAPI32.DLL PROVIDES ALL DLL'S WITHIN
5 THE OPERATING SYSTEM OR THE APPLICATIONS ACCESS
6 TO THE WINDOWS REGISTRY, WHICH IS USED AT MANY
7 POINTS ALONG THE WAY DURING THE ACCESS METHOD
8 NUMBER ONE.
9 Q. CAN YOU DESCRIBE FOR ME THE POINTS
10 ALONG THE WAY DURING WHICH THE REGISTRY IS USED?
11 FIRST OF ALL, LET'S BACK UP.
12 WHAT IS THE REGISTRY THAT YOU JUST
13 DESCRIBED IN THAT LAST ANSWER?
14 A. THE WINDOWS REGISTRY IS A STORAGE
15 LOCATION FOR CONFIGURATION INFORMATION ABOUT THE
16 OPERATING SYSTEM AND COMPUTER CONFIGURATION, AS
17 WELL AS USER PREFERENCES, AS WELL AS
18 MISCELLANEOUS INFORMATION THAT MAY OR MAY NOT BE
19 ORGANIZED IN ANY FASHION. SO IT'S HARD TO
20 COMPLETELY ANSWER.
21 Q. OKAY. CAN YOU GIVE ME AN EXAMPLE OF
22 WHAT A MISCELLANEOUS THING WOULD BE, JUST SO I
23 HAVE SOME SENSE OF WHAT YOU'RE TALKING ABOUT
24 THERE.
25 A. A MISCELLANEOUS THING WOULD BE A RANDOM

1 PIECE OF SOFTWARE THAT YOU INSTALL ON YOUR
2 COMPUTER, DECIDES IT WANTS TO REMEMBER SOME
3 INFORMATION, AND IT DUMPS IT IN THE REGISTRY
4 SOMEWHERE SOME TIME.
5 Q. SO, THIRD-PARTY SOFTWARE CAN ACTUALLY
6 MODIFY THE REGISTRY?
7 A. ABSOLUTELY.
8 Q. OKAY. AND IT CAN ACTUALLY ADD
9 ADDITIONAL REGISTRY ENTRIES IN ADDITION TO--CAN
10 IT--DOES THIRD-PARTY SOFTWARE HAVE THE ABILITY TO
11 ADD ADDITIONAL ENTRIES TO THE REGISTRY?
12 A. YES. THIRD-PARTY SOFTWARE CAN ADD,
13 CHANGE OR DELETE ENTRIES IN THE WINDOWS REGISTRY.
14 Q. GOING BACK TO THE ANSWER WITH REGARD TO
15 ADVAPI32.DLL, YOU MENTIONED THAT DURING ACCESS
16 METHOD NUMBER ONE, THE REGISTRY IS ACCESSED AT
17 NUMEROUS TIMES.
18 CAN YOU DESCRIBE FOR ME THE VARIOUS
19 WAYS IN WHICH THE REGISTRY IS ACCESSED DURING
20 EXECUTION OF THIS METHOD.
21 A. SO, BECAUSE OF THE MISCELLANEOUS NATURE
22 OF THE REGISTRY, I CAN'T PROMISE AN EXHAUSTIVE
23 LIST.
24 Q. SO, IF WE WERE TO JUST SAY--CAN WE GET
25 AN EXHAUSTIVE LIST IF WE SAY YOU JUST HAVE

1 WINDOWS 98 WITH INTERNET EXPLORER AND NOTHING
2 ELSE INSTALLED?
3 A. I UNDERSTAND. EVEN STILL I CAN GIVE A
4 (SIC) OKAY LIST.
5 Q. OKAY.
6 A. BUT AN EXHAUSTIVE LIST YOU WOULD NEED
7 TO REVIEW EVERY LINE OF SOURCECODE AND USE A
8 DEBUGGER TO TRACK EXACTLY WHAT THINGS ARE.
9 Q. OKAY. FAIR ENOUGH.
10 A. THE TYPES OF FUNCTIONS THAT I WOULD
11 COUNT WOULD BE THE DISPLAYING OF THE START MENU.
12 THE WINDOWS REGISTRY INCLUDES INFORMATION ABOUT
13 WHAT ITEMS TO DISPLAY IN THE START MENU TO START.
14 IT INCLUDES INFORMATION ABOUT THE DISPLAY OF THE
15 WINDOWS EXPLORER WHEN THAT IS OPENED. FOR
16 EXAMPLE, THE WINDOW SIZE TO OPEN TO--FOR EXAMPLE;
17 THE COLORS TO DISPLAY FOR THE WINDOWS EXPLORER
18 AND OTHER VARIOUS USER CONFIGURATIONS OF THE
19 DISPLAY OF THE WINDOWS EXPLORER.
20 AT THE TIME OF TYPING A WEB ADDRESS
21 INTO THE ADDRESS BAR, THE REGISTRY INCLUDES USER
22 CONFIGURATION INFORMATION ABOUT WHETHER OR NOT
23 THE USER WANTS TO USE THE URL AUTO COMPLETE
24 FUNCTIONALITY AS A TYPING ASSISTANT DURING THE
25 TYPING OF A WEB ADDRESS INTO THE ADDRESS BAR.

1 DURING THE NAVIGATION, THE REGISTRY
2 PROVIDES INFORMATION ABOUT VARIOUS DLL'S THAT ARE
3 LAUNCHED TO PERFORM THE VARIOUS FUNCTIONS THAT
4 ARE INVOLVED IN THE STEPS OF THE NAVIGATION. FOR
5 EXAMPLE, IT IDENTIFIES THE DLL'S RESPONSIBLE FOR
6 HTTP, THE HTTP PROTOCOL, AND IDENTIFIES THE DLL'S
7 RESPONSIBLE FOR DISPLAY OF HTML, SPECIFICALLY IN
8 THIS CASE MSHTML.DLL.
9 (EXCERPT.)
10 Q. OKAY. AS YOU USED IT IN THAT LAST
11 ANSWER, WHAT DID YOU MEAN WHEN YOU SAID DEFAULT
12 BROWSER?
13 MS. D'ARCANGELO: I'M GOING TO OBJECT
14 TO THAT QUESTION AS BEYOND THE SCOPE OF THE
15 30(B)(6).
16 YOU CAN ANSWER THAT ONE QUESTION, BUT
17 WE'RE NOT GOING TO GO VERY FAR WITH THIS.
18 THE WITNESS: I WOULD HAVE MEANT THE
19 BROWSER IDENTIFIED IN THE REGISTRY AS THE--OR,
20 RATHER, THE EXECUTABLE, THE .EXE FILE ASSOCIATED
21 IN THE REGISTRY, AS THE HANDLER FOR THE FILE TYPE
22 .HTM OR .HTML OR .JPEG OR .GIF OR AS THE HANDLER
23 FOR THE PROTOCOL HTTP OR FTP.
24 BY MS. DE MORY:
25 Q. OKAY. SO, IS THERE AN EXECUTABLE FOR

1 INTERNET EXPLORER?

2 MS. D'ARCANGELO: OBJECT TO THE

3 QUESTION AS VAGUE AND AMBIGUOUS.

4 BY MS. DE MORY:

5 Q. AS YOU'VE JUST USED EXECUTABLE IN YOUR

6 LAST ANSWER, IS THERE AN EXECUTABLE FOR INTERNET

7 EXPLORER?

8 A. IF YOU DEFINE INTERNET EXPLORER AS THE

9 SET OF TECHNOLOGIES THAT ARE USED IN THE

10 OPERATING SYSTEM FOR DISPLAYING WEB CONTENT SUCH

11 AS HTML, JPEG, GIF, THERE ARE TWO EXECUTABLES

12 INCLUDED IN WINDOWS 98 THAT USE THESE

13 TECHNOLOGIES. ONE IS IEXPLORE.EXE. THE OTHER IS

14 EXPLORER.EXE. AND I'M ASSUMING THAT BY THE WORD

15 "EXECUTABLE," YOU MEAN AN .EXE FILE ON THE HARD

16 DRIVE.

17 (EXCERPT.)

18 Q. OKAY. MOVING TO ACCESS METHOD NUMBER

19 THREE--WELL, ACTUALLY, LET ME ASK YOU THIS ABOUT

20 ACCESS METHOD NUMBER TWO.

21 IN ACCESS METHOD NUMBER ONE, WE

22 DISCUSSED REGISTRY ENTRIES. AND MY QUESTION WITH

23 REGARD TO ACCESS METHOD NUMBER TWO IS: ARE THERE

24 ANY REGISTRY ENTRIES ASSOCIATED WITH ACCESS

25 METHOD NUMBER TWO THAT CAUSE IE TO BE LAUNCHED?

1 A. WHEN YOU SAY "IE," DO YOU MEAN--

2 Q. I MEAN, YOU'VE DEFINED IT AS BEING ONE

3 OF TWO EXECUTABLES, AND SO--

4 A. THERE IS (SIC) TWO DIFFERENT

5 DEFINITIONS THAT WE'VE USED AT DIFFERENT TIMES.

6 ONE WOULD BE THE DEFINITION OF ALL THE SET OF

7 DLL'S THAT ARE INCLUDED IN A DOWNLOAD--FROM A WEB

8 DOWNLOAD OF IE 4.01 OR 4.0 FROM THE WEB.

9 THE OTHER DEFINITION WOULD BE THE

10 DISTINCTION BETWEEN IEXPLORE.EXE OR EXPLORER.EXE.

11 Q. SO, WHEN WE'RE TALKING ABOUT THE

12 REGISTRY--AND THIS IS TO MAKE SURE WE'RE ALL ON

13 THE SAME PAGE--IS IT CORRECT THAT I SHOULD ASK

14 YOU, IS THERE AN ENTRY--IS THERE AN ENTRY IN THE

15 REGISTRY THAT CAUSES IE.EXE--IE.EXPLORER.EXE OR

16 EXPLORER.EXE TO BE LAUNCHED? IS THAT THE PROPER

17 WAY TO ASK THAT?

18 A. THAT WOULD BE HOW I WOULD ASK IT.

19 FOR CLARIFICATION, I WOULD USE--I'M

20 GOING TO USE THE WORD "INTERNET EXPLORER" TO

21 REFER TO ALL THE SET OF COMPONENTS THAT ARE

22 INCLUDED IN THE WEB DOWNLOAD. AND I WILL USE

23 IEXPLORE.EXE OR EXPLORER.EXE TO REFER TO THE

24 PARTICULAR EXECUTABLES.

25 (EXCERPT.)

1 BY MS. DE MORY:

2 Q. HOW DOES SHELLEXECUTE DECIDE TO USE

3 IE--IEXPLORE.EXE?

4 A. SHELLEXECUTE, THE SUBROUTINE WITHIN THE

5 SHELL32.DLL, EXAMINES THE TEXT ENTERED INTO THE

6 ADDRESS BAR. ASSUMING IT IS A WEB ADDRESS, IT

7 USES THE PARSING FUNCTIONS OF SHLWAPI.DLL,

8 W-A-P-I, .DLL, TO PARSE THE WEB ADDRESSES TO

9 DETERMINE WHETHER THE PROTOCOL OF THE WEB ADDRESS

10 IS HTTP OR FTP OR WHETHER THE FILE POINTED TO IS

11 A .HTM FILE.

12 AND THIS ACTUALLY WOULD BE THE CASE IF

13 IT'S NOT A WEB ADDRESS, IF IT'S A LOCAL FILE

14 ADDRESS. AND IN ANY OF THOSE THREE SCENARIOS, AS

15 WELL AS FOR A NUMBER OF OTHER FILE TYPES, SUCH AS

16 JPEG OR GIF IMAGES OR THE FTP PROTOCOL, FOR ANY

17 OF THESE WEB PROTOCOLS OR WEB FILE TYPES, THE

18 SHELLEXECUTE CODE USES THE ADVAPI32.DLL TO LOOK

19 UP THE ASSOCIATED HANDLER, PER SE, WITHIN THE

20 WINDOWS REGISTRY.

21 AND IN THIS PARTICULAR CASE WITH HTTP,

22 FTP, HTML, JPEG, OR GIF CASES AND A COUPLE OF

23 OTHERS, THEY WOULD USE IEXPLORE.EXE AS THE

24 HANDLER. AND IT WOULD LAUNCHED (SIC) A NEW

25 WINDOWS PROCESS FOR THAT EXECUTABLE TO HANDLE THE

1 WEB ADDRESS.

2 Q. WHAT DOES IT MEAN TO LAUNCH A NEW

3 WINDOWS PROCESS?

4 A. WINDOWS LIKE--WINDOWS 98, LIKE MOST

5 OPERATING SYSTEMS, HAS THE CONCEPT OF MULTIPLE

6 PROCESSES OR MULTIPLE THREADS WHICH ARE BASICALLY

7 NAMES FOR RUNNING APPLICATIONS OR RUNNING PIECES

8 OF CODE. AND IT IS NOT--IT IS INDEPENDENT OF

9 WHETHER THEY'RE PART OF THE OPERATING SYSTEM OR A

10 THIRD-PARTY PIECE OF SOFTWARE. WHAT A PROCESS

11 DOES IS IT SEPARATES OUT THE FUNCTIONALITY IN A

12 PIECE OF CODE, SO THAT IT CAN BE RUN IN ITS OWN

13 PROCESS SPACE OR ENVIRONMENT, SO THAT EFFECTS

14 THAT IT MAY HAVE DO NOT EFFECT OTHER PROCESSES.

15 SO, FOR EXAMPLE, IF IT HAS A BUG AND

16 CRASHES, THE REST OF THE OPERATING SYSTEM DOESN'T

17 CRASH.

18 (EXCERPT.)

19 Q. IF A USER DESIGNATES IE 4 TO BE THE

20 DEFAULT BROWSER IN THE CIRCUMSTANCES YOU JUST

21 DESCRIBED, DOES THAT ENTRY TRANSLATE INTO THE

22 REGISTRY ENTRY THAT YOU DESCRIBED WITH REGARD TO

23 ACCESS METHOD NUMBER THREE?

24 MS. D'ARCANGELO: I'M GOING TO OBJECT

25 TO THE QUESTION AS LACKING FOUNDATION.

1 BUT GO AHEAD. YOU CAN ANSWER.

2 THE WITNESS: AGAIN, THE QUESTION ISN'T

3 VERY SPECIFIC. BUT THE SPECIFIC STATEMENT I

4 COULD SAY WOULD BE THAT WHEN THE USER ANSWERS YES

5 TO THE QUESTIONS THAT I PREVIOUSLY DESCRIBED, THE

6 INTERNET EXPLORER ASKS WHETHER THE USER WOULD

7 LIKE INTERNET EXPLORER TO BE THE DEFAULT BROWSER;

8 AND A SET OF REGISTRY ENTRIES ARE CHANGED TO MARK

9 IEXPLORE.EXE THE EXECUTABLE AS THE HANDLER FOR A

10 NUMBER OF FILE TYPES. AND THOSE ARE THE SAME

11 REGISTRY ENTRIES THAT ARE INVOKED IN ACCESS

12 METHOD NUMBER THREE.

13 (EXCERPT.)

14 BY MS. DE MORY:

15 Q. HOW ABOUT WITH REGARD TO THE REGISTRY

16 ENTRIES THAT RELATE TO INTERNET EXPLORER?

17 A. I WOULD SAY IN A SYSTEM AS DESCRIBED IN

18 THE INTERROGATORY WHERE AN OEM AS WINDOWS 98

19 INSTALLED WITHOUT ANY ADDITIONAL SOFTWARE, THOSE

20 REGISTRY ENTRIES TAKE ONE FORM. AND IF THERE IS

21 A THIRD-PARTY BROWSER SOFTWARE THAT HAS THEN BEEN

22 INSTALLED ON TOP OF THAT SOFTWARE, AND THE USER

23 HAS NOT THEN AGAIN LATER ANSWERED YES TO A

24 QUESTION BY INTERNET EXPLORER TO CHANGE BACK TO

25 THE DEFAULT BROWSER, ASSUMING THAT THIRD-PARTY

1 SOFTWARE HAS FOLLOWED A SET OF GUIDELINES FOR
2 REGISTERING ITSELF AS THE HANDLER FOR MULTIPLE
3 FILE TYPES, THEN YES, THE REGISTRY ENTRIES ARE
4 DIFFERENT.
5 AND THIS COULD DEPEND ON WHAT
6 THIRD-PARTY BROWSER SOFTWARE OR OTHER SOFTWARE
7 MAY BE INVOLVED. FOR EXAMPLE, DEPENDING ON THE
8 THIRD-PARTY SOFTWARE, THERE IS (SIC) ALSO THIRD
9 PARTIES THAT HANDLE JPEG AND GIF IMAGES, BUT NOT
10 HTML, FOR EXAMPLE, OR NOT HTTP.
11 (EXCERPT.)
12 BY MS. DE MORY:
13 Q. OKAY, OKAY. TAKING WHAT YOU HAVE SET
14 FORTH HERE IN GOVERNMENT EXHIBIT 687, CAN YOU
15 EXPLAIN TO ME WHY NUMBER 11, ACCESS NUMBER 11, IS
16 AFFECTED BY THE CHANGE IN THE REGISTRY AND ACCESS
17 METHOD NUMBER ONE IS NOT?
18 MS. D'ARCANGELO: I'M GOING TO OBJECT
19 TO THE FORM OF THE QUESTION.
20 BUT GO AHEAD. YOU CAN ANSWER.
21 THE WITNESS: THE REASON IS--WELL, ARE
22 YOU ASKING WHAT THE DIFFERENCE BETWEEN THE CODE
23 PATHS ARE?
24 BY MS. DE MORY:
25 Q. YES.

1 A. SO--BECAUSE IN ACCESS METHOD NUMBER 11,
2 DOUBLE-CLICKING ON A URL SHORTCUT LAUNCHES THE
3 CODE THAT I DESCRIBED CALLED SHELLEXECUTE. AND
4 THAT'S THE ROUTINE THAT ACCESSES THOSE REGISTRY
5 METHODS TO DETERMINE WHAT SHOULD BE THE HANDLER.
6 AND PARTICULARLY, ACTUALLY, SHELLEXECUTE IS FIRST
7 LAUNCHED TO HANDLE THE URL SHORTCUT, WHICH IS A
8 .URL FILE.
9 ONCE IT READS THAT .URL FILE FROM
10 WITHIN, THAT IT FINDS THE ACTUAL URL STRING AND
11 THEN PARSES THAT URL STRING USING THE CODE WE
12 TALKED ABOUT IN SHLWAPI. AND THEN IT DETERMINES
13 IF IT INVOLVES HTTP, HTML, JPEG, GIF AND SO ON
14 AND SO FORTH, AND THEN LOOKS UP THE REGISTRY TO
15 FIND THE ASSOCIATED HANDLER. AND THAT CODE IN
16 SHELLEXECUTE DECIDES WHAT IS THE APPROPRIATE
17 HANDLER FOR THE URL SHORTCUT--OR, RATHER, THE
18 RESOURCE POINTED TO BY THAT URL SHORTCUT.
19 IN ACCESS METHOD NUMBER ONE, THE CODE
20 IN SHELLEXECUTE IS NOT INVOLVED WHEN TYPING THE
21 WEB ADDRESS INTO THE ADDRESS BAR, BECAUSE THE
22 TYPING OF A WEB ADDRESS INTO THE ADDRESS BAR IS
23 ALREADY IMPLICITLY GOVERNED BY THE CODE SHDOCVW,
24 WHICH HOSTS THE ADDRESS BAR INSIDE IT.
25 AND WHEN IT SEES THE WEB ADDRESS, IT

1 IMPLICITLY UNDERSTANDS HOW TO USE THAT WEB
2 ADDRESS WITHOUT HAVING TO ASK THE SHELLEXECUTE
3 SUBROUTINE. AND IT KNOWS HOW TO LAUNCH A NEW
4 INSTANCE OF MSHTML OR GOING THROUGH THE WHOLE
5 STEPS OF NAVIGATING THROUGH URLMON, WININET,
6 WINSOCK, AND BACK UP AND EVENTUALLY DOING A WEB
7 PAGE NAVIGATION.
8 Q. CAN YOU TELL ME WHY THE CODE PATH FOR
9 NUMBER 12 IS DIFFERENT THAN THE CODE PATH THAT
10 YOU'VE DESCRIBED FOR NUMBER ONE?
11 A. THE EXACT SAME ANSWER.
12 (EXCERPT.)
13 Q. AND WHAT IS BROWSE IN A NEW PROCESS?
14 A. THE BROWSE IN NEW PROCESS FLAG, MORE
15 THAN ANYTHING ELSE, HAS TO DO WITH STABILITY.
16 AND THE SPECIFIC ISSUE IS THAT THERE ARE
17 USABILITY REASONS FOR STAYING WITHIN ONE WINDOW
18 WHEN VIEWING INFORMATION.
19 AS I MENTIONED, IF I'M LOOKING AT ONE
20 WEB PAGE, WHEN I WANT TO VIEW THE NEXT WEB PAGE,
21 IT'S CONSIDERED TO BE MORE USABLE OR
22 UNDERSTANDABLE OR SIMPLE FOR THE USER TO STAY
23 WITHIN THE SAME WINDOW, WHICH IN THAT CASE
24 STAYING WITHIN THE SAME APPLICATION PROCESS AS
25 DEFINED BY THE WINDOWS OPERATING SYSTEM. AND

1 THAT'S THE CONCEPT WE JUST DESCRIBED.

2 NOW, IT TURNS OUT--DO YOU WANT TO TAKE

3 TIME?

4 Q. NO. GO AHEAD.

5 A. IT TURNS OUT FOR WINDOWS 98, THE

6 EXPLORER.EXE PROCESS, THIS IS AN APPLICATION

7 PROCESS FOR EXPLORER.EXE, IS ALWAYS RUNNING. AND

8 THAT PROCESS--THE APPLICATION CODE BEHIND

9 EXPLORER.EXE DISPLAYS THE TASK BAR AT THE BOTTOM

10 OF THE SCREEN, THE START BUTTON, THE START MENU,

11 THE DESKTOP WITH ALL THE DESKTOP ICONS, WHICH THE

12 ACTIVE DESKTOP IF IT'S ENABLED. ALL OF THE STUFF

13 THAT YOU SEE WHEN YOU START WINDOWS AFTER YOU

14 DISMISS THE "WELCOME TO WINDOWS 95" SCREEN,

15 EVERYTHING YOU SEE IS DISPLAYED BY EXPLORER.EXE.

16 NOW, THERE IS (SIC) TWO POSSIBLE WAYS

17 YOU COULD HAVE AN IMPLEMENTATION WHEN YOU WANT TO

18 START A BROWSER WINDOW OR THE WINDOWS EXPLORER

19 WINDOW TO DISPLAY THE EXPLORER. AND WHETHER IT'S

20 IN THE--SO, ONE WAY OF DOING IT WOULD BE TO USE

21 THE SAME APPLICATION PROCESS SPACE WITHIN THE

22 WINDOWS OPERATING SYSTEM, IN WHICH CASE THE SAME

23 EXACT EXPLORER.EXE HAS A NEW WINDOW WITHIN THE

24 SAME APPLICATION PROCESS, SO EVEN THOUGH YOU SEE

25 THE DESKTOP AND A SEPARATE WINDOW ON TOP, THEY'RE

1 WITHIN THE SAME PROCESS GOVERNED BY THE SAME
2 EXPLORER.EXE.
3 Q. OKAY.
4 A. THE BENEFITS OF DOING THAT ARE THAT
5 THERE IS (SIC) FEWER PROCESSES MANAGED BY THE
6 OPERATING SYSTEM, AND THERE IS SOME PERFORMANCE
7 ENHANCEMENTS BY HAVING FEWER PROCESSES. THEY
8 SHARE MEMORY. THEY SHARE A LOT OF CODE AND DATA.
9 THE DISADVANTAGE IS IF THAT BROWSING
10 WINDOW CRASHES AT SOME POINT, THE ENTIRE PROCESS
11 CRASHES, THE ACTIVE DESKTOP CRASHES, THE TASK BAR
12 CRASHES, EVERYTHING DISAPPEARS AND THEN RESTARTS.
13 AND THIS WAS ACTUALLY HOW THINGS WERE ARCHITECTED
14 IN THE EARLY DAYS OF WINDOWS 98 AND IN THE
15 SHIPPED VERSION OF IE 4.0, I BELIEVE.
16 BUT FOR STABILITY REASONS, BECAUSE WE
17 DIDN'T WANT THE CRASHING OF THE BROWSER WINDOW TO
18 ALSO CRASH THE DESKTOP, WE IMPLEMENTED THE BROWSE
19 IN NEW PROCESS FLAG, WHICH WOULD LAUNCH A
20 SEPARATE APPLICATIONS PROCESS FOR THE WINDOW THAT
21 WAS OPEN SEPARATE FROM THE DESKTOP.
22 SO, THAT MEANS IN THE CASE WHEN YOU'RE
23 NOT FULLY VIEWING THE BROWSER WINDOW AND YOU
24 DECIDE TO START A NEW BROWSER, EVEN THOUGH THE
25 EXPLORER.EXE PROCESS IS RUNNING AND FULLY CAPABLE

1 OF DOING WEB BROWSING AND CONTAINS ALL THE CODE
2 FOR DOING WEB BROWSING, ALONG WITH THE DLL'S
3 ASSOCIATED, WE LAUNCHED A SEPARATE PROCESS JUST
4 FOR THE SEPARATION OF THE PROCESSES IN CASE ONE
5 CRASHES.
6 Q. AND YOU SAID THAT THE--THIS ABILITY TO
7 BROWSE IN A NEW PROCESS THAT WAS SHIPPED WITH
8 WINDOWS 98 OR NOT?
9 A. THE BROWSE IN NEW PROCESS FLAG WAS
10 ENABLED BY DEFAULT IN WINDOWS 98 IN ORDER TO MAKE
11 SURE TO HAVE THE STABILITY BENEFITS OF DOING THAT
12 SO THAT A CRASH IN A BROWSING EXPLORER WINDOW
13 WOULD NOT CRASH THE DESKTOP.
14 A USER CAN TURN THAT FLAG ON OR OFF
15 USING THE ADVANCED OPTIONS THAT ARE ASSOCIATED
16 WITH THE EXPLORER, THE ADVANCED INTERNET OPTIONS.
17 AND IF YOU TURN THE OPTION OFF, ALL BROWSING
18 HAPPENS IN THE SAME PROCESS. YOU GET SOME
19 PERFORMANCE BENEFITS BY NOT HAVING A SEPARATE
20 APPLICATION PROCESS. YOU MAY GET SOME STABILITY
21 DISADVANTAGES IF YOU BROWSE TO WEB PAGES THAT
22 INCLUDE PROGRAM CODE THAT MAY OR MAY NOT CRASH
23 THE WEB BROWSER.
24 (EXCERPT.)
25 Q. COULD ACCESS METHOD NUMBER ONE BE SET

1 UP SUCH THAT IT ACCESSES THE REGISTRY IN THE
2 MANNER SIMILAR TO WHAT YOU DESCRIBED FOR ACCESS
3 METHOD 12?
4 A. SO, IF YOUR QUESTION IS CAN MICROSOFT
5 WRITE A DIFFERENT SET OF CODE FOR THE ADDRESS BAR
6 IN WINDOWS EXPLORER SO THAT WHEN YOU TYPE A WEB
7 ADDRESS INTO THE ADDRESS BAR, THAT THE
8 SHELLEXECUTE SUBROUTINE IS CALLED, AND THEN WHAT
9 IS KNOWN AS YOUR DEFAULT BROWSER IS LAUNCHED,
10 WHETHER IT'S NETSCAPE OR IE? YES, ONE COULD
11 WRITE THE CODE THAT WAY. AND THERE IS A WORLD OF
12 CONJECTURE ONE COULD MAKE ABOUT HOW ONE COULD
13 WRITE CODE.
14 Q. OKAY.
15 A. I COULD ALSO ADD THOSE TWO SPECIFIC
16 BENEFITS YOU WOULD LOSE IF YOU WROTE THINGS THAT
17 WAY. PARTICULARLY, EVEN IF INTERNET EXPLORER WAS
18 YOUR DEFAULT BROWSER, DOING THINGS THAT WAY WOULD
19 LAUNCH A NEW WINDOW EVEN IN THAT CASE, RATHER
20 THAN STAYING WITHIN THE SAME WINDOW.
21 AND THAT HAS BOTH THE DISADVANTAGE OF
22 WHAT MAY BE PERCEIVED AS USABILITY LOSS AND THE
23 DISADVANTAGE OF A PERFORMANCE LOSS OF HAVING
24 TWICE THE MEMORY TAKEN UP HAVING TWO PROCESSES
25 OPEN AND SO ON.

1 Q. AND THAT JUST REMINDS ME, AND IT'S
2 TOTALLY UNRELATED OF THE QUESTION THAT I WANTED
3 TO ASK YOU ABOUT BROWSING NEW PROCESS, WHICH I
4 FORGOT TO ASK YOU, WHICH IS: AS YOUR
5 UNDERSTANDING IS THAT IN WINDOWS 98 THAT THE
6 BROWSING DEFAULT PROCESS IS SET AS THE DEFAULT;
7 RIGHT?
8 AND YOU GAVE A LONG EXPLANATION OF WHAT
9 HAPPENS. AND THE ONLY THING I DIDN'T CATCH WAS:
10 DOES THAT MEAN THAT IT POPS UP A NEW WINDOW WHEN
11 THE BROWSING NEW PROCESS FLAG IS SET? OR IS IT
12 JUST COMPLETELY INVISIBLE TO THE USER AND A NEW
13 PROCESS IS STARTED?
14 A. IT'S MORE THAT WHEN A NEW WINDOW IS
15 BEING OPENED, DO YOU WANT TO RE-USE THE EXISTING
16 RUNNING PROCESS FOR EXPLORER OR JUST ADD A WINDOW
17 TO THAT, OR START A SEPARATE NEW PROCESS?
18 BECAUSE THE EXPLORER THAT'S RUNNING AND
19 DISPLAYING THE DESKTOP, YOU MIGHT THINK THAT'S A
20 SEPARATE PROCESS FROM "MY COMPUTER", BUT WHEN YOU
21 DOUBLE-CLICK ON "MY COMPUTER", IT'S ACTUALLY ALL
22 WITHIN THE SAME PROCESS. SO THE DESKTOP, "MY
23 COMPUTER" AND C: BACK SLASH, IF YOU'RE LOOKING AT
24 ALL OF THESE, THEY'RE ALL ONE PROCESS. AND IF
25 ONE OF THEM TRASH CRASHES, THEY ALL CRASH.

1 AND THE QUESTION IS: IF YOU START A
2 NEW WEB BROWSING WINDOW, DO YOU WANT THAT ALSO TO
3 USE THE SAME PROCESS, THAT IS, SHOWING ALL THESE
4 THINGS? IN WHICH CASE, ONE CRASHES, THEY ALL
5 CRASH.
6 OR DO YOU WANT THAT TO LAUNCH IN A
7 SEPARATE APPLICATION PROCESS SPACE, AS THE
8 OPERATING SYSTEM DEFINES IT, SO THAT WHEN ONE
9 CRASHES, THE OTHERS DON'T CRASH. BUT YOU HAVE
10 THE DISADVANTAGE OF PERFORMANCE COST. SO IT'S AT
11 THE TIME OF OPENING A NEW WINDOW WHETHER YOU
12 RE-USE THE EXISTING PROCESS OR START A NEW ONE.
13 Q. OKAY.
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