UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA

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UNITED STATES OF AMERICA,          :
                                   :
        PLAINTIFF,                 :
                                   :
    V.                             : C.A. NO. 98-1232
                                   :
MICROSOFT CORPORATION,             :
                                   :
        DEFENDANT.                 :
- - - - - - - - - - - - - - - -X
STATE OF NEW YORK, ET AL.,         :
                                   :
        PLAINTIFFS,                :
                                   :
    V.                             : C.A. NO. 98-1223
                                   :
MICROSOFT CORPORATION,             :
                                   :
        DEFENDANT.                 :
- - - - - - - - - - - - - - - - -X
MICROSOFT CORPORATION,             :
                                   :
        COUNTERCLAIM-PLAINTIFF,    :
                                   :
    V.                             :
                                   :
DENNIS C. VACCO, ET AL.,           :
                                   :
        COUNTERCLAIM-DEFENDANTS.   : JANUARY 13, 1999
- - - - - - - - - - - - - - - - -X  WASHINGTON, D.C.
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VOLUME 37-B

TRANSCRIBED DEPOSITION EXCERPTS

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(DEPOSITION EXCERPTS OF HADI PARTOVI.)

Q. WHAT IS A DLL?

A. A DLL IS A DYNAMICALLY LINKED LIBRARY. IT IS A PACKAGE OF CODE THAT CONTAINS SUBROUTINES PERFORMING PARTICULAR FUNCTIONS. AND IT CAN BE USED BY OTHER CODE AND OTHER APPLICANTS OR OTHER DLL'S OR OPERATING SYSTEM FUNCTIONS.

Q. IT CONTAINS SUBROUTINES THAT EXECUTE VARIOUS FUNCTIONS; IS THAT CORRECT?

A. CORRECT.

Q. AND DO THOSE SUBROUTINES HAVE A NAME? ARE THEY GENERICALLY DESCRIBED IN SOME WAY? BASICALLY, I'M JUST TRYING TO--I'M GOING TO ASK SOME MORE SPECIFIC QUESTIONS. I JUST WANT TO MAKE SURE THAT WE'RE ALL USING THE SAME TERMINOLOGY SO THAT THERE IS NO CONFUSION.

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

Q. IS THERE MORE THAN ONE LAYER? IS THERE A HIERARCHICAL STRUCTURE WITHIN A DLL? OR ARE THEY JUST A SERIES OF FUNCTIONS GROUPED INTO THIS FILE CALLED A DLL?

A. WITHIN A DLL THERE IS NO RULE ON HOW TO ORGANIZE A SET OF FUNCTIONS. THEY ARE OFTEN A STRAIGHT LIST OF FUNCTIONS. THE UNDERLYING IMPLEMENTATION MAY BE HIERARCHICAL.

Q.   AND HOW--FOR EXAMPLE, IS WININET A DLL?

A.   YES.

Q.   AND SO, FOR EXAMPLE, WITH WININET--YOU TESTIFIED THAT YOU WORKED ON THE DEVELOPMENT OF WININET; IS THAT CORRECT?

A.   I WORKED AS A PROGRAM MANAGER, NOT AS A DEVELOPER.

Q.   OKAY. WERE YOU AT ALL INVOLVED WITH DECIDING WHICH FUNCTIONS OR WHICH SUBROUTINES WERE CONTAINED WITHIN THE WININET.DLL?

A.   TO SOME EXTENT, YES.

Q.   AND TO THE EXTENT THAT YOU'RE FAMILIAR, CAN YOU DESCRIBE TO ME HOW THE DECISION IS MADE AS TO--HOW THE DECISION WAS MADE AS TO WHICH FUNCTIONS ARE INCLUDED IN WININET.DLL.

A.   THE DECISION WAS BASED ON BOTH WHICH FUNCTIONALITY WAS NEEDED BY OTHER COMPONENTS OF THE OPERATING SYSTEM. FOR EXAMPLE, IF THE URL MONIKER.DLL REQUIRED SOME FUNCTIONALITY OF THE WININET.DLL, THAT WAS ONE WAY THE DECISION WAS MADE.

THE OTHER WAY WAS BASED ON FUNCTIONALITY THAT WAS DESIRED BY THIRD-PARTY APPLICATION VENDORS THAT DESIRED TO USE THE 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

FUNCTIONALITY DOES THAT PROVIDE WITH REGARD TO ACCESS METHOD NUMBER ONE OF GOVERNMENT EXHIBIT 686?

A.   ADVAPI32.DLL PROVIDES ALL DLL'S WITHIN THE OPERATING SYSTEM OR THE APPLICATIONS ACCESS TO THE WINDOWS REGISTRY, WHICH IS USED AT MANY POINTS ALONG THE WAY DURING THE ACCESS METHOD NUMBER ONE.

Q.   CAN YOU DESCRIBE FOR ME THE POINTS ALONG THE WAY DURING WHICH THE REGISTRY IS USED? FIRST OF ALL, LET'S BACK UP.

WHAT IS THE REGISTRY THAT YOU JUST DESCRIBED IN THAT LAST ANSWER?

A.   THE WINDOWS REGISTRY IS A STORAGE LOCATION FOR CONFIGURATION INFORMATION ABOUT THE OPERATING SYSTEM AND COMPUTER CONFIGURATION, AS WELL AS USER PREFERENCES, AS WELL AS MISCELLANEOUS INFORMATION THAT MAY OR MAY NOT BE ORGANIZED IN ANY FASHION. SO IT'S HARD TO COMPLETELY ANSWER.

Q.   OKAY. CAN YOU GIVE ME AN EXAMPLE OF WHAT A MISCELLANEOUS THING WOULD BE, JUST SO I HAVE SOME SENSE OF WHAT YOU'RE TALKING ABOUT THERE.

A.   A MISCELLANEOUS THING WOULD BE A RANDOM

PIECE OF SOFTWARE THAT YOU INSTALL ON YOUR

COMPUTER, DECIDES IT WANTS TO REMEMBER SOME

INFORMATION, AND IT DUMPS IT IN THE REGISTRY

SOMEWHERE SOME TIME.

Q.   SO, THIRD-PARTY SOFTWARE CAN ACTUALLY

MODIFY THE REGISTRY?

A.   ABSOLUTELY.

Q.   OKAY. AND IT CAN ACTUALLY ADD

ADDITIONAL REGISTRY ENTRIES IN ADDITION TO--CAN

IT--DOES THIRD-PARTY SOFTWARE HAVE THE ABILITY TO

ADD ADDITIONAL ENTRIES TO THE REGISTRY?

A.   YES. THIRD-PARTY SOFTWARE CAN ADD,

CHANGE OR DELETE ENTRIES IN THE WINDOWS REGISTRY.

Q.   GOING BACK TO THE ANSWER WITH REGARD TO

ADVAPI32.DLL, YOU MENTIONED THAT DURING ACCESS

METHOD NUMBER ONE, THE REGISTRY IS ACCESSED AT

NUMEROUS TIMES.

CAN YOU DESCRIBE FOR ME THE VARIOUS

WAYS IN WHICH THE REGISTRY IS ACCESSED DURING

EXECUTION OF THIS METHOD.

A.   SO, BECAUSE OF THE MISCELLANEOUS NATURE

OF THE REGISTRY, I CAN'T PROMISE AN EXHAUSTIVE

LIST.

Q.   SO, IF WE WERE TO JUST SAY--CAN WE GET

AN EXHAUSTIVE LIST IF WE SAY YOU JUST HAVE

WINDOWS 98 WITH INTERNET EXPLORER AND NOTHING

ELSE INSTALLED?

A.   I UNDERSTAND. EVEN STILL I CAN GIVE A

(SIC) OKAY LIST.

Q.   OKAY.

A.   BUT AN EXHAUSTIVE LIST YOU WOULD NEED

TO REVIEW EVERY LINE OF SOURCECODE AND USE A

DEBUGGER TO TRACK EXACTLY WHAT THINGS ARE.

Q.   OKAY. FAIR ENOUGH.

A.   THE TYPES OF FUNCTIONS THAT I WOULD

COUNT WOULD BE THE DISPLAYING OF THE START MENU.

THE WINDOWS REGISTRY INCLUDES INFORMATION ABOUT

WHAT ITEMS TO DISPLAY IN THE START MENU TO START.

IT INCLUDES INFORMATION ABOUT THE DISPLAY OF THE

WINDOWS EXPLORER WHEN THAT IS OPENED. FOR

EXAMPLE, THE WINDOW SIZE TO OPEN TO--FOR EXAMPLE;

THE COLORS TO DISPLAY FOR THE WINDOWS EXPLORER

AND OTHER VARIOUS USER CONFIGURATIONS OF THE

DISPLAY OF THE WINDOWS EXPLORER.

AT THE TIME OF TYPING A WEB ADDRESS

INTO THE ADDRESS BAR, THE REGISTRY INCLUDES USER

CONFIGURATION INFORMATION ABOUT WHETHER OR NOT

THE USER WANTS TO USE THE URL AUTO COMPLETE

FUNCTIONALITY AS A TYPING ASSISTANT DURING THE

TYPING OF A WEB ADDRESS INTO THE ADDRESS BAR.

DURING THE NAVIGATION, THE REGISTRY

PROVIDES INFORMATION ABOUT VARIOUS DLL'S THAT ARE

LAUNCHED TO PERFORM THE VARIOUS FUNCTIONS THAT

ARE INVOLVED IN THE STEPS OF THE NAVIGATION. FOR

EXAMPLE, IT IDENTIFIES THE DLL'S RESPONSIBLE FOR

HTTP, THE HTTP PROTOCOL, AND IDENTIFIES THE DLL'S

RESPONSIBLE FOR DISPLAY OF HTML, SPECIFICALLY IN

THIS CASE MSHTML.DLL.

(EXCERPT.)

Q.   OKAY. AS YOU USED IT IN THAT LAST

ANSWER, WHAT DID YOU MEAN WHEN YOU SAID DEFAULT

BROWSER?

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

TO THAT QUESTION AS BEYOND THE SCOPE OF THE

30(B)(6).

YOU CAN ANSWER THAT ONE QUESTION, BUT

WE'RE NOT GOING TO GO VERY FAR WITH THIS.

THE WITNESS: I WOULD HAVE MEANT THE

BROWSER IDENTIFIED IN THE REGISTRY AS THE--OR,

RATHER, THE EXECUTABLE, THE .EXE FILE ASSOCIATED

IN THE REGISTRY, AS THE HANDLER FOR THE FILE TYPE

.HTM OR .HTML OR .JPEG OR .GIF OR AS THE HANDLER

FOR THE PROTOCOL HTTP OR FTP.

BY MS. DE MORY:

Q.   OKAY. SO, IS THERE AN EXECUTABLE FOR

INTERNET EXPLORER?

MS. D'ARCANGELO: OBJECT TO THE QUESTION AS VAGUE AND AMBIGUOUS.

BY MS. DE MORY:

Q. AS YOU'VE JUST USED EXECUTABLE IN YOUR LAST ANSWER, IS THERE AN EXECUTABLE FOR INTERNET EXPLORER?

A. IF YOU DEFINE INTERNET EXPLORER AS THE SET OF TECHNOLOGIES THAT ARE USED IN THE OPERATING SYSTEM FOR DISPLAYING WEB CONTENT SUCH AS HTML, JPEG, GIF, THERE ARE TWO EXECUTABLES INCLUDED IN WINDOWS 98 THAT USE THESE TECHNOLOGIES. ONE IS IEXPLORE.EXE. THE OTHER IS EXPLORER.EXE. AND I'M ASSUMING THAT BY THE WORD "EXECUTABLE," YOU MEAN AN .EXE FILE ON THE HARD DRIVE.

(EXCERPT.)

Q. OKAY. MOVING TO ACCESS METHOD NUMBER THREE--WELL, ACTUALLY, LET ME ASK YOU THIS ABOUT ACCESS METHOD NUMBER TWO.

IN ACCESS METHOD NUMBER ONE, WE DISCUSSED REGISTRY ENTRIES. AND MY QUESTION WITH REGARD TO ACCESS METHOD NUMBER TWO IS: ARE THERE ANY REGISTRY ENTRIES ASSOCIATED WITH ACCESS 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.)

BY MS. DE MORY:

Q. HOW DOES SHELLEXECUTE DECIDE TO USE IE--IEXPLORE.EXE?

A. SHELLEXECUTE, THE SUBROUTINE WITHIN THE SHELL32.DLL, EXAMINES THE TEXT ENTERED INTO THE ADDRESS BAR. ASSUMING IT IS A WEB ADDRESS, IT USES THE PARSING FUNCTIONS OF SHLWAPI.DLL, W-A-P-I, .DLL, TO PARSE THE WEB ADDRESSES TO DETERMINE WHETHER THE PROTOCOL OF THE WEB ADDRESS IS HTTP OR FTP OR WHETHER THE FILE POINTED TO IS A .HTM FILE.

AND THIS ACTUALLY WOULD BE THE CASE IF IT'S NOT A WEB ADDRESS, IF IT'S A LOCAL FILE ADDRESS. AND IN ANY OF THOSE THREE SCENARIOS, AS WELL AS FOR A NUMBER OF OTHER FILE TYPES, SUCH AS JPEG OR GIF IMAGES OR THE FTP PROTOCOL, FOR ANY OF THESE WEB PROTOCOLS OR WEB FILE TYPES, THE SHELLEXECUTE CODE USES THE ADVAPI32.DLL TO LOOK UP THE ASSOCIATED HANDLER, PER SE, WITHIN THE WINDOWS REGISTRY.

AND IN THIS PARTICULAR CASE WITH HTTP, FTP, HTML, JPEG, OR GIF CASES AND A COUPLE OF OTHERS, THEY WOULD USE IEXPLORE.EXE AS THE HANDLER. AND IT WOULD LAUNCHED (SIC) A NEW 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

SOFTWARE HAS FOLLOWED A SET OF GUIDELINES FOR
REGISTERING ITSELF AS THE HANDLER FOR MULTIPLE
FILE TYPES, THEN YES, THE REGISTRY ENTRIES ARE
DIFFERENT.

AND THIS COULD DEPEND ON WHAT
THIRD-PARTY BROWSER SOFTWARE OR OTHER SOFTWARE
MAY BE INVOLVED. FOR EXAMPLE, DEPENDING ON THE
THIRD-PARTY SOFTWARE, THERE IS (SIC) ALSO THIRD
PARTIES THAT HANDLE JPEG AND GIF IMAGES, BUT NOT
HTML, FOR EXAMPLE, OR NOT HTTP.

(EXCERPT.)

BY MS. DE MORY:

Q.   OKAY, OKAY. TAKING WHAT YOU HAVE SET
FORTH HERE IN GOVERNMENT EXHIBIT 687, CAN YOU
EXPLAIN TO ME WHY NUMBER 11, ACCESS NUMBER 11, IS
AFFECTED BY THE CHANGE IN THE REGISTRY AND ACCESS
METHOD NUMBER ONE IS NOT?

MS. D'ARCANGELO: I'M GOING TO OBJECT
TO THE FORM OF THE QUESTION.

BUT GO AHEAD. YOU CAN ANSWER.

THE WITNESS: THE REASON IS--WELL, ARE
YOU ASKING WHAT THE DIFFERENCE BETWEEN THE CODE
PATHS ARE?

BY MS. DE MORY:

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

IMPLICITLY UNDERSTANDS HOW TO USE THAT WEB

ADDRESS WITHOUT HAVING TO ASK THE SHELLEXECUTE

SUBROUTINE. AND IT KNOWS HOW TO LAUNCH A NEW

INSTANCE OF MSHTML OR GOING THROUGH THE WHOLE

STEPS OF NAVIGATING THROUGH URLMON, WININET,

WINSOCK, AND BACK UP AND EVENTUALLY DOING A WEB

PAGE NAVIGATION.

Q.   CAN YOU TELL ME WHY THE CODE PATH FOR

NUMBER 12 IS DIFFERENT THAN THE CODE PATH THAT

YOU'VE DESCRIBED FOR NUMBER ONE?

A.   THE EXACT SAME ANSWER.

(EXCERPT.)

Q.   AND WHAT IS BROWSE IN A NEW PROCESS?

A.   THE BROWSE IN NEW PROCESS FLAG, MORE

THAN ANYTHING ELSE, HAS TO DO WITH STABILITY.

AND THE SPECIFIC ISSUE IS THAT THERE ARE

USABILITY REASONS FOR STAYING WITHIN ONE WINDOW

WHEN VIEWING INFORMATION.

AS I MENTIONED, IF I'M LOOKING AT ONE

WEB PAGE, WHEN I WANT TO VIEW THE NEXT WEB PAGE,

IT'S CONSIDERED TO BE MORE USABLE OR

UNDERSTANDABLE OR SIMPLE FOR THE USER TO STAY

WITHIN THE SAME WINDOW, WHICH IN THAT CASE

STAYING WITHIN THE SAME APPLICATION PROCESS AS

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

WITHIN THE SAME PROCESS GOVERNED BY THE SAME

EXPLORER.EXE.

Q.   OKAY.

A.   THE BENEFITS OF DOING THAT ARE THAT

THERE IS (SIC) FEWER PROCESSES MANAGED BY THE

OPERATING SYSTEM, AND THERE IS SOME PERFORMANCE

ENHANCEMENTS BY HAVING FEWER PROCESSES. THEY

SHARE MEMORY. THEY SHARE A LOT OF CODE AND DATA.

THE DISADVANTAGE IS IF THAT BROWSING

WINDOW CRASHES AT SOME POINT, THE ENTIRE PROCESS

CRASHES, THE ACTIVE DESKTOP CRASHES, THE TASK BAR

CRASHES, EVERYTHING DISAPPEARS AND THEN RESTARTS.

AND THIS WAS ACTUALLY HOW THINGS WERE ARCHITECTED

IN THE EARLY DAYS OF WINDOWS 98 AND IN THE

SHIPPED VERSION OF IE 4.0, I BELIEVE.

BUT FOR STABILITY REASONS, BECAUSE WE

DIDN'T WANT THE CRASHING OF THE BROWSER WINDOW TO

ALSO CRASH THE DESKTOP, WE IMPLEMENTED THE BROWSE

IN NEW PROCESS FLAG, WHICH WOULD LAUNCH A

SEPARATE APPLICATIONS PROCESS FOR THE WINDOW THAT

WAS OPEN SEPARATE FROM THE DESKTOP.

SO, THAT MEANS IN THE CASE WHEN YOU'RE

NOT FULLY VIEWING THE BROWSER WINDOW AND YOU

DECIDE TO START A NEW BROWSER, EVEN THOUGH THE

EXPLORER.EXE PROCESS IS RUNNING AND FULLY CAPABLE

OF DOING WEB BROWSING AND CONTAINS ALL THE CODE

FOR DOING WEB BROWSING, ALONG WITH THE DLL'S

ASSOCIATED, WE LAUNCHED A SEPARATE PROCESS JUST

FOR THE SEPARATION OF THE PROCESSES IN CASE ONE

CRASHES.

Q.   AND YOU SAID THAT THE--THIS ABILITY TO

BROWSE IN A NEW PROCESS THAT WAS SHIPPED WITH

WINDOWS 98 OR NOT?

A.   THE BROWSE IN NEW PROCESS FLAG WAS

ENABLED BY DEFAULT IN WINDOWS 98 IN ORDER TO MAKE

SURE TO HAVE THE STABILITY BENEFITS OF DOING THAT

SO THAT A CRASH IN A BROWSING EXPLORER WINDOW

WOULD NOT CRASH THE DESKTOP.

A USER CAN TURN THAT FLAG ON OR OFF

USING THE ADVANCED OPTIONS THAT ARE ASSOCIATED

WITH THE EXPLORER, THE ADVANCED INTERNET OPTIONS.

AND IF YOU TURN THE OPTION OFF, ALL BROWSING

HAPPENS IN THE SAME PROCESS. YOU GET SOME

PERFORMANCE BENEFITS BY NOT HAVING A SEPARATE

APPLICATION PROCESS. YOU MAY GET SOME STABILITY

DISADVANTAGES IF YOU BROWSE TO WEB PAGES THAT

INCLUDE PROGRAM CODE THAT MAY OR MAY NOT CRASH

THE WEB BROWSER.

(EXCERPT.)

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.

Q.   AND THAT JUST REMINDS ME, AND IT'S
TOTALLY UNRELATED OF THE QUESTION THAT I WANTED
TO ASK YOU ABOUT BROWSING NEW PROCESS, WHICH I
FORGOT TO ASK YOU, WHICH IS: AS YOUR
UNDERSTANDING IS THAT IN WINDOWS 98 THAT THE
BROWSING DEFAULT PROCESS IS SET AS THE DEFAULT;
RIGHT?

AND YOU GAVE A LONG EXPLANATION OF WHAT
HAPPENS. AND THE ONLY THING I DIDN'T CATCH WAS:
DOES THAT MEAN THAT IT POPS UP A NEW WINDOW WHEN
THE BROWSING NEW PROCESS FLAG IS SET? OR IS IT
JUST COMPLETELY INVISIBLE TO THE USER AND A NEW
PROCESS IS STARTED?

A.   IT'S MORE THAT WHEN A NEW WINDOW IS
BEING OPENED, DO YOU WANT TO RE-USE THE EXISTING
RUNNING PROCESS FOR EXPLORER OR JUST ADD A WINDOW
TO THAT, OR START A SEPARATE NEW PROCESS?

BECAUSE THE EXPLORER THAT'S RUNNING AND
DISPLAYING THE DESKTOP, YOU MIGHT THINK THAT'S A
SEPARATE PROCESS FROM "MY COMPUTER", BUT WHEN YOU
DOUBLE-CLICK ON "MY COMPUTER", IT'S ACTUALLY ALL
WITHIN THE SAME PROCESS. SO THE DESKTOP, "MY
COMPUTER" AND C: BACK SLASH, IF YOU'RE LOOKING AT
ALL OF THESE, THEY'RE ALL ONE PROCESS. AND IF
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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