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Starting a Windows App from DOS

Most Windows applications will print "This program requires Microsoft Windows" on the screen if run from DOS.   Even if you are running Windows and are in a DOS box, this is the normal result.   Win-Link alleviates this problem by starting Windows applications from Windows when run from a DOS box.

Win-Link will start a Windows program when you type its name in a DOS box.   It accomplishes this by looking at all files a DOS box is going to EXEC and if a file is a Windows program, it will attempt to launch it from Windows instead.   If Windows can't launch the program, then it will attempt to run it in the DOS box.

Potentially, some programs will have a complete DOS program as well as a Windows program in one .EXE file.   In this case, you may wish to run the DOS program rather than the Windows program.   You can list programs that you wish to **NOT** have Win-Link run as Windows programs.

WIN.COM is a special case.   WIN.COM itself is not a Windows program but running WIN.COM within a DOS box is generally bad news as it will start a real-mode version of Windows in that DOS box.   Win-Link is set up to handle this special case and allow you to avoid running Windows in WIndows.

Finally, because of the way share handles file locking, share can cause some problems trying to run multiple copies of a program.   Windows needs to access a program file while it is running to read resources and discarded code segments.   Therefore it locks access to the file.   This can cause the dreaded "Abort, Retry, Ignore" message to appear when running a second copy of a program.   You can eliminate this by marking your program files read-only.

Launching a Windows Application

WIN.COM special case

Don't EXEC files

Share & file locking

Launching a Windows Application

If you try to run a Windows Application from a DOS box, Win-Link will instead send a message to Windows telling Windows to launch the program.   After the program is successfully launched, Window's focus will be set to that application, exactly as though you had double-clicked on its icon.

The program will not be launched if its on the list of Don't Exec files or Windows tried to launch it and failed.   In both cases, it will then be executed by DOS.

WIN.COM is also treated seperately.   While it is not a Windows application and cannot be launched, it may or may not be executed.

Finally, you can still launch your Windows applications by double clicking on them with the mouse.

Attempting to run WIN.COM from Windows

Generally, trying to run <u>WIN.COM</u> from a DOS box is very bad news.   It will generally succeed but you will be running a second copy of Windows in real mode in the DOS box, under Windows.   Windows is not designed for this and you will usually inflict major trauma on your system doing this.

Win-Link looks for WIN.COM and if it sees you trying to run it, will do 1 of 4 things;   1) It will switch you to the program manager, 2) It will put up a message telling you that you are already in Windows and then return (when running in full screen mode its easy to forget sometimes), 3) It will go ahead and run Windows, or 4) It will prompt you for a choice from the previous 3 choices.

In the Win-Link dialog box you can set which of the above <u>options</u> you wish to have occur when you try to run Windows.

Files to NOT Launch under Windows

Because a Windows (segmented) <u>EXE</u> file contains a complete DOS program as well as a complete, totally seperate Windows program, its quite possible that some programs will have actual programs in the DOS part rather than a message saying the program needs Windows.

In this case, you may wish to run the DOS part of the program instead of the Windows part. To do so, just add the name of the program to the **Don't Exec** <u>list</u> in Win-Link's dialog box.

Share & file locking impacts on EXEC

Share is a DOS TSR (included with DOS) that implements file locking.   Because DOS was originally designed as a non-networked, single tasking operating system, when share was designed it had to handle old DOS applications.   If a file is opened in the old "compatibility" mode, no other program can access it until it is closed.

When Windows launches an application, it keeps the .EXE file open and access to it locked. Windows needs to be able to read the file to read resources and discarded code segments. Unfortunately, Windows 3.0 openes the file in compatibility mode.

Therefore, if an application is already running and you run it again in a DOS box, Win-Link cannot open the file to see if its a Windows file.   In this case, Win-Link will blindly try to launch it and if the launch fails, will allow the DOS EXEC to complete.

You can eliminate this problem by setting all your programs to be read-only.   This is a good idea in general anyway and makes life easier for Windows also.

Printing to the Windows Spooler from DOS

Win-Link will re-direct any printing it can to the Windows Spooler.   This allows multiple DOS boxes to print at the same time without contention errors and makes printing much faster since it is being spooled to disk.

Win-Link does this by intercepting requests to the DOS print utility to print a file (print itself uses this so we can intercept any files printed with print) and any calls to parallel port 1 made via int 17h which includes writing to LPT1 or PRN.

While a specific file is being printed or a DOS program is in the process of printing to port 1, The file or program name will be displayed in the Win-Link dialog box print job list.   When a job has been finished, it will disappear from Win-Link but will be in the Windows Print Manager until completely printed.

Because there is no way generally (there are exceptions) to tell when a program has finished printing something (it just stops sending to the printer), a time-out needs to be set and if nothing is sent to the printer for that period of time, a job is ended.

Finally, to be able to send output directly to a printer, without changing it in any way, a specialized printer driver, RAW.DRV is needed.   This driver will work with any printer connected to a parallel port.   A regular printer driver cannot be used.

RAW.DRV
Using DOS Print
Using LPT1
Using INT 17h
DOS program printing
Print Time-Out
Win-Link Print list

Using the RAW.DRV printer driver

RAW.DRV is a special printer driver.   Windows printer drivers are designed to be passed commands from a program (ie, draw a line here) and turn it into the printed output. RAW.DRV is the opposite, it passes all characters it receives directly through to the printer without changing anything.

This capability is critical as a DOS application does not know that Windows is there and is passing commands directly to the printer.   For this reason, Win-Link can print only if RAW.DRV is loaded.   If RAW.DRV is not loaded, Win-Link will turn its printer re-direction off.

Printing with the DOS print utility

The DOS print utility uses a little know int 2Fh call to pass the names of files it wishes to print to the resident part of itself.   Win-Link intercepts these calls, copies the file names, and the returns to print.

If Win-Link is unable to find RAW.DRV, it will continue the int 2Fh call to the resident part of print which will then print directly to the spooler.   In either case your file will be fully printed.

Because of the design of the int 2Fh call for print, there are no problems that arise from printing to a spooler in a multi-tasking environment.

Printing to devices LPT & PRN

When you copy to LPT1 or PRN, you are calling DOS which then calls int 17h.   This also holds true for programs that open the file LPT1 or PRN (if a program does **NOT** print in the background it probably does this) and write to them.

Unfortunately, the design of DOS precludes multiple programs accessing the same device at the <u>same time</u>.   Therefore, if 2 programs attempt to write to LPT1 or PRN (they are the same device internally) at the same time, you will get an Abort, Retry, Ignore message.   Let one finish then "retry" the second.   Printing to the spooler is so fast, you're better off doing one at a time.

Printing to LPT1 & PRN also has the same concerns as printing to <u>int 17h</u> since they perform their actual printing using int 17h.

Printing using int 17h

Programs that print in the background, and some that print in the foreground, generally print to the parallel port using int 17h (although some print directly which is NOT intercepted by Win-Link).

These calls to int 17h are intercepted by WinLink and sent to the spooler instead.   If Win-Link cannot access RAW.DRV, it will not intercept the calls to int 17h and printed characters will go directly to the printer.

Programs that print directly to int 17h will NOT see any Abort, Retry, Ignore messages and should not have any problems unless thay mix calls to int 17h and direct port access.

Printing from a DOS program

DOS programs print by a variety of means.   First, a program can print to any of the parallel or serial ports on a computer.   Win-Link will only intercept printing sent to the first parallel port.   It does not look at any other print output.

If a program prints by creating a print file and sending it to <u>PRINT</u> via int 2fh, then Win-Link will intercept the call and print the file.

If a program prints by opening <u>LPT1</u> or PRN, then Win-Link will see the printing when LPT1/PRN make calls to int 17h to print the characters.   This method can lead to <u>sharing conflicts</u> and write failures (all of which will succeed on a retry).

If a program prints directly to int 17h, Win-Link will see the characters one at a time.   This method should always work although there is no sure way of knowing when a <u>job ends</u>.

Also, the program name is retrieved from the PSP's MCB.   This only works on dos 4.0 and later and some earlier programs tromp on this space.   Therefore, Win-Link may show no or a garbage program name.   This has **NO** effect on the printing of the job.

Print jobs time-out

When a program is printing using int 17h, it sends a character on each call.   There is no call to say a job has ended.   Therefore, the only way to guess that a job has ended is if more than a certain number of seconds has passed with no characters, you assume the job is over.   This time-out value can be set in Win-Link's dialog box.

If a job waits more than this time-out value between characters, it will be split into 2 jobs and another job may print between these 2 jobs.   This can be real bad because it may stop in the middle of a page or after loading fonts, etc.   If the delay is too long, multiple jobs may be placed in one job sent to the spooler.   The only downsides to this is that you may get a real big spooler file and you have to wait longer for it to print (it won't start until the job is all in the spooler).

There is an exception to this.   There is an undocumented call that can be made to say that a print job has ended.   DOS makes this call whenever a program ends - so when a program ends we are told to end the job.

Print job list

The Win-Link dialog box shows all <u>print jobs</u> it is in the process of sending to the spooler. Once Win-Link has sent all of a job to the spooler, it will disappear from Win-Link's list although it will remain in the spooler until it is fully printed.

This list is a display list only.   You cannot do anything to the jobs by clicking on the list, etc.

Setting the Win-Link options

The Win-Link options can be set by one of 2 ways.   You can directly edit the win.ini file (only do this when Windows is not running OR with the Windows .ini editor).   Or you can set values in the Win-Link dialog box and then select **File-Save** from the menu.   This will write the values presently in WinLink to win.ini (if a presently set value is the default, no value will be written).

You can also read the contents of win.ini into the Win-Link dialog by selecting **File-Restore** from the menu.   While Win-Link does this automatically on start-up, if you have temporarily changed some values in the Win-Link dialog, this will re-set them all back to their default.

The **Options** menu:

TimeOut: Will set the new time-out value to be the number in the **Print TimeOut** box (must be 0 - 300).

Add: Will add the string in the **Add** box to the list of file names under Don't Exec.   The string should be a root file name only, no sub-directory or disk drive.   You can only select this menu item when you are on the Add box.

Delete: Will delete the file presently selected in the **Don't Exec** list.   You can only select this menu item if a string is selected in the list.

WinExec: Will set the string in the **ADD** box as the new name for WIN.COM.   This new name will then be reflected as the name above the WIN.COM action radio buttons.

Below is how win.ini would be if you set it for all default values (you don't need to do this, if there is nothing in win.ini, then these values would be used).   Also, the programs clock and reversi have been added to the Don't Exec list (this is NOT the default behavior) to show how to put Don't Exec files in win.ini.

[WinLink]

Windows=WIN.COM

ExecWin=PrgmMgr

Off=

Ignore=clock.exe, reversi.exe

TimeOut=45

      WIN.COM handling

      EXEC ON/OFF

      PRINT ON/OFF

      Print Time-Out

      WIN.COM name

      Don't EXEC files

      Print Jobs

Handling an EXEC of WIN.COM

When a user types win, WinLink will do 1 of 4 things;   1) It will switch you to the program manager, 2) It will put up a message telling you that you are already in Windows and then return (when running in full screen mode its easy to forget sometimes), 3) It will go ahead and run Windows, or 4) It will prompt you for a choice from the previous 3 choices.

Click on the radio button under WIN.COM to pick the option you wish <u>executed</u> when you type win.   To change the name permanently, either click on the menu item **File-Save** or set win.ini as follows (choose one of the four strings seperated by '|'):

[WinLink]

ExecWin=PrgmMgr | Ignore | Run | Prompt

Turning Launching Wndows Applications ON/OFF

If you clear the check box for "DOS EXEC", then Win-Link will not launch Windows applications from DOS boxes.   Instead, they will be exec'ed by DOS.   This does not affect Win-Link's handling of WIN.COM.

To change the name permanently, either click on the menu item **File-Save** or set win.ini as follows (to turn off EXEC & Print enter Off=Exec, Print):

[WinLink]

Off=Exec

Turning Printing DOS Applications to Spooler ON/OFF

If you clear the check box for "DOS Print", Win-Link will not send DOS print output to the Windows Spooler.   You can turn this off & on all you want although if you print directly from DOS before turning it back on, you may get a <u>contention</u> error.

To change the name permanently, either click on the menu item **File-Save** or set win.ini as follows (to turn off EXEC & Print enter Off=Print, Exec):

[WinLink]

Off=Print

Setting the Print Time-Out

Win-Link normally has no way of knowing if a <u>print job has ended</u> except by the amount of time that has elapsed since the last character was printed.   **Print Time Out:** is the number of seconds that must go by with no characters printed for a job to be ended (you may enter 0 - 600).

This time is measured in time the DOS box that is printing has had scheduled for it.   If a DOS box does not execute in the background, then when the DOS box is in the background no time will pass.

I have found that different computers get this time off by up to a factor of 2.   While this is supposed to be the number of seconds, set yours to give you the actual delay you want.

To change the name permanently, either click on the menu item **File-Save** or set win.ini as follows (the number must be 0 - 600):

[WinLink]

TiemOut=45

Setting a different name for WIN.COM

If you have renamed WIN.COM, Type the new name in **Add:** and then click on the menu item **Options-WinExec**.   The new name will be reflected above the radio buttons giving the options on what to do when someone types in win.   The new name should be the root file name only - DON'T include the directory or disk (ie WIN.COM, not c:\windows\WIN.COM).

To change the name permanently, either click on the menu item **File-Save** or set win.ini as follows:

[WinLink]

Windows=WIN.COM

Setting files to NOT Launch from Windows

You may wish to <u>not launch</u> some programs from Windows if run from a DOS box.   To do this, type the program name (just the file name, not the sub-directory or drive) in the Add box and select the menu item **Options-Add**.

To delete a file from the list, select the file from the list and then select **Options-Delete** from the menu.

To change the name permanently, either click on the menu item **File-Save** or set win.ini as follows:

[WinLink]

Ignore=file1.ext, file2.ext

The Print Job List

The **Printing** list displays all jobs that WinLink is presently sending to the WIndows Spooler. This list is for display only.   While you can select item in the list, this has no affect and is possible only because Windows allows the user to select items in ALL lists - it can't be turned off.

If Win-Link is printing a file it intercepted being sent to the <u>print utility</u>, the line in the list will be "FILE: file.ext".

If Win-Link is printing characters it is intercepting being sent to <u>int 17h</u>, the line in the list will be "PROGRAM: file".   In the case of programs, the name may be blank or have garbage characters - don't worry, its due to using a feature of DOS that some programs overwrite to get the program name.   The overwriting has no effect on the actual printing.

Miscellaneous Items

These are the miscellaneous items that didn't fit in any of the above categories.   Click on the one you wish to see:

General Description
Destroy or Minimize Win-Link
Installing Win-Link
Abort, Retry, Ignore
Use by other programs

General Description of Win-Link

Win-Link provides 3 services; 1) It allows you to run Windows programs from a DOS box (and conditionally not run WIN.COM), 2) It allows DOS programs to print to the Windows spooler, and 3) It provides Interprocess Communicatio between Windows and DOS applications.

Win-Link is composed of three parts; 1) win_link.exe (a Windows program), 2) win_ipc.386 (a Windows VxD), and 3) raw.drv (a printer driver).   All three pieces are needed for Win-Link to be able to work.

Win-Link will only run if Windows is running in enhanced (386) mode.   Win-Link was written by Dave Thielen.

Destroy or Minimize Win-Link

If Win-Link is in the process of printing, it cannot be destroyed, it will be minimized (iconized) instead.

This is done because stopping print jobs half way through is almost never what a user desires.   If you wish to kill Win-Link, <u>turn off</u> the printing capability, wait for the print jobs to end, and then kill it.

Installing Win-Link

Installing Win-Link is composed of 3 steps (two of which you've accomplished if you are reading this).   Be careful while setting up Win-Link to **NOT** edit any of your .INI files with a normal text editor under Windows - it will corrupt them.   You can edit after closing Windows down OR use the .INI editor provided in Windows.

1)   You need "device=c:\windows\system\win_ipc.386" in system.ini.   The directory shown is the reccomended one although it can be any directory as long as the file win_ipc.386 is there.

2)   You need "load=c:\windows\win_link.exe" (or run= if you wish).   The directory shown is the reccomended one although it can be any directory as long as the file win_link.exe is there.

3)   You need to install raw.drv as a printer driver.   If you skip this step Win-Link will still be able to launch Windows applications form DOS and perform Interprocess Communication but it won't be able to print from DOS to the Windows spooler.

Abort, Retry, Ignore

Unfortunately it is not possible to guarantee that Win-Link will never cause Abort, Retry, Ignore to come up on a DOS box - especially if printing in several DOS boxes at once.   Since Win-Link cannot determine if a retry would work or the printer/spooler truely can't accept any printers, the user needs to respond to the message.

Also, Windows will put a DOS box in full screen mode before displaying the message.   If your DOS box was a window before, just press "ALT-ENTER".   You may do this before replying to the Abort, Retry, Ignore.

Use by Other Programs

Other programs may use Win-Link for Interprocess Communication.   If this is so, they should state so and then you should NOT kill Win-Link while these other programs are running.

Contention

If 2 programs were both allowed to print to a parallel port at the same time, you would end up with their output intermixed on the same page, obviously not a good situation.   Without Win-Link, Windows only allows one application at a time to access a port.   If another tries, this is a contention error and Windows will put up a dialog box asking which application gets the port.

.EXE

A .EXE file is an executable program that DOS can run.   A Windows .EXE file is actually two complete programs in one file.   The first part of the file is a normal DOS program (usually a program called winstub that prints "This program requires Microsoft Windows").   If DOS executes a .EXE, this will be all it sees.

If Windows executes the .EXE file however, it reads the second program in the file, a Windows program, and executes that second program.   This second program is only in a Windows .EXE file.   Win-Link looks for the existence of this second program in a .EXE file and has Windows launch it if it is a Windows .EXE

EXEC

When DOS runs a program, it "executes" it.   This is known as the EXEC function.   When you type a file name at the DOS command prompt, command.com finds that file and passes the file name to the DOS EXEC function.   DOS will then load the file into memory and start running it.

Launch

The term launch is used for starting Windows programs instead of execute.   While the two terms are interchangeable, Windows uses launch since Windows will start a program and then return immediately while the program is running (multi-tasking).   DOS however doesn't return until a program has finished.

Launch is used because it conotates just starting a program rather than running until done better than execute.

WIN.COM

WIN.COM is the file which starts Windows.   WIN.COM (it can be renamed to something else) should usually not be run from a Wndows DOS box.   However, because it is a normal DOS program, there is no way of distinguishing it **EXCEPT** by its name.