

# Printing With LANtastic

## Performance Objectives

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When you finish this module you will be able to walk a customer through the following actions:

- Installing a new printer in an existing machine (server or workstation)
- Monitoring and controlling a print queue
- Setting up a global printing resource
- Using RPS and RPD

You will also be able to:

- Explain the reasons for all timeouts and their effects on printing
- Make appropriate changes to increase print speeds in DOS and Windows
- Identify and correct common printing problems

## Preliminary Setup

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1. Obtain the following equipment:
  - Two computers of 386SX16 class or better equipped with NR2000 adapters
  - Appropriate cabling, terminators, t-connectors
  - Dot matrix printer
  - Printer paper
2. Set up the two computers as follows:
  - Delete any LANtastic software from the hard drive, including control directories.
  - Verify that Windows 3.1 is loaded on both machines.
  - Perform a Windows install of LANtastic version 6.0, on both machines. Configure them as servers. Name one machine PRN-SERVER and the other PRNCLIENT.
  - Use Net Manager to delete all printer resources from both machines.
  - Clear all privileges from the wildcard accounts.

## Installing a New Printer

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1. Boot PRNSERVER and PRNCLIENT and verify that machines communicate and that you are able to transfer files.
2. Use NET SHOW to verify no printer redirections on either machine.
3. Install a dot matrix printer on the LPT1 port of PRNSERVER.
4. Turn on the printer and make sure that it is on-line and has paper.
5. Verify printer operations by copying the AUTOEXEC.BAT file to PRN.
6. At PRNSERVER, run NET\_MGR and select *Shared Resources Management*. Note that there are no printer resources.
7. Add a new printer resource with the name @MATRIX. Point the resource at LPT1.
8. Press *Esc* to return to the command prompt.
9. At PRNCLIENT, run NET and select *Connect to Other Computers' Printers*.
10. Select LPT1 then select PRNSERVER from the list of servers. Note that the @MATRIX resource is listed even though PRNSERVER has not been rebooted. You cannot count on this, though. It's best to remove and reinstall server when making changes to Net Manager.
11. Select the @MATRIX resource. Note that the menu shows the complete redirection.
12. Escape out to the command line.
13. Use NET SHOW to verify the printer redirection.
14. At machine PRNCLIENT, from the root direction, copy the AUTOEXEC.BAT file to PRN. The file will print.
15. At PRNSERVER, copy the AUTOEXEC.BAT file to PRN. You will get a "Not Ready Writing Device PRN. (A)bort (R)etry (F)ail." This is because the parallel port is now controlled by Server. You can't print to it directly.
16. Abort and/or Fail the job to get back to the command prompt.
17. At PRNSERVER, redirect LPT1 from the command line as follows:

```
NET USE LPT1: \\PRNSERVER\@MATRIX
```
18. Attempt to print again. This time the job will print.  
Leave the computers and printer in the current configuration and proceed to the next section.

## Controlling a Printer Queue

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1. Turn the printer off.
2. At PRNSERVER, change to the *Windows* directory and copy the WIN.INI file to PRN. You will get a message saying "1 File Copied" even though the printer is off. This is because the job actually goes to the server's spooler.
3. Change directory to LANTASTI.NET\SPOOL.NET and do a directory. You will see a file with an *\_SP* extension. This is your print job.
4. The NET program owns this spool file. Prove this by attempting to TYPE the file. You will get a sharing violation.
5. Run NET, select *View Print Jobs* then select PRNSERVER from the list of servers. You will see the job you just printed sitting in the queue. The status will show "printing" even though it is not printing. This means the file is open and server is attempting to despool it.
6. Tap the *Del* key then press *Enter* to confirm the deletion. Note that the status changes to DELETED but the job stays on the list.
7. Escape out to the command prompt then run NET again and select *View Print Jobs*. Note that the job still appears.
8. Turn on the printer. The printer will start to work and the job will disappear from the queue.
9. Watch the printer output. Note that it only prints the first few lines of the file. If you were to count the characters, you would find 512 of them. By no mean coincidence, this is default size of Server's printer buffer. You will also see that after the buffer clears out you will get a banner labeled "CANCELED". This banner would also print if a long job were deleted while it was printing.
10. Turn the printer off.
11. At PRNCLIENT, run NET, select *View Print Jobs*, then select PRNSERVER from the list of servers.
12. Tap the *Ins* key. You will get a popup menu. Select *Using the LANtastic Editor*.
13. At the editor screen, type a few lines of text. Press *F2-Send*. Note that you have the option of delaying the printing to another time and date. Press *Enter* to accept the current time.
14. Enter a comment to identify the job.
15. Enter 3 copies.
16. Note that the print status line only shows one job. Server knows to send the job three times.
17. Turn the printer on. Note that the lines print three times.
18. Press the spacebar after printing has finished. Note that the job disappears from the queue.

19. Press *F7-Printers*. Select *LPT1 - Multiple Jobs (Not Despooling)*. You will get an error message because you do not have the Q (SuperQueue) privilege.
20. At machine PRNSERVER, run NET\_MGR and select *Wildcard Accounts*.

*NOTE* The privilege assignment in the next step is only for purposes of this workshop. Under general circumstances, you would not want to give management privileges to the wildcard account.

21. Select the asterisk. Cursor down to the *Privileges* line and press *Q*. Escape back to the command line.
22. At PRNCLIENT, press *F7-Printers* again and select *LPT1 - Multiple Jobs (Not Despooling)*. The following menu appears:

Halt	Halts all despooling
Stop	Stops despooling at end of current job
Pause	Temporarily suspends despooler
One-Job	One job is despoiled, then despooling stops
Start	Begins despooling if paused or stopped
Restart	Spools current entry from the beginning

23. Select *Halt*. You get the same error message as before. The account privilege change does not immediately take effect.
24. At PRNSERVER, remove Server from memory (SERVER/REM) then put it back into memory.
25. At PRNCLIENT, press *F7-Printers* again and once again select *LPT1 - Multiple Jobs (Not Despooling)*.
26. Select *Halt*. The status of the queue changes to DISABLED.

*NOTE:* The following steps demonstrate that no jobs will print on a halted port no matter what workstation sends the job nor what resource is used.

27. You're still at PRNCLIENT. Escape back to the JOB CONTROL screen and tap *Ins*. Choose *By Copying An Existing Text File* then enter \AUTOEXEC.BAT.
28. Select *Time, Comments, and Copies*. Note that the job sits in the queue with a status of WAITING.

29. Select the line containing your print job. You will get the following menu:

```
Show      More information about selected job
Delete    Remove the selected job from queue
Hold      Suspend printing of the selected job
Release   Allow the selected job to be printed
View      View the contents of the selected job
Copy      Copy the selected job to a file
Print     Print the selected job
Rush     Give the selected job top priority
```

30. Select *Release*. Note that the job stays put with a status that stubbornly remains WAITING.

31. Escape all the way to the command prompt. Verify that you are in the LANTASTI directory.

32. Type the following line:

```
TYPE STARTNET.BAT > LPT1
```

After a pause you will get another command prompt.

33. Run NET, select *View Print Jobs*, then select PRNSERVER from the server list. Note that there are now two jobs in the queue.

34. Press *F7-Printers* and select *LPT1*.

35. Select *One-Job*. Note that the printer begins printing.

36. Escape to the *View Jobs* screen and press the spacebar to update the screen. Note that the first job has exited the queue.

37. Press *F7-Printers* and select *LPT1*. Select *Restart*. Note that the printer begins printing the second job. Press the spacebar to refresh the screen and note that the queue is now empty.

Escape back to the command prompt and proceed to the next section.

## Demonstrating Effects of LPT TIMEOUT

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When most programs launch, they enable a suite of standard I/O devices. One of those is the default printer port, usually PRN. (PRN and LPT1 are two DOS devices that point to the same hardware port.)

When an application sends a print job to PRN, for example, it opens the device just as if it were opening a file. When the application has completed sending the print job, it should politely close the PRN file. **This file closure signals the end of the job.**

When Server sees the file closed, it closes the spool file and begins despooling. If *Immediate Despooling* was enabled, the job has probably begun printing. When it's finished, Server closes the spool file and deletes it from the spool directory.

If the application misbehaves and leaves the print file open, Server has no way of knowing that the application has finished printing. The print job will stick in the spool queue like a marble in a garden hose until the user shuts down the application. When that happens, DOS closes the standard I/O devices and *voilà*, the job begins printing.

*NOTE: You've heard this complaint before. "I'm running Lotus 1-2-3 and Lotus says the print job's finished but the Laserjet doesn't start spitting out paper until I exit the program."*

This is a common situation so the network has a way to respond when an application doesn't do its job correctly. When Redirector sends off a network print job, it monitors the progress of the job. If nothing happens for a specified period, Redirector forces the print file closed. This signals server that the job has finished so despooling can commence.

This feature is called LPT TIMEOUT. **The default setting for this parameter is 0 (disabled.)** The 10 seconds you typically see when running NET SHOW comes from the NET LPT TIMEOUT statement in the STARTNET.BAT file.

*NOTE: Users who move the network drivers to the AUTOEXEC.BAT so MEMMAKER will see them often miss this line. Suddenly they notice their print jobs aren't coming out anymore.*

Sometimes the cure is worse than the disease, though. Often applications like databases and accounting packages spend a long time calculating their output as they print. If the application waits longer than 10 seconds (or whatever the setting for LPT TIMEOUT), Redirector will close the job.

When the program completes its calculations and starts sending data again, server will assume it's a new print job and start up a separate spool queue. But what if server had other print jobs in the queue already? Why, she'll start them printing, of course.

*NOTE: Complaint number two: Every week when we close the books and print the financial statements, we get letters from the receptionist and graphics from the art department mixed in with the print job.*

You could disable timeout (NET LPT TIMEOUT 0) but that puts you back at the pitcher's mound with print jobs that hang the output file. Increasing the timeout to accommodate the longest pause is a better solution. If the longish delay in starting the print job is irritating, make a batch file for that long report to temporarily increase or disable LPT TIMEOUT.

The next few steps will demonstrate how LPT TIMEOUT works. We'll use DOS's Print-Screen to simulate a poorly behaved application.

1. At PRNCLIENT, run NET SHOW. Find the line that says *LPT Timeout in seconds: 10*. The default setting for this parameter is 0, but Install placed a NET LPT TIMEOUT line in the STARTNET.BAT file changing it to 10.
2. At the command prompt, enter the statement NET LPT TIMEOUT 30. Now run NET SHOW again. Note that the timeout is now 30 seconds.

*NOTE: Remember, it's the LPT TIMEOUT setting on the **workstation** that determines the time delay, not the server.*

3. At PRNCLIENT, change to the LANTASTI directory. Verify that the printer is turned on and on-line. Use NET SHOW at PRNCLIENT to verify that LPT1 is redirected to \PRNSERVER\@MATRIX.
4. At PRNCLIENT, run NET and select *View Print Jobs* then select PRNSERVER from the server list.
5. Tap the *Print Screen* key. Note that printing does not begin immediately.
6. Tap the spacebar. Note that the job does not appear. The spool file is still open so Server has no way of knowing it exists.
7. Wait for the timeout to occur. When it does, you will hear a beep and the job will begin printing. Tap the space bar to catch the job in the queue.
8. At PRNCLIENT, escape out to the command prompt. Enter NET LPT TIMEOUT 0. This disables the LPT TIMEOUT feature.
9. Run NET, select *View Print Jobs* then pick PRNSERVER from the server list. Tap the *Print Screen* key again. Wait for a full minute. Note that the job does not print. Don't touch any keys.
10. At PRNSERVER, use NET SHOW to verify that LPT1 is redirected to PRNSERVER\@MATRIX. (Remember, a server must NET USE its own printer port.)
11. At PRNSERVER, from the root directory, enter DIR > PRN. This will direct the output of DIR to the PRN device.
12. Note that the job begins printing immediately. DOS is well-behaved. It closes the device when it's done. This demonstrates that an open file caused by an unterminated print stream from another machine will not prevent the queue from taking other print jobs.
13. At PRNCLIENT, press *Escape* to get out of NET. Note that the print screen now begins to print. This is because DOS closed any open file when it exited the program.
14. At PRNCLIENT, go to the DOS directory. Find a README.TXT file. It's about 60K in size. If you do not have this file, find another ASCII text file of the same size or larger.
15. Verify the printer is on-line and no jobs are in the print queue.

*NOTE* The next step involves looking for a time delay that only lasts a few seconds. Please read the step carefully before performing it.

16. From the command line, type  
COPY README.TXT+README.TXT+README.TXT+README.TXT PRN.  
Press *Enter*. Note that all four files finish copying before the printer starts working.
17. Turn off the printer. No reason to waste paper.
18. Run NET at PRNCLIENT then select *View Print Jobs* then select PRNSERVER from the server list.
19. Press *F7-Printers*. Select *LPT1* then *Halt the queue*.
20. Escape back to the VIEW JOBS screen.
21. Select the highlighted print job.
22. From the popup menu, select *Delete*. NET removes The job from the queue.

*NOTE:* This is the only effective method for deleting a despooling print job. Remember that the job is really an open DOS file and can't be directly deleted.

23. Press *F7-Printers* and select *LPT1* then *Restart the queue*. Escape out to the command prompt.
24. Turn the printer on. A few characters may spill out depending on what was in the print buffer.

Leave the computers and printer in their current configuration and proceed to the next section.

## **Demonstrating Effects of Immediate Despool**

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A common complaint aimed at Server's print spooler is the long delay before a job begins printing.

*Immediate Despool* solves this complaint. It begins despooling the job as it's spooling. It also gives the print job priority access to the queue. If the job goes idle for some reason, the *Despool Timeout* feature prevents it from blocking the queue by forcing the despool file closed and rescheduling the job for normal despool.

As you are about to see, it is important to set this time higher than the setting for LPT Timeout. Here's why. Server keeps track of the spool and despool progress with two pointers. It's important that these two pointers don't touch. If they do, Server will have nothing to print and it will get confused.

1. At PRNSERVER, run NET\_MGR and select *Server Startup Parameters*.
2. Select *Printing* then set *Immediate Despooling* to ENABLED.

3. Escape twice to the MAIN MENU then select *Shared Resources Management*.
4. Select the @MATRIX resource. The DETAIL screen appears.
5. Select *Immediate Despool*. The status will toggle to *Enabled*. Note that the *Despool Timeout* changes to 30 seconds. Leave it at this setting and escape out to the command prompt.
6. Remove Server from memory then reload it.
7. At PRNCLIENT, type  
COPY README.TXT+README.TXT+README.TXT+README.TXT PRN.  
Press enter. Note that the printer starts up before all the files finish copying. This demonstrates that Immediate Despool works.
8. Turn off the printer and delete the job from the queue. Don't forget to restart the queue when you're done.
9. At PRNSERVER, run NET\_MGR and select *Shared Resources Management*.
10. Select the @MATRIX resource.
11. Set the *Despool Timeout* for 1 second.
12. Escape back to the command prompt. Remove server from memory then reload it.
13. At PRNCLIENT, enter the following at the command line:  

```
NET LPT TIMEOUT 10
```
14. run NET SHOW and verify that LPT1 is still redirected to PRNSERVER\@MATRIX and that LPT TIMEOUT is set for 10 seconds.
15. Tap the Print Screen key. Watch the printer. It will start to print right away thanks to immediate despooling. But watch what happens when it reaches line 25. Note the TIMEOUT message. Then the screen prints again.

*NOTE This sequence of events happens because the job did not close until LPT TIMEOUT forced it closed, but by then Immediate Despool Timeout had already sensed that the job was idle and rescheduled it.*

*Proceed to the next section.*

## Using Remote Print Server (RPS)

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Normally a machine must be a full-fledged server to act as a network printer resource. Floppy workstations or remote boot workstations have no room for a control directory big enough to spool most print jobs.

LANTastic version 5.0 introduced Remote Print Despooling RPD feature. This permits a workstation to despool a job from a server's print queue. We will not demonstrate RPD in this workbook.

LANTastic version 6.0 improved on RPD with a new program, Remote Print Server (RPS.) RPS is more robust than RPD and is the preferable alternative.

In virtually all cases, a machine with a hard drive should be configured as a server rather than use RPS. This will maximize printing performance.

1. At PRNSERVER, run NET\_MGR and select *Shared Resources Management*.
2. Tap *Ins* to add a resource. When prompted, give the resource a name of @REMOTE.
3. When prompted by the popup list, select *Remote*.
4. Escape back to the MAIN MENU and select *Server Startup Parameters*.
5. Select *Printing* then select *RPS Support* to enable the feature.

*NOTE* One of the most common reasons that customers can't get RPS to work is neglecting to enable RPS Support.

6. Escape back to the main Net Manager menu and select *Wildcard Account Management*.
7. Press *Enter* on the asterisk account. The ACCOUNT INFORMATION screen appears.
8. Highlight *Privileges* then press *D* to set the *Despool* privilege.

*NOTE:* If you have individual accounts rather than a wildcard, things get a little confusing. RPS can use a name that's different than the machine name. The *Despool* privilege must be set for the account used by RPS.

9. Escape back to the command prompt. Remove and reinstall Server.
10. At machine PRNCLIENT, edit the STARTNET.BAT file and remark out the SERVER line. Also verify that machine PRNCLIENT will log into server PRNSERVER automatically.
11. Reboot machine PRNCLIENT. Verify that the network drivers load and that Server does not load.

*NOTE:* RPS will not install over SERVER.

12. From the LANTASTI directory, enter the following line:

```
RPS USERNAME=PRNCLIENT
```

You can also specify a password on this line if the account has a password.

13. When you press *Enter*, the RPS program loads. You're not done yet, though. The program needs to know what local port to use and what server resource to despool from.

14. Enter the following at the command line:

```
RPS DEVICE_NAME=anything PORT=LPT1
```

The device name can be any bogus name.

The port must point at the port on the workstation where the printer is connected. If the printer were connected to the second com port, this switch would read PORT=COM2.

15. The following information is displayed:

```
CONFIGURATION COMMAND...
Printer port LPT1 assigned to ANYNAME
Printer tasks allocated: 1
Printer tasks available: 0
Resources allocated: 1
Resources available: 1
----- Remote Printer Server was NOT installed now -----
```

16. Don't get concerned about the warning line. RPS is already loaded, so it gives this message. The command still took effect as long as you didn't get an error message stating otherwise. All configuration commands given after the first load of RPS will result in this error.

17. Enter the following at the command line:

```
RPS ATTACH LPT1:\\PRNSERVER\\@REMOTE
```

18. There is no space between the colon and the double-backslash.

19. The following information is displayed:

```
ATTACH/DETACH COMMAND...
Printer tasks allocated: 1
Printer tasks available: 0
Resources allocated: 1
Resources available: 0
----- Remote Printer Server was NOT installed now -----
```

This third command completes the RPS configuration.

*NOTE This workstation will poll the despool server every 60 seconds to see if there's a print job waiting. If the print job is sent by the user just after that polling, it may take upwards of a full minute for the job to print.*

20. At server PRNSERVER, redirect the LPT2 port to the @REMOTE resource.
21. Copy the AUTOEXEC.BAT file to LPT2. You should get the notification "1 file copied."
22. Run NET and select *View Print Jobs*. Your job should be waiting in the queue.
23. Wait patiently. Eventually the job will print.

This is the end of this exercise. Please straighten up the computer lab and return all materials to the Learning Resource Center.

# **Network Printing With LANtastic**

**Training Workbook  
Module NOS02  
Revision 5  
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