Power Macintosh DOS Compatibility Card & LAN Manager (5/96)

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TOPIC ---

I have several Power Macintosh computers with DOS Compatibility cards at a site where LAN Manager is used for networking our PCs. I realize that there is currently only an ODI driver for built-in Ethernet available, but I'm trying to find a way to make NDIS-based LAN Manager work.

I came across some information which recommends installing Novell Netware client software on the DOS Compatibility Card, but I do not know how to get it to work. What can I do?

DISCUSSION ---

First, Apple does not support any protocols other than TCP/IP and IPX on the Apple DOS Compatible Card.

In a DOS PC environment, there are typically two standards by which network protocol stacks can access network interface cards, NDIS and ODI. The current release of the Apple DOS Compatibility Card software (v1.0.3) ships only with MACODI, an ODI compliant driver that lets the DOS Compatibility Card run PC network software over the Power Macintosh 6100 computer's built-in Ethernet. Since the DOS Compatibility Card does not have an NDIS driver, it has not been obvious how to run network clients that cannot directly operate with ODI drivers. Microsoft LAN Manager is one such system, LAN Manager is NOT supported by Apple. It is possible to run LAN Manager over MACODI on the DOS Compatibility Card. There may be two ways for you to do this, though to date we have had success with only one. It may be possible to run other NDIS-based PC software on the DOS Compatibility Card using these methods. We want to stress that both methods require a user to run additional client software that they are not running now.

Solution #1: ODINSUP

One way we have been able to solve this problem is with Novell's ODINSUP adapter, which provides NDIS support over ODI drivers. This adapter, or shim, has been around for a while. This shim intercepts calls from NDIS and re-routes them through an ODI driver. By installing the Novell Link Support Layer, the MACODI driver, and ODINSUP we have successfully run LAN Manager v2.2 on the DOS Compatibility Card.

We have had success with either the older, or newer versions of Novell's client software. The current versions are available on Novell's Internet server (ftp.novell.com) in the NetWire section. We have used LSL.COM v2.05 and ODINSUP 1.22 running on DOS 6.22 and Windows 3.11. We have also had success using LSL v2.12 and ODINSUP v2.0 together without problems.

Below are the installation steps we followed:

1) Install DOS 6.22 & video drivers.
2) Install Windows 3.11.
3) Install Apple DOS Compatibility Card software.
4) Install SoundBlaster software.
5) Create NOVELL directory and copy the LSL.COM, MACODI.COM, ODINSUP.COM; created NET.CFG as shown below.
6) Install LAN Manager 2.2a with LMSETUP. Pick a driver like NE2000 when the installer prompts you, then edit LAN Manager's .INI files replacing NE2000 with MACODI. The LAN Manager installer won't show you MACODI since it's looking for NDIS drivers.
7) Edit AUTOEXEC.BAT, CONFIG.SYS, and NET.CFG as shown below.

Since this solution requires some pieces of Novell's Netware client for DOS, it is not an ideal solution, however, it does not use much memory and it's inexpensive. If the user has any Novell servers at their site, they already have a license to use the required client pieces. If they don't, Novell will sell a site-wide license to use the Netware client by calling 1-800-UPDATE1.

NOTE: You do not need to load Novell's NETX (Netware 3.x clients) or VLM (4.x clients) to use ODINSUP.

We have also used ODINSUP and LAN Manager to run a DOS NDIS TCP packet driver that the DOS version of NCSA Telnet uses.

Solution #2: Windows for Workgroups v3.11

We haven't tried this approach, but it appears Windows for Workgroups version 3.11 includes an adapter that's similar to ODINSUP, called ODIHLP.EXE. Chapter 8 of the Windows for Workgroups v3.11 Resource Kit goes into details about this approach in the section entitled "Configuring Windows for Workgroups with Novell Netware", which begins on Page 8-9. You should be able to skip installing the Windows for Workgroups applications like Mail, Schedule, and so on and use the Network setup part of the installer to get the software you need.

Simultaneous TCP/IP in DOS and Mac OS

The Apple DOS Compatibility Card introduces one more complication that is easily solved. Since a PowerMac 6100 DOS system is really two computers in one, it is not possible to run the same network protocol stack on the same network adapter, under DOS and Mac OS, at the same time. It is, however, possible to run two completely different protocol stacks at the same time, which is very useful. For example, a customer mounts an HP series 800 HP-UX server from their PCs via LAN Manager/X using TCP/IP, but accesses the same server from their Macintosh computers using an AppleTalk-based Xinet server package that runs on the same

host. Since the DOS Compatibility Card is using TCP/IP, and Mac OS is using AppleTalk, there's no problem with simultaneous access to the file server from both sides at the same time.

However, the customer also runs NCSA Telnet on both DOS and Mac OS. Normally, this would not be possible simultaneously. While few people will want or need to run Telnet on DOS and Mac OS at the same time, planning problems (common in computer labs or computer classrooms) can easily lead to that result. For example, user A walks up, starts using the DOS card which connects to the LAN Manager server via TCP/IP, then leaves. User B walks up, switches back to Mac OS and tries to start NCSA Telnet. Since the PC is still connected to the LAN Manager server via TCP/IP, problems will occur if the user doesn't shut down the PC before starting the Mac NCSA Telnet. User B is trying to run two TCP/IP stacks on the same network card at the same time. The best solution allows a user to walk up to any Power Macintosh, and switch to DOS or to Mac OS without worrying about the state of the machine from the last user and without the need to shut down the PC. If the DOS PC is always using TCP/IP, via LAN Manager, for file server access, any attempt to use MacTCP-based Macintosh applications will cause file server access problems on the PC.

An excellent solution, which avoids the need to shut down the PC, is using the Apple IP Gateway software to provide MacTCP services under Mac OS via AppleTalk. In this scenario, MacTCP wraps TCP/IP packets within AppleTalk packets and sends the AppleTalk packets to the gateway. The gateway strips off the AppleTalk wrapper and sends the TCP/IP packets to the appropriate address. This solution does require both "machines", Macintosh and DOS Compatibility Card, to have their own TCP/IP addresses. The Apple IP Gateway and MacTCP can be configured so the addresses are assigned manually or dynamically from an allowable range. Setting up MacTCP to use the gateway is simple: open MacTCP, select the "Ethertalk" icon, and use the pop-up menu to choose the zone containing your IP Gateway. Using the Apple IP Gateway provides a complete, stateless solution that does not affect network administration of the PC side and does not require any changes in TCP/IP applications on the Macintosh side since the AppleTalk-IP encapsulation is handled transparently by MacTCP.

Further Reading

For more information the following may be helpful:

- Novell Netware Workstation for DOS and Windows (Part 100-001623-001)
- Microsoft LAN Manager Installation and Configuration Guide (Part 24945)
- Windows 3.11 Resource Kit (from a book store or computer store)
- Windows for Workgroups 3.11 Resource Kit (from a book store or computer store)

Edited: AUTOEXEC.BAT, CONFIG.SYS, NET.CFG, PROTOCOL.INI, and LANMAN.INI
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AUTOEXEC.BAT

```
@ECHO OFF
```

```
SET SOUND=C:\SB16
SET BLASTER=A220 I5 D1 H1 T6
C:\SB16\MIXERSET /P /Q

PROMPT $p$g
PATH C:\WINDOWS;C:\DOS;C:\NOVELL;C:\;C:\APPLE;C:\LOCAL\BIN
SET TEMP=C:\DOS
SET TMP=C:\TEMP

REM Do we really need this for ODINSUP??
REM
LH SETVER C:\DOS NETX.EXE 6.00 > NUL:

REM The following server may be necessary under DOS 6.22...
REM see the LANMAN v2.2b README.TXT.
REM
LH SETVER C:\DOS NETWKSTA.EXE 6.00 > NUL:
VER

REM
REM The following allow the "MacDOS card" run LAN Manager over its
REM ODI driver (MACODI.COM)...
REM
CD \NOVELL
LH LSL
LH MACODI
LH ODINSUP
CD \

@REM == LANMAN 2.2a == DO NOT MODIFY BETWEEN THESE LINES == LANMAN 2.2a =
SET PATH=C:\LANMAN.DOS\NETPROG;%PATH%
C:\LANMAN.DOS\DRIVERS\PROTOCOL\tcpip\umb.com
NET START WORKSTATION
LOAD TCPIP
SOCKETS
DNR
@REM == LANMAN 2.2a == DO NOT MODIFY BETWEEN THESE LINES == LANMAN 2.2a =

REM Load Windows packet driver...
REM
LH WINPKT 0x60

REM Connect to UMD server...
REM
NET LOGON lmguest ""

REM CALL C:\ACSUPWIN.BAT

C:\DOS\SMARTDRV.EXE /X

REM Load "MacDOS card" pieces...
REM
LH C:\Apple\ApplePC
```

```
REM LH C:\Apple\MacShare
REM LH C:\DOS\MSCDEX /D:CDDRVR /L:E
REM LH C:\Apple\DOSClip

CD \WINDOWS
WIN
```

REMARKS: The order in which the networking pieces load is important: LSL must come first, then MACODI, then ODINSUP. For LAN Mgr v2.2, you don't appear to need to run NETBIND; NET START WORKSTATION seems to take care of that. There was a remark in Microsoft's LAN Manager documentation that you want to run NETBIND early, so I assume that means NET START should happen fairly early, too. This AUTOEXEC is for a customer who's using MS TCP/IP in LAN Manager. This also loads a TCP driver for NCSA Telnet. MacShare and DOSClip were disabled to leave memory for other things. We didn't spend any time optimizing the use of memory under DOS.

CONFIG.SYS

```
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\DOS\HIMEM.SYS /TESTMEM:OFF
REM If you are using PC Setup 1.0.7, the lines are:
REM DEVICE=C:\DOS\EMM386.EXE NOEMS X=C800-CFFF RAM=D000-EFFF
REM or
REM DEVICE=C:\DOS\EMM386.EXE X=C800-CFFF RAM=D000-EFFF
REM
REM For PC Setup 1.5, the command lines are:
REM DEVICE=C:\DOS\EMM386.EXE NOEMS I=CA00-CBFF X=CC00-CFFF RAM=D000-EFFF
REM or
REM DEVICE=C:\DOS\EMM386.EXE I=CA00-CBFF X=CC00-CFFF RAM=D000-EFFF
REM
DEVICE=C:\DOS\EMM386.EXE I=CA00-CBFF X=CC00-CFFF RAM=D000-EFFF
DOS=HIGH,UMB
FILES=60
BUFFERS=40
LASTDRIVE=Z
STACKS=9,256

DEVICE=C:\LANMAN.DOS\DRIVERS\PROTMAN\PROTMAN.DOS /i:C:\LANMAN.DOS
DEVICE=C:\LANMAN.DOS\DRIVERS\PROTOCOL\tcpip\tcpdrv.dos /i:C:\LANMAN.DOS
DEVICE=C:\LANMAN.DOS\DRIVERS\PROTOCOL\tcpip\nemm.dos
DEVICEHIGH=C:\LANMAN.DOS\DRIVERS\DIS_PKT.DOS

DEVICE=C:\Apple\CDROM.SYS /D:CDDRVR
```

NET.CFG

```
link driver macodi
     frame ethernet_II
     frame ethernet_802.3
     frame ethernet_802.2
```

```
     frame ethernet_snap
     protocol IP 800 ethernet_II
     protocol arp 806 ethernet_II
     port 300
     int 6

protocol odinsup
     bind macodi
     buffered
```

Remarks: The "buffered" keyword is important; see the attached document on ODINSUP for more info.Note that NET.CFG is only used for basic configuration; all of the protocol configuration still happens within LAN Manager. Drop the DIS_PKT.DOS if you're only interested in LAN Manager. Again, we didn't spend any time optimizing the use of memory under DOS. Any suggestions would be appreciated.

PROTOCOL.INI

```
------------
[PROTMAN]
DRIVERNAME = PROTMAN$
DYNAMIC = YES
PRIORITY = NETBEUI

[TCPIP_XIF]

DRIVERNAME      = TCPIP$
IPADDRESS0 = 130 219 034 200
SUBNETMASK0 = 255 255 255 000
DEFAULTGATEWAY0 = 130 219 034 001
NBSESSIONS = 11
; the following two parameters added after documentation was completed
TCPSEGMENTSIZE  = 1450
TCPWINDOWSIZE   = 1450
LOAD            = tcptsr[c],tinyrfc[c],emsbfr[cr]
UNLOAD          = "unloadt /notsr[dc]"
BINDINGS = "macodi"
LANABASE = 0

;[NE2000_NIF]

; protocol.ini section for the Novell NE2000 Card

;    IOBASE = 0x300
;    INTERRUPT = 3
;    DRIVERNAME = MS2000$
```

Remarks: Note the NE2000 section has been commented out and BINDINGS was changed from NE2000 to MACODI.

LANMAN.INI

```
----------
;*****************************************************************;
;**             Microsoft LAN Manager                           **;
;**        Copyright(c) Microsoft Corp., 1993                   **;
;*****************************************************************;
[networks]
netservices = chknet, minses

[workstation]
wrkservices = encrypt,messenger,minipop
computername = acsn200
domain = STANDALONE
othdomains = langroup
numdgrambuf = 3
lanroot = C:\LANMAN.DOS

[netshell]
username = lmguest

[version]
lan_manager = 2.2b

[messenger]

[services]
chknet        = netprog\chknet.exe
minses        = netprog\minses.exe /n
workstation   = netprog\netwksta.exe
messenger     = services\msrv.exe
netpopup      = services\netpopup.exe
encrypt       = services\encrypt.exe
minipop       = services\minipop.exe
```

Remarks: By setting domain to STANDALONE and othrdomain to the customer's domain name, we made a significant difference in LAN Manager performance.

Article Change History:
23 May 1996 - Added New PC Setup CONFIG.SYS Information.
19 Apr 1995 - Corrected INT setting.
30 Mar 1995 - Corrected name of Mac OS.

Support Information Services

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