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Confidential Novell Labs Memo

To: Dave Owen
From: J.D. Brisk
Prepared by: Craig Lewin
Date: 22 October 1992
Subject: Report on Windows for Workgroup

Copies
- Richard Deane
- John Linney

The following report describes the Windows for Workgroups (WFW) test process.

Task Groups

4 groups spent approximately 325 man hours testing the WFW product over a 1 1/2 day period. One group focused on LAN driver and related issues and consisted of David Lye, Mike Hall, Mike Opsitnik, and Thayne Hillstedt. Another group targeted utility issues and consisted of Bryan Barney, Susan Moran, Val Adams, and Lyle Bates. The final test group handled NetWare 4.0 and DR DOS issues and claimed Richard Butler, Mark Christensen, and Eric Hazzelet as members. Team support was provided by Dave Owen, Dan Cole, JD Brisk, and Craig Lewin.

The first day each of 12 issues identified by executive staff were divided up between these groups as follows:

LAN Driver group

- IPX is being used in a way not supported by Novell
- WFW does not use ODI drivers and will not be compatible with ODI based products
- Customers forced to use NDIS drivers
- WFW doesn't read the NET.CFG file
- WFW doesn't correctly identify existing driver configurations
- WFW doesn't work with Packet Burst protocol (BNETX)

Utilities Group

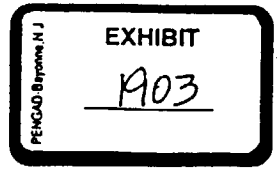
- NetWare utilities (XCOPY) and NWTools may be broken
- XCopy seems not to work
- SPX based programs seem to fail
- New Signature enhancements to NetWare 3.11 may not work

Miscellaneous Group

- NetWare 4.0 Issues
- DR DOS 6.0 Issues

A summary of the first day test results was produced in a memo to Dave Owen. In short, most of the areas failed or performed as expected.

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Lan Driver, Protocol, Connection Issues

Driver Configuration

When using the default setup from the WFW on a machine with two Lan cards (Token and Ether), the setup incorrectly installed the ethernet adapter even though the network was attached to the Token Ring adapter. After configuring the Token Ring adapter during the setup as per the instructions, the WS initialized the ethernet adapter and then 'hung' when it couldn't find a fileserver.

To correct this problem it was necessary to eliminate the network directory that had the specific files for that workstation as well as deleting the CONFIG.SYS and AUTOEXEC.BAT and other pertinent files on the workstation, starting setup again and eliminating the Ethernet adapter and selecting only the Token Ring adapter.

ARCNET drivers are not supported with NetWare under WFW. The supplied ARCNET drivers do not support IPX. While ARCNET is supported under WFW, Novell ARCNET users will be unable to use it.

When more than one NE2000 driver was added to the configuration the workstation would not boot. The ODI capability to run with multiple cards is not available with WFW.

Other Driver Issues

WFW does not provide drivers for the many LAN cards supported under NetWare including Novell/Anthem NE232 or NE3200. All NetWare customers using those products will be forced to change to another LAN card to run WFW.

The driver provided by WFW for the Novell/Anthem NE1500T and NE2100 is based on the AMD AM2100 (LANCE) Ethernet Adapter driver. MSIPX would not load after this driver was installed. The Driver appears to be incompatible with these boards. Users of the Novell/Anthem NE2100 and NE1500T will be forced to change to another board to run WFW.

The Novell/Anthem NE2000 and NE2 use the same generic driver. Under NetWare each LAN card has its own unique driver. This may not be a problem for dedicated IPX drivers under WFW.

VIPX and VNetWare

VNetWare386 is used when accessing NetWare, such as creating and removing files and directories on NetWare volumes. VIPX386 is a program which handles multiple IPX windows sessions. It is not used unless multiple windows sessions that require IPX connections to the network are open. When WFW is using peer-to-peer functionality it uses the NETBEUI transport protocol. WFW does not use either VIPX or VNETWARE when using peer-to-peer functionality.

NETBEUI (NETBIOS) is the WFW peer to peer transport protocol. Bill Alexander (Novell programmer) indicated that the Microsoft requested 3 or 4 weeks ago that enhancements to our NETBIOS be done. Bill said that adding these enhancements was a low priority because of the current goal to write a 32 bit NETBIOS emulator. The enhancements reported to Bill were the same as those reported to John Edwards by Tony Audino (Microsoft) in the October 18, 1992 letter.

PROTOCOLINI vs NET.CFG

The PROTOCOLINI file takes on the driver configuration functions and ignores the NET.CFG. The NET.CFG functions that are supported in NETX.COM are uncharged. This eliminates the ability to support multiple frames and any of the ODI features. Their drivers do not support these features either.

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ODINSUP Workaround

Using ODINSUP allowed stations to be brought up with Novell ODI workstation drivers. Peer to peer communication seemed to work and files were copied between various clients (NDIS to ODI, ODI to ODI, and ODI to NDIS) and the server without problems. WINL21 had previously only been able to run up to 57 iterations. With ODINSUP 4403 iterations were seen. When the workstation did error the server showed a SPX write failure message. "WINL21" tests SPX functionality. If this product Novell already produces can be shown to perform reliably, Novell has an option to allow all the certified Novell and Third Party drivers to be supported under WFW.

The configuration used to make ODI work with the WFW product are listed below:

PROTOCOL.INI

[protman]
DriverName=PROTMAN\$
PRIORITY=MS\$NETBEUI

[MS\$NETBEUI]
DriverName=ndebui\$
SESSIONS=10
NCBS=32
BINDINGS=NE1000
LANABASE=1

[NE1000]
DriverName=NE1000\$
IOBASE=0x800
INTERRUPT=3

NET.CFG

protocol odnsup
bind ne1000
BUFFERED
LINK DRIVER ne1000
frame Ethernet_802.3
frame ethernet_ii
frame ethernet_snap
frame ethernet_802.2
Protocol IPX 0 Ethernet_802.3

CONFIG.SYS

FILES=30
BUFFERS=30
device=C:\WINDOWS\protman.doc
%C:\WINDOWS
device=C:\WINDOWS\workgrp.sys
LASTDRIVE=Z
DEVICE=C:\WINDOWS\HIMEM.SYS
STACKS=9,256

AUTOEXEC.BAT

path C:\WINDOWS\support
C:\WINDOWS\SMARTDRV.EXE
id
ne1000
odnsup
netbind
C:\WINDOWS\net_start
load
netx

Connection Problems

There was difficulty when trying to connect to a portable server, the error message received was 'No connection slots available' no matter how many connection slots were actually available. This problem was never overcome when using MSIPX.

There was difficulty Connecting to a Specific Server. When trying to connect to a server on a backbone with multiple protocols running on that backbone, the preferred server option had to be specified using NETX.COM or no fileserver could be attached to. In this instance there was still a long delay in attaching to the preferred server.

Using Preferred Server option in the NET.CFG we had no problems on either a local or distant server.

Attempts to access a remote shared directory at the same time the remote machine was rebooted resulted in various errors in WFW. Error: "The system is either busy or has become unstable."

Utility, Tools, and Applications Issues

SPX - Printing

Upon realization that SPX products failed, we began to explore some known SPX applications. The area of greatest concern, of course, was printing. Printing relies heavily upon SPX. We put together three configurations to test various scenarios.

The first was the simplest, consisting of 2 systems, a WFW workstation with a printer attached and a 3.11 server. The WFW workstation had a queue attached to the 3.11 print server queue. The WFW workstation issued a print job through the file manager. The job showed up in the NetWare and WFW queues, but disappeared. No job was printed.

The second configuration was with a DOS workstation, running Rprinter, a 3.11 server, and the WFW workstation. A NetWare queue was attached to in WFW Print Manager. A job was issued in WFW, the job showed up in the NetWare and WFW queues and left the queues, but didn't print.

The third configuration had the LPT port captured to the NetWare Print server queue. The WFW print manager had the printer configured to the LPT port. A DOS Rprinter was configured on a workstation, attached to the 3.11 server. This configuration produced print jobs of text and graphics.

We also altered all three configurations by changing the sending station to use the MSIPX drivers, but not local WFW. In all three cases we were able to print. This indicates that there is a problem inside WINDOWS, not necessarily in the MSIPX driver.

After Dave discovered how to make the ODINSUP pieces work we tested the original configurations using ODI drivers. The ODI drivers allowed us to load a print server (P\$SERVER.EXE) inside the WFW and use that to print. In all cases, we could not print to a shared printer by going through a network queue. Network printing from a WFW workstation can only print when using the ODI drivers using LPT1 rather than the WFW queue.

SPX - WIN21 Test

WFW was having problems running SPX intensive applications. Under the normal WFW setup, a program called WIN21 was run as a stress test. The test would run between 0 and 57 times through the test. It was undetermined what was causing the failure other than the file server would occasionally report "SPX write failure". WFW made the write request to the server and the server was not able to service the request. Several errors occurred, 30% of the time the error reported on the workstation was "VSERVER error".

The WFW ND18 protocol was replaced with the Novell ODINSUB shim and the test was repeated. At last count we had gone through over 4800 iterations without error.

Copying Files

Using NCOPY.EXE to copy files from either a Novell directory or a local drive (C drive) to a shared local drive (peer to peer communication) caused a DOS sharing violation error occurs. WFW consistently gave an error when using NCOPY. NCOPY wrote a zero length file when attempting to copy to a REMOTE SHARED DIRECTORY. Loading SHARE.EXE caused NCOPY to fail as well, only it did not write zero length files.

XCOPY (DR DOS and Microsoft) worked correctly in tested cases.

When running FILER.EXE from the File Manager or a DOS BOX it would fail. This is a normal windows limitation because FILER.EXE will not run on a local drive. Windows will cause this error because it defaults to the WINDOWS directory when a DOS session is created. By using proper mappings and changing to a network drive, FILER worked fine.

Attempts to use Filer to copy from a network drive to a REMOTE SHARED DIRECTORY with SHARE.EXE loaded failed with EXTENDED ERROR 53.

With COINSUP configuration and no SHARE.EXE loaded, NCOPY and FILER both passed test cases consistently when copying a single file to a REMOTE SHARED DIRECTORY. Loading SHARE.EXE caused the remote drive to become unshareable.

Other Utility Testing

RENDIR appeared to work fine, but a side effect of changing a shared directory name was that after the directory was renamed it was no longer shared and WFW still looked for the old directory name.

NWTOOLS. The following NWTOOLS passed preliminary acceptance tests including exercise of utility through Program Group box: Map, Printers, Attachments, Userlist, Volume, Setpass, Send, Messages, System, and PConsole.

SEND initially will not send a message since the default setting in WFW is "Disable Incoming Messages" - Until default is changed, workstations cannot receive any messages

PConsole Printed jobs transferred into PCONSOLE's queue and also WFW's Print Manager queue but they do not move into the printer's buffer nor did they ever print out. See information listed above in SPX Printing.

All of the above utilities continued to function in the same manner with the COINSUP shim loaded.

RConsole

Using a v3.11 NetWare server and RCONSOLE files and a totally WFW workstation two sessions of RCONSOLE were loaded and control was switched between the active windows without a problem. This showed that RCONSOLE is functional under WFW. The workstation only had 4 MEG so more sessions could not be loaded.

In a separate test, RCONSOLE was brought up on a 3.11 server using three WFW windows sessions. It ran very slowly, and was unusable. On a third test, RCONSOLE hung after two keystrokes in the third session. A similar test was performed using Windows 3.11 with the same results. RCONSOLE was also tested using SPT III with the same results.

NetWare 4.0, DR DOS 6.0, Performance, and other issues

NetWare 4.0

The IBM machine was used as a WFW client and attached to both a 3.11 and 4.0 server. Bindery emulation was used to attach to the 4.0 server, using LOGIN SUPERVISOR as the login command. Directory Services access is not possible without ODI support.

Files were copied from the 4.0 server to the client using 4.0 version of NCCOPY.

NLIST was used to identify other servers on the network.

DR DOS installations

In no cases were we able to get WFW to run on a system booted with DR DOS 6.0. Installation strips out all DR DOS information from AUTOEXEC.BAT and CONFIG.SYS without warning.

WFW failed to boot with DR DOS 6.0 loaded on the hard drive. The Microsoft Protocol Manager fails to load; it hangs. The workstations booted WFW correctly with the following modifications:

- A. Use a Compaq 3.51 bootable floppy diskette to boot the machines.
- B. Before booting with the diskette, transfer to the floppy diskette the CONFIG.SYS and AUTOEXEC.BAT files that were created on the hard drive during the WFW setup procedure.

No DR DOS users will be able to use this product. Users of DR DOS would be required to switch to MS DOS.

Performance Issues

Through the testing, several cases were noted regarding poor performance from the Windows for Workgroup. The degradation was noticed most often after logging in or attaching to a NetWare file server through the WFW product. The performance was not consistently slow, and attempts to reproduce the poor performance were unsuccessful.

Name Space Issues

MAC files were successfully copied from one directory to another on a 3.11 server. NDIR and DOB OOMP was used to verify the successful copy operation.

A server running name space support including: MAO, FTAM, DOS, and NFS was attached to and MAC files were copied from the server to the local hard drive using NCCOPY. Many files were copied multiple times without incident, also the same copy was completed numerous times without any sharing violations.

Signature/Package Authentication Issues

No compatibility problems were found with NetWare v3.11 Packet Signature Enhancement. All 16 combinations of client/server security settings were tested and nothing abnormal occurred.

With the MSIPX.COM driver loaded, files were copied back and forth across the wire with no problems. All NetWare utilities tested, including menu driven utilities, functioned normally. Tests were conducted with and without Windows loaded. Window's File Manager worked as did NCCOPY from inside the Windows DOS box.

Installation on WS previously loaded with ODI drivers

Setup has detected that your boot configuration uses Novell NetWare ODI network-adapter drivers. Setup will install the NDIS drivers that you select. You will need to manually remove all ODI software when Setup is complete. Express Setup strips out LSL and IPXODI references in AUTOEXEC.BAT without warning.

Final Notes

Much of the testing was performed as high level tests centered around the specific issues given us. More thorough testing is needed before any concrete action is taken.

Representatives should be invited from Microsoft to work with Novell engineers in the testing process.

Other alternatives should be explored (like ODINSUP) as possible enhancements to run with NetWare products.