
PATHWORKS for DOS V4.1a with Windows for Workgroups V3.11 Installation Guide

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Software Versions: PATHWORKS for DOS V4.1, V4.1a
Windows for Workgroups V3.11

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Introduction

This document describes how to integrate Digital Equipment's PATHWORKS™ for DOS V4.1a DECnet protocol stack and applications with Microsoft's Windows for Workgroups V3.11 product so that you may access PATHWORKS DECnet Servers and Microsoft LAN Manager Servers concurrently.

Digital Equipment provides a diskette of software to accomplish this integration. This software is available from Digital Equipment Corporation Software Support or the DECPCI forum on CompuServe. Digital may update and revise this software and document at a later date.

This document explains how to apply this software to combine the two products.

Before you start

Please look over this document in its entirety first. On the next page there is a flow chart explaining the steps you will need to take, depending on your starting situation.

If you have previously installed Windows for Workgroups, you do not need to install it again but you will need to run the Network Setup program (installed as an icon in the Networks Group) after we install PATHWORKS.

You will need to have the PATHWORKS Server with the Client File Services installed and running on the network with a Digital PATHWORKS for DOS Client kit loaded on it. If you have not installed a PATHWORKS Server, you will need to install one first, or use the PATHWORKS for DOS complete client diskette kit.

You will need to know the particulars of your network LAN adapter.

- That is the Memory address,
- I/O address, and
- IRQ number.

You will also need the PATHWORKS V4.1a Windows for Workgroups V3.11 Install diskette.

The software on the diskette can be copied to a directory or file service, but must be available to the system while using Windows for Workgroups Network Setup. The software on this diskette will take care of the details of the protocol integration.

Introduction to Windows for Workgroups

Microsoft's Windows for Workgroups consists primarily of a version of Windows that is network aware and comes with a number of peer-to-peer network applications. The network technology provided by Microsoft is LAN Manager based and contains a NETBIOS LAN transport protocol stack, known as NETBEUI. This protocol is compatible with IBM's PC LAN Network products. Microsoft's NETBEUI implementation is tailored to the Windows environment and runs in the protected mode of Windows, but only when Windows is active.

Windows for Workgroups V3.11 is an update to V3.1, the first release. Significant to the V3.11 release is the addition of protected mode network adapter drivers, which implement NDIS V3.0, and improved multiple network support in the File and Print Managers.

Windows for Workgroups can support network transports other than NETBEUI in three ways:

1. As a "*Primary Network*"
A complete network offering that provides network services of the vendor's specification. If NETBIOS session services are offered, LAN Manager networking can function, but Microsoft's peer-to-peer services will not be installed. PATHWORKS install support is already included in the Windows for Workgroups kit for this option.
2. As a "*Secondary Network*"
A network offering in addition to NETBEUI. Microsoft's peer-to-peer services and utilities will be installed, and can interface to the secondary network using the Winnet interfaces. If the secondary network supports a complete NETBIOS session interface, these Windows for Workgroups services will be operate over the secondary network as well.
3. As a "*Protocol*" under Windows for Workgroups networking
A NETBIOS compatible protocol stack using Microsoft's Windows for Workgroups components to interface the network to the Windows environment. Peer-to-peer services will operate.

This last technique is the integration technique that will be discussed in this document and implemented on the PATHWORKS for DOS V4.1a Install diskette.

Introduction to PATHWORKS

Digital's PATHWORKS for DOS product provides LAN Manager File and Print services primarily using NETBIOS services carried over the DECnet NSP transport and LAN/WAN network protocols.

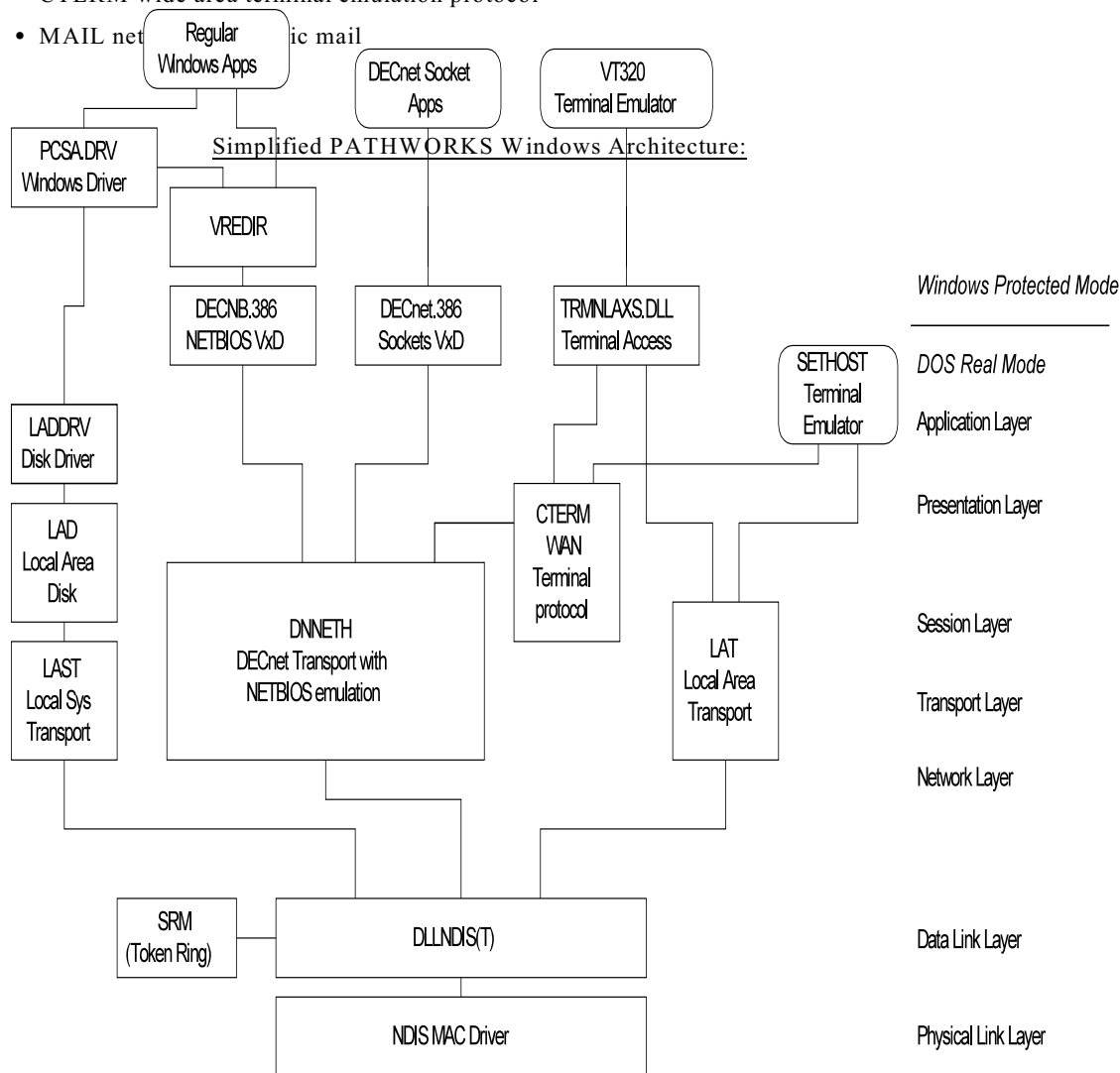
DECnet is a network architecture that spans all seven layers of the ISO network reference model. DECnet supports LAN media (Ethernet, FDDI, Token Ring) and WAN or point-to-point, media (e.g.: asynchronous and synchronous serial, X.25) DECnet provides a multilayer routing infrastructure which allows up to 65,000 nodes in a network. DECnet products are available on most major CPU and Operating systems platforms, including: Alpha AXP, VAX, MIPS, and the Intel i86 family, and the OpenVMS, ULTRIX, OSF/1, SCO-UNIX, MS-DOS, and OS/2 operating systems.

PATHWORKS also contains several other protocols that are used for various purposes:

- LAT (Local Area Transport) provides LAN based terminal emulation
- LAD (Local Area Disk) provides LAN based remote disk services

As well as these, PATHWORKS provides several DECnet peer-to-peer network services such as:

- NFT and FAL file transfer client and server
- CTERM wide area terminal emulation protocol
- MAIL net



Installation Configuration Assumptions

This configuration document and the diskette make the following assumptions about the network configuration

1. Ethernet or Token Ring NDIS configuration
Native DLL, DLC, or ODI driver interfaces are not handled. (Async DECnet is not described here)
2. DECnet Phase IV transport only.
PATHWORKS TCP/IP Add-on is not supported with Windows or Windows for Workgroups. NetWare Coexistence users should use Microsoft's integration tools. The PATHWORKS LANSESS protocol is not supported under Windows or Windows for Workgroups.
3. All File and Print Services will be done with Microsoft's Windows for Workgroups supplied Redirectors, either Real mode or Protected mode.

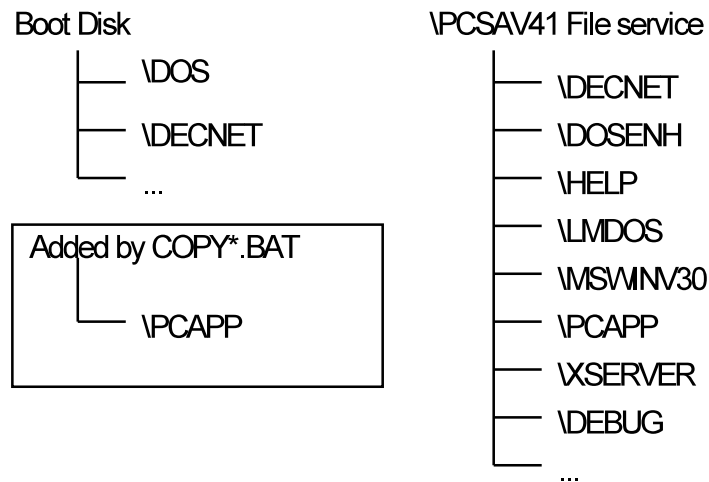
PATHWORKS File Layout Assumptions

Components of PATHWORKS are assumed to be run from a file service, so many programs are not copied to the local disk drive at installation time. Upon normal startup, a *System* file service (\PCSAV41) is connected and entered into the DOS PATH. This presents a problem when protected mode file services are used, as the DOS PATH cannot be altered in a system wide manner once Windows is loaded.

The following work around is provided for some of the PATHWORKS programs:

- COPYDNDR.BAT will copy down some important files to the local system, particularly LAT.EXE and CTERM.EXE, as well as the remaining pieces of NCP.
- COPYWINA.BAT will copy down some of the Windows oriented files (e.g.: *.PIF) and applications from the \MSWINV30 directory, including the VT320.EXE Windows terminal emulator. These files will be placed in a \PCAPP directory on the same disk as \DECNET. Note that not all the files in \MSWINV30 are suitable for the Windows for Workgroups environment.
- COPYDNAP.BAT will copy down most of the basic DECnet related network applications, such as NFT, FAL, Spawner, and DTS, DTR.
- Also provided are:
COPYSETH.BAT to copy down the DOS SETHOST terminal emulator
COPYSED.T.BAT to copy down the SEDT editor
COPYMAIL.BAT to copy down the DECnet mail client

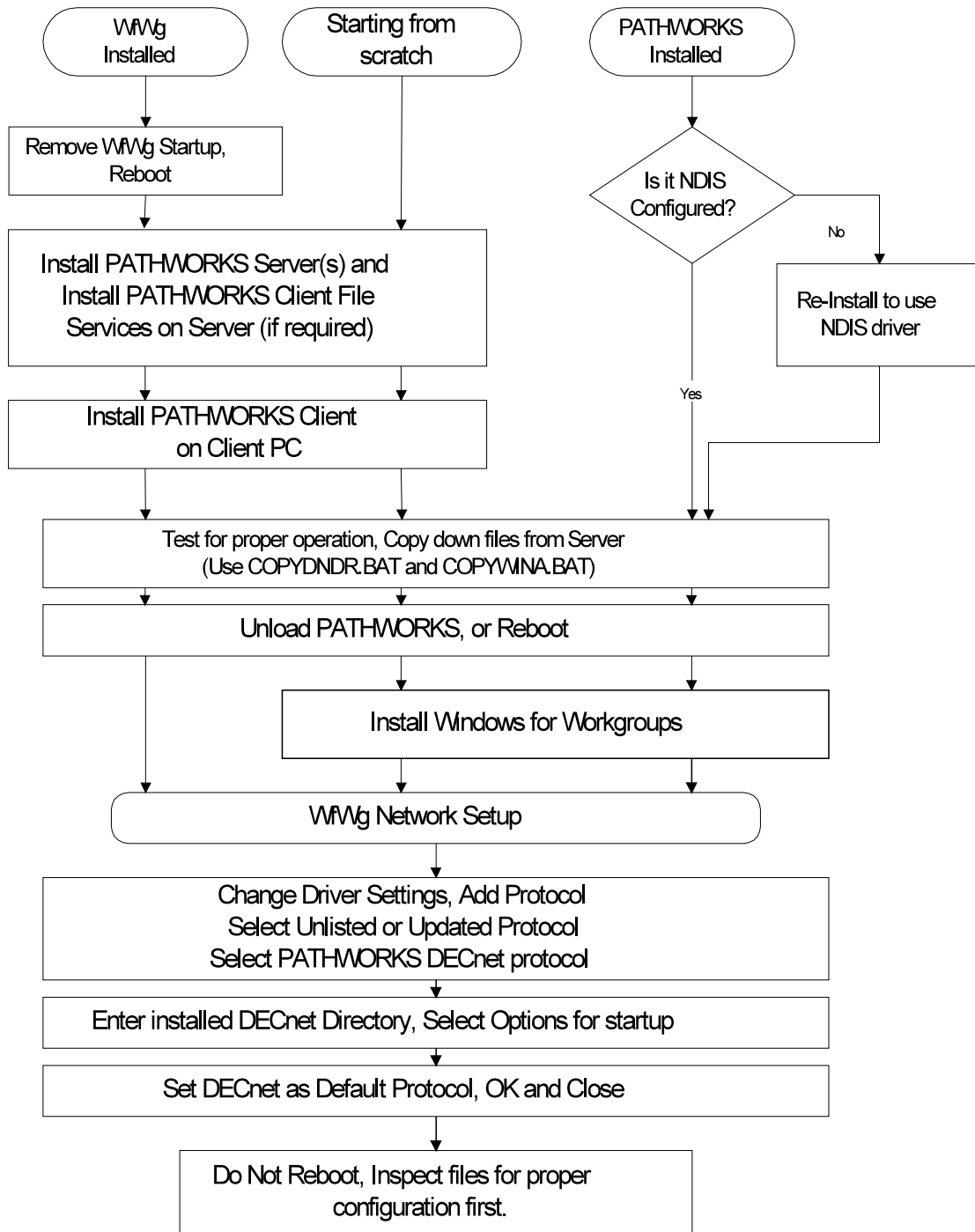
COPYDNDR.BAT and COPYWINA.BAT are strongly recommended. The others are optional.



Installation Process Overview Flowchart

This diagram is an overview of the installation process. Please consult the information in the following sections for details

Starting Situation:



Installation Procedure

Before we can integrate the two networking products, both sets of software must be installed on the system. The best agents to copy and setup the products are the installation tools provided by both. When we have all the programs and configuration files installed, we will use the Windows for Workgroups Network Setup program to activate the PATHWORKS Windows for Workgroups Configuration Utility, which will preform the final integration.

If PATHWORKS has been previously been installed

1. Check to see if you are using an NDIS device driver. You could tell this if DLLNDIS.EXE is in your \DECNET directory and PROTMAN.SYS referenced in your CONFIG.SYS.
2. If not, run NETSETUP again and reconfigure your network adapter to use an NDIS device driver.
3. Skip ahead to installing Windows for Workgroups.

If you already installed WfWg, but not PATHWORKS

1. Before you proceed, you should exit Windows,
2. Remove from your AUTOEXEC.BAT any loading of network components and,
3. Reboot the system.

The Microsoft network components would interfere with the PATHWORKS installation processes which executes at MS-DOS command level.

Install PATHWORKS V4.1a

1. You should consult the PATHWORKS V4.1 documentation and proceed. Typically the File Server systems are installed first. Then client software kits are installed onto the File Server.
2. Then the individual client systems can be configured by management action on the server, or by use of an initial connection kit on the client system itself.

During this final process, the core network software is copied down from the server and configured on the client system's local disk drive.

After PATHWORKS is installed

3. You should test out the configuration to make sure it works and reboot at least once to generate the network permanent databases.
4. Use the COPYDNDR.BAT procedure to copy basic DECnet utilities to your local system disk.
5. Use the COPYWINA.BAT procedure to copy files from the \MSWINV30 directory of the PCSAV41 System file service to your local system disk and put it in the path. This will make these files available when the network is not attached. (see previous section on PATHWORKS File Layout)

Network Setup Operation

Once the PATHWORKS software has been installed and configured, you should

1. Unload it, prevent it from loading at boot time, and reboot the system.

You are less apt to have problems installing Windows for Workgroups on a bare system.

If WfWg has not been previously installed

1. Install Windows for Workgroups now. After copying and configuring the Windows environment, a Network Setup phase will be entered. You can enter this phase at a later time to change the network setup using the Network Setup utility, or by selecting the "Change Network Settings" option inside the Windows Setup utility.

You will have to identify your device to Windows and set the device characteristics.

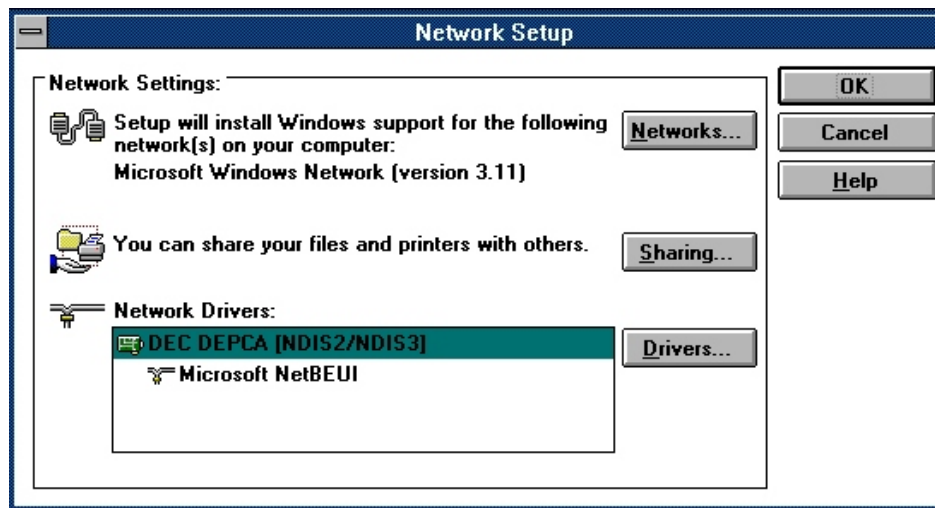
We recommend that you install only Microsoft's NETBEUI transport protocol during the initial pass, then install PATHWORKS DECnet in a second pass, as described below.

If you have already installed Windows for Workgroups

1. Run Windows and
2. Invoke the Network Setup utility.

The dialog windows are mostly the same as during installation. If you have problems invoking Windows in this state, try using WIN /N to suppress network usage by Windows for Workgroups. You will be warned of the unusual condition, but respond to continue.

You should first see the "Network Setup" dialog:



There will be two or three options in the "Network Settings:" frame:

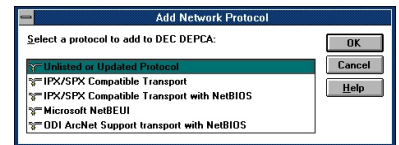
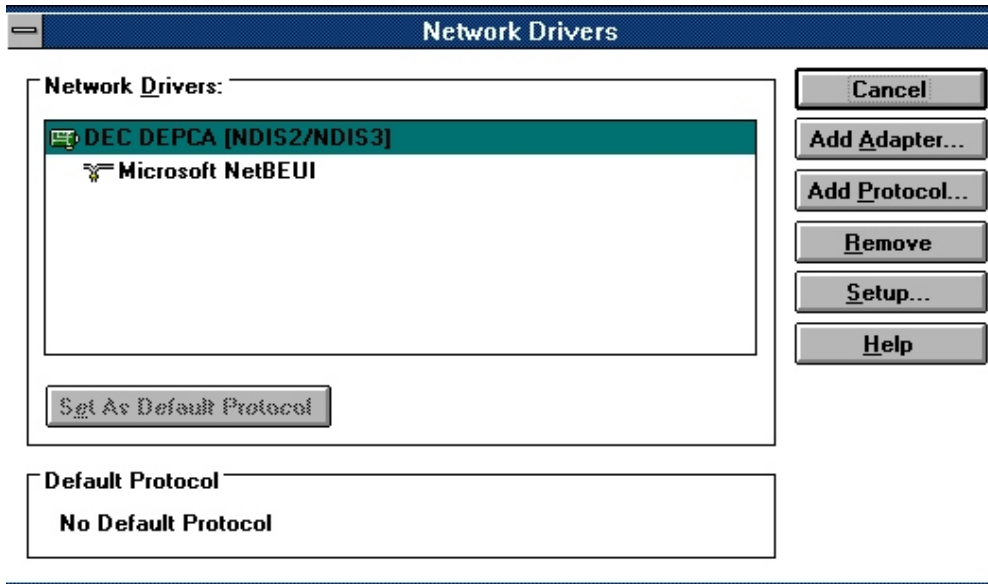
- Networks...
- Sharing...
- Drivers...

If the Drivers option is not shown, pushing the "Advanced" button on the right (not shown here) will make it visible.

Click on the "Drivers..." button and see this next dialog:

Press the "Add Protocol..." button,

At this time you should have your PATHWORKS V4.1 Windows for Workgroups diskette ready.



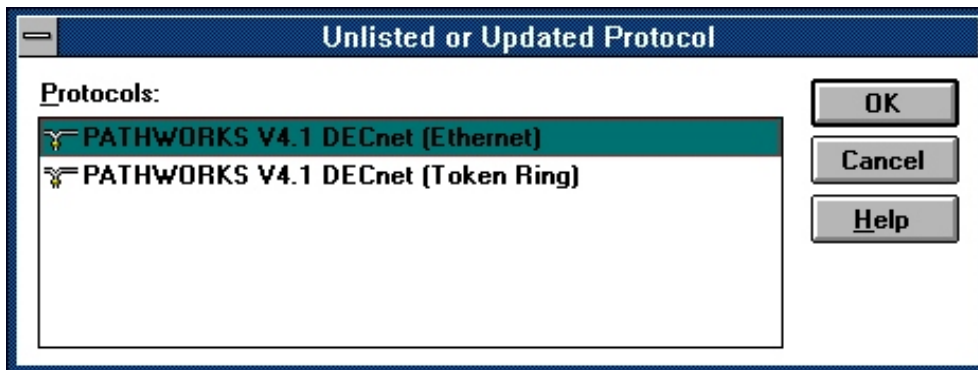
Select "Unlisted or Updated Protocol"

When you press the

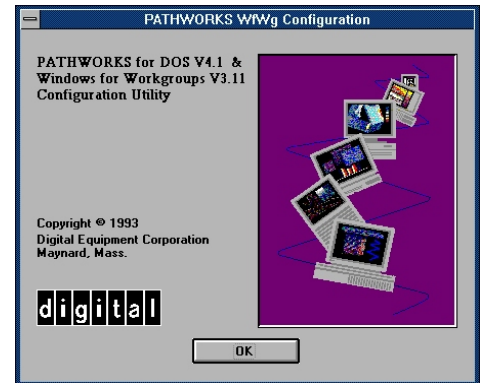
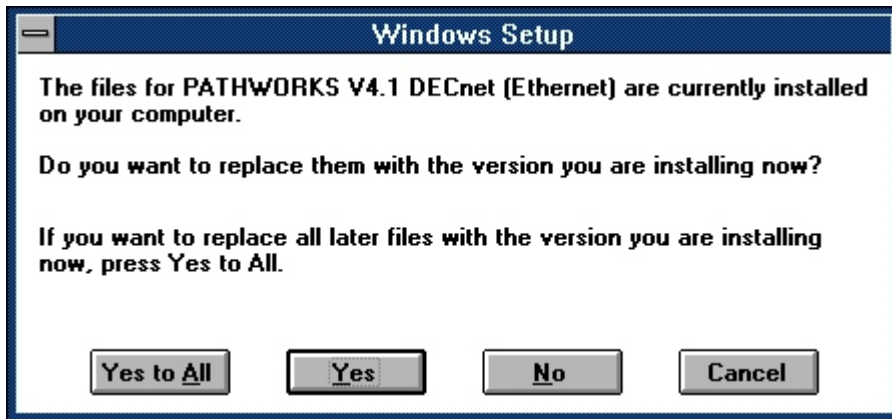
OK button, Network Setup will prompt you for the location of the diskette.

It will then read the diskette and offer you the choice of DECnet protocol types, Select the appropriate one for your system and Press OK

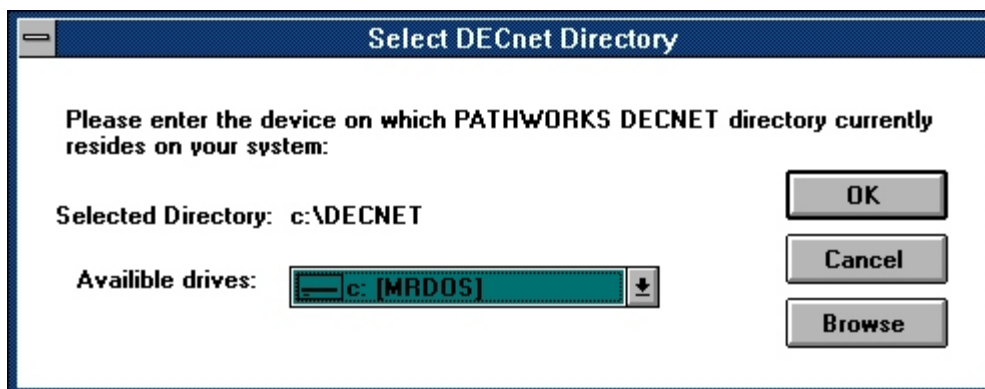
There will be some progress messages showing files being moved on to the system.



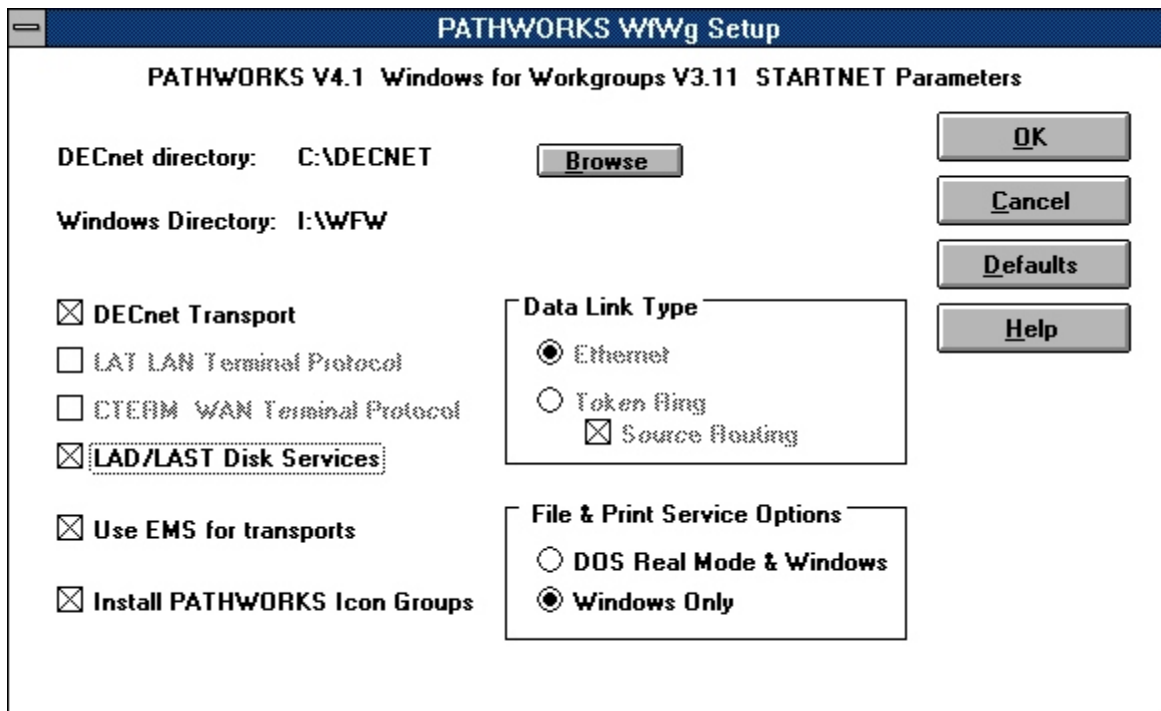
This dialog may appear depending on the state of the files on the system. Respond by clicking "Yes to All".



Next this PATHWORKS graphic window will appear. Press the OK button to proceed

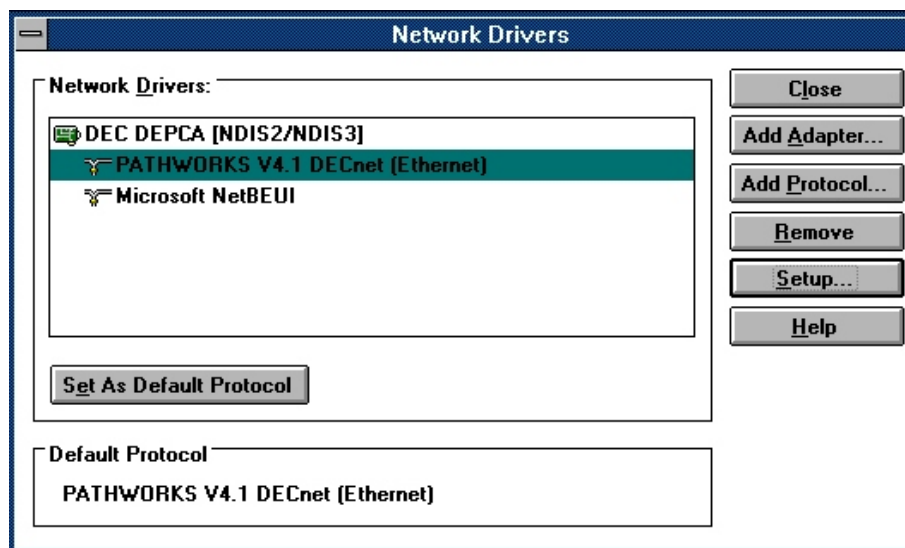


A dialog asking for the DECnet directory will appear. Enter the drive where your DECnet components have been installed.



Next an Options dialog will appear. The settings of the options should reflect our scanning of the STARTNET.BAT file found in your DECnet directory. Some options will be shown in gray, indicating that they have been disabled because the necessary files are not present on your local drive or they are inappropriate for your configuration.

You can change these options at this time. When you press the "OK" button, we will save your choices to an INI file and exit back to the Drivers dialog. DECnet will now be added to the list under the adapter. If you wish to change the options selected, you can press the "Setup" button and the PATHWORKS configuration program will be invoked again.

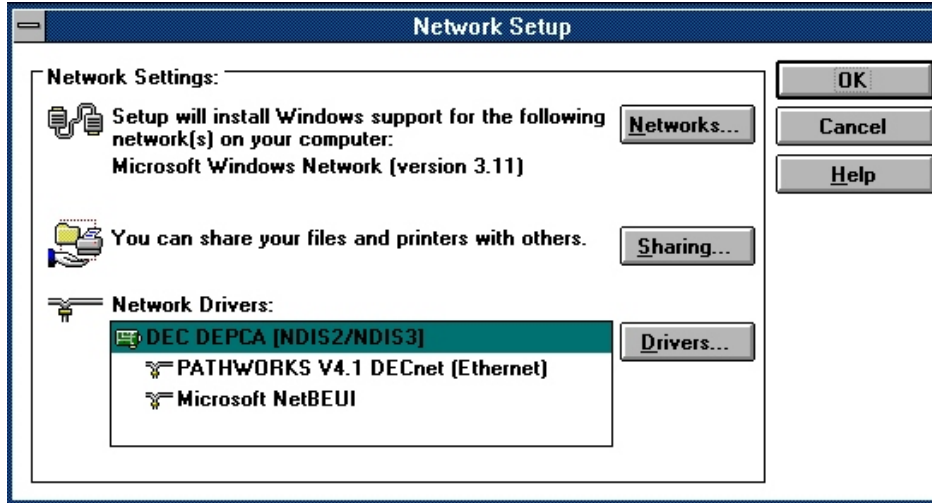


Next, select DECnet on the list and press the "Set As Default Protocol" button underneath. This makes DECnet the protocol that the File Manager will use first for establishing connections.

At this time you will probably see both NETBEUI and IPX/SPX protocols listed as well as DECnet. If you do not plan on using Novell NetWare, select and remove the IPX driver, as it will add significant overhead to the system.

To finish up with Drivers, Press the "Close" button and you will return to the

main "Network Setup" dialog box.



You can configure your system for sharing files and printers at this time, but this is not essential to our integration discussion.

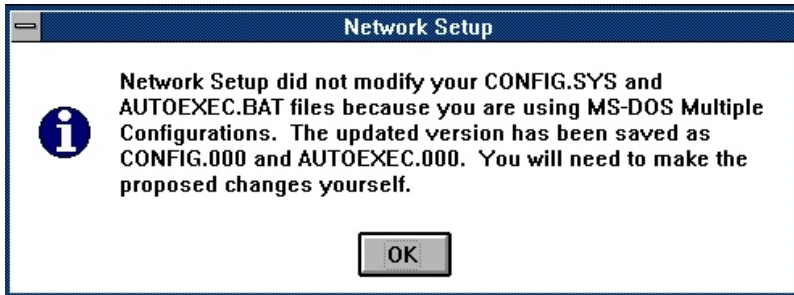
To finalize your configuration, Press the "OK" Button, and the installation process will copy the temporary files to their new permanent place.

The PATHWORKS

Configuration program takes your saved answers and writes a new STARTNET.BAT file to your Windows for Workgroups directory, and directs your AUTOEXEC.BAT to use it from now on.

The PATHWORKS Configuration program will also add two PATHWORKS Program Groups with icons for the Utility programs. Some of the properties of the icons may need to be changed before they can be used, depending on where you have located the files (see previous section on file locations). There may be a significant pause at the end of this process. Please be patient.

Windows for Workgroups may ask you some more questions about your LAN Manager Login Names before finishing.



When the Setup program exits, some of your Windows and DOS system files have been changed. You will see messages like these two, stating which files have been modified and where they've been placed.





At the Restart or Continue Question, we recommend that you do not restart, but instead press "Continue".

Then using a Windows editor of your choice, inspect the new AUTOEXEC.BAT and STARTNET.BAT for correctness before closing Windows and rebooting the system.

NOTE: In particular if you have

modified your AUTOEXEC.BAT to remove the calls to \DECNET\STARTNET.BAT, the installation will have left two lines near the beginning of the file. You should remove them and make sure you Call the \WINDOWS\STARTNET.BAT before starting Windows.

After your inspection and edits, you should exit Windows and reboot the system.

Post Installation

First Time and Permanent Connections

The first time you start Windows for Workgroups, you can establish your *persistent* file service connections. These connections will be remembered across Windows invocations. Use the File Manager application, and the Disk - Connect to Drive menu item or tool bar button to see the connection dialog. If the "Reconnect At Startup" check box is checked, the connection will be remembered.

These connections can also be viewed and modified from command line, using the `NET USE /PERSISTENT` switch.

When you start the network again, these connections may show as connected, but in Error or Paused state from NET USE or PATHWORKS USE. This is normal if in the Networks Control Panel, under Startup Settings, you have "Ghosted Connections" checked. The connection will be made when you first try to access that network drive. This option saves time at startup, but will take time when you actually attempt to use the drive.

PATHWORKS User Security Share access

PATHWORKS File services that are not LAN Manager Domain security compatible can only be connected to using PATHWORKS USE command in a DOS Window. e.g.: connections that would previously be made by a command of the form: `USE ? : \\DAVE\PRIVATE%username password`

LAD/LAST Drive Connections

PATHWORKS Disk services can only be connected by using PATHWORKS USE in a DOS Window.

Technical Information

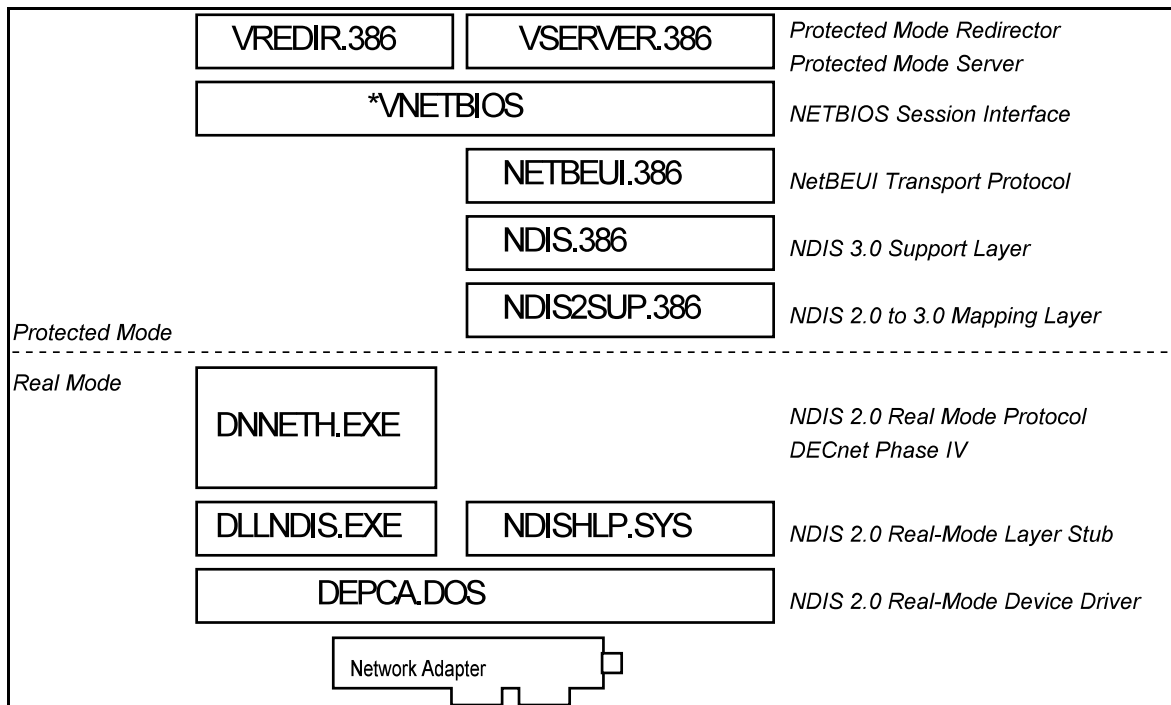
Detailed technical information about Microsoft's Windows for Workgroups is documented in the Microsoft Windows for Workgroups Resource Kit (MS Doc #0030-37275) and the Microsoft Windows for Workgroups Resource Kit Addendum for Version 3.11 (MS Doc #0030-54303)

The above documents contain detailed information on the internal operation, as well as the particulars of the INI files and the proper configuration of network components. They are strongly recommended.

The following provides technical information about how PATHWORKS V4.1a works with Windows for Workgroups

Concurrent stack configuration in memory

Windows for Workgroups V3.11 supports protected mode datalink drivers (NDIS V3.0) but this is only of use to protected mode transport protocols. In order to support real mode protocols, such as PATHWORKS DECnet, the NDISHLP.SYS driver helps by mapping the device driver into protected mode via the NDIS2SUP.386 as shown below.



PATHWORKS WfWg Configuration Program details

The software on the diskette contains an OEMSETUP.INF file which is used as a script by Network Setup. The script activates the PWWFWCFG program when the DECnet protocol is installed and committed. In addition the script also drives copying of files to the WfWg directories and the straightforward updating of the CONFIG.SYS, AUTOEXEC.BAT, SYSTEM.INI and PROTOCOL.INI files.

Install Phase:

- If an old PWWFWCFG.INI file is found, the user is queried,
- else the DECnet directory is prompted for, and STARTNET.BAT is scanned.
- Certain files are also tested for existence. If not found their option is cleared and disabled.
- Pressing OK, saves the option settings in the PWWFWCFG.INI file

Save Phase:

- The INI file is reopened and read.
- The \DECNET\PROTOCOL.INI [DATALINK] Section is copied to the \WFWG\PROTOCOL.INI
The LANABASE= number is remembered,
DECPARM=\DECNET is added.
- The new STARTNET.BAT is written. The LANA number is given to DNNETH.
The template file is PWWFWCFG.TPL. This file can be carefully modified.
- In SYSTEM.INI, [network drivers] section, DLLNDIS.EXE is moved to the front of the transports= line so that we can set the DECnet address first on the NDIS driver.
- A list of updated files (driven from PWWFWCFG.DAT) is copied from the source disk to the DECnet directory.
- If Icon installation was checked, the PWGROUP.TPL file is translated to a PWGROUP.INS and the PWICON program is invoked to actually create the program groups and items.

Standalone operation

The PWWFWCFG program can be run outside of the Network Setup process. In that mode all of the above steps can be individually activated by the Actions menu pull down. For example, you can change the Startup option settings and generate a new STARTNET.BAT file. The Help file can explain more about the options

Windows parameters changed by configuration

In the following example sections, the Windows for Workgroups directory will be C:\WFWG and DECnet will be in C:\DECNET. These are Ethernet configurations. Token Ring would use DLLNDIST instead of DLLNDIS.

CONFIG.SYS

Windows for Workgroups will remove the loading of the NDIS drivers and PROTMAN from CONFIG.SYS. Instead it will load only the DEVICE=IFSHLP.SYS

The Windows for Workgroups NET utility is capable of loading DOS devices after system boot time.

AUTOEXEC.BAT

WfWg will insert a C:\WFWG\NET START line at the very beginning of the file.

If you are running Token Ring, a C:\WFWG\SRM.EXE will follow.

The OEMSETUP script will attempt to locate the original first two references to C:\DECNET\STARTNET and replace them with C:\WFWG\STARTNET.BAT.

However if they have been removed, two lines of C:\WFWG\STARTNET.BAT will appear in your AUTOEXEC.BAT. You must edit the file appropriately.

You can remove all three (or four lines) and move them to the new STARTNET if you wish. Commented out lines are in the STARTNET.

STARTNET.BAT changes the system PATH. Any PATH statements after it in AUTOEXEC.BAT should take this into account. It is recommended that STARTNET be called near the end of the AUTOEXEC sequence.

STARTNET.BAT

This is a newly generated file using the options detected and confirmed by the PATHWORKS WfWg Setup program. The basic load sequence is:

```
NET START
(SRM.EXE) *if Token Ring
SCH.EXE
DNNETH.EXE /LANA:0
```

If you are using LAD/LAST Disk services,

```
LAST
LAD
```

If you wish to use PATHWORKS terminal emulation services during Windows, you may wish to issue the commands:

```
LAT.EXE and/or
CTERM.EXE, along with
SET NVTWIN=1 (for SETHOST)
```

to load the TSRs before invoking Windows.

Additionally if you want File and Print services during MS-DOS, enter the command:

```
NET START FULL
```

SYSTEM.INI

```
[386Enh]
netmisc=...,...,decnet.386
```

```
[network drivers]
transport=dllndis.exe,*netbeui,...
dllndis.exe=LOW
```

Note: DLLNDIS can be loaded HIGH provided there is sufficient space in the UMB for initialization.

Note: DLLNDIS must be first on the transport line for Ethernet or Token Ring systems not running Phase IV-Prime, so that it can set the MAC Station address to the Phase IV calculated value.

PROTOCOL.INI

Windows for Workgroups generates its own PROTOCOL.INI file during its installation process. The one generated by PATHWORKS in the DECnet directory will not be used in further network startups. The PWWFVCFG program will copy the [DATA LINK] section parameters to the this new file.

This is an example of a typical PROTOCOL.INI file:

```
[network.setup]
version=0x3110
netcard=ms$depca,1,MS$DEPCA,3
transport=ms$ndishlp,MS$NDISHLP
transport=ms$netbeui,NETBEUI
transport=dllndise,DLLNDISE
lana0=ms$depca,1,dllndise
lana1=ms$depca,1,ms$ndishlp
lana2=ms$depca,1,ms$netbeui
```

```
[protman]
DriverName=PROTMAN
PRIORITY=MS$NDISHLP
```

```
[MS$DEPCA]
DriverName=DEPCA$
Interrupt=2
IOAddress=0x300
RamAddress=0xD000
MaxMulticast=8
MaxTransmits=16
AdapterName=DEPCA
```

```
[LANCE]
Adapters=MS$DEPCA
```

```
[MS$NDISHLP]
DriverName=ndishlp$
BINDINGS=MS$DEPCA
```

```
[NETBEUI]
DriverName=netbeui$
SESSIONS=10
NCBS=12
BINDINGS=MS$DEPCA
LANABASE=1
```

```
[DLLNDISE]
BINDINGS=MS$DEPCA
LANABASE=0
DRIVERNAME=DLL$MAC
LG_BUFFERS=16
SM_BUFFERS=6
OUTSTANDING=32
HEURISTICS=0
DECPARM=C:\DECNET
```

Note: The LANABASE parameter is not used by DLLNDIS (because it's not a NETBIOS) but the PWWFVCFG program will pick up the value and propagate it to the DNNETH /LANA:n switch in STARTNET.BAT. If the system is re-configured with another NETBIOS as LANA number 0, then you must change the DNNETH switch to match the value Windows for Workgroups will write here.

Files provided on diskette

Many of the files on the diskette are compressed, but the proper names are listed here:

Installation Components:

README.TXT	Simplified text instructions on installation
OEMSETUP.INF	Network Setup script file
PWCONFIG.DLL	Network Setup protocol configuration DLL
PWWFWCFG.EXE	PATHWORKS WfWg Configuration Utility
PWWFWCFG.DAT	Data file for PWWFWCFG
PWWFWCFG.TPL	Template STARTNET.BAT
PWWFW.HLP	Help file for PWWFWCFG
CMDIALOG.VBX	Common dialog for PWWFWCFG
VBRUN300.DLL	Visual Basic V3.0 Run time for PWWFWCFG
PWICON.EXE	PATHWORKS Icon installer program
PWGROUP.TPL	Template file for PWICON
COPYDNDR.BAT	Copies DECnet driver TSRs to local system
COPYDNAP.BAT	Copies basic DECnet applications to local system
COPYWINA.BAT	Copies PATHWORKS Windows support files and basic applications
COPYSETH.BAT	Copies SETHOST, the DOS VT Terminal emulator utility
COPYSEDT.BAT	Copies SEDT, a Digital EDT like editor
COPYMAIL.BAT	Copies the DECnet Mail utility

Updated components to fix known problems:

DLLNDIS.EXE	Ethernet DLL to NDIS Interface multiplexer
DLLNDIST.EXE	Token Ring DLL to NDIS Interface multiplexer
	(Both DLLNDIS modules have been improved for WfWg use. The V4.1a modules will not work without hand tailoring the installation)
SRM.EXE	Token Ring Source Routing module
DNNETH.EXE	DECnet Transport with NETBIOS emulation
DECNET.386	DECnet Socket VxD
DECNB.386	DECnet NETBIOS VxD (use only if PATHWORKS NETBIOS extensions are required)
BCAST.EXE	NETBIOS Message Broadcast Utility
RCV.EXE	NETBIOS Message Receiver
WINRCV.EXE	Windows Message Receiver
WINRCV.HLP	Windows Message Receiver Text help file

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