appendix **A**

NET.CFG File Parameters

Overview

The NET.CFG file is a configuration file that you use to specify settings for your workstation other than the defaults. See “Configuring Your Workstation” on page 5 for instructions on creating the file.

This chapter contains only descriptions of the parameters you can use in the NET.CFG file. Figure A-4 on page 137 lists all the parameters, with defaults.

The following types of parameters are explained in this appendix.

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Link Driver Parameters

Use the “Link Driver” section to name your driver and specify various hardware and software settings for this driver. The “Link Driver” section has the following format:

LINK DRIVER *drivername*
- ALTERNATE
- DMA [#1| #2] *channel number*
- FRAME frame_type
- INT [#1| #2] *interrupt_request_number*
- LINK STATIONS *number*
- MAX FRAME SIZE *number*
- MEM [#1| #2] *hex_starting_address_* [*hex_length*]
- NODE ADDRESS *hex_address*
- PORT [#1| #2] *hex_starting_address_*[*hex_number_of_ports*]
- PROTOCOL *name hex_protocol_ID_frametype*
- SAPS *number*
- SLOT *number*

To use hardware options, see page 94.

To use software options, see page 99.

Note If you are using the driver’s defaults, you don’t need to enter parameters for that driver.

In Figure A-1 on page 93, square bullets indicate options available to both ISA (industry standard architecture) and MCA (microchannel architecture). Options marked with an I are available to ISA only; options marked with an M are available to MCA only; options marked with an E are available to EISA only.

Figure A-1
NET.CFG options available for LAN drivers

Options / LAN Drivers	DMA	INT	MEM	PORT	NODE ADDRESS	SLOT	FRAME	PROTOCOL	SAPS	LINK STATIONS	ALTERNATE	MAX FRAME SIZE	DOUBLE BUFFER OFF
EXOS		I	I	I	■	M	■	■					
LANSUP							■	■	■	■	■	■	
NE2					■	■	■	■					
NE2_32					■	■	■	■					
NE1000		■		■	■		■	■					
NE2000		■		■	■		■	■					
NE2100	■	■		■	■		■	■					
NE3200						E	■	■					E
NTR2000					I		I	I			I	I	
PCN2L					■	M	■	■			■		
TOKEN					■	M	■	■			■	■	
TRXNET		I	I	I		M		■					

E = EISA, extended industry architecture
M = MCA, microchannel architecture
I = ISA, industry standard architecture

Note

If you are using a LAN driver not listed above, refer to its documentation for parameter applicability.

To use the "Link Driver" section, replace *drivername* with the name of the driver you are using; it is typically the LAN driver's filename.

Replace *drivername* with one of the following driver names:

- EXOS® (for Novell EXOS205 and EXOS215)
- LANSUP™ (for the IBM LAN Support program only)
- NE2™ (for Novell Ethernet NE/2)

- NE2_32™ (for Novell Ethernet NE/2-32)
- NE1000™ (for Novell Ethernet NE1000)
- NE2000™ (for Novell Ethernet NE2000)
- NE2100™ (for Novell Ethernet NE2100)
- NE3200™ (for Novell Ethernet 3200)
- NTR2000™ (for Novell NTR2000 Token-Ring)
- PCN2L™ (for IBM PC Network II and II/A)
- TOKEN™ (for IBM Token-Ring)
- TRXNET™ (for Novell RX-Net and Turbo RX-Net)

After specifying a *drivername*, place settings for both hardware commands and software commands under the "Link Driver" heading.

You can specify options for each network board you are using, but you must have a separate "Link Driver*" drivername* heading for each network board.

Hardware Options for the "Link Driver" Section

The hardware options for the "Link Driver" section are as follows:

LINK DRVER *drivername*
DMA [#1| #2] *channel number*
INT [#1| #2] *interrupt_request_number*
MEM [#1| #2] *hex_starting_address_* [*hex_length*]
NODE ADDRESS *hex_address*
PORT [#1| #2] *hex_starting_address_*[*hex_number_of_ports*]
SLOT *number*

These options are described in the sections that follow. For the DMA, INT, MEM, and PORT options, you don't need to include the characters "#1" if you are specifying a value for only one network board.

For example, if you are using the first configurable DMA channel on a network board as DMA channel 3, you can place the following lines in your NET.CFG file:

```
LINK DRIVER drivername
   DMA 3
```

or

```
LINK DRIVER drivername
   DMA #1 3
```

If, however, you are using more than one DMA, INT, MEM, or PORT value, you must include the characters "#2" for the second value. This abbreviation convention is used for all NET.CFG options that use the [#1| #2] notation.

The following sections contain an explanation of each option's function and some possible reasons for changing the setting. In the explanations, these conventions are used:

[ ]	An optional element
number	A decimal number
hex	A hexadecimal number

DMA [#1 | #2] *channel_number*

Specifies the hardware setting of the network board used in the workstation. It allows DMA channels to be configured.

Enter the channel number to be used. The default is the first configurable channel (#1).

You can also specify two "DMA" values. For example, if the first configurable DMA channel on your board uses DMA channel 3 and the second configurable channel uses channel 4, place the following lines in your NET.CFG file:

```
LINK DRIVER driver name
   DMA #1 3
   DMA #2 4
```

INT [#1 | #2] *interrupt_request_number*

Specifies which interrupt (IRQ) the network board uses. Use the interrupt request number set on the board.

For example, to specify interrupt 5 on an NE2100 board, place the following lines in your NET.CFG file:

```
LINK DRIVER NE2100
   INT #1 5
```

To specify more than one *interrupt_request_number*, place the following lines in your NET.CFG file:

```
LINK DRIVER driver name
   INT #1 5
   INT #2 3
```

The second INT channel also requires you to use the pound sign (#).

MEM [#1 | #2] *hex_starting_address* [*hex_length*]

Specifies a memory range to be used by the network board.

Use the hexadecimal physical (absolute) address of the memory used by the board. This *hex_starting_address* must match the starting address configured on the board.

Enter the *hex_length* in hexadecimal paragraphs (a paragraph is 16 bytes) of the memory address range used by the board.

For example, if you address a board from D0000 to D4000 (bytes), the starting address is D0000 and the range is 400 hexadecimal paragraphs. In this case, for an EXOS board (for example, EXOS205), you would place the following lines in your NET.CFG file:

```
LINK DRIVER EXOS
   MEM D0000 400
```

Usually, the length (*"hex_length"*) is not needed.

NODE ADDRESS *hex_address*

Overrides any hard-coded node address in the network board, if the hardware allows it. Use the *hex_address* parameter to specify a hexadecimal address number.

Changing the node address on a board can create conflicts with other network boards. Use the hard-coded node address whenever possible.

The example below shows how to change the node address on a network board:

```
LINK DRIVER driver name
   NODE ADDRESS 12D43
```

PORT [#1 | #2] *hex_starting_address* [*hex_number_of_ports*]

Specifies the starting port (*hex_starting_address*) and number of ports in the range (*hex_number_of_ports*). All values must be written in hexadecimal notation.

For example, suppose you want to specify the starting port and the number of ports in the first range on your board. The starting I/O port is 300; 16 ports are in the first range. You would place the following lines in your NET.CFG file:

```
LINK DRIVER driver name
   PORT #1 300 16
```

The number of ports is optional. The following example specifies two ranges with 32 ports in each range:

```
LINK DRIVER driver name
   PORT #1 300 32
   PORT #2 340 32
```

SLOT *number*

In slot-based machines, the driver usually locates the board by scanning through the slots in order from lowest to highest. This option directs the driver to locate the board in the specified slot, instead of scanning for it.

Use the number of the slot into which you inserted the board. The slot number is usually found on the back of the computer.

For example, if you were using two NE/2 boards in the same workstation and you inserted one board into slot 1 and the other into slot 2, you would place the following lines in your NET.CFG file:

```
LINK DRIVER NE2
   SLOT 1

LINK DRIVER NE2
   SLOT 2
```

Then you would place the following lines in your batch file:

```
LSL
NE2
NE2
```

The “Slot” option directs the first NE2 driver to use an NE2 board in slot 1 and directs the second NE2 driver to use the NE2 board in slot 2.

Software Options for the “Link Driver” Section

The NET.CFG software options for the “Link Driver” section are as follows:

LINK DRIVER *drivername*
- ALTERNATE
- FRAME *frame_type*
- LINK STATIONS *number*
- MAX FRAME SIZE *number*
- PROTOCOL *name hex_protocol_ID frame_type*
- SAPS *number*

ALTERNATE

Specifies an alternate board. Normally, the LANSUP, IBM Token-Ring and NTR2000, and PCN2L drivers use the primary board.

Specify ALTERNATE under the appropriate driver section heading, as shown below:

```
LINK DRIVER LANSUP
   ALTERNATE
```

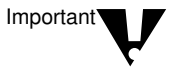
FRAME *frame_type*

Enables the frame types used by the network board. Use it with boards that support multiple frame types or when you want to overwrite the default frame type.

For example, to enable the Ethernet II frame type on an NE1000 board, you would place the following lines in the NET.CFG file:

```
LINK DRIVER NE1000
   FRAME ETHERNET_II
```

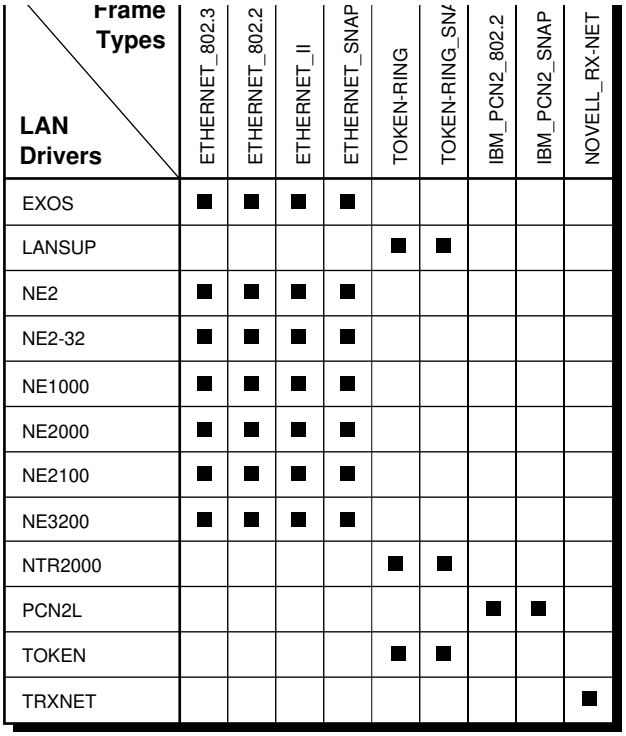
Ethernet LAN drivers now default to the Ethernet_802.2 frame type; Token-Ring LAN drivers default to the Token-Ring frame type.



Previous versions of NetWare defaulted to the Ethernet_802.3 frame type.

Figure A-2 lists the supported frame types for each LAN driver supplied by Novell.

Figure A-2
Supported frame types for LAN drivers



LAN Drivers \ Frame Types	ETHERNET_802.3	ETHERNET_802.2	ETHERNET_II	ETHERNET_SNAP	TOKEN-RING	TOKEN-RING_SNA	IBM_PCN2_802.2	IBM_PCN2_SNAP	NOVELL_RX-NET
EXOS	■	■	■	■					
LANSUP					■	■			
NE2	■	■	■	■					
NE2-32	■	■	■	■					
NE1000	■	■	■	■					
NE2000	■	■	■	■					
NE2100	■	■	■	■					
NE3200	■	■	■	■					
NTR2000					■	■			
PCN2L							■	■	
TOKEN					■	■			
TRXNET									■

LINK STATIONS *number*

Specifies the number of link stations needed for the LANSUP driver. Set "Link Stations" to allow for all applications using the IBM LAN Support Program. The maximum value depends on the type of board used.

Default: 1

Note LINK STATIONS is ignored if another application already opened the adapter before the LANSUP.COM driver was loaded.

MAX FRAME SIZE *number*

Sets the maximum number of bytes that can be put on the network by the LAN driver.

The NTR2000.COM driver's default size is 4216 bytes. But if your board has 8 KB of shared RAM available, the default size is 2168 bytes.

The LANSUP.COM driver's default is 1144 bytes. But if you're using the IBM LAN Support Program with an Ethernet device driver, the maximum size is 1496 bytes.

For NTR2000.COM and LANSUP.COM, the value for *number* must be a multiple of 8. It must include the number of bytes for the data packet (usually 1, 2, 4, or 8 KB), for adapter overhead (6 bytes), and for the largest possible header (currently, 40 bytes LAN header + 74 bytes protocol header = 114 bytes).

For example, to use 2 KB data packets, you would calculate the value for *number* as

2048 + 6 + 35 + 5 + 74 = 2168

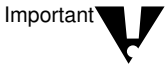
If the total isn't a multiple of 8, then the NTR2000.COM driver rounds it up to the next multiple of 8.

The NET.CFG file for a NTR2000 link driver with a maximum size of 2168 would have the following lines:

```
LINK DRIVER NTR2000
   MAX FRAME SIZE 2168
```

Note

When the driver loads, the sign-on message doesn't reflect the 6 bytes of overhead. Therefore, the "Max Frame" for the above example would be displayed as 2162.



If you are running Windows in enhanced mode, the VIPX.386 device driver requires the maximum frame size to be less than 8000 bytes. If the frame size exceeds 8000 bytes, network communication will fail.

If you are running TBMI2.COM or TASKID, you can't use MAX FRAME SIZE.

If the line speed is 16 Mbps, the value for *number* must be between 632 and 17,960. If the line speed is 4 Mbps, the value must be between 632 and 4464.

PROTOCOL *name hex_protocol_ID frame_type*

Allows existing LAN drivers to handle new network protocols.

Replace *name* with the name of the new protocol.

Replace *hex_protocol_ID* with the assigned hexadecimal protocol ID that the protocol is assigned.

Replace *frame_type* with the frame type that the new protocol ID applies to.

For example, to use a new protocol XYZ with an NE2-32 network board, you would place the following lines in NET.CFG file:

```
LINK DRIVER NE2_32
   FRAME ETHERNET_SNAP
   PROTOCOL XYZ 904A ETHERNET_SNAP
```

SAPS *number*

Specifies the *number* of Service Access Points (SAPS) needed for the LANSUP driver. Set this option to allow for all applications using the IBM LAN Support Program. The maximum value depends on the type of board used.

Default: 1

TSAPS is ignored if another application already opened the board before the LANSUP.COM driver was loaded.

Link Support Parameters

Use the “Link Support” section to configure receive buffers, the size of the memory pool buffers, and the number of boards and stacks.

The “Link Support” section has the following format:

LINK SUPPORT
    BUFFERS *number* [*size*]
    MAX BOARDS *number*
    MAX STACKS *number*
    MEMPOOL *number*

You can also specify command line parameters for this section. See Figure A-3 “Command line parameters” on page 135 for a these parameters.

BUFFERS *number* [*size*]

Configures the number and size of receive buffers that the Link Support Layer (LSL) will maintain.

The *number* of communication buffers must be large enough to hold all media headers and the maximum data size.

Default: 0

Refer to the documentation for the third-party protocol stacks for possible settings.

Buffer *size* is optional. The minimum size is 618 bytes. The total buffer space must fit into approximately 59 KB (*number* times *size*).

Default: 1130

MAX BOARDS *number*

Configures the maximum number of logical boards the LSL.COM can handle.

Each LAN driver logical board uses one board resource. For example, if you had the NE1000.COM configured to load all possible Ethernet frame types (ETHERNET_II, ETHERNET_802.3, ETHERNET_802.2, ETHERNET_SNAP), four board resources would be used. Therefore, to load all four frame types, "Max Boards" must be set to a value of 4 or higher.

Default: 4
Range: 1 to 16

This is an example of the NET.CFG option for this setting:

```
LINK SUPPORT
   MAX BOARDS 1
```

MAX STACKS *number*

Configures the maximum number of logical protocol stack IDs the LSL.COM can handle.

Each protocol stack uses one or more stack ID resources.

If a protocol stack fails to load because of an out-of-resource condition, increase the value for this option.

The amount of resident memory the LSL.COM consumes increases with larger "Max Stacks" values and decreases with smaller values. Thus, you can conserve some memory by reducing the value to the actual number of stack IDs used by a particular system.

Default: 4
Range: 1 to 16

This is an example of the NET.CFG option for this setting:

```
LINK SUPPORT
   MAX STACKS 3
```

MEMPOOL *number[k]*

Some protocols use the “Mempool” option to configure the size of the memory pool buffers that the LSL will maintain.

Thus, the *k* notation means multiply by 1024.

Note The IPXODI protocol stack does not use the “Mempool” buffers.

Refer to the documentation for other protocol stacks for recommended settings.

NetBIOS Parameters

Use the “NetBIOS” section to configure changes in the NetBIOS.

You can also specify command line parameters for NetBIOS. See Figure A-3 “Command line parameters” on page 135

NETBIOS ABORT TIMEOUT

Adjusts the amount of time, in ticks, that NetBIOS waits without receiving any response from the other side of a session before it terminates the session.

Increase this value (along with “NetBIOS Retry Count” and “NetBIOS Retry Delay”) if there are NetBIOS nodes across asynchronous lines or large internetworks.

The timeout number is in ticks (18.21 ticks per second on IBM PCs and compatibles).

Default: 540 ticks (about 30 seconds)

NETBIOS BROADCAST COUNT

When multiplied by the "NetBIOS Broadcast Delay" number, determines the total time needed to broadcast a name resolution packet across the network.

This number reflects the size of your network or internetwork.

Increase this value if you

- Have many LAN segments on the network with nodes that need NetBIOS support;
- Cannot attach to a gateway.

This value is automatically reduced if "NetBIOS Internet" = OFF.

Default: When "NetBIOS Internet" = ON: 4
Default: When "NetBIOS Internet" = OFF: 2
Range: 2 to 65,535

NETBIOS BROADCAST DELAY

When multiplied by "NetBIOS Broadcast Count," determines the total time (in ticks) needed to broadcast a name resolution packet across the network.

This value reflects the traffic of the network. The default is sufficient in most cases.

Increase this value if the packet loss rate is high or if the traffic is high; reduce "NetBIOS Broadcast Count" by a similar amount to maintain the same name resolution timeout value.

This value is automatically reduced if "NetBIOS Internet" = OFF.

Default: When "NetBIOS Internet" = ON: 36
Default: When "NetBIOS InterNET" = OFF: 18
Range: 18 to 65,535

NETBIOS COMMANDS

Sets the number of NetBIOS command available.

The number of commands needed may vary between applications. In most cases, the default setting of 12 is sufficient. However, if a NetBIOS command error 22 occurs, increase the parameter.

Most applications ignore this error and retry if a NetBIOS command is unavailable. In this case, increasing the number of commands improves application performance.

For specifics, contact the application's software developers to find out how many commands are required.

Default: 12 commands
Range: 4 to 250

NETBIOS INTERNET

- If you are running NetBIOS applications on a single network with a dedicated NetWare server, this parameter speeds up the delivery of name resolution and datagram packets when its value is set to OFF.
- If you are running on more than one network or LAN segment and will be communicating through bridges, or if you are running a nondedicated NetWare server, the value must remain at the default ON.

Default: ON

NETBIOS LISTEN TIMEOUT

Adjusts the time that NetBIOS waits (when no packets are received from the other side of a session) before it requests a keep-alive packet from the other side to assure the session is still valid.

If NetBIOS has not heard from the other side within this time period, it requests that the other side respond immediately.

NetBIOS continues to send these requests to the other side at an interval specified by “NetBIOS Verify Timeout” until the timeout specified by “NetBIOS Abort Timeout” has expired.

The timeout number is in ticks.

Default: 108 ticks (about 6 seconds)
Range: 1 to 65, 535

NETBIOS RECEIVE BUFFERS

Configures the number of IPX receive buffers that NetBIOS uses.

Increase this parameter when has:

- A workstation-server oriented
- A many-to-one relationship
- An incoming burst traffic situations, such as a 3270 gateway.

Default: 6 buffers
Range: 4 to 20 buffers

NETBIOS RETRY COUNT

Determines the number of times NetBIOS resends a packet to establish a session with a remote partner. Affects NetBIOS session commands only.

Adjust the parameter with “NetBIOS Retry Delay” to vary the timeout on establishing NetBIOS sessions. This number reflects the size of the network or internetwork.

Increase this value if you

- Have many LAN segments on the network with nodes that need NetBIOS support;
- Can’t attach to a gateway.

This value is automatically reduced if “NetBIOS Internet” = OFF.

Default: When “NetBIOS Internet” = ON: 20
Default: When “NetBIOS Internet” = OFF: 10
Range: 4 to 20

NETBIOS RETRY DELAY

Configures the delay (in ticks) between packets that NetBIOS sends during an attempt to establish a session. Affects NetBIOS session commands only.

NetBIOS sends the request (and waits to send the next request) the number of times indicated by “NetBIOS Retry Count.” This value reflects the size of the network or internetwork you are working on.

Increase this value if you

- Have many LAN segments on the network with nodes that need NetBIOS support;
- Can’t attach to a gateway.

Default: 10 ticks (about .5 second)
Range: 10 to 65, 535 ticks

NETBIOS SEND BUFFERS

Configures the number of IPX send buffers that NetBIOS uses.

Increase this parameter when there exist in the software has

- A workstation-server oriented
- A many-to-one relationship
- An incoming burst traffic situations such as a 3270 gateway.

Default: 6 buffers
Range: 4 to 250 buffers

NETBIOS SESSION

Configures the maximum number of virtual circuits that NetBIOS can support at the same time.

Default: 32 sessions
Range: 4 to 250 sessions

NETBIOS VERIFY TIMEOUT

Adjusts the frequency at which NetBIOS sends a keep-alive packet to the other side of a session to preserve the session.

If no packets are being exchanged on the NetBIOS session by the software that established the session, NetBIOS sends packets at regular intervals to make sure that the session is still valid.

The timeout number is in ticks (18.21 ticks per second on IBM PCs and compatibles).

Default: 54 ticks (about 3 seconds)
Range: 4 to 65,535 ticks

NPATCH

Patches any location in the NETBIOS.EXE data segment with any value.

Default: None

Protocol IPXODI Parameters

Use the “Protocol IPXODI” section to change the IPXODI protocol.

You can also specify command line parameters for Protocol IPXODI. See Figure A-3 “Command line parameters” on page 135.

BIND *board_name*

Usually a protocol binds to the first network board it finds. “Bind” forces the protocol to bind to the boards you specify.

Board numbers are displayed when you load the LAN drivers.

Replace *board_name* with the name of the board you want the protocol to bind to. For example, if you wanted protocol IPXODI to bind to your NE2000 board, the NET.CFG would look like this:

```
PROTOCOL IPXODI
   BIND NE2000
```

If you were to bind protocol IPXODI to the second and third logical boards, the NET.CFG would look like this:

```
PROTOCOL IPXODI
   BIND #2, #3
```

Note

Some protocols do not support binding to multiple boards. Refer to the protocol documentation for binding information.

CONFIG OPTION

Overrides the configuration options chosen during the WSGEN program. It does not permanently change the IPX file, just the configurations within the workstation RAM.

Use this parameter to change the network board’s configuration options temporarily without running WSGEN or DCONFIG (for example, when you find a possible conflict and want to see if a new configuration option will solve the problem).

If the configuration option must be changed permanently, reconfigure the IPX file with the WSGEN or DCONFIG program.

Default: option set during WSGEN or DCONFIG

INT64

Allows applications to use interrupt 64h to access IPX services.

IPX now uses interrupt 64h to maintain compatibility with earlier versions of NetWare.

If an application's documentation requests interrupt 64h or if you have an application that works on earlier versions of NetWare but hangs on NetWare v3.1, set this parameter to OFF.

Default: ON

INT7A

Allows applications to use interrupt 7Ah to access IPX services.

IPX now uses interrupt 7Ah to maintain compatibility with NetWare v2.0a.

If an application's documentation requests interrupt 7Ah or if an application works on earlier versions of NetWare but hangs on NetWare v3.1, set this parameter to OFF.

Default: ON

IPATCH

Allows any address in the IPXODI.COM file to be patched with any specified byte offset value.

Default: None

IPX PACKET SIZE LIMIT

Reduces the maximum packet size set by each LAN driver.

Even though a LAN driver could send 16 KB packets on the wire, the wasted memory for most operations may be unacceptable.

The optimum packet size for Token-Ring drivers is 4160 bytes. For Ethernet, the optimum is 1500 bytes. Reduce the maximum packet size if you receive out-of-memory errors at the workstation.

"IPX Packet Size Limit" is a new feature, and not all drivers support it.

Default: The lesser of either 4160 or the size specified by the LAN driver
Range: 576 to 6500 (bytes)

IPX RETRY COUNT

Sets the number of times the workstation resends a packet. On networks that lose many packets, this retry count may need to be increased.

IPX does not actually resend a packet. It uses this count to recommend the number of retries to the DOS shell and SPX.

Increasing this number causes a longer delay for some network functions, such as establishing a NetBIOS session or registering a NetBIOS name.

Default: 20 retries

IPX SOCKETS

Specifies the maximum number of sockets that IPX can have open at the workstation.

An IPX-specific program, such as LANSchool™ from LAN Systems Inc.®, may require more than the default number of sockets.

Default: 20 sockets

MINIMUM SPX RETRIES

Determines how many unacknowledged transmit requests are allowed before assuming the connection has gone bad.

SPX applications have two methods to specify a transmit retry count to SPX: first, the application can specify a retry value at the time of connection; second, if the application doesn't specify a retry value, SPX uses the configured "IPX Retry Count" value (defaults to 20).

This option is especially useful if an application that uses SPX is abnormally losing its connections. This may be due to a low value specified in the default retry count in the application or the "IPX Retry Count."

This parameter is supported by IPXODI.COM v2.00 and above.

Range: 0 to 255

SPX ABORT TIMEOUT

Adjusts the amount of time that SPX waits without receiving any response from the other side of the connection before it terminates the session.

The timeout number is in ticks (18.21 ticks per second on IBM PCs and compatibles).

Default: 540 ticks (about 30 seconds)

SPX CONNECTIONS

Specifies the maximum number of SPX connections a workstation can use at one time.

Default: 15 connections

SPX LISTEN TIMEOUT

Adjusts the time that SPX waits without receiving a packet from the other side of the connection before it requests the other side to send a packet to assure the connection is still valid.

If SPX has not heard from the other side of the connection within this time, it sends packets to the other side asking for verification that the connection still exists.

The timeout number is in ticks (18.21 ticks per second on IBM PCs and compatibles).

Default: 108 ticks (about 6 seconds)

SPX VERIFY TIMEOUT

Adjusts the frequency at which SPX sends a packet to the other side of a connection to indicate that it is still alive.

If no packets are being exchanged on the SPX connection by the software that established the session, SPX sends packets at regular intervals to make sure that the connection is still working.

The timeout number is in ticks (18.21 ticks per second on IBM PCs and compatibles).

Default: 54 ticks (about 3 seconds)

NetWare DOS Requester Parameters

Use the "NetWare DOS Requester" section to change the NetWare DOS Requester and its VLMs. The following sections describes each parameter, its defaults, and the VLM file that uses it.

AUTO LARGE TABLE

Allocates a small table of 34 bytes per connection for bindery reconnects. When the setting is enabled, AUTO.VLM allocates a large connection table of 178 bytes per connection for bindery reconnects.

If a username and password is longer than 16 characters, set this parameter to ON.

Default: OFF
Modules: AUTO.VLM and BIND.VLM

For this parameter to work, also set BIND RECONNECT = ON.

AVERAGE NAME LENGTH

Allows the NetWare DOS Requester to set aside space for a table of NetWare server names based on the "Average Name Length" and the value for "Connections." For shorter NetWare server names, you can save some memory by setting the average length to a lower number.

Default: 48 characters
Range: 2 to 48 characters
Module: CONN.VLM

AUTO RECONNECT

When this option is set to ON, AUTO.VLM reconnects a workstation to a NetWare server and rebuilds the workstation's environment (excluding file-specific items) prior to connection loss.

When this option is set to OFF, and a connection is lost, reconnecting to a NetWare server becomes the user's responsibility.

Default: ON

Modules: AUTO.VLM, NDS.VLM, PNW.VLM

You must include the parameter VLM = AUTO.VLM to enable VLM.EXE to load AUTO.VLM.

AUTO RETRY

Number of seconds AUTO.VLM waits before attempting a retry after receiving a network critical error.

Default: 0
Range: 0/3640
Modules: AUTO.VLM, NDS.VLM, BIND.VLM, PNW.VLM

When this parameter is 0, AUTO.VLM makes no retry attempts.

BIND RECONNECT

Automatically rebuilds bindery connections and restores drive mappings and printer connections.

Default: OFF
Modules: AUTO.VLM and BIND.VLM

For this parameter to work, also set AUTO RECONNECT = ON.

CACHE BUFFERS

Sets how many cache buffers the NetWare DOS Requester uses for local caching of nonshared, nontransaction-tracked files.

Each buffer allocated allows the NetWare DOS Requester to cache one file.

You can increase the number of cache buffers to speed up the process of sequential reads/writes. However, increasing this parameter also increases memory use.

Default: 5 cache blocks
Range: 0 to 64 cache blocks
Module: FIO.VLM

CACHE BUFFER SIZE

Sets the buffer size for the cache buffers that the FIO module uses.

Increasing this parameter allows you to cache larger amounts of data, thereby increasing performance and also memory use.

When specifying this parameter, don't exceed the maximum packet size of the network board.

Default: 512 bytes
Range: 64 to 4096 bytes
Module: FIO.VLM

CACHE WRITES

Sets the cache write requests to ON or OFF.

Setting this parameter to OFF increases data integrity but decreases performance. Leaving this parameter set to ON can cause data loss if the NetWare server runs out of disk space between write requests.

Default: ON
Module: FIO.VLM

CHECKSUM

Provides a higher level of data integrity by validating NCP packets.

Setting this parameter to 2 or 3 increases data integrity but decreases performance. The checksum values are these:

0 = disabled
1 = enabled but not preferred
2 = enabled and preferred
3 = required

Default: 1
Module: IPXNCP.VLM and NWP.VLM

Ethernet frame type 802.3 doesn't support checksums. The Ethernet drivers must be configured to use a frame type other than 802.3 to use checksums.

CONNECTIONS

Sets the maximum number of connections the NetWare DOS Requester supports.

The NetWare DOS Requester supports up to 50 connections in its connection table. A value larger than needed uses memory unnecessarily.

Default: 8 connections
Range: 2 to 50 connections
Module: CONN.VLM and FIO.VLM

Values other than 8 may decrease NETX compatibility.

DOS NAME

Sets the name of the operating system used in the shell.

The %OS variable in the login script uses this variable when mapping a search drive to the network DOS directory. This parameter uses a maximum of five characters.

Default: MSDOS
Module: NETX.VLM and GENERAL.VLM

The NetWare DOS Requester automatically recognizes DRDOS and sets this option. However, setting this option overrides the auto-detect feature.

FIRST NETWORK DRIVE

Sets the first network drive to the letter of choice when the NetWare DOS Requester makes a connection to the NetWare server.

This parameter accepts only the drive letter and not the colon.

Default: First available drive
Range: A to Z
Module: GENERAL.VLM

HANDLE NET ERRORS

Determines the default method for handling network errors.

A network error is generated when the workstation doesn't receive a response from the NetWare server. The two values are as follows:

ON = interrupt 24 handles network errors
OFF = return NET_RECV_ERROR (example: 8805h)

Default: ON
Module: IPXNCP.VLM

Some applications may not work properly if this parameter is set to OFF.

LARGE INTERNET PACKETS

In the past, NetWare communicated across routers and bridges with a 576-byte maximum packet size. However, Ethernet and Token- Ring are capable of using larger packets for communication.

When this parameter is set to ON, the maximum packet size negotiated between the NetWare server and the workstation is used, even across routers and bridges.

Default: ON
Module: IPXNCP.VLM

Some routers and bridges have been hardcoded to use 576-byte packets. In this case, the NetWare DOS Requester can use only 576-byte packets, regardless of this parameter.

LOAD CONN TABLE LOW

When using the initial release of NetWare v4.0 utilities, you must set the "Load Conn Table Low" parameter to ON. This loads the connection table low which increases conventional memory requirements required by the initial release of NetWare v4.0 utilities.

If you are not using an initial release of the NetWare v4.0 utilities, the default setting (OFF) will give you better memory performance. The default setting loads the connection table in an UMB, if available.

Default: OFF
Modules: CONN.VLM

LOAD LOW CONN

By default, the connection manager, CONN.VLM, is loaded in conventional memory. If this parameter is set to OFF, CONN.VLM loads in upper memory, saving memory but sacrificing performance.

Default: ON
Module: CONN.VLM

LOAD LOW IPXNCP

By default, the transport protocol implementation for IPX, IPXNCP.VLM, is loaded in conventional memory. If this parameter is set to OFF, IPXNCP.VLM loads in upper memory, saving memory but sacrificing performance.

Default: ON
Module: IPXNCP.VLM

LOCAL PRINTERS

Overrides the number of local printers on the workstation, which is normally determined by the BIOS. The BIOS defaults to a local printer for each parallel port.

By setting the number of local printers to 0, you can prevent a workstation from hanging if you press <Shift> and <Print Screen> while the workstation isn't capturing and doesn't have a local printer.

Default: 3
Range: 0 to 9
Module: PRINT.VLM

LONG MACHINE TYPE

Tells the NetWare DOS Requester what type of machine is being used each time the %MACHINE variable is accessed. Use this parameter to set the machine's search path to the correct version of DOS.

Default: IBM_PC
Maximum: 6 letters
Module: NETX.VLM and GENERAL.VLM

MAX TASKS

Configures the maximum number of tasks that can be active at one time.

Certain multitasking applications, such as Windows and DESQview™, allow several programs to run at one time. If you have problems running a new program, increase the value of this parameter.

Default: 31 tasks
Range: 20 to 128 tasks
Module: CONN.VLM

MESSAGE LEVEL

Sets how you want to display load time messages. Each message level implies the previous level's message (example: 1 implies 0).

The values are as follows:

0 = Always display copyright message and critical errors
1 = Display warning messages
2 = Display program load information for VLMs
3 = Display configuration information
4 = Display diagnostic information

Default: 1
Module: NWP.VLM

MESSAGE TIMEOUT

Defines timeout in ticks before broadcast messages are cleared from the screen without user intervention.

Default: 0 (wait for user)
Range: 0 to 10 000 (approximately six hours)
Module: NWP.VLM

NAME CONTEXT = "*name context*"

Allows you to set your current position in the Directory tree structure. This parameter applies only to workstations connecting to a NetWare v4.0 network.

The default is the root, which may cause confusion if duplicate usernames exist. The quotation marks are required in this parameter.

Module: NDS.VLM

NETWORK PRINTERS

Sets the number of LPT ports the NetWare DOS Requester can capture. This parameter allows you to capture and redirect LPT1 through LPT9.

Increasing the number increases memory use. Setting this parameter to 0 specifies that PRINT.VLM does not load.

Default: 3
Range: 0 to 9
Module: PRINT.VLM

PB BUFFERS

Controls the use of Packet Burst protocol for file input/output.

Packet Burst is automatically enabled in the NetWare DOS Requester. For more information on Packet Burst, see “Using Packet Burst to Increase Speed” on page 12.

The values are as follows:

0 = off
non-zero = on

Setting this option to 0 decreases memory use and, in some cases, decreases performance.

Default: 3
Range: 0 to 10
Module: FIO.VLM

PREFERRED SERVER = *servername*

Sets the NetWare server you attach to first and helps guarantee your connection to the network. If the server specified has a connection available, the NetWare DOS Requester attaches to that server.

Default: no preferred server
Module: BIND.VLM

If both preferred tree (for NetWare Directory Services) and preferred server (for bindery services) are specified, then the first protocol to successfully build an attachment is used.

PREFERRED TREE = *tree name*

Sets the tree you first want to connect to in a NetWare v4.0 network if you have multiple trees. If the tree specified has a server with a free connection, the NetWare DOS Requester attaches to that tree.

Default: No preferred tree
Module: NDS.VLM

If both preferred tree (for NetWare v4.0) and preferred server (for NetWare v2.*x* and v3.*x*) are specified, then the first protocol to successfully build an attachment is used.

PRINT BUFFER SIZE

Determines the size, in bytes, for the print buffer. The print buffer acts as a cache for 1-byte print requests, which increases the size of some jobs.

Increasing this option increases memory use, while increasing some printing output.

Default: 64 bytes
Range: 0 to 256 bytes
Module: PRINT.VLM

PRINT HEADER

Sets the size of the buffer that holds the information used to initialize a printer for each print job.

If you send print jobs with many instructions in the header (such as initializing a printer for an emulated mode or changing defaults, font selections, page length, or orientation) and the printer is not delivering all the requested attributes, increase the size of the print header.

Default: 64 bytes
Range: 0 to 1024 bytes
Module: PRINT.VLM

PRINT TAIL

Sets the size of the buffer that holds the information used to reset the printer after a print job.

If your printer is not clearing out the buffer completely or resetting after each print job, increase the “Print Tail” size.

Default: 16 bytes
Range: 0 to 1024 bytes
Module: PRINT.VLM

READ ONLY COMPATIBILITY

Determines whether a file marked Read Only can be opened with a read/write access call. Certain applications require this parameter to be set to ON.

Prior to NetWare v2.1, a program could open a Read Only file with write access without getting an error, though any attempt to write to the file produced an error.

To be compatible with DOS, NetWare v2.1 and above does not allow a Read Only file to be opened for write access. Setting the "Read Only Compatibility" to ON causes the shell to revert to the old mode and allow the open request to succeed.

Default: OFF
Module: REDIR.VLM

SEARCH MODE

Alters the NetWare DOS Requester's method for finding a file if it is not in the current directory.

Most .EXE and .COM files use a specific search mode to locate files in a directory structure. The search mode set in the NET.CFG file is global and affects all .EXE and .COM files.

When using "Search Mode," select the search mode that works correctly with most of your .EXE and .COM files.

If you want to set a search mode for one particular .EXE or .COM, use the "Search Mode" option in FLAG (see "FLAG" in *Utilities Reference*).

Default: 1
Module: GENERAL.VLM

Valid search modes are explained below.

0 No search instructions. Default setting for executable files.

1 If a directory path is specified in the executable file, the executable file searches only that path. If a path is not specified, the executable file searches the default directory and network search drives.

2 The executable file searches only the default directory or the path specified.

3 If a directory path is specified in the executable file, the executable file searches only that path. If a path is not specified and the executable file opens data files flagged Read Only, the executable file searches the default directory and search drives.

4 Reserved.

5 The executable file searches the default directory and NetWare search drives whether or not the path is specified in the executable file. If a search mode is set, the shell allows searches for any *.xxx* extension; otherwise DOS searches only for .EXE, .COM, and .BAT.

6 Reserved.

7 If the executable file opens data files flagged Read Only, the executable file searches the default directory and search drives whether or not the path is specified in the executable file.

In previous NetWare workstation software versions, the default drive had to be a network drive for "Search Mode" to function. The NetWare DOS Requester, as mentioned, is global and affects all .EXE and .COM files, regardless of the current drive.

SET STATION TIME

Synchronizes the workstation date and time with that of the NetWare server to which the workstation initially attaches.

Setting this option to OFF disables the synchronization feature.

Default: ON
Module: VLM.EXE

SHOW DOTS

The NetWare server doesn't have directory entries for . and .. as DOS does. To see . and .. in directory listings, use SHOW DOTS = ON.

Default: OFF (for Windows 3.*x*, set SHOW DOTS = ON)
Module: REDIR.VLM

SHOW DOTS is supported only by NetWare versions 2.11 and above.

SHORT MACHINE TYPE

This option is similar to the "Long Machine Type," except that it is used specifically with overlay files.

Use it when the %SMACHINE variable is accessed. Examples of files using this parameter include the IBM$RUN.OVL file for the windowing utilities and the CMPQ$RUN.OVL file that uses a default black-and-white color palette for NetWare menus.

Default: IBM
Maximum: 4 letters
Module: NETX.VLM and GENERAL.VLM

SIGNATURE LEVEL

Designates the level of enhanced security support.

Enhanced security includes the use of a message digest algorithm and a per connection/per request session state. The values are as follows:

0 = disabled
1 = enabled but not preferred
2 = preferred
3 = required

Setting this option to 2 or 3 increases security but decreases performance.

Default: 1
Module: NWP.VLM

TRUE COMMIT

Selects whether the commit NCP is sent on DOS commit requests.

OFF = opts for performance over integrity
ON = opts for integrity over performance

Set this option to ON when processing critical data to guarantee data integrity (for example, database applications).

Default: OFF
Module: FIO.VLM

USE DEFAULTS

Overrides the default VLMs that VLM.EXE loads. Without it, the VLM will attempt to load these VLMs:

CONN
IPXNCP
TRAN
SECURITY
NDS
BIND
NWP
FIO
GENERAL
REDIR
PRINT
NETX

If you specify VLMs that are normally loaded by default in the NET.CFG file and don't set "Use Defaults" to OFF, any default VLMs you specify will attempt to load twice, producing an error during load.

Default: ON
Module: VLM.EXE

VLM = *path VLM*

Specifies a .VLM file that VLM.EXE should load. This option allows VLMs not listed in the default for VLM.EXE to be added. The following VLMs are not listed in the default load table:

RSA
AUTO
NMR

You must specify the complete file name, including the .VLM extension.

Maximum: 50 VLMs
Module: VLM.EXE

TBMI2 Parameters

Use the TBMI2 parameters to change the task-switching environment.

You can also specify command line parameters for TBMI2. See Table B-1, “TBMI2 Command Line Parameters” on page 134.

DATA ECB COUNT

Specifies how many data ECBs are allocated for use by DOS programs needing virtualization.

These ECBs apply to most IPX and SPX send-and-receive packets. If a nondata ECB request is made when none are available, a data ECB is used.

Each allocated data ECB requires 628 bytes of memory; the 60 ECB default requires 37,680 bytes.

The maximum allocation also depends upon available memory; the total size of all ECBs must be less than 64 KB, which normally limits the data ECB count to less than 255.

Default: 60
Maximum: 89
Minimum: 10

ECB COUNT

Specifies how many nondata event control blocks (ECBs) are allocated for use by DOS programs needing virtualization.

These ECBs apply to most AES (asynchronous events services) events. If TBMI2 runs out of nondata ECBs, data ECBs can be allocated for use.

Each allocated ECB requires 52 bytes of memory; the 20 ECB default requires 1,040 bytes.

The maximum allocation also depends upon available memory; the total size of all ECBs must be less than 64 KB, which normally limits the ECB count to less than 255.

Default: 20

Maximum: 255
Minimum: 10

INT64

Allows applications to use interrupt 64h to access IPX and SPX services.

IPX and SPX now use interrupt 64h to maintain compatibility with earlier versions of NetWare. If an application's documentation requests interrupt 64h, set this parameter to OFF.

Default: ON

INT7A

Allows applications to use interrupt 7Ah to access IPX and SPX services.

IPX and SPX now use interrupt 7Ah to maintain compatibility with NetWare v2.0. If an application's documentation requests interrupt 7Ah, set this parameter to OFF.

Default: ON

USE MAX PACKETS

Tells TBMI2 to use the maximum packet size as specified by the IPX "Max Packet" size.

USING WINDOWS 3.0

Tells TBMI2 to use TASKID. Setting this parameter tells NetWare to identify tasks in each DOS BOX as separate tasks.

TBMI2 Command Line Parameters

Table A-1 shows the TBMI2 parameters that you can run at the command line.

Table A-1
TBMI2 command line parameters

Parameter	Syntax	Description
Help	/? or /H	Displays help or usage information.
Configuration Files	/C = *filename*	Specifies configuration files. Example: Type TBMI2/C = TBMI2.CFG at the DOS prompt.
Diagnostic	/D	Displays diagnostic information.
Version	/I	Displays version information.
Unload	/U	Unloads TBMI2.

Command Line Parameters

These parameters can be run at the command line, and can be used with NETX, IPXODI, LSL, NetBIOS and TBMI2 unless otherwise specified. None is case-sensitive.

Figure A-3 on page 135 shows the various parameters that you can use.

Figure A-3
Command line parameters

Parameter	Description	Works with
/C=	Allows users to specify a configuration file for the DOS Requester to use as it loads. Otherwise, NET.CFG is used for configuration information. Type **vlm/c=[path\]filename.ext <Enter>** If no path is designated, the current directory is the default directory. If no path is specified, the configuration file must be in the current directory for the system to use that file.	All but NETBIOS
/F	Allows users to forcibly unload the shell even if other terminate-and-stay-resident programs (TSRs) were loaded after the shell. Type **netx/f <Enter>** It doesn't allow the shell to be unloaded if any interrupts are hooked or if the workstation is running DESQview.	NETX only
/PS=	Allows user to choose a preferred server. Type **vlm=server name <Enter>**	VLM and NETX only
/U	Allows users to unload the DOS Requester if no other terminate-and-stay-resident programs (TSRs) are loaded above the DOS Requester. Type **vlm/u <Enter>** It doesn't allow the DOS Requester to be unloaded if any interrupts are hooked or if the workstation is running DESQview.	All but IPX
/?	Displays usage information. Type **vlm/? <Enter>**	All but NETBIOS
/H	Displays usage information at the command line. Type **tbmi2/h <Enter>**	TBMI2 only
/O#	Load using hardware option #. Type **ipx/o# <Enter>**	IPX only

NET.CFG Options

NetWare supports the following configuration options in your NET.CFG file

- Link Driver
- Link Support
- Protocol
- NetWare DOS Requester
- TBMI2

Figure A-4 on page 137 shows the various parameters and settings that you can use. Notice the following markings in figure text:

* The default setting is the maximum value for NetWare v2.*x* and v3.*x* networks.

† This option is invalid for NetWare v2.*x* and v3.*x* networks.

Figure A-4
NET.CFG options

NetWare Configuration Options

Options and Settings	Defaults
link driver *drivername*	
alternate	
dma [*#1*] [*#2*] *channel_number*	
frame *frame_type*	
int [*#1*] [*#2*] *interrupt_request_number*	
link stations *number*	
max frame size *number*	
mem [*#1*] [*#2*] *hex_starting_address* [*hex_length*]	
node address *hex_address*	
port [*#1*] [*#2*] *hex_starting_address* [*hex_number_of_ports*]	
protocol *name hex_protocol_ID frame_type*	
saps *number*	
slot *number*	
link support	
buffers *communication_number* [*size*]	
max boards *number*	
max stacks *number*	
mempool *number* [*k*]	
netbios abort timeout *number*	*540* (30 seconds)
netbios broadcast count *number*	*2*
netbios broadcast delay *number*	*18* (1 second)
netbios commands *number*	*12*
netbios internet [on|off]	*on*
netbios listen timeout *number*	*108* (6 seconds)
netbios receive buffers *number*	*6* (buffers)
netbios retry count *number*	*10* (1 second)
netbios retry delay *number*	*10* (1 second)
netbios send buffers *number*	*6*
netbios session *number*	*32*
netbios verify timeout *number*	*54* (3 seconds)
npatch *byte offset, value*	

Figure A-4 ***continued***
NET.CFG options

NetWare Configuration Options (*continued*)	
Options and Settings	**Defaults**
protocol *protocol_name*	
bind *board_number*	
config option *number*	
int64 [on|off]	*on*
int7A [on|off]	*on*
ipatch *byte offset, value*	
ipx packet size limit *number*	*4160* (or set by each LAN driver)
ipx retry count *number*	*20 retries*
ipx sockets *number*	*20 sockets*
minimum spx retries *number*	
spx abort timeout *number*	*540* (≈30 seconds)
spx connections *number*	*15* (connections)
spx listen timeout *number*	*108* (≈6 seconds)
spx verify timeout *number*	*54* (≈3 seconds)
netware dos requester	
auto large table [on|off]	*off*
auto reconnect [on|off]	*on*
auto retry *number*	*0*
average name length *number*	*48*
bind reconnect [on|off]	*off*
cache buffers *number*	*5* (cache blocks)
cache buffers size *number*	*512* (bytes)
cache writes [on|off]	*on*
checksum *number*	*1*
* **connections** *number*	*8*
dos name *name*	*ms_dos*
first network drive *drive_letter*	(first available drive)
handle net errors [on|off]	*on*
* **large internet packets [on|off]**	*on*
load low conn [on|off]	*on*
load low ipxncp [on|off]	*on*
local printers *number*	*3*

Figure A-4 ***continued***
NET.CFG options

NetWare Configuration Options (*continued*)

Options and Settings	Defaults
long machine type *name*	*ibm_pc*
max tasks *number*	*31*
message level *number*	*1*
message timeout *number*	*0*
† **name context** "*name*"	
* **network printers** *number*	*3*
pb buffers *number*	*3*
pburst read window size *number*	*16*
pburst write window size *number*	*10*
† **preferred server** *server_name*	(no preferred server)
* **preferred tree** *tree_name*	(no preferred tree)
* **print buffer size** *number*	*64* (bytes)
* **print header** *number*	*64* (bytes)
print tail *number*	*16* (bytes)
read only compatibility [on|off]	*off*
search mode *number*	*1*
set station time [on|off]	*on*
show dots [on|off]	*off*
short machine type *name*	*ibm*
signature level *number*	*1*
true commit [on|off]	*off*
use defaults [on|off]	*on*
vlm *path vlm*	
tbmi2	
data ecb count *number*	
ecb count *number*	
int64 [on|off]	
int7a [on|off]	
use max packets	
using windows 3.0	

* The default setting is the maximum value for NetWare v2.*x* and 3.*x* networks