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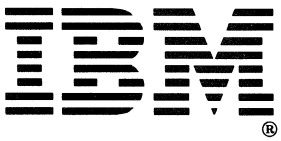

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Introduction and Welcome

These are the Proceedings of the IBM Personal Computer Seminar, designed for independent developers of products for IBM Personal Computers. The purpose of these Proceedings is to aid you in your development efforts by providing relevant information about new product announcements and enhancements to existing products. This issue is prepared in conjunction with this seminar. The Proceedings of future seminars for the IBM Personal Computers also will be published and will cover topics presented at those seminars.

Throughout these Proceedings, the term IBM Personal Computer and the term family of IBM Personal Computers address the IBM Personal Computer, the IBM Personal Computer XT, the IBM PC*jr*, the IBM Portable Personal Computer and the IBM Personal Computer AT.

Purpose

What is our purpose in issuing a publication such as this? It is quite simple.

The IBM Personal Computer family is a resounding success. We've had a lot of help in achieving this success, and much of it came from the independent developers.

As you proceed with your development, do you at times wish for some bit of information or direction which would make the job easier? Information which IBM can provide? This is the type of information we want to make available to you.

Since we want to be assured of giving you the information you need, we ask you to complete the questionnaire which appears at the end of these Proceedings. Your response to this questionnaire will be taken into account in preparing the content of future issues, as well as the content of seminars we will present at microcomputer industry trade shows.

Topics

The following list gives a general indication of the topics we plan to cover in future seminars and include in the IBM Personal Computer Seminar Proceedings:

- Information exchange forum — letters to the editor format
- Development tools — languages, database offerings
- Compatibility issues
- New devices — capacities and speeds
- System capacities — disk and memory
- Enhancements in maintenance releases
- Tips and techniques
- New system software
- Hardware design parameters
- Tips on organizing and writing documents for clear and easy reading
- Changes to terms and conditions

IBM PC Network SMB Protocol

Introduction

This document describes the protocol used by the IBM PC Network Program to communicate between machines on the IBM PC Network. This protocol is called the Server Message Block (SMB) Protocol, named for the primary data structure passed across the network.

This document is both an architecture document and a description of the first implementation of the architecture, the "PC Network Program 1.0" dialect of the SMB Protocol.

Conditions

This is a PRELIMINARY DOCUMENT and is subject to change prior to First Customer Ship of the IBM PC Network Program product.

Any use of the SMB Protocol, SMB's or the fields within the SMB's that is not consistent with this document is not supported. Please refer to the Protocol Extension Guidelines section for more details.

Intended Readership

This document is intended for those programmers who are designing or writing programs that interact with or co-exist with the IBM PC Network Program over the IBM PC Network.
Readers should have an understanding of the IBM PC Network Program, the IBM Personal Computer DOS 3.1 interrupt 21H function calls and the IBM PC Network.

The reader, upon reading this document should understand the protocol between the distributed components of the IBM PC Network Program (servers, redirectors, receivers, messengers).

User Responsibilities

The SMB Protocol does not do extensive checking for invalid fields in SMB's or related data blocks. Erroneous values in these fields will probably cause the IBM PC Network Program to operate incorrectly. It is the responsibility of anyone using, modifying or extending the protocol to adequately test the operation of their application or system programs with the IBM PC Network Program to insure the correct operation of both.

Related Documentation

- IBM PC Network Program User's Guide
- IBM PC Network Technical Reference
- IBM Personal Computer DOS 3.1 Technical Reference

SMB Protocol Overview

The SMB Protocol supports networking functions such as session control, resource sharing, data base sharing, remote print spooling, and messaging between network users. These functions are provided over the IBM PC Network which is a local area network designed to logically and physically connect two or more personal computers. The SMB Protocol has been implemented by the IBM PC Network Program running on the IBM DOS operating system, version 3.1.

This document describes the SMB Protocol in detail and makes references to functions of the IBM PC Network, IBM PC Network Program, and the IBM DOS version 3.1 operating system. For detailed information on these, Please reference the *IBM PC NETWORK TECHNICAL REFERENCE*, *IBM PC NETWORK PROGRAM* User's Guide, and *IBM DOS VERSION 3.1 TECHNICAL REFERENCE*.

This section gives an overview of the SMB Protocol. Before getting into the protocol, a brief description of the IBM PC Network is given.

IBM PC Network Concepts

The SMB Protocol is designed to make efficient use of the following functions and concepts of the IBM PC Network local area network

- Peer network

  Each member of the network is treated equally on a first come, first serve basis. There are no hierarchical relationships as in traditional host/terminal telecommunications operations.

- Reliable virtual connection service

  The IBM PC Network provides the establishment of the physical connection between the members and provides link level support required to transmit the data from one member to another.

- Network Naming

  As each member is added to the network, the member gives the network a name that is recognizable to humans. The network guarantees that the name is unique on the network and passes back a handle which is used for subsequent operations. Other members on the network use this name to communicate with that member. Each member may concurrently use more than one name.

- Sessions

  After the names are specified, two of the members may communicate with each other in a session. An IBM PC Network session is a point-to-point connection that may be full duplex depending upon the protocol used over it. The session is established by one member "calling" another member that is "listening". The IBM PC Network establishes the connection and gives each member a handle that is used for subsequent guaranteed deliveries of data and messages.

- Broadcast Datagram

  The IBM PC Network supports the sending of messages without the establishment of a session with the Datagram service. The SMB Protocol uses the Broadcast Datagram to send a message to all members on the net.

IBM PC Network Adapter Overview

This section describes the IBM PC Network adapter data transfer process. The adapter supports the lower five layers of the OSI OIA data transfer protocols as shown in Figure 1 on page 5 and described as follows:

- Physical Layer

  The physical provides a 2 Mbit/sec physical channel on a broadband network through a single channel RF modem. The carrier sense multiple access with collision detection (CSMA/CD) technique is used to resolve contention and allows sharing of the common channel on the broadband cable.

- Link Layer

  This layer is largely responsible for assembling the bits, transmitted by the Network layer or received from the Physical layer, into data units. When the Physical layer has received a transmission of bits from the cable, it is the responsibility of the Link layer to check and assemble the bits. Once the bits are assembled into a data unit, the unit is tagged with appropriate start and end bits.

  When the Network layer has a packet to transmit, the Link layer has the responsibility to break the packets into data units. The data units are further broken down to remove any starting or ending bytes from the data units for the physical layer.

- Network Layer

  This layer has the responsibility of correctly assembling and routing a group of data units into a packet. When a message or large block of data is received from the Transport layer, this layer uses the correct routing convention for the message and assembles part or all of the message into the correct packet. The packet is then passed on to the Link layer for processing.

  When this layer has received a data unit from the Link layer, the Network layer assembles the units to form a packet for interpretation by the Transport layer.

- Transport Layer

  This layer primarily has the reponsibility of isolating the Session layer from the other lower layers. Also, this layer transmits messages between the Session and Network layers with the appropriate error correction.

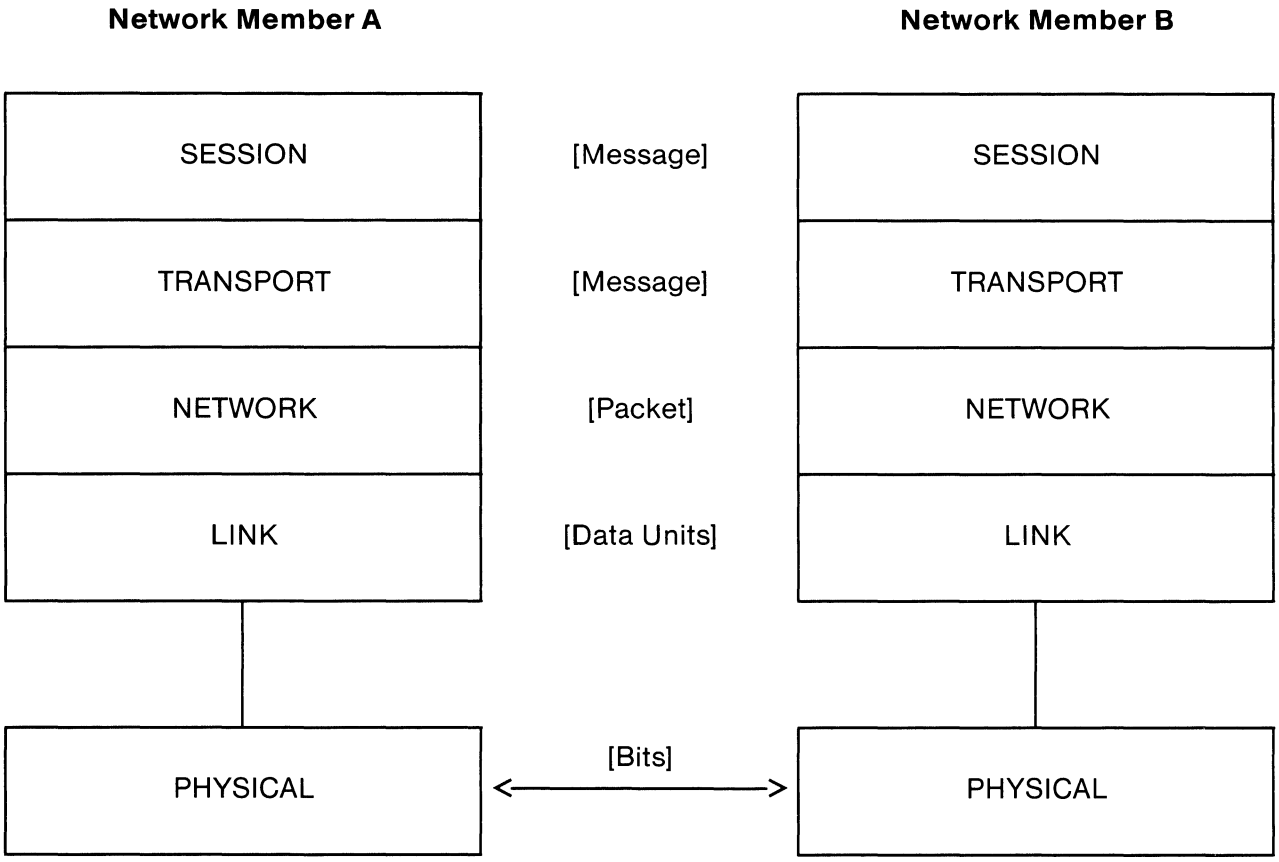


Figure 1. Adapter Protocol Layers

- Session Layer

  This layer presents the front end to the network layer for the user's program. Responsibilities for this layer include error correction of data sent to this layer, establishing a session with two names, and interpreting commands from the user. These commands are presented to the Session layer via a Network Control Block (NCB). The following commands support the SMB protocol:

  - Name Support
    - — ADD NAME
    - — DELETE NAME
  - Session Support Commands
    - — CALL
    - — LISTEN
    - — SEND
    - — RECEIVE
    - — RECEIVE ANY
    - — SESSION STATUS
    - — HANG UP
  - Datagram Support
    - — SEND BROADCAST DATAGRAM
    - — RECEIVE BROADCAST DATAGRAM

SMB Protocol Concepts

Components

The IBM PC Network Program is made up of four basic components. These components may be configured as shown in Figure 2 on page 7.

Redirector

Transforms local requests on one system into network requests (called Server Message Block Requests). The requests may be device accesses

(disks, diskettes, printers, etc), data base accesses (create, open, etc), job spooling (printer), or messages (short, long or broadcasts).

The following components transform the network requests from the redirector into local requests at the remote site. These components are known in this document collectively as Server components.

Receiver

Receives network requests for messages to the computer name and presents them to the user or logs them to a local file.

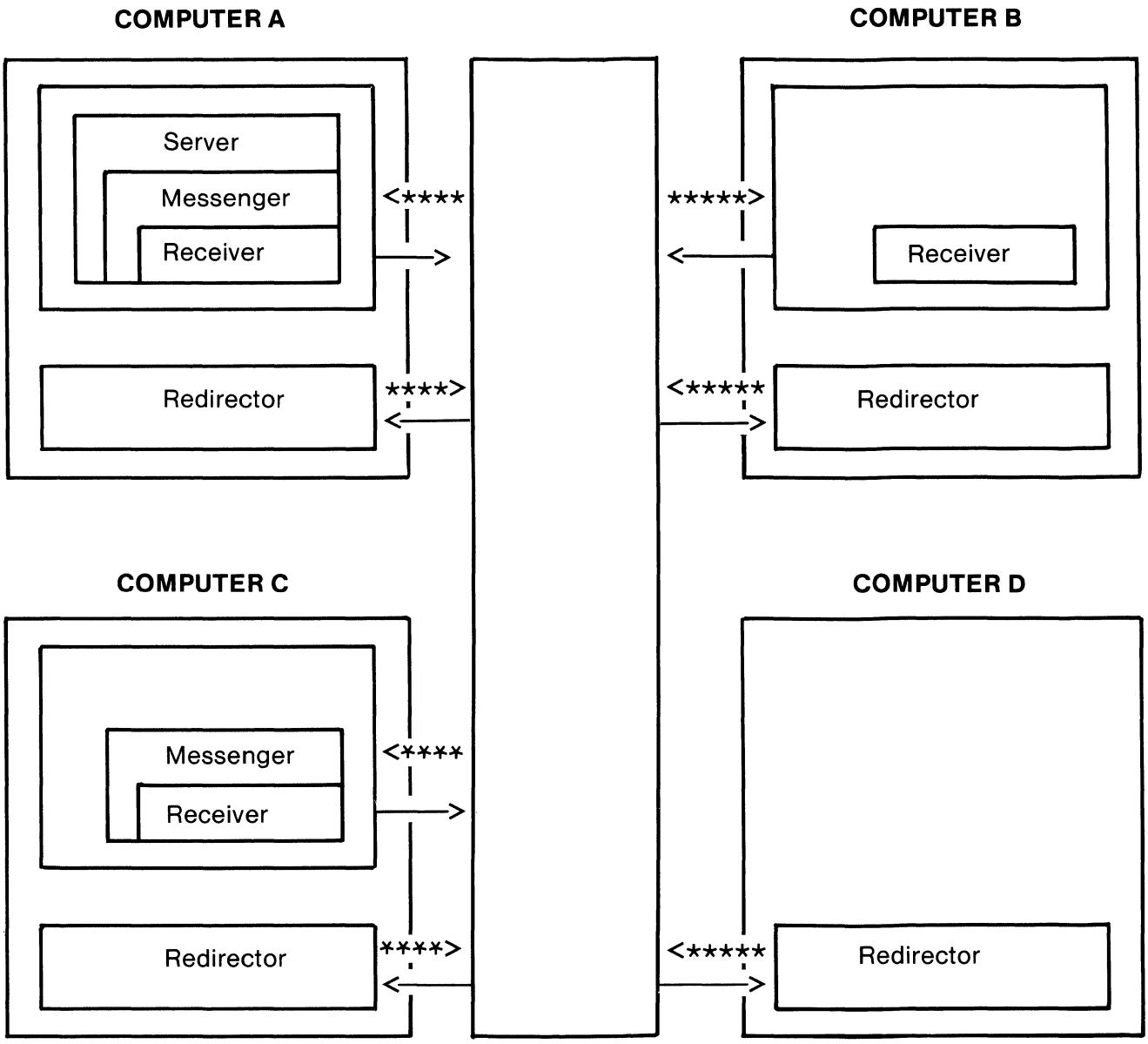
Messenger

A super-set of the receiver. The Messenger also allows the reception of messages for additional user names (other than the computer name) and the ability to transfer the reception of these names to another computer.

Server

A super-set of the Messenger. The Server also transforms network requests for device accesses, data base accesses, and job spooling into local requests.

An exchange of information on an IBM PC Network is always initiated by some action on a requestor's computer. The request flows from the requestor (generally the Redirector) to the Server (or one of the Server's sub-sets).



Key:

****> Requests for Services and Messages
[always sent from Redirector]

———> Responses to Requests for Services and Messages
[always sent from Server/Messenger/Receiver]

Figure 2. Adapter Protocol Layers

Naming

There are two classes of names in the SMB Protocol, Network names and Network Paths.

Network Names

Network names are added to the IBM PC Network in order to communicate between the components. The Network name is padded with blanks and a suffix of one byte is added to create the Machine, Server, Redirector, Main User and Additional User names which are added to the network. The format of the Network names is defined in the SMB Protocol Term Definition section.

Note—The values 00H - 1FH in the sixteenth byte are reserved.

The types of names that are added are as follows:

Machine Name A one to fifteen character name given to the computer by its user.

Server Name A 16 byte name consisting of a machine name with a 20H in the sixteenth byte. This name is used to communicate with the Server.

Redirector Name A 16 byte name consisting of a machine name with a 00H in the sixteenth byte. This name is used to communicate with the Redirector.

Additional User Name or Main User Name A 16 byte name consisting of a machine name with a 03H in the sixteenth byte. This name is used to send and receive messages.

Forwarded User Name A User name, Main or Additional, whose suffix has been changed to 05H. The name is added to the network when asked to "forward a name" (see Forwarding below).

User names are sometimes referred to in this document as "send-to" names.

Network Paths

Resources that are to be shared by the network are identified and given names at the Server. A Network Path name is created for the resource by prefixing the Machine name to the resource name. This Network Path name is used by the network to share the resource.

Connectivity

In order to communicate with a server, the Redirector attempts to establish an IBM PC Network session with the Server (the Server name). If there is room in the local adapter's session table, a session is started. The Redirector and the Server agree on a protocol dialect and start communications.

In order to share resources at a server, The Redirector requests that a connection be set up to the resource (passing the resource name, Network Path, and optionally a password). The Server validates the device name against the Network path device (defined at the Server) and checks the password. Then the Server responds with the maximum Server transmission block size and a connection handle called the Network Path ID which is to be used for all requests to the resource. After finishing with the resource, the Redirector informs the Server to end the connection and free the handle.

Note—There are two sessions between two computers if each computer shares resources of the other. The Redirector in each establishes a session with the Server of the other.

All Server requests (SMB's) are not sent across the same Redirector session. Refer to each SMB request for more information.

Sending Messages

In order to send messages, the Redirector starts a session with the target name (specified by the user). There may be two sessions active between a Redirector and a Server while a message is being sent. The name called has a suffix of 03H. This may be either a machine name or additional name in the eyes of the user but it is considered a user name internally.

Forwarding Messages

This concept allows the forwarding of messages to users even if the home computer is offline. Messages generally go to the computer where the user's name was added. The user may request that his messages be received at another computer. The Server (or a sub-set) requests that the target computer add the User name (Main or Additional) to the network as a Forwarded name. Henceforth, the messages for that user will go to the target computer.

This works because the algorithm for sending messages is to first try to send the message to the Forwarded name (05H suffix). If this fails because the name has not been forwarded and does not exist on the network, send the message to the User name (Main or Additional, 03H suffix).

SMB Protocol Overview

The SMB Protocol consists of a set of data structures called *Server Message Blocks (SMB's)* which are passed over an IBM PC Network session and a set of rules governing the sending of these data structures. There are four general types of Server Message Blocks:

Connection Control Primarily used for the controlling of connections within an IBM PC Network session.

File Used for passing file access requests and data.

Print Used for spooling files for print and the accessing of the print queue.

Message Used for the message function including the Forwarding function.

SMB Protocol Function Description

This section describes the functions of the SMB protocol.

Session Control

These SMB's perform two major functions, dialect determination and connection control.

Dialect Determination

The SMB protocol was designed to be as general as possible allowing the distribution of functions between computers with different operating systems. The protocol described in this document has been designed to support IBM PC's running the IBM DOS 3.1 operating system on an IBM PC Network. However, the protocol provides the dialect determination function to allow future IBM extensions or to allow others to optimize the protocol to suit their operating systems or applications.

The mechanism used is the following: after a session is established between a Redirector and a Server, the Redirector sends the command Verify Dialect with a list of supported dialects to the Server. If the Server can support one of these dialects, it responds by telling the Redirector which one it can support. Following this interaction the two computers proceed to communicate in that dialect. If the Server cannot support one of the dialects requested by the Redirector it returns an error and the session is broken.

Note—This document describes the "PC Network Program 1.0" dialect.

The Verify Dialect command is described in detail in the SMB Protocol Command Description section on Session Control Commands.

Note—Not all SMB transactions occur over a session established with the Start Connection and Verify Dialect commands. These sessions are only used for file and print activity.

The SMB Protocol Command Description section describes the format and content of the data structures.

Connection Control

This function starts and ends a Redirector connection to a network resource at the Server. There are two commands supporting this function:

Start Connection

Establish a Redirector connection to a network resource at the Server. The connection is established over the Redirector/Server IBM PC Network session and all subsequent commands/responses use that session.

End Connection

End a Redirector connection to a network resource. Sent by the Redirector when it is through sharing a device.

These commands are described in detail in the SMB Protocol Command Description section on Session Control Commands.

File Access

This function allows a Redirector to access a file system at a Server for which a Start Connection has been done. The following general functions are supported by these commands:

- Directory Commands
  - Create Directory
  - Check Directory
  - Remove a Directory
- File Creation/Deletion/Maintence
  - Create File
  - Create New File
  - Create Temporary File
  - Delete File
  - Rename File
  - Get File Attributes
  - Set File Attributes
  - Get Disk Attributes - See NOTE.
  - Search Multiple Files - See NOTE.
- File Access
  - Open File
  - Close File

- Read Byte Block
- Write Byte Block
- Commit Process
- End of Process

- File Locking

  - Lock Byte Block
  - Unlock Byte Block

Note—These are DOS specific commands. They contain information concerning internal structures of the DOS operating system.

These commands are described in detail in the SMB Protocol Command Description section on File Commands.

Print Server

This function allows a Redirector to queue files to a print queue at a Server for which a Start Connection has been done. The Redirector may also obtain the entries of the print queue for status.

The print queue status may be obtained without establishing a connection to the printer. The Redirector/Server session is used for the transmission of the request and responses.

The Commands supporting this function are as follows:

- Create Spool File
- Spool Byte Block
- Close Spool File
- Return Print Queue

These commands are described in detail in the SMB Protocol Command Description section on Print Commands.

Messages

The protocol provides several functions for sending and receiving messages.

- Sending/receiving

  compact

  - short messages (one transmission).
  - long messages (several transmissions)

- Broadcasting Short Messages (one transmission)
- Forwarding/cancel forwarding message reception.

The protocol allows multiple User names at one computer to either send or receive messages. (NOTE: The IBM PC Network Program implementation is to allow a computer to receive messages for multiple User names but to send messages from only a single name.)

The receipt of these messages for a User name may be forwarded from one computer to another (if the computer can support the function). This forwarding may be then cancelled to begin reception again at the initial computer.

The following commands support these functions:

- Send Single Block Message
- Send Broadcast Message
- Send Start of Multiple Block Message
- Send Text of Multiple Block Message
- Send End of Multiple Block Message
- Forward User Name
- Cancel Forward
- Get Machine Name

These commands are described in detail in the SMB Protocol Command Description section on Message Commands.

SMB Protocol Command Description

This section describes the SMB Protocol commands as they are implemented in the "PC Network Program 1.0" dialect which distributes functions of IBM DOS 3.1 over the network. This command description contains references and information about these DOS functions. These are included for information only. The reader should refer to the IBM DOS 3.1 Reference and IBM DOS 3.1 Technical Reference manuals for details.

General Format

This section describes some common terms that are used through out the SMB Protocol Command section and defines the Server Message Block (SMB) structure that is used for the commands.

SMB Protocol Term Definition

Destination Name

1 to 15 characters of the same ASCIIZ characters as filename.

Device Name

DOS device name – a 1 to 8 ASCIIZ character string optionally followed by a colon. The characters are the same as filename. If there is only 1 character followed by a colon then the device is a DASD device. If more than 1 character then the device is a character device. Only LPT1: is defined as a printer in the "PC Network Program 1.0" dialect.

Dialect Name

A string of characters of the same ASCIIZ characters as filename.

Dirname

Same as filename.ext

Filename.ext

- filename

  DOS filename - 1 to 8 ASCIIZ characters. The following are invalid:

  – " . / \ [ ] : ¦ < > + = ; ,
  – ASCIIZ characters less than 20H
  – All others are valid.

- .ext

  ext is 0 to 3 chars of the same ASCIIZ characters as filename. If ext is not present than neither is the . separator.

llhh

Term used in this document to describe a word field that is in (low,high) order - the low byte is stored first with the high byte second. The field is transmitted on the wire in this form.

Network Name

16 characters of the following format

```
ccccccccccccccpx
where:
c = 1 to 15 characters of the
    same ASCIIZ characters as
    filename
p = blanks padding the
    remainder of the 15
    characters above
x = 00H Network name is
    Redirector name
    03H Network name is a
    Main or Additional
    User name
    05H Network name is a
    Forwarded name
    20H Network name is
    Server name
```

Note—Values of x = 00H - 1FH are reserved. Refer to the IBM PC Network Program User's Guide for a further discussion of Network Names.

Network Path Name

A name identifying a network resource. It has the following format:

```
\\nnnnnnnnnnnnnnn\ddddddddddddd...ddd
where:
  nnnnnnnnnnnnnnn  is a 1-15 character
                   Machine name
  ddddddddddd...ddd is either a device
                   name or a directory
                   path
```

Note—The total maximum length of a Network Path name is 146 bytes.

Origin Name

1 to 15 characters of the same ASCIIZ characters as filename.

Password

1 to 8 characters of the same ASCIIZ characters as filename.

Path

1 to 128 character route to a directory in the following format:

```
[\][dirname][\dirname[...]]
```

Server Message Block (SMB) Field Description

The following is a list of the SMB fields and the description of each field.

All strings are in ASCII and all word values are in (low,high) order. Please reference Figure 3 on page 16 for the format of the SMB.

SMB__MSGTYP

A 1 byte field identifying the type of message contained in the SMB. The "PC Network Program 1.0" dialect uses only message type 0FFH and values 080H-0FFH are reserved by IBM.

SMB__SERVER

A 3 byte field giving a 3 ASCII character identifier of the server component being addressed. The "PC Network Program 1.0" dialect uses 'SMB' as the server identifier.

SMB__FUNCTION

A 1 byte field identifying the network request represented by this SMB. Please reference Figure 4 on page 17 for a summary of the network request commands.

Note— Function codes 00H-FEH are reserved. All extensions to the SMB protocol should use function code FFH and pass the secondary function code in the SMB__HEINFO field (see below).

SMB__RETCLASS

A 1 byte field indicating the return error class presented to the requestor upon completion of the command. The following list describes the current possible return class codes:

00H No error. The command completed successfully. Figure 5 on page 18 describes informational return codes that are returned in SMB__RETCODE for message commands.

01H The command failed while performing a DOS INT 21H function at the server. The DOS return code is returned in the SMB__RETCODE Field. Please reference the IBM DOS 3.1 Technical Reference manual for a description of these codes.

02H The command failed while performing a Server function. The type of error is returned in the SMB__RETCODE field.

Or

The command was a successful completion of a message transmission.

Please see Figure 6 on page 19 for a listing of the possible network return codes.

03H The command failed due to a critical error in the operating system of the server. The DOS return code is returned in the SMB__RETCODE Field. Please reference the IBM DOS 3.1 Technical Reference manual for a description of these codes.

0FFH The command failed because it was not in the proper SMB format.

04H-7FH Reserved

SMB__HEINFO

A 1 byte field containing the AH value returned from a DOS 24H interrupt. Otherwise the field is reserved. Please reference the IBM DOS 3.1 Technical Reference manual for a description of these codes.

Note—This field is used to pass the secondary function code for programs that use SMB__FUNCTION = FFH for extending the Protocol.

SMB__RETCODE

A 1 word field used with SMB__RETCLASS to give more information concerning the completion status of the command.

Note—Implementers should be aware that the protocol or DOS could be extended and that new error classes and return codes could be added.

SMB__RESV1

A 1 byte field. The high bit (bit 7) indicates the direction of the SMB:
0=Request to server
1=Response to redirector
All other bits (6-0) must be set to 0.

SMB__RESV2-RESV08

Seven 1 word fields that are reserved for future use. They must be set to 00H.

SMB__NPID

A 1 word field containing the network path id that is returned on the Start Connection SMB. Otherwise it is 00H.

SMB__PID

A 1 word field containing the process identification that is assigned to the connection by the Redirector component. The server uses this ID for clean-up functions.

SMB__RESV9-RESV10

Two 1 word fields that are reserved for future use. They must be set to 00H.

SMB__PARMCNT

A 1 byte field containing a count for the number of parameters that will immediately follow this field. If there are no parameters the field is set to 00H.

SMB__P1-Pn

A set of 1 word fields containing SMB command dependent parameters. The count of this set is placed in SMB__PARMCNT.

SMB__BUFLEN

A 1 word field containing the length of the entire buffer area following this header.

SMB__BUF

A buffer area containing zero or more variable length structures. The first byte of each structure contains a 1 byte field that indicates the structure type as follows:

01H The structure is a Server Data Block of variable length.

02H The structure is a Dialect ID string

03H The structure is an ASCIIZ Path Name string

04H The structure is an ASCIIZ string

05H The structure is a function specific variable length data block.

00H,06H-7FH ID's are reserved.

The string structures must contain the 1 byte structure type field (as stated above), followed by the string, and ended by 1 byte containing the value 00H.

The varible length data blocks must contain the 1 byte structure type field, followed by a 1 word field containing the length of the following data, and then the data.

SMB_ID	DB OFFH	PC Network Program 1.0 Message type
SMB_SERVER	DB 'SMB'	SMB Server type
SMB_FUNCTION	DB 0	Function Code
SMB_RETCLASS	DB 0	Return Error Class
SMB_HEINFO	DB 0	AH value on INT 24H or reserved = 0
SMB_RETCODE	DW 0	Return Error code
SMB_RESV1	DB 0	Reserved, must be zero
SMB_RESV2	DW 0	Reserved, must be zero
SMB_RESV3	DW 0	Reserved, must be zero
SMB_RESV4	DW 0	Reserved, must be zero
SMB_RESV5	DW 0	Reserved, must be zero
SMB_RESV6	DW 0	Reserved, must be zero
SMB_RESV7	DW 0	Reserved, must be zero
SMB_RESV8	DW 0	Reserved, must be zero
SMB_NPID	DW 0	Network Path ID
SMB_PID	DW 0	Process ID
SMB_RESV9	DW 0	Reserved, must be zero
SMB_RESV10	DW 0	Reserved, must be zero
SMB_PARMCNT	DB 0	Count of Parameters in SMB
SMB_P1-Pn	DW 0	Function Dependent Parameters Described Under the SMB Command description
SMB_BUFLEN	DW 0	Length of SMB_BUF
SMB_BUF	EQU This byte	Start of Buffer Area

Figure 3. Server Message Block (SMB) Format for Dialect PCLAN1.0

Value	Network Request Command
00H	Create Directory
01H	Delete Directory
02H	Open File
03H	Create File
04H	Close File
05H	Commit All Files
06H	Delete File
07H	Rename File
08H	Get File Attribute
09H	Set File Attribute
0AH	Read Byte Block
0BH	Write Byte Block
0CH	Lock Byte Block
0DH	Unlock Byte Block
0EH	Create Unique File
0FH	Create New File
10H	Check Directory
11H	End of Process
12H	LSEEK

Value	Network Request Command
70H	Start Connection
71H	End Connection
72H	Verify Dialect
80H	Get Disk Attributes
81H	Search Multiple Files
C0H	Create Spool File
C1H	Spool Byte Block
C2H	Close Spool File
C3H	Return Print Queue
D0H	Send Message
D1H	Send Broadcast
D2H	Forward User Name
D3H	Cancel Forward
D4H	Get Machine Name
D5H	Start Multi-Block Message
D6H	End Multi-Block Message
D7H	Multi-Block Message Text

Figure 4. Values for the SMB_FUNCTION Field

Return Code	Value	Meaning
SMBBUFFERED	0054H	Message Has Been Buffered
SMBLOGGED	0055H	Message Has Been Logged
SMBRCVED	0056H	User Message Displayed

Figure 5. Values for SMB_RETCODE for SMB_RETCLASS = 00H

Return	Value	Meaning
	0000H	Reserved
SMBERROR	0001H	Non_Specific Error?
SMBBADPW	0002H	Bad Password
SMBBADTYPE	0003H	Device Type Mismatch on Assign
SMBACCESS	0004H	Netname Access Level Violated
SMBINVNNID	0005H	Invalid Network Path ID
SMBINVNETNAME	0006H	Invalid Network Path [Not Found]
SMBINVDEVICE	0007H	Invalid Device
SMBQFULL	0031H	Print Queue Full [Files]
SMBQTOOBIG	0032H	Print Queue Out of Space
SMBQEOF	0033H	End of File on Print Queue Dump
SMBINVPFID	0034H	Invalid Print File ID
SMBPAUSED	0051H	Server is Paused
SMBMSGOFF	0052H	Nor Receiving Messages
SMBNOROOM	0053H	No Room to buffer Message
SMBTOOMANYRMUNS	0057H	Too many remote user names
SMBDUPNAME	0058H	Duplicate name on network
SMBNOTSUPPORTED	FFFFH	Function Not Supported

Figure 6. Values for SMB_RETCODE for SMB_RETCLASS = 02H

Session Control Commands

Verify Dialect

Purpose

Sent by the Redirector to establish the dialect to be used on a IBM PC Network session.

Description

The Redirector sends the list of dialects that it can support to the Server. The Server may then pick the one that it will support during the IBM PC Network session. If the Server can not support any of the dialects, it indicates this and the Redirector hangs-up the session. The list of dialects is as follows:

- PC Network Program 1.0

Session suffix: 00H - 20H; Redirector to Server name from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  72H     Verify Dialect
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  0000H
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H     No parameters
SMB_BUFLEN              DW  11hhH   Total length of following items
SMB_BUF                             Contains one or more of the
                                    following dialect strings:
                        DB  02H     Item is a Dialect ASCIIZ string
                        DB  "dialect"  (Note:  The maximum length of
                                    all the "dialect" strings, not
                                    counting the 02H item code and the
                                    final zero bytes, is 64 bytes for
                                    the IBM PC Network Program, Version 1.0)
                        DB  00H     End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  72H     Verify Dialect
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  11hhH   As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H     One parameter
SMB_P1                  DW  11hhH   Zero base index into the set of dialect
                                    strings passed on the request or FFFFH
                                    if none of the dialects can be supported
SMB_BUFLEN              DW  0000H   No Buffer
```

Start Connection

Purpose

Sent by the Redirector to establish a Redirector/Server Connection.

Description

The Redirector sends this command to the Server requesting that a connection be made to a network resource. The Server maintains a table identifying the local resources that it will share with the network. The table contains the mapping from the Network Path name to the local name, the type of resource, and optionally a password required to access the resource. This command contains the Network Path name for the resource, the resource type that the Redirector expects and optionally a password. The Server maps the Network Path name into a local resource name, verifies that the device is what the Redirector expects, and verifies the password.

The Server passes back a network path ID that must be used for subsequent requests for that resource. The Server also returns the maximum size transmission block that it will accept. The Redirector may send smaller blocks if it so chooses.

If Start Connection is not used in establishing communication with a server then the maximum transmission size *must* be assumed to be 512 bytes.

Session suffix: 00H - 20H; Redirector to Server name from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB 0FFH
SMB_SERVER              DB "SMB"
SMB_FUNCTION            DB  70H   Start Connection
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH Total length of following items
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "\\ network path" Network path name of
                            resource
                        DB  00H   End of String
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "password" Null if no password
                        DB  00H   End of String
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "device name" Device name represents
                            the type of device expected, for example:
                            A:    resource is DASD
                            LPT1: resource is a device
                        DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB OFFH
SMB_SERVER              DB "SMB"
SMB_FUNCTION            DB  70H    Start Connection
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH Must be used for subsequent access
                            of resource
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  02H    Two parameters
SMB_P1                  DW  llhhH  Maximum transmit size to Server
                            Transmissions on this connection
                            must not exceed this size
SMB_P2                  DW  llhhH  Network path ID
SMB_BUFLEN              DW  0000H No Buffer
```

End Connection

Purpose

Sent by the Redirector to end a Redirector/Server Connection.

Description

The Server ends the connection to the resource. The protocol does not require that files that were open during the connection be closed upon receipt of this command by the Server.

Session suffix: 00H - 20H; Redirector to Server name form DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB OFFH
SMB_SERVER              DB "SMB"
SMB_FUNCTION            DB  71H   End Connection
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  11hhH As returned on the Start Connection
SMB_PID                 DW  11hhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB OFFH
SMB_SERVER              DB "SMB"
SMB_FUNCTION            DB  71H   End Connection
SMB_RETCLASS            DB  00H   If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  11hhH As sent on request
                            of resource
SMB_PID                 DW  11hhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

File Commands

Create Directory

Purpose

Sent by the Redirector to implement the DOS MKDIR function.

Description

The effect of this command is to create a directory with the given name at the level specified by the given path.

The \path-new-directory-name is affixed to the Network path represented by the SMB__NPID and the new directory is created.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  00H    Create Directory
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                            for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H    No parameters
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H    Buffer is an ASCIIZ string
                        DB  "\path\filename.ext" New directory name
                        DB  00H    End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  00H    Create Directory
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                            for the Network Path
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H    No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Remove a Directory

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Purpose

Sent by the Redirector to implement the DOS RMDIR function.

Description

The effect of this command is to Remove a directory from the network file system.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  01H   Delete Directory
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                            for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "\path\filename.ext" Directory name
                        DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  01H   Delete Directory
SMB_RETCLASS            DB  00H   If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                            for the Network Path
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Check Directory

Purpose

Sent by the Redirector to determine if a directory exists at the Server.

Description

The Redirector maintains its own view of the current directory for a network resource. The user may use any directory on the network resource as his current directory by using the DOS CHDIR command. The Redirector uses the Check Directory SMB command to determine if the directory exists on the network resouce represented by the network path id in the SMB__NPID field.

This command does not result in a changing the current directory at the server.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  10H   Check Directory
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                            for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "\path"
                        DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  10H    Check Directory
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                            for the Network Path
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Open File

Purpose

Sent by the Redirector to establish a handle to an existing file for subsequent access.

Description

The Server issues a DOS open of the file for the Redirector. The file may be opened for access of read only, write only, or both read and write. It may be opened in one of the following sharing modes:

Compatibility Mode

The file may be opened any number of times provided that the file was not previously opened with one of the four modes below. If the file was previously opened in one of the other sharing modes, the open is rejected.

Deny Read/Write Mode

This mode gains exclusive access to the file. The open is rejected if the file has been previously opened in any mode.

Deny Write Mode

This mode allows the file to be opened again for reading. The open is rejected if the file has been opened with a write access or in compatibility mode.

Deny Read Mode

This mode allows the file to be opened by others for writing. This open is rejected if the file has been opened by others for reading in compatibility mode.

Deny None Mode

This mode allows the file to be opened by others for both reading and/or writing. This open is rejected if the file has been opened in any other mode.

The Server returns a file handle to the Redirector which is to be used for subsequent accesses.

It is possible for a process at the Redirector to open a file using the DOS 21H interrupt function call 0FH (commonly called an FCB open). The FCB open does not support the access or sharing modes. DOS determines what read/write and sharing access to assign to the file from the state of the file at the time of this open. The "PC Network Program 1.0" dialect supports an FCB open by providing an indication on the Open SMB. The Redirector marks the Open File SMB as an FCB open. The Server may then apply the algorithm at its site.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  02H   Open File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                            for the Network Path
SMB_PID                 DW  llhhH Used to correlate handle to process
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  02H   Two parameters
SMB_P1                  DW  00acH Access code
                            ac is in the following bit form:
                              PSSS0AAA or 11111111
                            Where:
                            P    Deny Passing of file to child
                                 process during exec
                            SSS  Sharing Mode
                                 0 = Compatibility
                                 1 = Deny Read/Write
                                 2 = Deny Write
                                 3 = Deny Read
                                 4 = Deny None
                            0    Reserved - must be zero
                            AAA  Access Mode
                                 0 = Open for Read only
                                 1 = Open for Write only
                                 2 = Open for Read/Write

                           11111111  The file is being opened via
                                     an FCB open
SMB_P2                      DW  00aaH Attribute - Sent by the Redirector
                                      but is not used by the Server in
                                      "PC Network Program 1.0" dialect
SMB_BUFLEN                  DW  llhhH Length of Buffer Including type
SMB_BUF                     DB  04H   Buffer is an ASCIIZ string
                            DB  "\path\filename.ext"
                            DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  02H     Open File
SMB_RETCLASS            DB  00H     If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H   If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  11hhH   As returned on the Start connection
                                    for the Network Path
SMB_PID                 DW  11hhH   As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  07H     Seven parameters
SMB_P1                  DW  11hhH   The handle to be used for access
SMB_P2                  DW  00aaH   The attribute of the file from the
                                    files directory.  It is not the one
                                    that was sent on the request.
SMB_P3                  DW  11hhH   Low word of a double word containing
                                    time recorded as the number of seconds
                                    from Jan. 1, 1970
SMB_P4                  DW  11hhH   High word of the time double word
SMB_P5                  DW  11hhH   Low word of a double word containing
                                    the size of the file opened
SMB_P6                  DW  11hhH   High word of the file size double word
SMB_P7                  DW  000nH   Access allowed for this file:
                                       n=0  RO Read Only
                                       n=1  WO Write Only
                                       n=2  RW Read Write
SMB_BUFLEN              DW  0000H   No Buffer
```

Create File

Purpose

Sent by the Redirector to create a new file or to truncate an old file to zero length and to establish a handle to the file for subsequent access.

Description

The effect of this command to create a file of zero length with the attributes given on the SMB command. The file is opened with sharing mode of compatibility and read/write access or read only if the file has read only attribute. The handle is passed back for subsequent access.

For existing files, the create is rejected if the file is already opened or if the file attribute is read only.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  03H   Create File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                            for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  03H   Three parameters
SMB_P1                  DW  00aaH Attribute
                            aa is in the following bit form:
                            00advshr
                            Where:
                            0   reserved - must be zero
                            a   Changed and not archived
                            d   directory file
                            v   entry is a volume label
                            s   system file
                            h   hidden file
                            r   read only file
                                v and d must be set to zero for
                                this command.
SMB_P2                  DW  llhhH Low word of a double word containing
                                  time recorded as the number of
                                  seconds from Jan. 1, 1970.
SMB_P3                  DW  llhhH High word of the time double word
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "\path\filename.ext"
                        DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  03H    Create File
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H  If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH  As returned on the Start connection
                                   for the Network Path
SMB_PID                 DW  llhhH  As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H    One parameter
SMB_P1                  DW  llhhH  The handle to be used for access
SMB_BUFLEN              DW  0000H  No Buffer
```

Close File

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Purpose

Sent by the Redirector to close a file.

Description

The file represented by the file handle is closed. The time passed on the command is used as the time the file was last accessed.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  04H   Close File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  03H   Three parameters
SMB_P1                  DW  llhhH The handle from the open
SMB_P2                  DW  llhhH Low word of a double word containing
                                  time recorded as the number of
                                  seconds from Jan. 1, 1970.
                                  SMB_P1 and SMB_P2 = FFFFH if no
                                  change needed
                                  (write-protected diskettes)
SMB_P3                  DW  llhhH High word of the time  double word
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  04H   Close File
SMB_RETCLASS            DB  00H   If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                                  for the Network Path
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Commit File

Purpose

Sent by the Redirector to cause all buffers for a file to be written to the media.

Description

The Server forces the I/O to be done for the file represented by the file handle. The response to the command is not sent until the I/O is complete. The Redirector may also request that the Server commit all files opened in the connection represented by the network path id in the SMB__NPID field.

Note—"PC Network Program 1.0" implementation commits all files for all network paths.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  05H    Commit File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH Used to correlate files opened by
                                  this process
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H    One parameter
SMB_P1                  DW  llhhH The handle from the open or
                                  FFFFh to commit all files
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  05H    Commit File
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                                  for the Network Path
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H    No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Delete File

Purpose

Sent by the Redirector to delete a file.

Description

This command removes a directory entry associated with a filename. Read-only files cannot be deleted by this command (The Set File Attribute SMB command may be used to change the files read-only attribute and then the file may be deleted).

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  06H   Delete File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H   One parameter
SMB_P1                  DW  00aaH Attribute
                            aa is in the following bit form:
                            00advshr
                            Where:
                            0  reserved - must be zero
                            a  Changed and not archived
                            d  directory file
                            v  entry is a volume label
                            s  system file
                            h  hidden file
                            r  read only file
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "\path\filename.ext" (global characters allowed)
                        DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  06H   Delete File
SMB_RETCLASS            DB  00H   If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                                  for the Network Path
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Rename File

Purpose

Sent by the Redirector to rename an existing file within a network resource.

Description

This command changes the directory entry associated with the old filename. If the new filename is on a different path than the old filename, the old directory entry is deleted and a new one created on the new directory. The attributes are copied over to the new entry.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value
SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  07H   Rename File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H   One parameter
SMB_P1                  DW  00aaH Attribute
                            aa is in the following bit form:
                            00advshr
                            Where:
                            0  reserved - must be zero
                            a  Changed and not archived
                            d  directory file
                            v  entry is a volume label
                            s  system file
                            h  hidden file
                            r  read only file
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H   Buffer entry is an ASCIIZ string
                        DB  " path filename.ext" (global characters allowed)
                            Old file name
                        DB  00H   End of String
                        DB  04H   Buffer entry is an ASCIIZ string
                        DB  "\path\filename.ext" New file name
                        DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value
SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  07H   Rename File
SMB_RETCLASS            DB  00H   If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                                  for the Network Path
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Get File Attributes

Purpose

Sent by the Redirector to obtain information about a file.

Description

The Server returns the file's attributes, time of last access and the file size.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  08H   Get File Attributes
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "\path\filename.ext"
                        DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

Field	Value	
SMB_MSGTYPE	DB	0FFH
SMB_SERVER	DB	"SMB"
SMB_FUNCTION	DB	08H Get File Attributes
SMB_RETCLASS	DB	00H If command successful
SMB_HEINFO	DB	00H
SMB_RETCODE	DW	0000H If command successful
SMB_RESV1	DB	00H
SMB_RESV2-RESV8	DW	0,0,0,0,0,0,0
SMB_NPID	DW	llhhH As returned on the Start connection for the Network Path
SMB_PID	DW	llhhH As sent on the request
SMB_RESV9-RESV10	DW	0,0
SMB_PARMCNT	DB	0AH Ten parameters
SMB_P1	DW	00aaH Attribute aa is in the following bit form: 00advshr Where: 0 reserved – must be zero a Changed and not archived d directory file v entry is a volume label s system file h hidden file r read only file
SMB_P2	DW	llhhH Low word of a double word containing time recorded as the number of seconds from Jan. 1, 1970
SMB_P3	DW	llhhH High word of the time double word
SMB_P4	DW	llhhH Low word of a double word containing the size of the file opened
SMB_P5	DW	llhhH High word of the file size double word
SMB_P6-P10	DW	0000H Reserved - Must be zero
SMB_BUFLEN	DW	llhhH Length of Buffer including type
SMB_BUF	DB	04H Buffer is an ASCIIZ string
	DB	"" (Null string)
	DB	00H End of string

Set File Attributes

Purpose

Sent by the Redirector to set a file's attribute for subsequent access.

Description

The Server returns the files attributes sets the attributes.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  09H   Set File Attributes
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH Used to correlate handle to process
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  08H   Eight parameters
SMB_P1                  DW  00aaH Attribute
                            aa is in the following bit form:
                            00advshr
                            Where:
                            0  reserved - must be zero
                            a  Changed and not archived
                            d  directory file
                            v  entry is a volume label
                            s  system file
                            h  hidden file
                            r  read only file
SMB_P2-P3               DW  0,0
SMB_P4-P5               DW  000000000000000rB
                            Where:
                            r is the read only file attribute
                            bit from the SMB_P1 parameter
SMB_P6-P8               DW  0,0,0
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "\path\filename.ext"
                        DB  00H   End of String
                        DB  04H   Buffer is a null ASCIIZ string
                        DB  00H   End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  09H    Set File Attributes
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H  If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH  As returned on the Start connection
                                   for the Network Path
SMB_PID                 DW  llhhH  As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H    No parameters
SMB_BUFLEN              DW  0000H  No Buffer
```

Read Byte Block

Purpose

Sent by the Redirector to read a block of data from a file.

Description

The Server obtains the requested amount of data from the file and sends it to the Redirector. If the number of bytes is less than the byte count requested, then end of file has been reached. The Redirector may increase performance by sending the Server the total number of bytes left to read. This allows the server to pre-read. The Server does not require that the next Read Byte Block command reflect the information provided.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0AH   Read Byte Block
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  05H   Five parameters
SMB_P1                  DW  llhhH The handle from the open
SMB_P2                  DW  llhhH The number of bytes to be read
SMB_P3                  DW  llhhH Low word of a double word
                                  containing the file offset
                                  to start reading
SMB_P4                  DW  llhhH High word of file offset
                                  double word
SMB_P5                  DW  llhhH Total count left to read (including
                                  this read)
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

Field	Value	
SMB_MSGTYPE	DB	0FFH
SMB_SERVER	DB	"SMB"
SMB_FUNCTION	DB	0AH Read Byte Block
SMB_RETCLASS	DB	00H If command successful
SMB_HEINFO	DB	00H
SMB_RETCODE	DW	0000H If command successful
SMB_RESV1	DB	00H
SMB_RESV2-RESV8	DW	0,0,0,0,0,0,0
SMB_NPID	DW	llhhH As returned on the Start connection for the Network Path
SMB_PID	DW	llhhH As sent on the request
SMB_RESV9-RESV10	DW	0,0
SMB_PARMCNT	DB	05H No parameters
SMB_P1	DW	llhhH Number of bytes read. If less than requested, EOF reached.
SMB_P2-P5	DW	0000H Reserved
SMB_BUFLEN	DW	llhhH Buffer of length hhll includes type
SMB_BUF	DB	01H Buffer is a Variable length data block
	DW	llhhH Length of following buffer
	DB	xx-xx Data block

Write Byte Block

Purpose

Sent by the Redirector to write a block of data into a file

Description

The Server writes the requested number of blocks into the file. If the written number of bytes is less than the byte count requested to write, then there was an error on the write. Usually this is caused by the disk being full. The Redirector may increase performance by sending the Server the total number of bytes left to write. The Server does not require that the next Write Byte Block command reflect the information provided.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0BH   Write Byte Block
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  05H   Five parameters
SMB_P1                  DW  llhhH The handle from the open
SMB_P2                  DW  llhhH The number of bytes to be written
SMB_P3                  DW  llhhH Low word of a double word
                                  containing the file offset
                                  to start writing
SMB_P4                  DW  llhhH High word of file offset
                                  double word
SMB_P5                  DW  llhhH Total count left to read (including
                                  this write)
SMB_BUFLEN              DW  llhhH Buffer of length hhll includes type
SMB_BUF                 DB  01H   Buffer is a Variable length data
                                  block
                        DW  llhhH Length of following buffer
                        DB  xx-xx Data block
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0BH    Write Byte Block
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H  If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH  As returned on the Start connection
                                   for the Network Path
SMB_PID                 DW  llhhH  As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H    One Parameter
SMB_P1                  DW  llhhH  Number of bytes written. If less
                                   than requested, there was an error
                                   on the write
SMB_BUFLEN              DW  0000H  No Buffer
```

LSEEK

Purpose

Sent by the Redirector to move the File Read/Write Pointer.

Description

The Server does an LSEEK operation on the file and returns the new pointer location. This operation is used by the IBM PC Network Program primarily to determine file size.

Only sent for files opened for shared output (when EOF can change).

Request SMB Values Sent to the Server from the Redirector

```
Field                Value

SMB_MSGTYPE          DB  0FFH
SMB_SERVER           DB  "SMB"
SMB_FUNCTION         DB  12H    LSEEK
SMB_RETCLASS         DB  00H
SMB_HEINFO           DB  00H
SMB_RETCODE          DW  0000H
SMB_RESV1            DB  00H
SMB_RESV2-RESV8      DW  0,0,0,0,0,0,0
SMB_NPID             DW  11hhH  As returned on the start connection
SMB_PID              DW  11hhH
SMB_RESV9-RESV10     DW  0,0
SMB_PARMCNT          DB  04H    Four parameters
SMB_P1               DW  11hhH  File handle
SMB_P2               DW  11hhH  Type of LSEEK
SMB_P3               DW  11hhH  Low offset
SMB_P4               DW  11hhH  High offset
SMB_BUFLEN           DW  0000H  No Buffer
```

Return SMB Values Sent to the Redirector from the Server

```
SMB_MSGTYPE          DB  0FFH
SMB_SERVER           DB  "SMB"
SMB_FUNCTION         DB  12H    LSEEK
SMB_RETCLASS         DB  00H    If command successful
SMB_HEINFO           DB  00H
SMB_RETCODE          DW  0000H  If command successful
SMB_RESV1            DB  00H
SMB_RESV2-RESV8      DW  0,0,0,0,0,0,0
SMB_NPID             DW  11hhH  As returned on the start connection
SMB_PID              DW  11hhH  As sent on the request
SMB_RESV9-RESV10     DW  0,0
SMB_PARMCNT          DB  02H    Two parameters
SMB_P1               DW  11hhH  Location of pointer low
SMB_P2               DW  11hhH  Location of pointer high
SMB_BUFLEN           DW  0000H  No Buffer
```

Lock Byte Block

Purpose

Sent by the Redirector to lock a region of bytes within a file.

Description

This function provides a simple mechanism for excluding others read/write access to a region of the file. The locked regions can be anywhere within the logical file. Locking beyond end of file is not an error.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0CH   Lock Byte Block
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  05H   Five parameters
SMB_P1                  DW  llhhH The handle from the open
SMB_P2                  DW  llhhH Low word of a double word
                                  containing the count of
                                  bytes to lock
SMB_P3                  DW  llhhH High word of lock count double word
SMB_P4                  DW  llhhH Low word of a double word
                                  containing the file offset
                                  to start lock
SMB_P5                  DW  llhhH High word of file offset
                                  double word
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0CH   Lock Byte Block
SMB_RETCLASS            DB  00H   If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start connection
                            for the Network Path
SMB_PID                 DW  llhhH As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No Parameter
SMB_BUFLEN              DW  0000H No Buffer
```

Unlock Byte Block

Purpose

Sent by the Redirector to unlock a region of bytes within a file

Description

Unlock releases the lock issued in the Lock Byte Block command. The region specified must be exactly the same as the region specified in the previous lock on the file. Closing a file or ending a connection with the Server with locks held causes undefined results.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0DH   Unlock Byte Block
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  05H   Five parameters
SMB_P1                  DW  llhhH The handle from the open
SMB_P2                  DW  llhhH Low word of a double word
                                  containing the count of
                                  bytes to unlock
SMB_P3                  DW  llhhH High word of unlock count
                                  double word
SMB_P4                  DW  llhhH Low word of a double word
                                  containing the file offset
                                  to start unlock
SMB_P5                  DW  llhhH High word of file offset
                                  double word
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0DH    Unlock Byte Block
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H  If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH  As returned on the Start connection
                                   for the Network Path
SMB_PID                 DW  llhhH  As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H    No Parameter
SMB_BUFLEN              DW  0000H  No Buffer
```

Create Unique File

Purpose

Sent by the Redirector to create a unique file.

Description

The Server creates a file with a unique name and passes the name back to the Redirector. The file is opened in the compatible mode with read/write access.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

This request is useful for creating unique temporary or work files.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0EH     Create Unique File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                            for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  03H   Three parameters
SMB_P1                  DW  00aaH Attribute
                            aa is in the following bit form:
                            00advshr
                            Where:
                            0  reserved - must be zero
                            a  Changed and not archived
                            d  directory file
                            v  entry is a volume label
                            s  system file
                            h  hidden file
                            r  read only file
                               v and d must be set to zero for
                               this command.
SMB_P2                  DW  llhhH Low word of a double word
                            containing time recorded as
                            the number of seconds from
                            Jan. 1, 1970.
SMB_P3                  DW  llhhH High word of the time double
                            word
SMB_BUFLEN              DW  length
SMB_BUF                 DB  04H    Item is an ASCIIZ string
                        DB  "\path" Path of sub-directory to create file in.
                        DB  00H    End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0EH    Create Unique File
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H  If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH  As returned on the Start connection
                                   for the Network Path
SMB_PID                 DW  llhhH  As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H    One parameter
SMB_P1                  DW  llhhH  The handle to be used for access
SMB_BUFLEN              DW  llhhH  Length of Buffer Including type
SMB_BUF                 DB  04H    Buffer is an ASCIIZ string
                        DB  "\path\filename.ext" Name of new file
                        DB  00H    End of String
```

Create New File

Purpose

Sent by the Redirector to create a new file.

Description

This command is identical to the Create File command except that it will fail if the file name already exists. The file is created in compatibility mode with read/write access.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0FH    Create New File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  03H    Three parameters
SMB_P1                  DW  00aaH Attribute
                            aa is in the following bit form:
                            00advshr
                            Where:
                            0  reserved - must be zero
                            a  Changed and not archived
                            d  directory file
                            v  entry is a volume label
                            s  system file
                            h  hidden file
                            r  read only file
                               v and d must be set to zero for
                               this command.
SMB_P2                  DW  llhhH Low word of a double word
                                  containing time recorded as
                                  the number of seconds
                                  from Jan. 1, 1970.
SMB_P3                  DW  llhhH High word of the time
                                  double word
SMB_BUFLEN              DW  llhhH Length of Buffer including type
SMB_BUF                 DB  04H    Buffer is an ASCIIZ string
                        DB  "\path\filename.ext" Name of file
                        DB  00H    End of String
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  0FH    Create File
SMB_RETCLASS            DB  00H    If command successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H  If command successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH  As returned on the Start connection
                                   for the Network Path
SMB_PID                 DW  llhhH  As sent on the request
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H    One parameter
SMB_P1                  DW  llhhH  The handle to be used for access
SMB_BUFLEN              DW  0000H  No Buffer
```

End Of Process

Purpose

Sent by the Redirector to end all work within this connection that belongs to the given process.

Description

This Server ends all work belonging to the given process within the connection.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

An End of Process is sent for each network path a redirector has active. This can cause a server to receive multiple End of Processes for the same process. Also, if the user has shared a printer, an End of Process will be received each time a user application ends in the server foreground.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  11H   End of Process
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH Close all files for this process ID
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  11H   End of Process
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH All Files closed for this process
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Get Disk Attributes - DOS Specific Request

Purpose

Sent by the Redirector to get storage sizes and disk layout.

Description

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

This is a "PC Network Program 1.0" dialect specific request.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  80H   Get Disk Attributes
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  80H   Get Disk Attributes
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH All Files closed for this process
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  05H   Five parameters
SMB_P1                  DW  llhhH Number of clusters per disk
SMB_P2                  DW  llhhH Number of sectors per cluster
SMB_P3                  DW  llhhH Size of each sector in bytes
SMB_P4                  DW  llhhH Number of free clusters
SMB_P5                  DW  00xxH FAT ID byte
SMB_BUFLEN              DW  0000H No Buffer
```

Search Multiple Files - DOS Specific Request

Purpose

Sent by the Redirector to implement the FCB and ASCIIZ search function.

Description

This is a "PC Network Program 1.0" dialect specific request. The command passes the path and the file name of the file to be found. The filename portion can contain global filename characters. An attribute is also sent to be used in the file search. The following search pattern is used:

1. If the attribute is zero, only normal file entries are found. Entries for volume label, sub-directories, hidden and system files will not be returned.
2. If the attribute is set for hidden or system files, or directory entries, it is to be considered as an inclusive search. All normal file entries plus all entries matching the specified attributes are returned. To look at all directory entries except the volume label, the attribute may be set to hidden + system + directory (all 3 bits on).
3. If the Attribute is set for the volume label, it is considered an exclusive search, and only the volume label entry is returned.

The Server returns multiple search entries to provide for better network performance.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command.

Request SMB Values Sent To The Server From The Redirector

Field	Value
SMB_MSGTYPE	DB 0FFH
SMB_SERVER	DB "SMB"
SMB_FUNCTION	DB 81H Search Multiple Files
SMB_RETCLASS	DB 00H
SMB_HEINFO	DB 00H
SMB_RETCODE	DW 0000H
SMB_RESV1	DB 00H
SMB_RESV2-RESV8	DW 0,0,0,0,0,0,0
SMB_NPID	DW 11hhH As returned on the Start Connection for the Network Path
SMB_PID	DW 11hhH
SMB_RESV9-RESV10	DW 0,0
SMB_PARMCNT	DB 02H Two parameters
SMB_P1	DW 11hh Maximum number of search entries to return
SMB_P2	DW 00aaH Attribute aa is in the following bit form: 00advshr Where: 0 reserved – must be zero a Changed and not archived d directory file v entry is a volume label s system file h hidden file r read only file
SMB_BUFLEN	DW 11hhH Length of items below
SMB_BUF	DB 04H Entry is an ASCIIZ string DB "\path\filename,ext" Name of file Global chars allowed DB 00H End of String DB 05H Entry is variable length - function specific format DW 11hhH Length of data to follow 0000H for first time search 1500H (21 bytes) for next searches DB xx-xx DOS search status Non-existent first time Next time contains reserved DOS information.

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  81H     Search Multiple Files
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  11hhH   As returned on the Start Connection
                                    for the Network Path
SMB_PID                 DW  11hhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H     One parameter
SMB_P1                  DW  11hhH   Count of search entries returned
SMB_BUFLEN              DW  11hhH   Length of data items below
SMB_BUF                 DB  01H     Server Data Block
                        DW  11hhH   Length of SDB (SMB_P1*2BH)
```

Zero or more of the following DOS directory data areas:

```
                        DB  21 DUP(?)  Reserved
                        DB  aaH     Attribute found
                        DW  11hhH   Files time in the following format:
                                    <        hh         > <      11     >
                                    15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
                                    <     hh     > <    mm    > <   xx  >
                                    hh - binary number of hours (0-23)
                                    mm - binary number of minutes (0-59)
                                    xx - binary number of 2 second
                                         increments
                        DW  11hhH   Files date in the following format:
                                    <        hh         > <      11     >
                                    15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
                                    <      year       > <month> <  day  >
                                    year  - 0-119 (1980-2099)
                                    month - 1-12
                                    day   - 1-31
                        DW  11hhH   Low word of a double word
                                    containing the file size
                        DW  11hhH   High Word of file size double word
                        DB  "filename.ext" No Blanks - 13 bytes
                                    right padded with zeros
```

Print Commands

Create Spool File

Purpose

Sent by the Redirector to mark a new print data stream

Description

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command, or Redirector to Server name session from secondary command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  C0H    Create Spool File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  02H    Two parameters
SMB_P1                  DW  llhhH Length of print setup data that
                                  will come in the first block of
                                  the print data. Maximum length
                                  is 64 bytes of printer setup.
SMB_P2                  DW  llhhH Mode indicator in the
                                  following format:
                                  <        hh         > <    ll       >
                                  15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
                                  < Reserved - must be set to zero  ><f>
                                  f - 0 = text mode, 1 = graphics mode (see note 1.)
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  04H    Buffer is an ASCIIZ string
                        DB  "originator name" maximum of 15 char
                        DB  00H    End of String
```

Note 1: Text mode means expand tabs to spaces and end at 1AH. Graphics mode means copy entire file as is.

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  C0H   Create Spool File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H   One parameter
SMB_P1                  DW  llhhH Print spool file ID
SMB_BUFLEN              DW  0000H No Buffer
```

Spool Byte Block

Purpose

Sent by the Redirector to transfer a block of data to be spooled.

Description

The first block of data contains the setup data for the printer. The length of this data was sent on the Create Spool File command.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command, or Redirector to Server name session from secondary command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  C1H   Spool Byte Block
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H   One parameter
SMB_P1                  DW  llhhH Spool file ID as returned on the
                            Create Spool File command
SMB_BUFLEN              DW  llhhH Length of Buffer Including type
SMB_BUF                 DB  01H   Buffer is a variable length data
                                  block
                        DW  llhhH length of following data
                        DB  xx-x  Print data - first block may
                                  contain printer setup data.
                                  The format is printer specific
                                  and is transmitted directly
                                  to the printer (depending on
                                  mode set in SMB_PZ on Create
                                  Spool File SMB)
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  C1H   Spool Byte Block
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Close Spool File

Purpose

Sent by the Redirector to mark the end of a print spool data stream.

Description

The Server closes the spool file and queues the file for printing.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command, or Redirector to Server name session from secondary command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  C2H   Close Spool File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H   One parameter
SMB_P1                  DW  llhhH Spool file ID as returned on the
                            Create Spool File command
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  C2H   Close Spool File
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  llhhH As returned on the Start Connection
                                  for the Network Path
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Return Print Queue

Purpose

Sent by the Redirector to get the contents of the Server Print queue.

Description

The Server returns the elements of its print queue to the Redirector. The Redirector sends a maximum count of print queue elements to return and an index into the print queue. The queue elements may be obtained in either a forward or a backward manner starting at the beginning or the end of the queue. The Server returns the requested count of queue elements (if there are that many) and an index into the queue where another Return Print Queue may start.

Note—Multiple commands may not reflect the true nature of the queue as queue elements may be printed in between transmissions of the commands.

Note—A Start Connection is not required before issuing this command. Also, the "PC Network Program 1.0" dialect supports only searching in the forward direction.

Session suffix: 00H - 20H; Redirector to Server name session from DOS assign call or NET USE command, or Redirector to Server name session from secondary command.

Request SMB Values Sent To The Server From The Redirector

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  C3H   Return Print Queue
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H Not Required
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  02H   Two parameters
SMB_P1                  DW  llhhH Max count of entries to return
                                  If count is positive search forward
                                  If count is negative search backward
SMB_P2                  DW  llhhH Index to start search at
                                  0000 start at the beginning
                            nnnnH Start at nnnn element (FFFFH means start at end)
SMB_BUFLEN              DW  0000H No Buffer
```

Return SMB Values Sent To The Redirector From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  C3H    Return Print Queue
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H Not Required
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  02H    Two parameters
SMB_P1                  DW  llhhH Count of entries Returned
                                  If count less than count requested,
                                  at end/top of queue
SMB_P2                  DW  llhhH Index to next entry in search
SMB_BUFLEN              DW  llhhH Buffer of queue elements
```

Zero or one of the following queue elements:

```
SMB_BUF                 DB  01H    Buffer is a variable length data
                                   block
                        DW  llhhH length of following data
```

The following data is repeated SMP_P1 times:

```
                        DW  llhhH  Files date in the following format:
                                   <         hh          > <      11     >
                                   15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
                                   <      year       > <month> <  day  >
                                   year  - 0-119 (1980-2099)
                                   month - 1-12
                                   day   - 1-31
                        DW  llhhH  Files time in the following format:
                                   <         hh          > <      11     >
                                   15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
                                   <     hh     > <    mm    > <   xx  >
                                   hh - binary number of hours (0-23)
                                   mm - binary number of minutes (0-59)
                                   xx - binary number of 2 second
                                        increments
                        DB  nnH    Entry status in following format:
                                   01H = Held or stopped
                                   02H = Printing
                                   03H = Awaiting Print
                                   04H = In Intercept
                                   06H = File Had Error
                                   06H = Printer Error
                                   07H-7F Reserved
                        DW  llhhH  File Number given to file at time
                                   of spooling
                        DW  llhhH  Low word of a double word
                                   containing the file size
                        DW  llhhH  High Word of file size double word
                        DB  00H    Reserved
                        DB  "originator name" 16 characters,
                            right-padded with blanks.
```

Message Commands

Send Single Block Message

Purpose

Used to send a single block message.

Description

This command is used to send short messages. The IBM PC Network Program limits the message text length to 128 characters.

Session suffix: 00H - 03H or 00H - 05H; Redirector to send-to name session from secondary command.

Request SMB Values Sent To The User From The Sender

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D0H   Send Single Block Message
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  11hhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  11hhH total length of buffer entries
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "originator name"
                            maximum of 15 char
                        DB  00H   End of String
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "destination name"
                            maximum of 15 char
                        DB  00H   End of String
SMB_BUF                 DB  01H   Buffer is a variable length data
                                  buffer
                        DW  11hhH Length of message
                        DB  "---" Message Text
```

Return SMB Values From The User

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D0H   Send Single Block Message
SMB_RETCLASS            DB  00H   If successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  11hhH See return codes
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  11hhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Send Broadcast Message

Purpose

Used to send a single block message to all User names on the network.

Description

This command uses the SEND/RECEIVE BROADCAST DATAGRAM to broadcast message to all computers on the network. The IBM PC Network Program limits message text to 128 characters in length.

Session suffix: no session used.

Request SMB Values Sent To The User From The Sender

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D1H   Send Broadcast Message
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH total length of buffer entries
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "originator name" maximum
                            of 15 char
                        DB  00H   End of String
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "*"   Broadcast to everyone
                            listening
                        DB  00H   End of String
SMB_BUF                 DB  01H   Buffer is a variable length data
                                  buffer
                        DW  llhhH Length of message
                        DB  "---" Message Text
```

Return SMB Values From The User

There is no reponse to this command.

Send Start of Multi-Block Message

Purpose

Sent to start a message of multiple blocks.

Description

The receiver returns a message group ID to be used for the message text blocks. The sender uses this to send the message.

The IBM PC Network Program limits the total message length to 1600 characters. Each text block is limited to 128 characters.

Session suffix: 00H - 03H or 00H - 05H; Redirector to send-to name session from secondary command.

Request SMB Values Sent To The User From The Sender

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D5H   Send Start of Multi-Block Message
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH total length of buffer entries
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "originator name" maximum
                            of 15 char
                        DB  00H   End of String
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "destination name" maximum
                            of 15 char
                        DB  00H   End of String
```

Return SMB Values From The User

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D5H   Send Start of Multi-Block Message
SMB_RETCLASS            DB  00H   If successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  llhhH See return codes
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H   One parameter
SMB_P1                  DW  llhhH Message group ID
SMB_BUFLEN              DW  0000H No Buffer
```

Send Text of Multi-Block Message

Purpose

Used to send text of multiple blocks of a message.

Description

Each block must contain the message group id returned on the Send Start of Multi-Block Message. The IBM PC Network Program limits the total message length to 1600 characters. Each text block is limited to 128 characters.

Session suffix: 00H - 03H or 00H - 05H; Redirector to send-to name session from secondary command or Redirector to forwarded-name session from secondary command.

Request SMB Values Sent To The User From The Sender

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D7H    Send Text of Multi-Block Message
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  11hhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H    One parameter
SMB_P1                  DW  11hhH Message Group ID
SMB_BUFLEN              DW  11hhH total length of buffer entries
SMB_BUF                 DB  01H    Buffer is a variable length data
                                   buffer
                        DW  11hhH Length of message
                        DB  "---" Message Text
```

Return SMB Values From The User

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D7H    Send Text of Multi-Block Message
SMB_RETCLASS            DB  00H    If successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  11hhH See return codes
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  11hhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H    No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Send End of Multi-Block Message

Purpose

Used to signal the end of a multiple block message.

Description

Session suffix: 00H - 03H or 00H - 05H; Redirector to send-to name session from secondary command or Redirector to forwarded-name session from secondary command.

Request SMB Values Sent To The User From The Sender

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D6H    Send End Of Multi-Block Message
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  01H    One parameter
SMB_P1                  DW  llhhH Message Group ID
SMB_BUFLEN              DW  0000H No buffer
```

Return SMB Values From The User

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D6H    Send End Of Multi-Block Message
SMB_RETCLASS            DB  00H    If successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  llhhH See return codes
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H    No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Forward User Name

Purpose

Sent to a Server (or sub-set) requesting that the Server receive messages for the given additional user name.

Description

The Server creates the Forwarded User name and adds it to his adapter for receiving messages for that user.

Session suffix: 00H - 03H or 00H - 05H; Redirector to send-to name session from secondary command or Redirector to forwarded-name session from secondary command.

Request SMB Values Sent To The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D2H   Forward User Name
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH total length of buffer entries
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "forwarded name" maximum of 15 char
                        DB  00H   End of String
```

Return SMB Values From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D2H   Forward User Name
SMB_RETCLASS            DB  00H   If successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Cancel Forward

Purpose

Sent to a Server (or subset) requesting that the Server not receive messages for the given forwarded user name.

Description

The Server deletes the Forwarded User name from its adapter.

Note—This request must not be sent on a session to the name to be deleted. If sent to the name to be deleted, errors will occur. Use Get Machine Name to find the name to send the Cancel Forward to.

Session suffix: 00H - 03H or 00H - 05H; Redirector to send-to name session from secondary command or Redirector to forwarded-name session from secondary command.

Request SMB Values Sent To The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D3H   Cancel Forward
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH total length of buffer entries
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "forwarded name" maximum of 15 char
                        DB  00H   End of String
```

Return SMB Values From The Server

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D3H   Cancel Forward
SMB_RETCLASS            DB  00H   If successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  0000H No Buffer
```

Get Machine Name

Purpose

Sent to obtain the machine name of a User name.

Description

This is generally used with the Cancel Forward command to determine what name to send the Cancel Forward command to. The command is sent to a Forwarded name. The Server returns the machine name on the response SMB.

Session suffix: 00H - 03H or 00H - 05H; Redirector to send-to name session from secondary command or Redirector to forwarded-name session from secondary command.

Request SMB Values Sent To The User

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D4H   Get Machine Name
SMB_RETCLASS            DB  00H
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
```

Return SMB Values From The User

```
Field                   Value

SMB_MSGTYPE             DB  0FFH
SMB_SERVER              DB  "SMB"
SMB_FUNCTION            DB  D4H   Get Machine Name
SMB_RETCLASS            DB  00H   If successful
SMB_HEINFO              DB  00H
SMB_RETCODE             DW  0000H If successful
SMB_RESV1               DB  00H
SMB_RESV2-RESV8         DW  0,0,0,0,0,0,0
SMB_NPID                DW  0000H
SMB_PID                 DW  llhhH
SMB_RESV9-RESV10        DW  0,0
SMB_PARMCNT             DB  00H   No parameters
SMB_BUFLEN              DW  llhhH total length of buffer entries
SMB_BUF                 DB  04H   Buffer is an ASCIIZ string
                        DB  "machine name" maximum of 15 char
                        DB  00H   End of String
```

Protocol Extension Guidelines

The SMB Protocol supports a limited ability for application and system programmers to extend the protocol for additional functions.

Extending The Protocol

The following procedure may be used for extending the SMB Protocol:

The SMB__FUNCTION field should be set to 0FFH to indicate to the Server that the SMB is an extended SMB.

An extended function code should be passed in SMB_HEINFO. This code corresponds to the real function desired.

An ASCIIZ string may be defined in the SMB_BUF area to be used to verify the owner of the extended SMB. This string could contain the company name or application name.

The handler of the SMB protocol extensions on the Server machine should use the GET Current Post Address and SET New Post Address functions and monitor network events for a SMB post event. (Refer to Appendix C of the IBM PC Network Program User's Guide for a description of Server event posting).

Inputs from the SMB Event Handler

On Entry	Register Contents
AH	00H
AL	10H
DS:DI	Pointer to Server Message Block (SMB)
ES:BX	Pointer to Network Control Block (NCB)
CX	Maximum Transmission Size for Reply

Outputs to the SMB Event Handler

On Exit	Register Contents
AX	Response Code: 0 ;USER HAS PROCESSED ;User post routine has processed the ;Network request and has built a ;response SMB in the buffer at DS:DI. ;The PC Network Program will send the ;response SMB back to the redirector ;(see notes below). —1 ;NORMAL PROCESS ;The PC Network Program will process ;the SMB and send the response back ;to the redirector. (No other post ;routine on the chain will see the SMB). 1 ;RETURN ERROR ;Bad SMB—The PC Network Program ;will format a standard error response ;SMB and send it back to the redirector. 10H ;TRANSFER CONTROL ;The user post routine passes control ;to the next post handler on the chain ;by jumping to the address saved by ;Get Current Post Address. This action ;is equivalent to setting AX to —1 and ;doing an IRET if no other post routine ;is on the chain.

Note—All returns to SMB Event Handler are done by an IRET except TRANSFER CONTROL which is by a jump far to the saved post address.

Notes for USER HAS PROCESSED:

- User post routines should follow the same guidelines given in "Restrictions on Network Event Handlers" under the "Set New Post Address" function in Appendix C of the Personal Computer Network Program User's Guide.

- If the originator of the SMB is the DOS redirector of the same machine as the Server the user post routine is running on, the user post routine should not originate any new requests to DOS that would result in the request being redirected onto the network. Failure to follow this rule will result in a hung Server machine.

- User post routines should return as quickly as possible as the Server is held up and will not process any other network requests while the user post routine has control.

- For requests taking a long time to process, the user post routine should:

    1. Enter the SMB into a queue.

    2. Send a "request accepted" response by exiting with AX=0.

    3. The foreground user application should then process the SMBs entered on the queue in step 2 when it gets control.

    4. To send the real response back to the requestor, either:

        — A. Use LSN (Local Session Number) from originally passed NCB to send the response back, or:

        — B. Have the requestor periodically send completion poll SMB's and answer "done" or "not done". Send any response data on a "done" resonse.

Note—SMB_FUNCTION codes 00H-FEH are reserved. Refer to the General Format section for a description of the SMB_FUNCTION and SMB_HEINFO fields, and Figure 4 on page 17 "Values for the SMB_FUNCTION Field".

User Responsibility

The SMB Protocol does not do extensive checking for invalid fields in SMB's or related data blocks. Erroneous values in these fields will probably cause the IBM PC Network Program to operate incorrectly. It is the responsibility of anyone using, modifying or extending the protocol to adequately test the operation of their application or system programs with the IBM PC Network Program to insure the correct operation of both.

SMB Protocol Flows

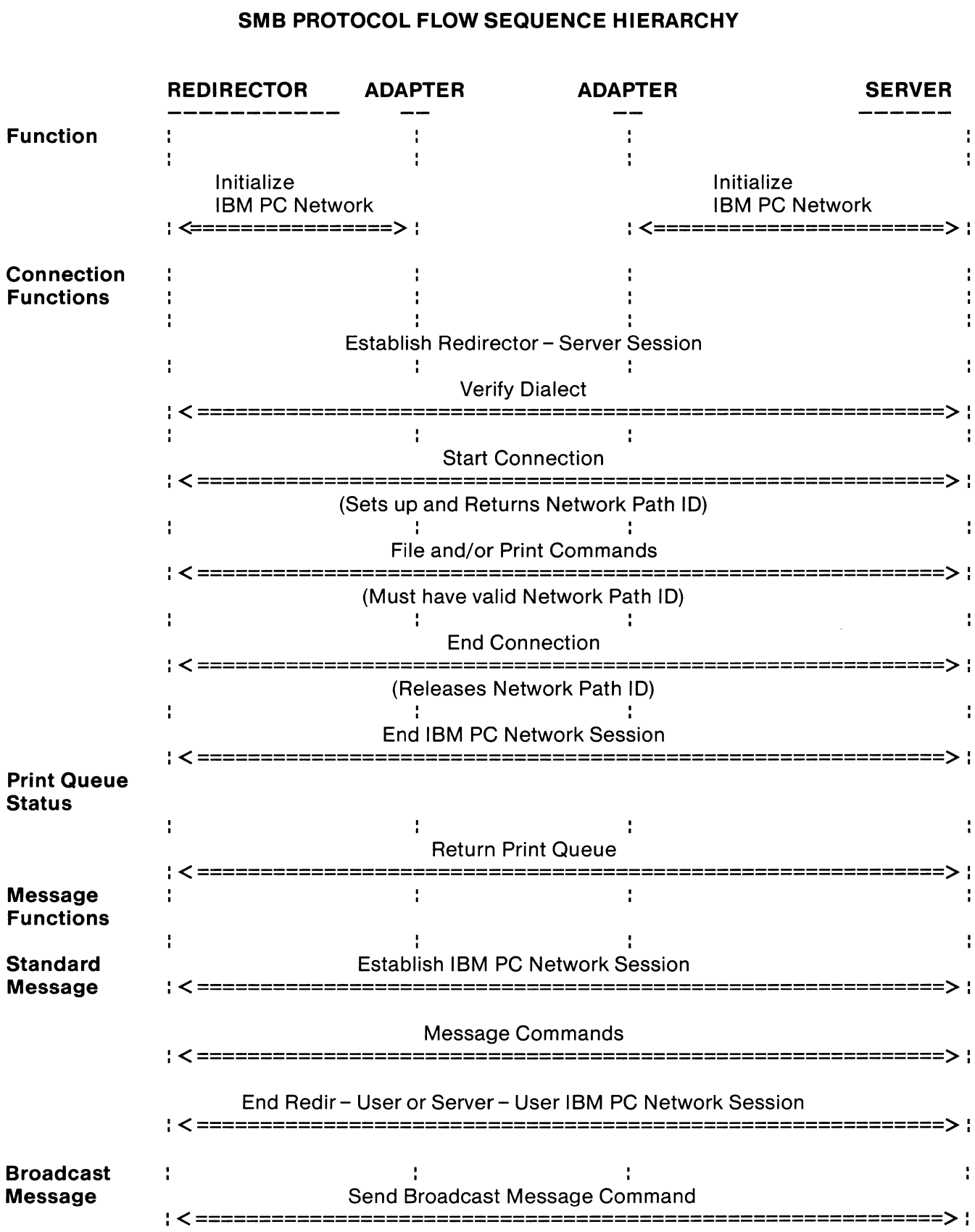
This section describes the Protocol flow sequences. The first chart gives the heirarchy of the protocol. The others give detail where required. The following is a key for the charts:

<==> A flow that contains many sub-flows

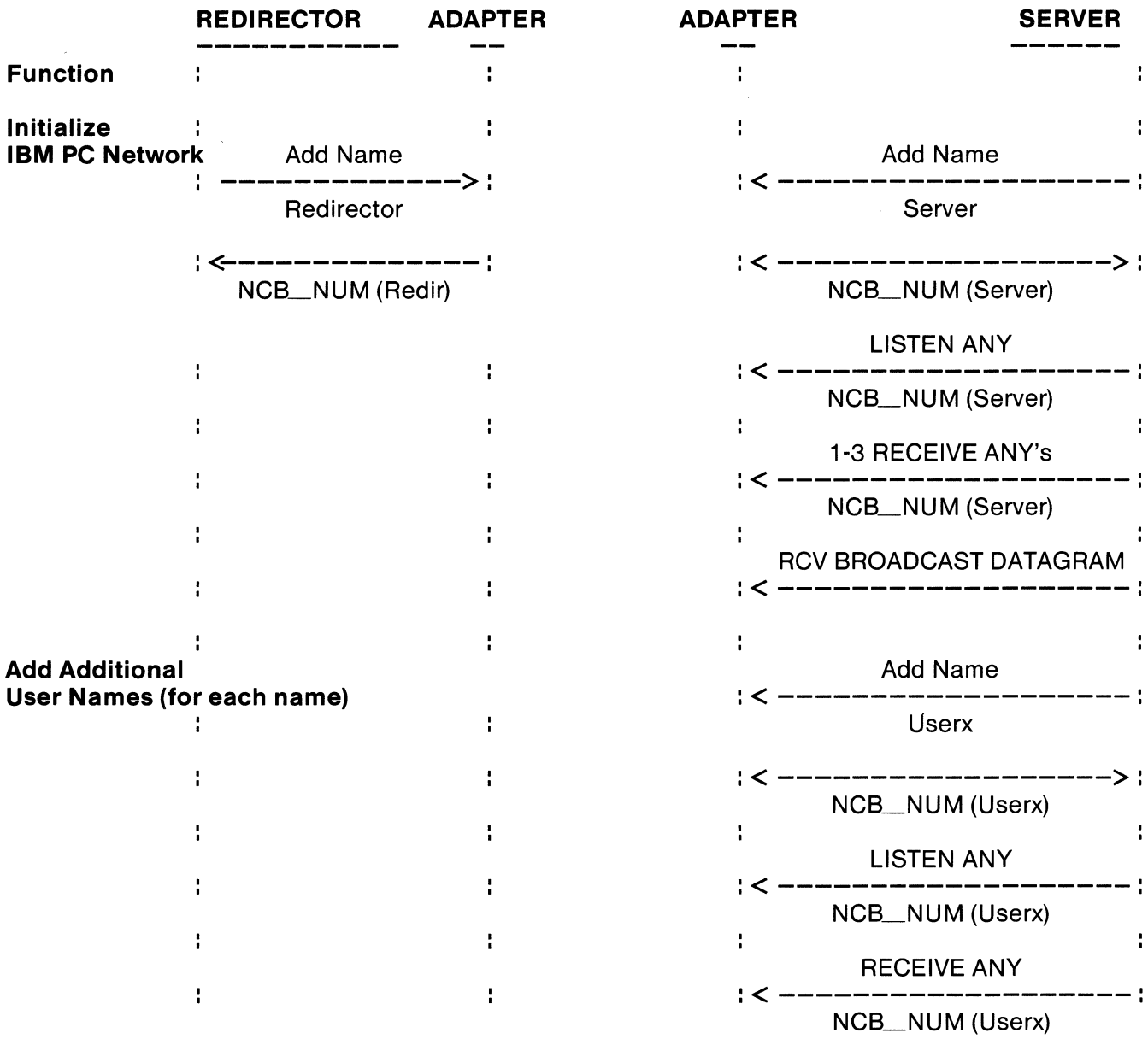
|--------> | A flow starting at one point and ending at another.

Note—These protocol flows are intended to give the reader a conceptual overview of the protocol and are not intended to be a detailed specification of the flows.

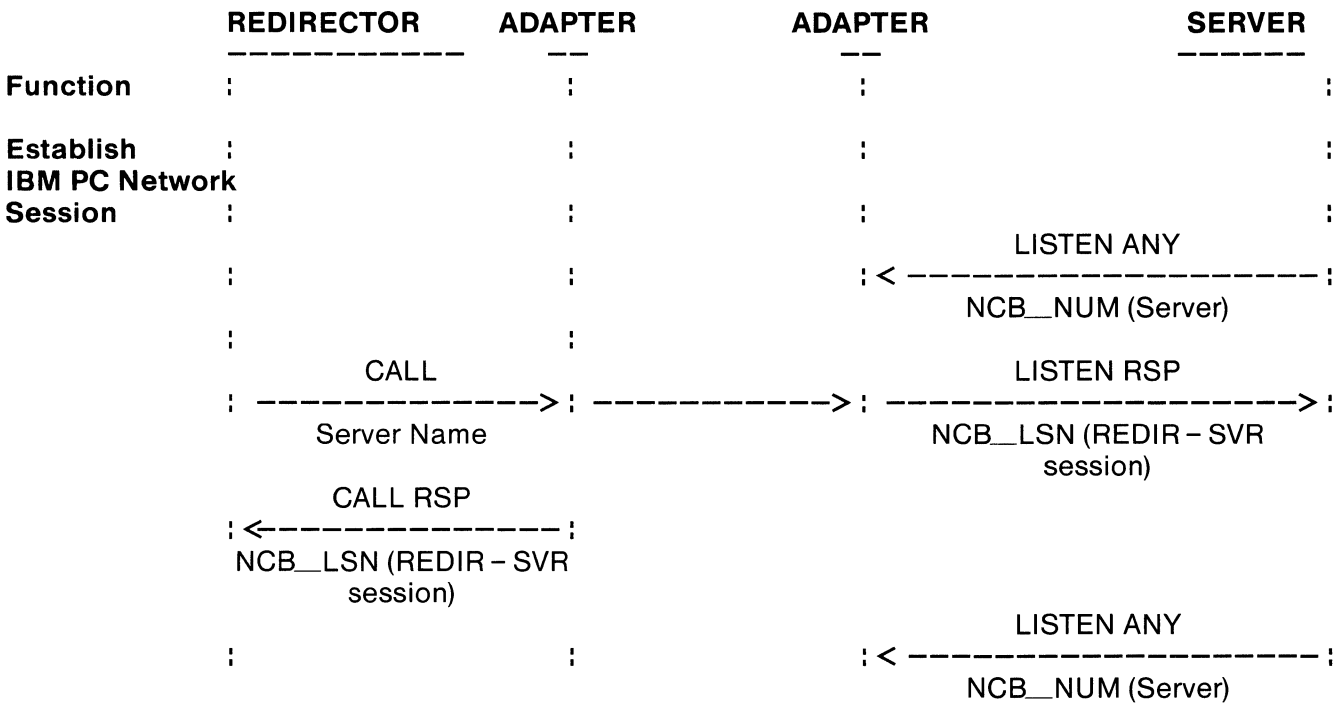
SMB Protocol Flow Sequence Hierarchy



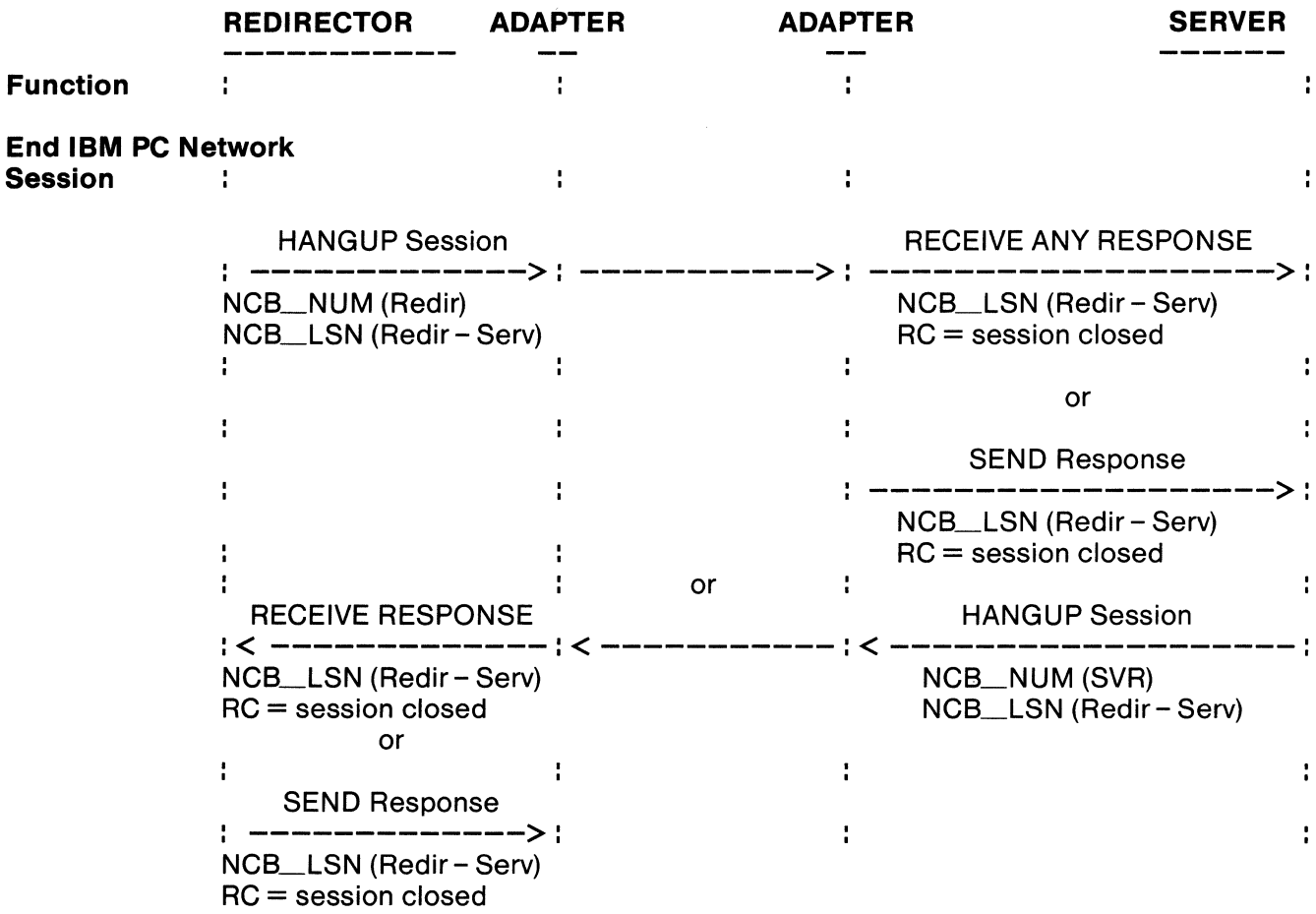
Initialize IBM PC Network and Add Additional User Names



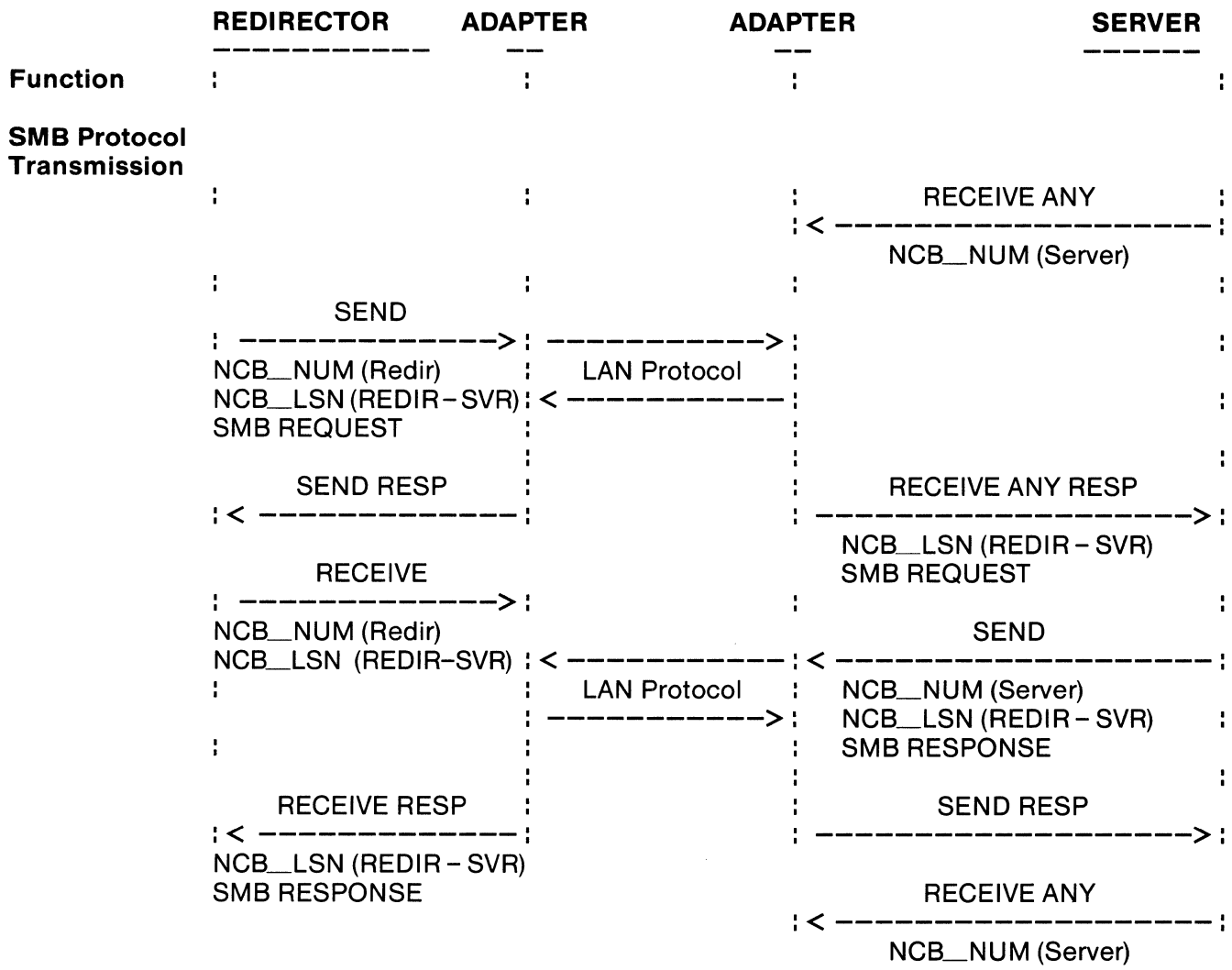
Establish an IBM PC Network Session



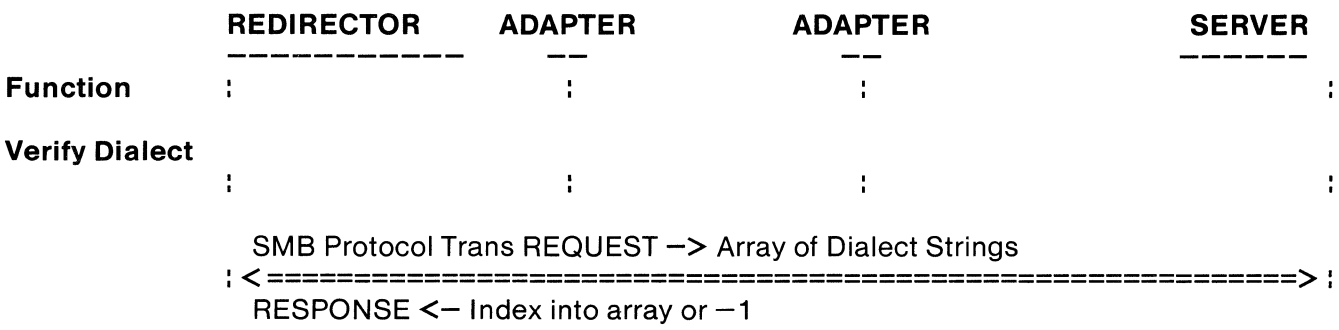
End an IBM PC Network Session

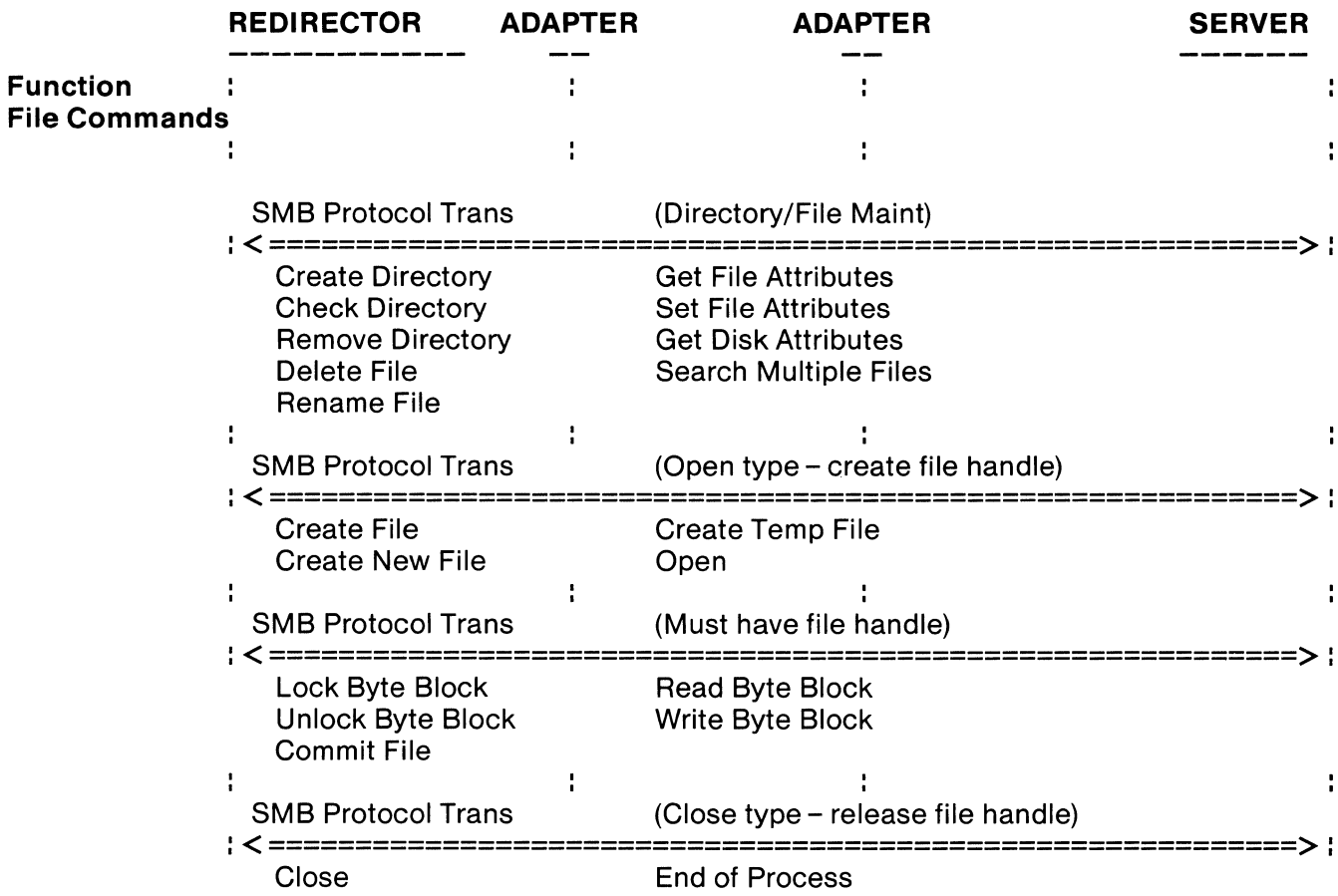


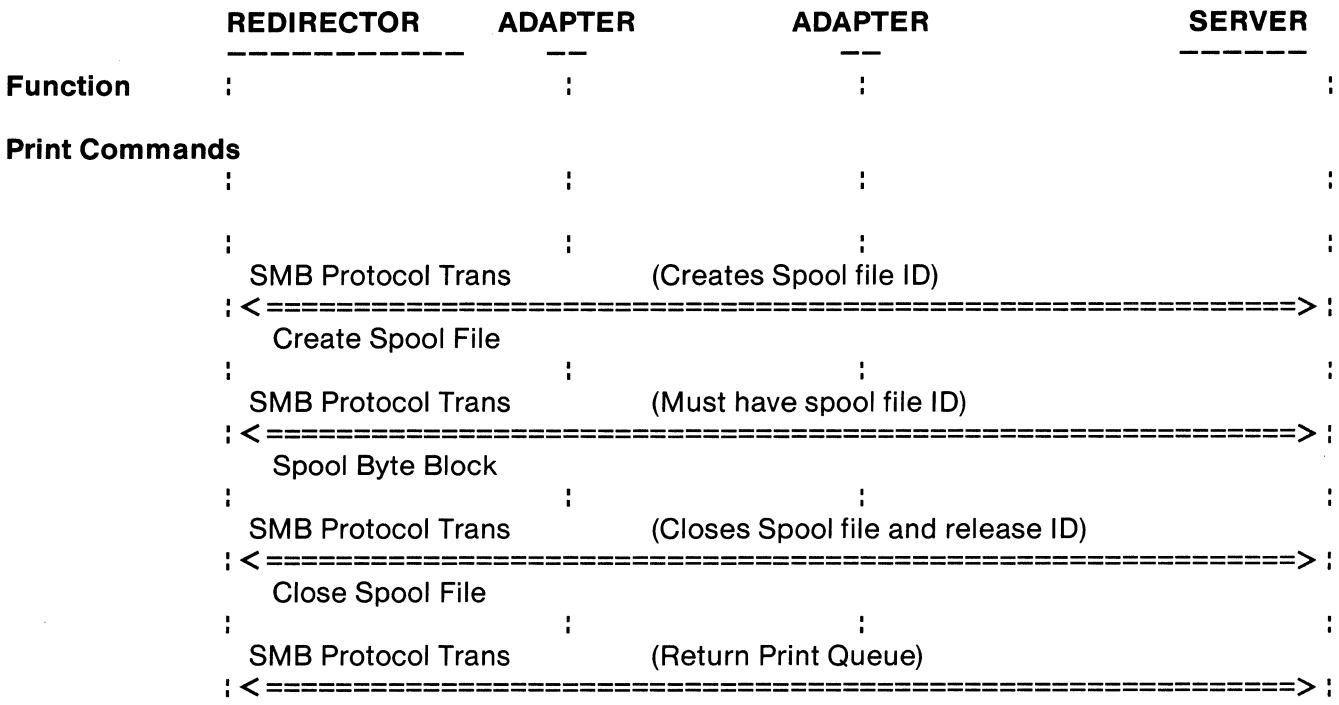
SMB Protocol Transmission over IBM PC Network

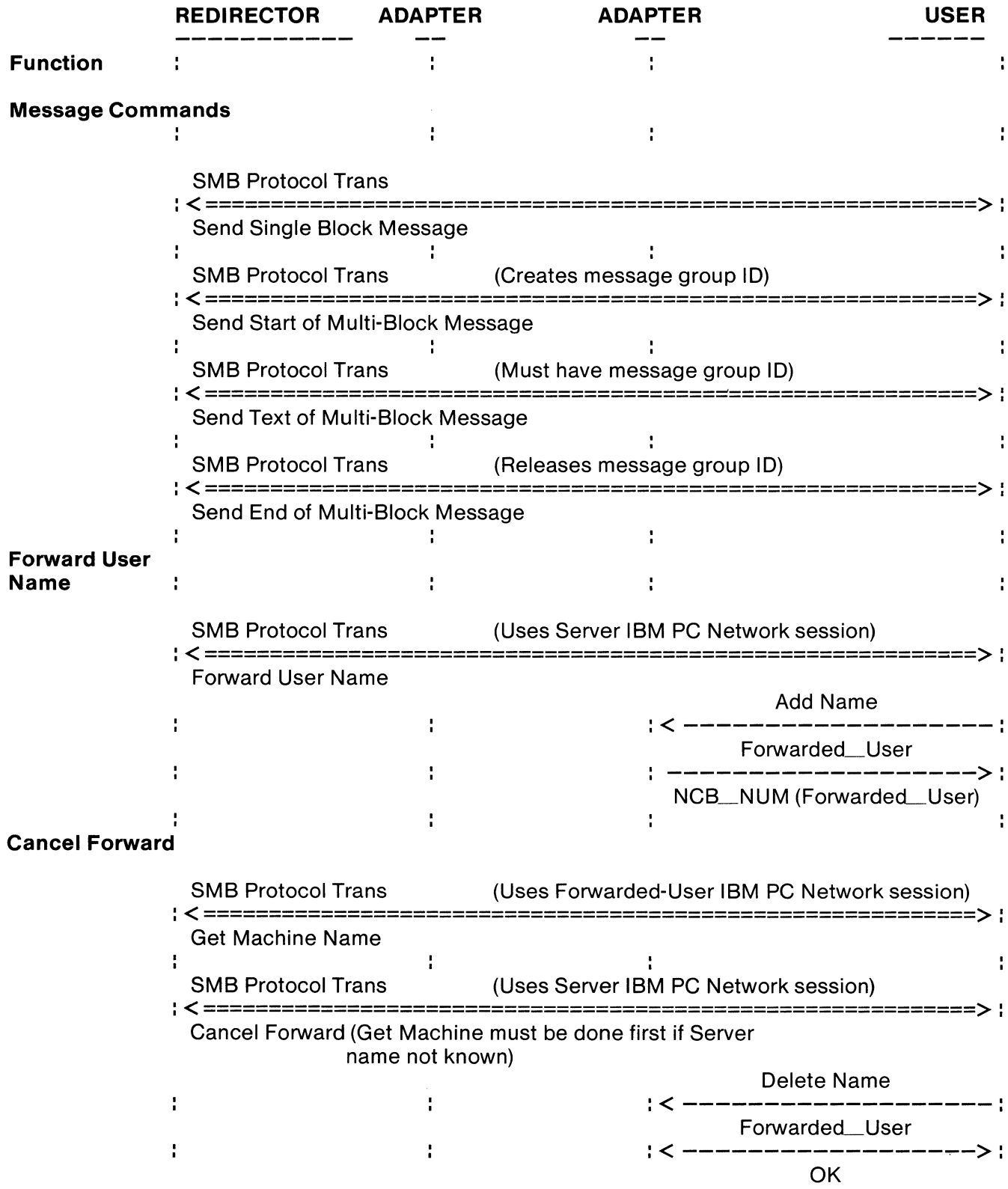


Verify Dialect

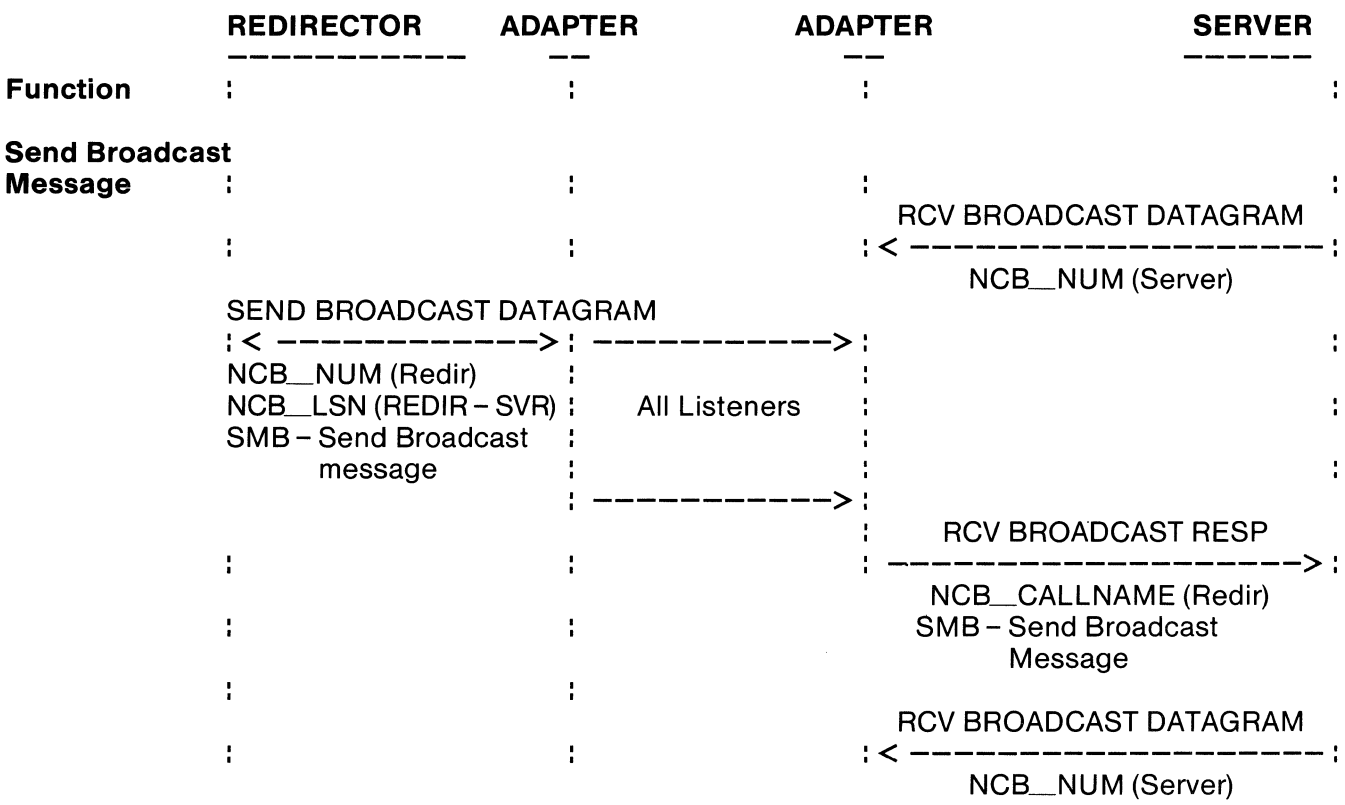



REDIRECTOR
ADAPTER
ADAPTER
SERVER
Function
File Commands
SMB Protocol Trans
(Directory/File Maint)
Create Directory
Check Directory
Remove Directory
Delete File
Rename File
Get File Attributes
Set File Attributes
Get Disk Attributes
Search Multiple Files
SMB Protocol Trans
(Open type – create file handle)
Create File
Create New File
Create Temp File
Open
SMB Protocol Trans
(Must have file handle)
Lock Byte Block
Unlock Byte Block
Commit File
Read Byte Block
Write Byte Block
SMB Protocol Trans
(Close type – release file handle)
Close
End of Process


REDIRECTOR
ADAPTER
ADAPTER
SERVER
Function
Print Commands
SMB Protocol Trans
(Creates Spool file ID)
Create Spool File
SMB Protocol Trans
(Must have spool file ID)
Spool Byte Block
SMB Protocol Trans
(Closes Spool file and release ID)
Close Spool File
SMB Protocol Trans
(Return Print Queue)


REDIRECTOR
ADAPTER
ADAPTER
USER
Function
Message Commands
SMB Protocol Trans
Send Single Block Message
SMB Protocol Trans (Creates message group ID)
Send Start of Multi-Block Message
SMB Protocol Trans (Must have message group ID)
Send Text of Multi-Block Message
SMB Protocol Trans (Releases message group ID)
Send End of Multi-Block Message
Forward User Name
SMB Protocol Trans (Uses Server IBM PC Network session)
Forward User Name
Add Name
Forwarded_User
NCB_NUM (Forwarded_User)
Cancel Forward
SMB Protocol Trans (Uses Forwarded-User IBM PC Network session)
Get Machine Name
SMB Protocol Trans (Uses Server IBM PC Network session)
Cancel Forward (Get Machine must be done first if Server name not known)
Delete Name
Forwarded_User
OK

Send Broadcast Message



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