



CHAPTER

15

OS/2: NetBIOS and MNetBIOS Access Methods

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Tasks That Are Common to SAS/CONNECT and SAS/SHARE

System Administrator, User, Applications Programmer, or Network Administrator
To use the NetBIOS or the MNetBIOS access method with an OS/2 host for SAS/CONNECT and SAS/SHARE, perform these tasks:

- 1 Verify that you have met all your site and software requirements.
- 2 Verify that you know how to set options in SAS software.
- 3 Set the SAS/CONNECT and SAS/SHARE options that you want.

System and Software Requirements for SAS/CONNECT and SAS/SHARE

Ensure that the following conditions have been met:

- 1 SAS software is installed on both the local and remote hosts.
- 2 Release 3.0 or a subsequent release of OS/2 has been installed.
- 3 NetBIOS has been installed at your site.

You may choose between the IBM NetBIOS 3.0 Interface or the LAN Manager 1.0 Submit Interface.

If you plan to use the IBM NetBIOS 3.0 Interface, you must install one of the following products:

- the IBM NTS/2, Version 1.0 or subsequent version
- the IBM LAN Server, Version 2.0 or subsequent version
- the IBM LAN Enabler, Version 2.0 or subsequent version.

If you use the LAN Manager 1.0 Submit Interface, you must install one of the following products:

- the Novell Netware Requestor for OS/2 2.11
- the IBM LAN Server, Version 2.0 or subsequent version
- the IBM LAN Enabler, Version 2.0 or subsequent version.

Note: Be sure to use the same vendor or compatible vendors on the local and the remote sides of the connection. Δ

Setting SAS Options

You may need to set specific options to allow the desired connections with SAS/CONNECT and SAS/SHARE using the NetBIOS communications access method.

Consult with your network administrator to determine what options must be set and what values to assign to them.

You may specify an option in several forms, as follows:

- in an OPTIONS statement in a SAS session or in an AUTOEXEC file:

OPTIONS SET=*variable-name value*;

Example:

options set=vqmlinks 3;

- SAS configuration file or at SAS invocation:

-SET *variable-name value*

Example:

-set vqmlinks 3

- DOS operating system environment variable:

SET *variable-name=value*

Example:

set vqmlinks=3

Values for these options may contain up to eight characters, consisting of alphanumeric characters, the percent sign (%), the dollar sign (\$), the pound sign (#), the at sign (@), and the underscore (_).

If you set multiple forms of the same option, here is the order of precedence that is followed:

- OPTIONS statement
- AUTOEXEC file
- SAS invocation
- SAS configuration file
- DOS environment variable.

SAS/CONNECT and SAS/SHARE Options

VQMLINKS *number-of-links*

specifies the number of links that can be active simultaneously.

For SAS/CONNECT, each time you sign on to a remote host, you initiate one link. If you want to sign on to more than one remote host during a single SAS session, set VQMLINKS to the number of links that will be active at the same time. There is no limit to the number of links that you can specify, but use the smallest number possible to conserve NetBIOS session resources. The number that you specify for this option must be the same as or less than the maximum number of sessions that are configured for NetBIOS when it is installed. If you specify 0, VQMLINKS defaults to the number of sessions configured for a single NetBIOS user.

At the SAS/CONNECT remote host, set both VQMLINKS and VQMCONVS to 1. Specify a higher value if you are accessing a SAS/SHARE server from your SAS/CONNECT remote session or you are using Remote Library Services. See the VQMCONVS option in this section.

At a SAS/SHARE server, set the VQMLINKS option to a value that represents the maximum number of clients that can be connected simultaneously. Specifying 0 implies that no limit is to be enforced and that the maximum is constrained by the number of sessions that are configured for NetBIOS when it is installed. The default is 0.

The server administrator should specify this value if a limit is desired.

VQADAPTR *adapter-number*

specifies which network adapter and, therefore, which network to use when establishing the link. You do not need this option if you are connected to only one network. Use this option only when COMAMID=NETBIOS. If COMAMID=MNETBIOS, see the VQNETNAME option.

Note that if both the SAS/CONNECT local and remote hosts or a SAS/SHARE server and clients are connected to multiple networks, both hosts must specify the same network to establish a connection. For example, if your node has network connections for a token-ring network and an Ethernet network and you want to connect to another node on the Ethernet network, you must set VQADAPTR to the correct adapter number for that network. This doesn't necessarily mean that the value of VQADAPTR is the same on both hosts. One host may have adapter 0 set to Ethernet while the other host has adapter 1 set to Ethernet. In this case, VQADAPTR must be 0 for one host and 1 for the other host.

Check with your SAS Software Representative for help on determining which adapter to use for each network.

Ask the system administrator for help on determining this value.

VQCAMLEN *access-method-buffer-and-packet-length*

specifies the access method buffer and packet length. This option determines the maximum number of characters that can be transmitted in a single packet. The value can range from 55 to 65535 characters. The default value is 4096.

Ask your system administrator for help on determining this value.

VQMCONVS *number-of-sessions*

specifies the number of sessions that can occur simultaneously. Each time you sign on to a remote host or access a library, you initiate one session; therefore, set this value to at least the same value as VQMLINKS. There is no limit on the number of sessions that you can specify, but use the smallest number possible to conserve NetBIOS command resources. The number you specify for this option must be the same or less than the number of commands that are configured for NetBIOS. If you specify 0, VQMCONVS defaults to the number of commands configured for a single NetBIOS user.

VQNETNAME *netname*

specifies which network in the NetBIOS driver to be used. Currently, Netware Requestor does not allow the access method to specify the network name but instead always uses the first network driver in the table.

Ask your network administrator for help in determining this value.

Setting Security for SAS/CONNECT and SAS/SHARE

For SAS/CONNECT, you must supply identifying information to sign on without a script to a remote host running a spawner program. A SAS/SHARE server, running secured, requires identification from each connecting client. The next two sections outline the alternatives for specifying security information.

Providing Client Identification in a Version 8 Session

In Version 8, you provide client identification to a SAS/CONNECT remote host or a SAS/SHARE server using the USER= and PASSWORD= options. These options are valid in the following statements:

SIGNON**RSUBMIT****LIBNAME****PROC SQL**

Connect to Remote

PROC OPERATE

(in the PROC statement)

set server

stop server

quiesce server

start server

display server

Specifying client identification in the SASUSER= and SASPASS= options is still accepted but is not recommended in Version 8. The USER= and PASSWORD= options take precedence over the client SASUSER= and SASPASS= options when both are specified. For example, a SAS/SHARE client's execution of a LIBNAME statement with

values assigned to the USER= and PASSWORD= options would override the SASUSER= and SASPASS= options setting in the same client SAS session.

Here is the syntax and definitions for these options:

USER | **USERNAME** | **USERID** | **UID**=*username* | **_PROMPT_**

PASSWORD | **PASSWD** | **PASS** | **PWD** | **PW**=*password* | **_PROMPT_**

Specifying these options allows a user on the local host whose username and password have been verified to access the remote host.

username

is a valid userid for the remote host and is thus host-dependent in form. If the value contains blanks or special characters, it must be enclosed in quotes.

password

is the password, if any, required for authentication of the supplied username. This value will not be echoed in the SAS log. If the value contains blanks or special characters, it must be enclosed in quotes.

PROMPT

specifies that the SAS System prompts the client for *username* and *password*.

Note: The values provided when prompted must NOT be quoted. Δ

Specifying USER=_PROMPT_ and omitting the PASSWORD= specification will cause SAS to prompt you for both userid and password.

This is especially useful for allowing the SAS statements containing the USER= and PASSWORD= options to be copied and otherwise effectively reused by others.

For SAS/SHARE, the values supplied for the USER= and PASSWORD= options are valid for the duration of the remote host connection. Additional accesses of the remote host while the connection to that host is still in effect do not require re-supplying of the USER= and PASSWORD= options. For example, while the first connecting library assigns to a SAS/SHARE server may require specification of the options, subsequent assigns to the same server will not need specification of these options as long as the original connection is in-effect. A subsequent re-connect to the same server or connect to a different server would require re-supplying of the USER= and PASSWORD= options.

Here is a Version 8 example for SAS/SHARE:

```
libname test 'prog2 a' user=joeblue password="2muchfun" server=share1;
```

For SAS/CONNECT, these values are valid until SIGNOFF.

Here is a Version 8 example for SAS/CONNECT:

```
signon rmthost user=joeblack password=born2run;
```

As a security precaution, PASSWORD= field entries echoed in the log are replaced with Xs. If _PROMPT_ was specified for entering the password, the entry would not be displayed on the screen as it is typed.

Providing Client Identification in a pre-Version 8 Session

SASUSER *userid*

SASPASS *password*

On the local host, either assign a valid userid and password to the SASUSER and SASPASS options or supply them to SAS, when prompted.

Consult with the system administrator of the remote host at which the spawner is invoked for a valid userid and password.

The SASUSER and SASPASS options store the userid and the password of the remote host that, when passed to the remote host, allow a local host connection.

Example:

```
options set=sasuser bass;
options set=saspass time2go;
```

See “Setting SAS Options” on page 220 for examples of the forms that you can use to specify the SASUSER and SASPASS options.

Also see Chapter 35, “PC Spawner Program,” on page 471 for information about the -SECURITY option in the PC spawner program, which controls the security of the remote host.

SAS/CONNECT

Local Host Tasks

User or Applications Programmer

To connect an OS/2 local host to a remote host, perform these tasks at the local host:

- 1 Optionally set a userid and a password to ensure security at the remote host.
- 2 Specify the communications access method.
- 3 Specify a network name.
- 4 Sign on to the remote host.

Setting the Remote Host Userid and Password

If you are connecting to an OS/2 remote host by means of a PC spawner program with the -SECURITY option, either you may be required to assign a valid remote host userid and a password to the SASUSER and SASPASS options or you must supply them to SAS, when prompted.

Set security at the local host using either of the methods explained in “Setting Security for SAS/CONNECT and SAS/SHARE” on page 222. For Version 8 security behavior, specify the USER= and PASSWORD= options to the SIGNON statement. For details, see “Providing Client Identification in a Version 8 Session” on page 222.

For Version 7 security behavior, if you set the SASPASS and SASUSER options at the local host, either specify a userid and a password that are valid on the remote host or specify _PROMPT_ to supply the userid and password when connecting to a remote host. For information about setting the SASUSER and SASPASS option, see “Providing Client Identification in a pre-Version 8 Session” on page 223.

See Chapter 35, “PC Spawner Program,” on page 471 for information about starting the spawner on the remote host.

Specifying the NetBIOS or MNetBIOS Communications Access Method

You must specify the appropriate communications access method to make a remote host connection. Use the following syntax:

```
OPTIONS COMAMID=access-method-id;
```

where COMAMID is an acronym for Communications Access Method Identification. *access-method-id* identifies the method used by the local host to communicate with the remote host.

The *access-method-id* that you supply depends on whether you use the IBM NetBIOS 3.0 Interface or the LAN Manager 1.0 Submit Interface.

For IBM NetBIOS 3.0 Interface

use NETBIOS, which is an acronym for Network Basic Input/Output System.

For LAN Manager 1.0 Submit Interface

use MNETBIOS, which is an acronym for Microsoft Network Basic Input/Output System.

Examples:

```
options comamid=netbios;
```

```
options comamid=mnetbios;
```

Alternatively, you may set this option at a SAS invocation, in a SAS configuration file, or in an AUTOEXEC.SAS file.

Specifying the Network Name

To make a connection from an OS/2 local host to a remote host, use the following syntax:

```
OPTIONS REMOTE=network-name;
```

where *network-name* is the NETNAME option to the PC spawner program that you start on the remote host. The values for the REMOTE option and the NETNAME argument to the PC spawner must be identical. See Chapter 35, "PC Spawner Program," on page 471 for details about specifying the NETNAME argument when starting the PC spawner.

Example:

```
options remote=sasrem;
```

Alternatively, you may set this option at a SAS invocation or in a SAS configuration file.

Signing On to the Remote Host

To complete your sign on to the remote host, enter the SIGNON statement, as follows:

```
signon user=_prompt_;
```

The USER= option in the SIGNON statement specifies that the local host be prompted for a userid and a password that are valid on the remote host. Sign-on script files are not needed on an OS/2 local host because the NetBIOS access method connects to the spawner program that runs on the remote host. The spawner program then invokes the remote SAS session. This process replaces the need for a script file.

Although no errors are produced if you specify a script file, you do waste processing time. If you defined the RLINK fileref before establishing a connection, when you sign on, SAS/CONNECT processes and loads the script file identified by the fileref but the NetBIOS access method will ignore the script.

If you do not want to omit the RLINK fileref but you want to avoid wasting processing time, use the NOSCRIPT option in the SIGNON and SIGNOFF statements, shown as follows:

```
signon noscript;
```

```
.
```

```

.
.
signoff noscript;

```

Local Host Example

The following example illustrates the statements that you specify in an OS/2 local host SAS session to connect to a remote host with the NetBIOS access method.

```

options set=vqmlinks 3 set=vqmconvs 3;
options comamid=netbios remote=sasrem;
signon user=_prompt_;

```

This example assumes a connection to a PC spawner that is running in secure mode. Two options are set; see “SAS/CONNECT and SAS/SHARE Options” on page 221 for details. The NetBIOS communications access method is declared with a connection to a remote host that is identified as SASREM, which is the name that is specified in the -NETNAME option at the PC spawner invocation. The USER= option in the SIGNON statement specifies that the connecting local host be prompted for a userid and a password that are valid on the remote host. The SIGNON statement performs the sign-on process.

Remote Host Tasks

System Administrator

To allow a local host to make a remote host connection, perform these tasks at the remote host:

- 1 Start the spawner program.
- 2 Set several remote host options, as necessary.

Starting the PC Spawner Program

You must invoke the PC spawner program on the OS/2 remote host to enable local hosts to connect to it. The spawner program resides on a remote host, listening for SAS/CONNECT client requests for connection to the remote host. After the spawner program receives a request, it invokes the remote SAS session. See “Starting the PC Spawner Program” on page 471 for more information.

Setting Options at the Remote Host

Although sign-on script files are not used for the NetBIOS access method, you may set remote host options at the remote host. It is recommended that you set these options:

NOSSYNTAXCHECK

allows the continuation of statement processing at the remote host regardless of syntax error conditions.

NOSSYNTAXCHECK is valid as part of a configuration file or at SAS invocation.

NOTERMINAL

specifies whether a terminal is attached at SAS invocation. If NOTERMINAL is specified, requestor windows are not displayed.

Setting NOTERMINAL at the remote host is advisable so that no terminal is associated with the remote session. This option prevents SAS from displaying error messages and dialog boxes on the remote host, which requires user intervention.

NOTERMINAL is valid as part of a configuration file or at SAS invocation.

See *SAS Language Reference: Dictionary* for details about this option.

NOXWAIT

applies to OS/2 or Windows remote hosts only.

NOXWAIT specifies whether you have to type EXIT at the OS/2 prompt before the OS/2 shell closes. Setting NOXWAIT at the remote host is recommended to prevent SAS from displaying a dialog box on the remote host. Such a display gives the appearance that the REMOTE SUBMIT command is hung and requires that you explicitly type EXIT at the remote host.

NOXWAIT is valid as part of a configuration file, at a SAS invocation, in or an OPTIONS statement.

See the *SAS Companion for the OS/2 Environment* for details about this option.

Remote Host Example

The following example illustrates the statements that you specify in an OS/2 remote host's configuration file to prepare for a connection from a supported local host with the NetBIOS access method.

```
-dmr
-comamid netbios
-no$syntaxcheck
-noterminal
-noxwait
```

An example follows of how the PC spawner is invoked on an OS/2 remote host:

```
c:\sas\connect\sasexe\spawner -comamid netbios -netname sasrem
                               -file mysas.cmd
```

The spawner is invoked, and the NetBIOS access method is specified. The -NETNAME option specifies the name that the PC spawner program uses to communicate with the local host. The -FILE option executes the MYSAS.CMD file, which invokes a SAS session.

See "Starting the PC Spawner Program" on page 471 for information about the contents of a command file and about executing the PC spawner. Options that are set through the spawner override options that are set in the remote host configuration file.

SAS/SHARE**Client Tasks**

User and Applications Programmer

To prepare for accessing a SAS/SHARE server, perform the following tasks:

- 1 Specify the NetBIOS or MNetBIOS access method, as applicable.
- 2 Specify a server name.

Specifying the NetBIOS or MNetBIOS Access Method at the Client

You must specify either the NetBIOS or the MNetBIOS access method at the client before you can access a server. Use the following syntax to specify the NetBIOS or the MNetBIOS access method at each connecting client:

```
OPTIONS COMAMID=access-method-id;
```

where COMAMID is an acronym for Communications Access Method Identification. *access-method-id* identifies the method used by the client to communicate with the server. NetBIOS (an abbreviation for Network Basic Input/Output System) is an example of an *access-method-id*.

Example:

```
options comamid=netbios;
```

```
options comamid=mnetbios;
```

The server is accessed with the access method that you specify.

You may specify the COMAMID option in an OPTIONS statement, at a SAS invocation, or in a SAS configuration file.

Additionally, you may use the COMAUX1 and COMAUX2 options to designate auxiliary communications access methods. See Table 1.2 on page 9 for the supported access methods by host. If the first method fails to access a server, the second method is attempted, and so on. You can specify up to two auxiliary access methods, depending on the number of methods that are supported between client and server hosts.

COMAUX options can be specified only at a SAS invocation or in a SAS configuration file. The syntax for the COMAUX option follows:

```
-COMAUX1 alternate-method  
-COMAUX2 alternate-method
```

An example of configuration file entries for a OS/2 client connecting to a Windows NT server follows:

```
-comamid netbios  
-comaux1 tcp  
-comaux2 appc
```

If the server cannot be reached using the NetBIOS method, a second attempt is made with the TCP/IP access method, and then with the APPC method.

Specifying a Server Name

You must specify the server's identifier in the PROC OPERATE and LIBNAME statements as follows:

```
SERVER=identifier
```

Example:

```
server=monarch
```

Follow standard SAS naming rules when defining a server name. See *SAS Language Reference: Dictionary* for details about SAS naming rules. See *SAS/SHARE User's Guide* for details about the PROC OPERATE and LIBNAME statements.

Client Example

The following example illustrates the statements that you specify in an OS/2 client configuration file that are used to access a server with the NetBIOS access method:

```
-set vqmlinks 1
-set vqadaptr 0
```

See “SAS/CONNECT and SAS/SHARE Options” on page 221 for details about these options.

The following example shows the statements that are specified in an OS/2 client session:

```
options comamid=netbios;
libname sasdata 'c:edc\prog2\sasdata' server=share1;
```

The NetBIOS access method is declared, and the LIBNAME statement specifies the data library that is accessed through the server SHARE1.

Server Tasks

Server Administrator

To make a server accessible to a client, perform the following tasks:

- 1 Specify the NetBIOS or MNetBIOS access method, as applicable.
- 2 Specify the server name.

Specifying the NetBIOS and MNetBIOS Access Method at the Server

You must specify the NetBIOS or MNetBIOS access method at the server before you create a SAS/SHARE server. Use the following syntax:

```
OPTIONS COMAMID=access-method-id;
```

where COMAMID is an acronym for Communications Access Method Identification. *access-method-id* identifies the method used by the server to communicate with the client.

For IBM NetBIOS 3.0 Interface

use NETBIOS (an acronym for Network Basic Input/Output System) for *access-method-id*.

For LAN Manager 1.0 Submit Interface

use MNETBIOS (an acronym for Microsoft Network Basic Input/Output System) for *access-method-id*.

For a server that is running on a host on which only one communications access method is available, use only the COMAMID option.

Example:

```
options comamid=netbios;
```

```
options comamid=mnetbios;
```

The server will be available only to SAS/SHARE sessions that use the NetBIOS or MNetBIOS access method.

You may specify the COMAMID option in an OPTIONS statement, at a SAS invocation, or in a SAS configuration file.

However, if the host on which a server is running supports multiple access methods, you may specify up to two auxiliary access methods by which clients may access the server. See Table 1.2 on page 9 for the supported access methods by host.

All of the access methods initialize when the server initializes. The activation of multiple access methods makes a server available to several groups of clients, each using a different communications access method simultaneously.

COMAUX options can be specified only at a SAS invocation or in a SAS configuration file. The syntax for the COMAUX option follows:

```
-COMAUX1 alternate-method
-COMAUX2 alternate-method
```

An example of configuration file entries for a server that is running on an OS/2 host follows:

```
-comamid netbios
-comaux1 tcp
-comaux2 appc
```

When the server starts, all of the communications access methods are initialized. The server is simultaneously available to client sessions that use the NetBIOS access method as well as to clients that use the TCP/IP and APPC access methods.

Specifying a Server Name

Specify the server's identifier in the PROC SERVER statement as follows:

```
SERVER=identifier
```

Example:

```
server=monarch
```

Follow standard SAS naming rules when defining a server name. See *SAS Language Reference: Dictionary* for details about SAS naming rules. See *SAS/SHARE User's Guide* for details about the PROC SERVER statement.

Server Example

The following example illustrates the statements that you specify in a configuration file on the OS/2 host at which you start a server:

```
-set vqmlinks 1
-set vqadaptr 0
```

See "SAS/CONNECT and SAS/SHARE Options" on page 221 for details about these options.

Specify the following statements in a SAS session on the OS/2 remote host to start a server:

```
options comamid=netbios;
proc server id=share1;
run;
```

The NetBIOS access method is declared for the server SHARE1 that is started on the OS/2 remote host.

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