Appendix 5C
File-Open Compatibility

Abstract

When files are shared on a network, care must be taken to ensure that clients read and write to files properly. This appendix describes how clients can read, write, and cache on initial and subsequent openings of a file.

Definitions

Following are definitions of the various modes of opening a file.

Transactional

The file being opened is in a special status on the server where writes are tracked. Because certain applications require that all or none of a write take place (for example, a banking transaction in which one account is debited and another credited), all transactions to such files are tracked so that if a system failure occurs, a record is kept allowing the server to back out of any uncompleted transactions (for example, if one account is debited but the credit is never made, the debit will be removed).

Compatibility

A user may open a file for reading or writing even though the user may not have access to write, and the file is cacheable by other processes for reading only (that is, the server may say that the user doesn't have access rights in the area). The file can still be opened read/write and an error is given if the user attempts to write.

Shareable

Applications that are not network-aware always open files exclusively (denying all privileges to other users). The Shareable flag is a NetWare flag that overwrites that default, allowing files to be shared on a network. DOS knows nothing about this flag.

The following graph shows all possible modes for a file open, and then shows the corresponding caching and open privileges for subsequent opens. A file that cannot be shared may either (F)ail or (C)ritical Fail, meaning that an Int 24 is generated to notify the user.

File attributes: Normal

Subsequent Opens

First Open		Compatible R	Compatible W	Compatible RW	Deny All R	Deny All W	Deny All RW	Deny Write R	Deny Write W	Deny Write RW	Deny Read R	Deny Read W	Deny Read RW	Deny None R	Deny None W	Deny None RW
Compatible	R[1]	Y	C	C[7]	F	F	F	Y	F	F	F	F	F	Y	F	F
	W	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
	RW[2]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
Create	RW[3]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
Deny All	R[1]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
	W[2]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
	RW[3]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
Deny Write	R[1]	Y	C	C	F	F	F	Y	F	F	F	F	F	Y	F	F
	W	C	C	C	F	F	F	F	F	F	Y	F	F	Y	F	F
	RW[1]	C	C	C	F	F	F	F	F	F	F	F	F	Y	F	F
Deny Read	R	C	C	C	F	F	F	F	Y	F	F	F	F	F	Y	F
	W	C	C	C	F	F	F	F	F	F	F	Y	F	F	Y	F
	RW[6]	C	C	C	F	F	F	F	F	F	F	F	F	F	Y	F
Deny None	R[4]	Y	C	C	F	F	F	Y	Y	Y	F	F	F	Y	Y	Y
	W[5]	C	C	C	F	F	F	F	F	F	Y	Y	Y	Y	Y	Y
	RW[6]	C	C	C	F	F	F	F	F	F	F	F	F	Y	Y	Y

Table 1. Open Compatibility For Normal File Attributes

Shading indicates that the file may cache reads.

1 Can cache reads
2 Can cache writes
3 Can cache reads and writes
4 Can cache reads with bi-directional NCPs
5 Can cache writes with bi-directional NCPs
6 Can cache reads and writes with bi-directional NCPs

C Critical error
F Fail
Y Yes, successful open

File attributes: Shareable

Subsequent File is Opened

First Open		Compatible R	Compatible W	Compatible RW	Deny All R	Deny All W	Deny All RW	Deny Write R	Deny Write W	Deny Write RW	Deny Read R	Deny Read W	Deny Read RW	Deny None R	Deny None W	Deny None RW
Compatible	R[4]	Y	Y	Y	F	F	F	Y	Y	Y	F	F	F	Y	Y	Y
	W[5]	Y	Y	Y	F	F	F	F	F	F	Y	Y	Y	Y	Y	Y
	RW[6]	Y	Y	Y	F	F	F	F	F	F	F	F	F	Y	Y	Y
Create	RW[6]	Y	Y	Y	F	F	F	F	F	F	F	F	F	Y	Y	Y
Deny All	R[1]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
	W[2]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
	RW[3]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
Deny Write	R[1]	Y	C	C	F	F	F	Y	F	F	F	F	F	Y	F	F
	W	Y	C	C	F	F	F	F	F	F	Y	F	F	Y	F	F
	RW[1]	Y	C	C	F	F	F	F	F	F	F	F	F	Y	F	F
Deny Read	R	C	C	C	F	F	F	F	Y	F	F	F	F	F	Y	F
	W	C	C	C	F	F	F	F	F	F	F	Y	F	F	Y	F
	RW[6]	C	C	C	F	F	F	F	F	F	F	F	F	F	Y	F
Deny None	R[4]	Y	Y	Y	F	F	F	Y	Y	Y	F	F	F	Y	Y	Y
	W[5]	Y	Y	Y	F	F	F	F	F	F	Y	Y	Y	Y	Y	Y
	RW[6]	Y	Y	Y	F	F	F	F	F	F	F	F	F	Y	Y	Y

Table 2. Open Compatibility for Files with Shareable Attributes

Shading indicates that the file may cache reads.

1 Can cache reads
2 Can cache writes
3 Can cache reads and writes
4 Can cache reads with bi-directional NCPs
5 Can cache writes with bi-directional NCPs
6 Can cache reads and writes with bi-directional NCPs

C Critical error
F Fail
Y Yes, successful open

File attributes: Transaction

Subsequent file is opened:

First file is opened as below:		Compatible			Deny All			Deny Write			Deny Read			Deny None		
		R	W	R W	R	W	R W	R	W	R W	R	W	R W	R	W	R W
Compatible	R[1]	Y	C	C[7]	F	F	F	Y	F	F	F	F	F	Y	F	F
	W	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
	RW[1]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
Create	RW[1]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
Deny All	R[1]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
	W	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
	RW[1]	C	C	C	F	F	F	F	F	F	F	F	F	F	F	F
Deny Write	R[1]	Y	C	C	F	F	F	Y	F	F	F	F	F	Y	F	F
	W	C	C	C	F	F	F	F	F	F	Y	F	F	Y	F	F
	RW[1]	C	C	C	F	F	F	F	F	F	F	F	F	Y	F	F
Deny Read	R[4]	C	C	C	F	F	F	F	Y	F	F	F	F	F	Y	F
	W	C	C	C	F	F	F	F	F	F	F	Y	F	F	Y	F
	RW[4]	C	C	C	F	F	F	F	F	F	F	F	F	F	Y	F
Deny None	R[4]	Y	C	C	F	F	F	Y	Y	Y	F	F	F	Y	Y	Y
	W	C	C	C	F	F	F	F	F	F	Y	Y	Y	Y	Y	Y
	RW[4]	C	C	C	F	F	F	F	F	F	F	F	F	Y	Y	Y

Table 3. File attributes: Transaction.

Shading indicates that the file may cache reads.

1 Can cache reads
2 Can cache writes
3 Can cache reads and writes
4 Can cache reads with bi-directional NCPs
5 Can cache writes with bi-directional NCPs
6 Can cache reads and writes with bi-directional NCPs

C Critical error
F Fail
Y Yes, successful open