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## AppleShare 3.0: Transfers Are Faster Server to Client (3/93)

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TOPIC -----

AppleShare pulls (workstation copy from server) are always faster than pushes (workstation copy to server). I would imagine this is at the AFP level, but could you explain?

My environment:

- AppleShare 3.0
- Twisted-pair Phone Net, Active Star
- AppleShare running on a Macintosh IIci, and Quadra 950
- AppleShare is the only application running on each computer

DISCUSSION -----

The server-to-workstation copies are faster for two reasons. First, the server-to-workstation copy requires fewer transactions to accomplish the same job. Second, the retransmission timer is smaller for the workstation than for the server, which in the event of any packet loss results in faster retransmission of lost packets and thus faster over-all transfer times.

Workstation-to-Server Copy

```
-----  
Workstation -----> ATP TReq -----> Server  
Workstation <----- ATP TReq <----- Server  
Workstation -----> ATP TRsp -----> Server (1 to 8 response packets)  
...  
Workstation <----- ATP TRel <----- Server  
Workstation <----- ATP TRsp <----- Server  
Workstation -----> ATP TRel -----> Server
```

- 1) There are more transactions (two packets in each direction) in workstation to server because the workstation has to initiate the transaction by requesting that the server request the data from the workstation. This results in four additional packets, with the increased possibility of lost packets and retransmission. In addition, in the case of workstation-to-server copies, there are actually two ATP XO transactions, one wrapped inside the other, which means there are TRel's

passed in both directions; if either side losses the TRel packet no data will be passed in either direction for at least 30 seconds (TRel timer value), possibly more. The TRel timer value is set by the application program. TRels are never retransmitted:, see Inside AppleTalk, Second Edition, for more details concerning ATP XO transmissions.

- 2) The retransmission timer in the server is six seconds. If any of the eight data packets are lost, the server waits six seconds before requesting retransmission of the data by the workstation.

#### Server-to-Workstation Copy

```
-----  
Workstation -----> ATP TReq -----> Server  
Workstation <----- ATP TRsp <----- Server (1 to 8 response packets)  
...  
Workstation -----> ATP TRel -----> Server
```

In this case, several factors could contribute to faster transfer times. First, there are fewer transactions to complete the operation and less traffic is generated. In addition, if any of the data packets (1 - 8 TRsp) packets are lost, the workstation will request their retransmission in two seconds, verses the six seconds the server waits (see in the prior example) before asking for retransmission.

There is no simple way to change the ATP retransmission timer values. These timers are selected by the application developer at compile time and are therefore not easily changed.  
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