

Network Frames Addition

for datagram activity
Sat, Jun 14, 2003

The data stream called `NETFRAME` is used to log network activities, including both datagrams transmitted as well as received. This note develops a new way to mark whether the datagram was received or transmitted.

The determination of whether a given datagram was received or transmitted has been based upon the buffer pointer included in the data stream record. If the buffer address has bit 18 set, as in `0x60000–0x7FFFF`, it was interpreted as a datagram that was received; otherwise, it must have been one that was transmitted. The corresponding transmit buffer area was `0x80000–0x09FFFF`. (The buffers used for receiving ethernet datagrams in an IRM were located at `0x160200–0x17FFFF`; the transmit buffers were at `0x180000–0x19BFFF`.) This empirical scheme works, but it is not flexible enough. In the IRM, a reassembled datagram is stored in allocated dynamic memory, so its buffer address may not follow the empirically chosen convention described above. A better method is needed. It would be good if a new scheme for this does not cause problems for existing code that interprets these records.

The fields in the 16-byte record are the 2-byte node number, the 2-byte datagram size, the 4-byte buffer address, and the 8-byte time-of-day in the usual BCD format, with the last byte a binary value in units of half milliseconds within the indicated 15 Hz cycle of the calendar second.

Consider that a new way to indicate whether a datagram was sent or received be done by usurping the year byte in the time-of-day for the purpose. Suppose that new code that writes records into this data stream set the year byte to `0xC0` for reception and `0xC1` for transmission. The new client code that interprets these records can determine whether the new format is used, allowing the new interpretation, or whether the old format is still being used, in which case it would have to use the old interpretation. Note that valid year byte values do not exceed `0x99`.

Loss of the year byte value is not deemed significant. When time filtering is used on Page F, it can only match the current hours/minutes value. The listing of network activity produced by Page F only announces time to hours and minutes. On a 32-character “little console” line, it appears as followsL

```
01234567890123456789012345678901  
C509 003E R 167504 1132:33-03+18
```

The new scheme will allow more flexible assignment of network buffer, and it will solve the problem of misinterpretation of a large reassembled datagram that must be deposited into allocated memory.

It has been learned that a very large number of datagrams arriving nearly simultaneously at an IRM suffer from misinterpretation due to wrapping of the receive buffer. The receive buffer occupies 128K bytes, allowing for 85 buffers of 1500 bytes each. If 142 datagrams are received in response to a multicast UDP Echo request, they can all be received, all right, but the subsequent processing is late, which results in apparent duplicate responses, when in fact they come from different nodes. With the new scheme implemented, we can increase the receive buffer area to 512K bytes, say, allowing for some 340 full-frame buffers. This should eliminate the problem due to wrapping the receive buffer. A side benefit of having a larger receive buffer area is that capturing the contents of a received datagram is easier, since it will take longer for the receive buffer to wrap.