RETDAT Log

Diagnostic data stream

Tue, Dec 21, 1999

This note describes a scheme for monitoring Acnet data request activity by maintaining a log of RETDAT requests in a data stream.

The new code was added to the ReqD system task that provides RETDAT support. There are two kinds of requests: direct requests and server requests. A direct request includes only devices that are local, whereas a server request may include local devices but also devices from other nodes. The special case of a multicast request that includes no local devices is ignored, and such requests are not logged. Only requests that cause work to be done by a receiving node are logged.

The information to be logged is designed to fit into a 16-byte structure along the lines of many other data stream-related diagnostics, with the last 6 bytes serving as a time stamp. The last byte of the timestamp indicates the number of half-milliseconds within the current 15Hz cycle.

The first five words of the 16-byte structure are as follows:

node#
#reply bytes expected
#devices
FTD (frequency-time descriptor)
message-id

If the node# is a pseudo node#, it is converted into the usual node#, as it is unimportant for this diagnostic whether the source UDP port# is the standard Acnet port#. The pseudo node# is converted by obtaining the node# field from the IPARP entry via GetIPARP. The next 3 words are simply a copy of the first three words after the Acnet header in the RETDAT request message. To indicate whether a cancel message was received, install a data stream record that shows these three words of 0000. The message-id is used in order to make this useful. The total size of an Acnet data request is (6 + 16*n) bytes, where n is the #devices requested.

How can the data be displayed in the usual format of 32 characters? Here is one way:

```
01234567890123456789012345678901
nodedev#cyc rqid f hrmn:sc-cy+ms
```

The fields can be shown as follows:

`node` 4-char hex
`dev` 3-char #devices (currently Acnet limits this to 247)
`#cyc` 4-char period in 15Hz cycles. 0 means one-shot. Enn means event.
`rqid` 4-char request-id in hex
`f` 1-char size of reply in ethernet fragments = #bytes/1480. 0=no fragments.
The remainder of the line is in the usual time-of-day format.

Note that the format typically will not have fields shown without spaces between. The number of devices may be more than 99, but that is unusual. The period is often 1 second, in which the number of cycles would be shown as 15. Only a period longer than 1000/15 = 66 seconds would require 4 digits. If it is an event-based request, the field can specify `Eee`, where `ee` is the event# in hex.The number of bytes requested is shown as a count of fragments in hex; an indication of F would imply a reply size of 15*1480 = 22200!

The filter line on the display could be in the following format:

```
01234567890123456789012345678901
NODE=0000 P=  0 N=  0 TIME=0000
```

Filtering can be applied based upon the node sending the RETDAT message, the Frequency-Time Descriptor, the number of devices in the request, and the time stamp. The node, as always, is expressed in hex. The period is in units of 15Hz cycles, or if in the form Eee, it is an event#. The format for the number of devices is decimal. The time filter is expressed in HrMn form of the present day.

Filtering before logging

Another kind of filtering can be used before logging, based upon the source node#. There are 4 words of user area in the data stream queue located at an offset of 0x18 bytes fro the start of the queue header. The first two words are node#s whose requests should be logged. The last two words are node# whose requests are *not* to be logged. If a node# is specified in both places, the first overrides the second; i.e., the specified node will be logged. (Maybe this is not the best scheme.)

A different approach might be as follows: If the first of the four words is nonzero, it means that up to four words can specify the nodes to be logged. If the first word is zero, then one can specify up to three nodes whose requests are not to be logged.