

Multiple Settings

Extension of single setting network message

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Introduction

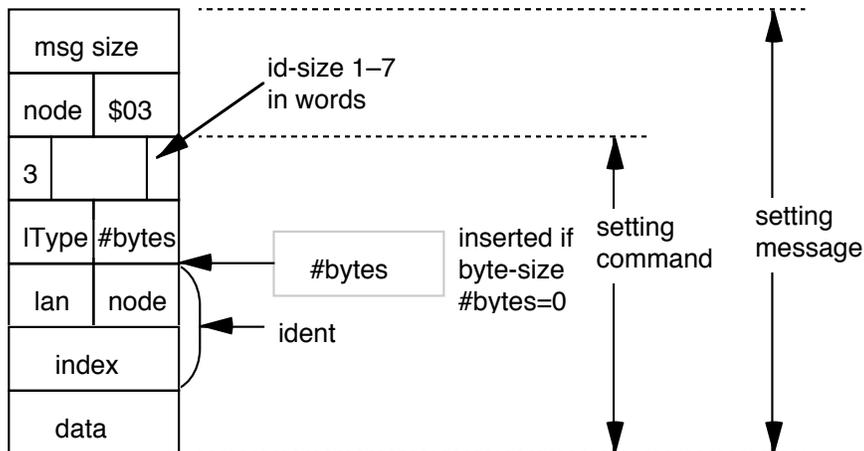
Network setting messages have been limited to a setting of a single listype-ident pair. Although multiple setting messages can be combined into a single network frame, some host-level implementations have found this feature difficult to support. The penalty in terms of network efficiency is quite severe when many settings cannot be combined in this way, as the network overhead time to process a frame is often quite high.

In view of the above state of affairs, it is worth considering allowing multiple setting commands to be combined into a single setting message. The program which builds the setting commands must realize that they are logically to be executed as a unit. An example of this is the extensive need that D0 has for downloading pedestals and other parameters of its fast physics data acquisition boards. Another example might be using "mults" for simultaneously adjusting steering magnets in a beamline to accomplish a parallel shift in beam position while preserving the beam direction.

It must be noted that the new D0 message protocols certainly allow for this type of multiple settings. However, as they are not yet ready for the VME systems, a small effort in extending the present protocols to support multiple settings should be worthwhile. It is a stopgap measure that allows host-level programming efforts to proceed unimpeded.

Implementation

Recall the present format for a network setting message:



In this example the ident-size is 2 words (4 bytes), and the data is two bytes. Note the definitions of a setting command vis à vis a setting message.

To implement multiple setting commands within a single setting message, merely concatenate the setting commands within the message. The message size word must reflect the total size of all the concatenated setting commands, plus 4 for the setting message header.

Data server option

Now that a setting message can comprise more than a single command, the idents could refer to different lan-nodes in the different commands. If a setting command designates a different station in the ident than the station which receives the setting message, the data server option would allow the setting to be passed on to the designated station. Without the option, such a setting would be ignored.

The data server option is enabled by setting bit#11 (mask=0x0800) in the first word of the setting command (the one with the 0x3000 in it). If a setting message is broadcast, any data server option bit set in the first word of an included setting command will be ignored. This is the analogous treatment of the data server option bit in data request messages.