Node0610 Mapping Changes

Upgrade to PowerPC

Sat, May 26, 2001

As nodes are upgraded from the token ring-based systems to the new PowerPC systems, it seems advisable to make some minor changes in the allocation layout of analog channels and binary bits. Most PowerPC systems are configured to support 1024 analog channels and 1024 binary bits. Some of the previous nodes were based upon 2048 channels and 3072 bits, even though the addressing space was only sparsely used. The new PowerPC systems are configured to use 512K bytes of nonvolatile memory for all the systems tables, whereas the older systems had 732K bytes available for the same tables. With the more limited space available for system tables, we can still support as many as 2048 channels and 2048 bits, but we try to get by with half as much, when it's convenient to do so.

Examination of the current layout of node0610, which supports both the H– and I– preaccelerators, reveals that most of this addressing space is unused, so that it seems attractive to economize to bring its requirements under the usual 1024 channels and 1024 bits range. This note details the changes made to do this.

The current layout of channels associated with the H– and I– preaccelerators are made alike as much as possible. The range of channels `03xx` is used for H– and range `05xx` is used for I–. Note that `05xx` is beyond the range of 1024 channels. But the actual analog channels in use in either range is very limited. Consider the `05xx` block:

Channel range	*Purpose*
`0500—051F`	signals from I– dome via `SRM3`
`0551—0553`	software values used by `LOOPPRES`
`05A0—05AB`	I– timers via `SRM3`

These signals can be moved to the `02xx` range and thereby remain under the 1024 channel range. The `02xx` range channels currently in use are as follows:

Channel range	*Purpose*
`0200`	`LINCD1` critical device control via `PLC`
`0240—0243`	software params used by `LOOPBPMA`
`0280—0284`	combined binary status words

It is easy to see that moving `05xx` channels to the `02xx` range only requires moving the current channel `0200` elsewhere. This only affects the Acnet database entry for this device. It could be moved to `0170`, for example.

The move from `05xx` to `02xx` also must affect all references to `05xx`. All Acnet devices that use such channel numbrs must be changed accordingly. In addition, all references to such channel numbers in the Data Access Table must be changed. Finally, all parameters of local applications that reference such channels also must be changed. The only one that does is `LOOPPRES`.

This change takes care of the `05xx` channels. But what about the binary bits? Looking

for cases in which bit numbers greater than 0400 are used, we find that only the following ranges are in use:

Bit range	*Purpose*
0500—053F	signals from I– dome via SRM3
0590—059F	repetition of 0500—050F, but watch for 059C!
05A0—05A7	extra control lines on Crate Utility Board
05A8—05AF	enable bit 05A8 used for LOOPPRES
0B00—0B1F	registers from quick digitizer

Suppose we again move the bits in the 05xx range to the 02xx range. What impact would this have? The only binary data occuping the 02xx range are three words of digital data accessed from a PLC that are currently in the range 0200—022F, so these would have to move. Let's move them to 02C0—02EF. What would be affected by this move? At channel 0045, the CRDEV has associated bits 0208 and 0228 that would be modified to 02C8 and 02E8. At channel 0200 (to be moved to channel 0170), the LINCD1 associated bits would have to make a similar adjustment, changing bit 0200 to bit 02C0 and changing bit 0228 to bit 02E8. In the parameters of the local application LOOPDNET, the "mapbit" parameter would change from 0200 to 02C0.

But what about the 0Bxx bits? They can be moved to bits 03C0—03DF, thereby occupying the analogous slot used by the 05xx move. There appear to be no assiaited bits in the 0Bxx range, and there are no local application parameters affected by this move. And there is no Data Access Table entry that gives these bits a value. That leaves only the binary address table entries that access the quick digitizer registers. Those four entries would have to move to an earlier part of the BADDR table, from offset 580 to offset 1E0. Since it is the VME I/O space that must be addressed, the addresses installed would be FBFFF100, FBFFF101, FBFFF104, and FBFFF105.