Acnet Database Forwarding

Reflecting setting values to central database

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IRM systems have not forwarded setting values to the central database, because they include nonvolatile memory that maintains the latest setting values, even across power failures. When an IRM comes up from a reset, it resends the last setting values to the hardware, since the hardware does not have such nonvolatile memory. These saved values will always be correct, because settings are made to the hardware only via the IRM software; no local hardware setting capability is formally supported. This note describes the forwarding protocol that Acnet uses and how support for such forwarding may be implemented.

The current Acnet database is a relational database from Sybase. The following protocol is described as the `SYBSET` protocol. The Acnet task name used by the `SYBSET` process on the `CDBS` node is `DBM...`; that is, `DBM` followed by three dots. In RAD-50 format, as used in IRM Acnet support, this is `0x5D197CB3`. The node number for `CDBS` is `0x09EB`.

The format of the message to forward a setting value to Sybase is:

Field	*Size*	*Meaning*
typecode	2	always 0x0001
replyLng	2	maximum expected length of reply in bytes
entries	2	number of setting packets to follow
packet1	10	first setting packet (for 2-byte setting value)
packet2	10	etc.

The format of a setting packet is as follows:

Field	*Size*	*Meaning*
function	2	always 0x0300
`PIDI`	4	property index/device index
entries	2	number of bytes of setting data
offset	2	offset to data in setting structure
data	2	actual setting data (for 2-byte case)

As usual, the `PIDI` structure is in the Vax byte order, which is the same as that received in the `SETDAT` message that prompted the forwarding action. Viewed as an array of two words, the first word is the low 16-bits of the device index, and the second word consists of the property index in the high byte and the most significant 8 bits of the device index in the low byte.

The offset value is the same offset value that was received in the `SETDAT` request. At present, IRM nodes only support such byte offsets for setting a part of an alarm block property.

If a request message is sent to the destination task name rather than a `USM`, there will be a reply from the central node. According to the `SYBSET` document in the `MOOC`

documentation, one can expect an error response of 16 –2, which means no data. This error code can somehow be interpreted as success.

To implement the above forwarding scheme in SETDAT as supported in IRMs, it should only be sent to CDBS if there is no error resulting from a setting. This is known by the node that actually performs the setting action. So, upon successful completion of a setting action, with the SETDAT request message still accessible, everything is available to form a forwarded setting message to CDBS using the above protocol. The PIDI is part of the SETDAT message, as is the offset word. So the node merely queues a SYBSET message directed to CDBS to the network. It may be easier to do this with a USM, in which no reply from CDBS would be forthcoming.

It is possible that too many setting messages may result from console knob activity, in which settings of Acnet devices may be sent from a console at 15Hz. The SYBSET process may object to such inundation of forwarded setting messages. In that case, a local application can be written to support the transfer of forwarded setting messages to SYBSET. Successful SETDAT action can result in writing into a queue that is monitored by the local application that may be called SETF (setting forwarded). It can throttle delivery of such forwarded setting messages, sending only the latest value when multiple settings are made in rapid succession, and limiting its rate of sending such forwarded messages to suit SYBSET.

The concept described in this note assumes that only settings made via SETDAT will be forwarded. Classic protocol setting are not forwarded, because the required device index value are unknown. But such settings would not normally be made to accelerator devices. If they are, they are not made in secret, as they are sent to the Acnet setting log server, so that operators can consult the resulting log if they suspect a device was affected by an unknown user. This setting accountability support, along with the nonvolatile record maintained in IRM nodes, may continue to obviate the need for support for forwarded settings to CDBS.