INTERPRETATION IC 135-2004-20 OF
ANSI/ASHRAE STANDARD 135-2004 BACnet® -
A Data Communication Protocol for Building
Automation and Control Networks

Approval Date: January 27, 2007

Request from: David Hudson (dhudson@deltacontrols.com) Delta Controls, 17850 56th Avenue, Surrey, BC V3S-1C7.

Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE Standard 135-2004, Sections 5.4, 5.4.1, 5.4.5.1, 5.4.5.3, and 12.11.27 related to Device Object and the APDU_Timeout property.

Background: Clause 12.11.27 (APDU_Timeout) does not indicate that, in addition to the existing definition, APDU_Timeout is an indication of the maximum amount of time a server device shal take between recieving a confirmed APDU request and sending its response or abort PDU. My interpretation of the following portions of Clause 5 is that a server device will either respond to a Confirmed APDU request or send an abort within (APDU_Timeout + the time it took to decode the received APDU and start the RequestTimer) of when it received the confirmed APDU.

Clause 5.4.1, for Tout, states "This parameter represents the value of the APDU_Timeout property of the node's Device object."

Clause 5.4.5.1 (State Machine for Responding BACnet User (server), IDLE) for ConfirmedUnsegmentedRecieved states "If a BACnet-Confirmed-Request-PDU whose 'segmented-message' parameter is FALSE is received from the network layer, then send a CONF_SERV indication to the local application program, start RequestTimer; and enter the AWAIT_RESPONSE state."

Clause 5.4.5.3 (State Machine for Responding BACnet User (server, AWAIT_RESPONSE) for Timeout, states "If RequestTimer becomes greater than Tout, then issue an N-UNITDATA. request with 'data_expecting_reply' = FALSE to transmit a BACnet-Abort-PDU with 'server' = TRUE; send ABORT.indication to the local application program; and enter the IDLE state.

Clause 5.4 states "...All BACnet devices shall be able to act as responding BACnet-users and therefore shall be prepared to receive APDUs sent by requesting BACnet-users.".

Interpretation: In addition to being an indication of the amount of time in milliseconds between retransmissions of an APDU requiring acknowledgment for which no acknowledgment has been received (which is documented in 12.11.27), the Device object property APDU_Timeout is an indication of the maximum amount of time the device shall take to respond to, or send an abort to, a ConfirmedRequest-PDU and as such should never be allowed to have a value of zero.

Question: Is this interpretation correct?

Answer: No.

Comments:

"The intent of the APDU_Timeout property has always been for its use in clients. There has been an error in the standard from the beginning and it should never have been used for server devices. The standard shall be fixed.

In server devices, the APDU_Timeout value indicates the maximum amount of time that the device will take to respond to a request and does not take into account network delay. For server devices that are always capable of responding immediately, a value of 0 is acceptable.

In any device that is configured to initiate BACnet-ConfirmedRequest-PDUs the APDU_Timeout value is required to be non-zero. This value reflects both network delay and maximum server processing time."