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## TRIDIUM NIAGARA<sup>AX</sup> 3.6 BACNET PICS

#### **BACnet Protocol Implementation Conformance Statement**

**Date:** June 14, 2012 **Vendor Name:** Tridium

Product Name: Niagara AX BACnet Integration

Product Model Number: Tridium JACE models T-2xx, T-6xx, T-7xx, T-SEC-J-2xx,

<u>T-SEC-J-6xx</u>, <u>T-J-NXS-AX-x</u>, <u>T-NXT-xx</u> (<u>T-J-NXS-AX-x</u> and <u>T-NXT-xx</u> are <u>IP or Ethernet only</u>), JACE models JACE-4xx, JACE-5xx, JACE-NX (J-NX-AX, IP or Ethernet only),

SoftJACE (SJ-XX-x, IP or Ethernet only)

**Application Software Version:** 3.6.47 or higher

Firmware Revision: 3.6.47 or higher

**BACnet Protocol Revision:** 7

#### **Product Description:**

Niagara AX provides the ability to view, monitor, and control BACnet devices over IP, raw Ethernet, or MS/TP media. Devices, points, schedules, alarms, and logs can be learned and managed from Niagara AX. In addition, Niagara points, schedules, histories, and alarming can be exposed to BACnet for monitor and control by foreign BACnet clients.

#### **BACnet Standardized Device Profile (Annex L):**

□ BACnet	Advanced Operator Workstation (B-AWS)
□ BACnet	Operator Workstation (B-OWS)
<b>□</b> BACnet	Operator Display (B-OD)
<b>☒</b> BACne	t Building Controller (B-BC)
<b>□</b> BACnet	Advanced Application Controller (B-AAC)
<b>□</b> BACnet	Application Specific Controller (B-ASC)
<b>□</b> BACnet	Smart Sensor (B-SS)
<b>□</b> BACnet	Smart Actuator (B-SA)

#### Additional BACnet Interoperability Building Blocks Supported (Annex K):

Data Sharing	Device & Network Management
DS-RP-A, B	DM-DDB-A, B
DS-RPM-A, B	DM-DOB-A, B
DS-WP-A, B	DM-DCC-B
DS-WPM-A, B	DM-RD-B
DS-COV-A, B	DM-TS-B
DS-COVU-A, B	DM-UTC-B
DS-V-A	DM-LM-A, B
DS-M-A	DM-BR-B
DS-COVP-B	DM-ANM-A
	DM-ADM-A
	DM-ATS-A
	DM-MTS-A

Alarm & Event Management	Trending
AE-N-A, -I-B	T-VMT-I-B, -E-B
AE-ACK-A, B	T-ATR-A, B
AE-ASUM-B	T-V-A
AE-ESUM-B	
AE-INFO-B	
AE-VN-A	
AE-VM-A	
Scheduling	Network Management
SCHED-I-B, -E-B	NM-CE-A
SCHED-VM-A	

#### **Segmentation Capability:**

Feature	Supported	Window size
Transmit Segmented Messages	yes	10
Receive Segmented Messages	yes	any

### **Standard Object Types Supported:**

- The CreateObject and DeleteObject services are not supported, so no objects are dynamically creatable or deletable through BACnet service requests, although these objects are dynamically creatable and deletable through Niagara.
- No general range restrictions exist; however, certain specific applications may have specific range restrictions.
- All potentially available properties are listed for each object type.
- Optional properties are listed in *italics*. Not all instances support all optional properties.
- Writable properties are listed in **bold**. Any range limitations are expressed in parentheses following the property name.

#### **Notes from Table**

- 1. The File\_Size property of File objects is only writable if the underlying system file is changeable.
- 2. The Setpoint property of Loop objects is writable only if the setpoint is not linked from within Niagara.
- 3. The Recipient\_List property of the Notification Class object will maintain entries that are internally configured within Niagara.
- 4. The List\_Of\_Object\_Property\_References property of the Schedule object will maintain entries that are internally configured within Niagara.
- 5. The Priority\_For\_Writing property of Schedule objects is not important for internal Niagara operation, as the priority at which a point is commanded is determined by the input to which the Schedule output is linked.
- 6. These Trend Log object properties are not writable if the backing history for the exported Trend Log is a Niagara-generated history. If the history is created as a BACnet Trend Log, then they are writable.

Object Type	Properties		
Analog Input	Object_Identifier  Object_Name Object_Type Present_Value  Description Device_Type Status_Flags Event_State Reliability Out_Of_Service Units Min_Pres_Value Max_Pres_Value	Resolution  COV_Increment  Time_Delay  Notification_Class  High_Limit  Low_Limit  Deadband  Limit_Enable  Event_Enable  Acked_Transitions  Notify_Type  Event_Stamps	
Analog Output	Object_Identifier  Object_Name Object_Type Present_Value  Description Device_Type Status_Flags Event_State Reliability Out_Of_Service Units Min_Pres_Value Max_Pres_Value Resolution	Priority_Array  Relinquish_Default  COV_Increment  Time_Delay  Notification_Class  High_Limit  Low_Limit  Deadband  Limit_Enable  Event_Enable  Acked_Transitions  Notify_Type  Event_Time_Stamps	
Analog Value	Object_Identifier  Object_Name Object_Type Present_Value  Description Status_Flags Event_State Reliability Out_Of_Service Units Priority_Array Relinquish_Default	COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Event_Enable Acked_Transitions Notify_Type Event_Stamps	

Object Type	Properties		
Binary Input	Object_Identifier  Object_Name Object_Type Present_Value  Description Device_Type Status_Flags Event_State Reliability Out_Of_Service Polarity Inactive_Text Active_Text	Change_Of_State_Time Change_Of_State_Count (0) Time_Of_State_Count_Reset Elapsed_Active_Time (0) Time_Of_Active_Time_Reset Time_Delay Notification_Class Alarm_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	
Binary Output	Object_Identifier  Object_Name Object_Type Object_Type Present_Value  Description Device_Type Status_Flags Event_State Reliability Out_Of_Service Polarity Inactive_Text Active_Text Change_Of_State_Count (0)	Time_Of_State_Count_Reset Elapsed_Active_Time (0) Time_Of_Active_Time_Reset Minimum_Off_Time Minimum_On_Time Priority_Array Relinquish_Default Time_Delay Notification_Class Feedback_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	
Binary Value	Object_Identifier Object_Name Object_Type Present_Value Description Status_Flags Event_State Reliability Out_Of_Service Inactive_Text Active_Text Change_Of_State_Time Change_Of_State_Count (0) Time Of State Count Reset	Elapsed_Active_Time (0) Time_Of_Active_Time_Reset Minimum_Off_Time Minimum_On_Time Priority_Array Relinquish_Default Time_Delay Notification_Class Alarm_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	
Calendar	Object_Identifier  Object_Name  Object_Type	<b>Description</b> Present_Value <b>Date_List</b>	

Object Type	Properties		
J JF	Object_Identifier	•	
	Object Name	Daylight_Savings_Status	
	Object Type	APDU_Segment_Timeout	
	System Status	APDU_Timeout	
	Vendor Name	Number_Of_APDU_Retries	
	Vendor Identifier	Time_Synchronization_Recipients	
	Model Name	Max_Master	
	Firmware Revision	Max_Info_Frames	
	Application_Software_Revision	Device_Address_Binding	
	Location	Database_Revision	
	<b>Description</b>	Configuration_Files	
Device	Protocol Version	Last_Restore_Time	
	Protocol Revision	Backup_Failure_Timeout	
	Protocol_Services_Supported	Active_COV_Subsriptions	
		UTC_Time_Synchronization_Recipients	
	Protocol_Object_Types_Supported	Time Synchronization Interval	
	Object_List	Align Intervals	
	Max_APDU_Length_Accepted	Interval Offset	
	Segmentation_Supported	proprietary-1338	
	Max_Segments_Accepted	proprietary-1339	
	Local_Time	proprietary-1340	
	Local_Date	proprietary-1341	
	UTC_Offset	<u> </u>	
File (Stream Access	Object_Identifier	File_Size <sup>1</sup>	
	Object_Name	Modification_Date	
	Object_Type	Archive	
Only)	Description	Read_Only	
	File_Type	File_Access_Method	
	Object_Identifier	Proportional_Constant_Units	
	Object_Name	Integral_Constant	
	Object_Type	Integral_Constant_Units	
	Present_Value	Derivative_Constant	
	Description	Derivative_Constant_Units	
	Status_Flags	Bias	
	Event_State	Maximum Output	
	Reliability	Minimum Output	
Τ.	Out Of Service	Priority For Writing	
Loop	Output Units	COV Increment	
	Manipulated Variable Reference	Time Delay	
	Controlled Variable Reference	Notification Class	
	Controlled Variable Value	Error Limit	
	Controlled Variable Units	Deadband	
	Setpoint Reference	Event Enable	
	Setpoint <sup>2</sup>	Acked Transitions	
	Action	Notify Type	
	Proportional Constant	Event Time Stamps	
	1 ropornonal_Constant	Dveni_1 inte_bianips	

Object Type	Properties		
	Object_Identifier	Number_Of_States	
	Object_Name	State_Text	
	Object_Type	Time_Delay	
	Present_Value	Notification_Class	
Multi state Innut	<u>Description</u>	Alarm_Values	
Multi-state Input	Device_Type	Fault_Values	
	Status_Flags	Event_Enable	
	Event_State	Acked_Transitions	
	Reliability	Notify_Type	
	Out_Of_Service	Event_Time_Stamps	
	Object_Identifier	State Tout	
	Object_Name	<b>State_Text</b> Priority Array	
	Object_Type	Relinquish Default	
	Present_Value	Time Delay	
Multi-state	Description	Notification Class	
	Device_Type	Feedback Value	
Output	Status_Flags	Event Enable	
	Event_State	Acked Transitions	
	Reliability		
	Out_Of_Service	Notify_Type  Evant Time Stamps	
	Number_Of_States	Event_Time_Stamps	
	Object Identifier	State_Text	
	Object Name	Priority_Array	
	Object Type	Relinquish_Default	
	Present Value	Time_Delay	
	Description	Notification_Class	
Multi-state Value	Status Flags	Alarm_Values	
	Event State	Fault_Values	
	Reliability	Event_Enable	
	Out Of Service	Acked_Transitions	
	Number Of States	Notify_Type	
		Event_Time_Stamps	
	Object_Identifier	Notification_Class	
Notification Class	Object_Name	Priority	
	Object_Type	Ack_Required	
	<b>Description</b>	Recipient_List <sup>3</sup>	
	Object_Identifier	Exception_Schedule	
	Object_Name	Schedule_Default	
0.1.1.1	Object_Type	List_Of_Object_Property_References <sup>4</sup>	
Schedule	Present_Value	Priority_For_Writing <sup>5</sup>	
	<b>Description</b>	Status_Flags	
	Effective_Period	Reliability	
	Weekly_Schedule	Out_Of_Service	

Object Type	Properties		
Trend Log	Object_Identifier  Object_Name Object_Type  Description Log_Enable <sup>6</sup> Start_Time Stop_Time Log_DeviceObjectProperty Log_Interval <sup>6</sup> Stop_When_Full Buffer_Size Log_Buffer Record_Count (0) <sup>6</sup>	Total_Record_Count Notification_Threshold Records_Since_Notification Last_Notify_Record Event_State Notification_Class Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps Logging_Type Status_Flags	
Structured View	Object_Identifier <b>Object_Name</b> Object_Type <b>Description</b>	Node_Type  Node_Subtype Subordinate_List Subordinate Annotations	

Data Link Layer Options:
☑ BACnet IP, (Annex J)
☑ BACnet IP, (Annex J), Foreign Device
☑ ISO 8802-3, Ethernet (Clause 7)
□ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
□ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s)
☑ MS/TP master (Clause 9), baud rate(s): <u>9600</u> , <u>19200</u> , <u>38400</u> , <u>76800</u>
☐ MS/TP slave (Clause 9), baud rate(s):
☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):
☐ Point-To-Point, modem, (Clause 10), baud rate(s):
□ LonTalk, (Clause 11), medium:
☐ Other:
Device Address Binding:
Is static device binding supported? (This is currently necessary for two-way communication
with MS/TP slaves and certain other devices.) ⊠Yes □ No
Networking Options:
☑ Router, Clause 6 – Routing configurations: Ethernet-IP, Ethernet-MS/TP, IP-MS/TP
☐ Annex H, BACnet Tunneling Router over IP
☑ BACnet/IP Broadcast Management Device (BBMD)
Does the BBMD support registrations by Foreign Devices?   Yes □ No
= 100 = 100 = 100 = 100
Character Sets Supported:

Indicating support for multip simultaneously.	le character sets does not impl	y that they can all be supported
<ul><li>☒ ANSI X3.4</li><li>☒ ISO 10646 (UCS-2)</li></ul>	☐ IBM <sup>™</sup> /Microsoft <sup>™</sup> DBCS ☐ ISO 10646 (UCS-4)	☑ ISO 8859-1 ☐ JIS C 6226

# If this product is a communication gateway, describe the types of non-BACnet equipment/networks(s) that the gateway supports:

This product supports communications between BACnet and any third-party system to which Niagara can connect. Contact Tridium for a list of supported protocols.

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