



# ADDENDA

**ANSI/ASHRAE Addendum bx to  
ANSI/ASHRAE Standard 135-2020**



# A Data Communication Protocol for Building Automation and Control Networks

Approved by ASHRAE and by the American National Standards Institute on September 30, 2024.

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ISSN 1041-2336



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**[This foreword and the “rationales” on the following pages are not part of this standard. They are merely informative and do not contain requirements necessary for conformance to the standard.]**

## FOREWORD

*Addendum bx is the result of a change proposal made pursuant to the ASHRAE continuous maintenance procedures and of deliberations within Standing Standard Project Committee 135. Changes are as follows:*

### **135-2020bx-1. Add Device Address Proxy functions, p. 3**

In the following document, language to be added to existing clauses of ANSI/ASHRAE 135-2020 and Addenda is indicated through the use of *italics*, while deletions are indicated by ~~strike through~~. Where entirely new subclauses are proposed to be added, plain type is used throughout. Only this new and deleted text is open to comment at this time. All other material in this document is provided for context only and is not open for public review comment except as it relates to the proposed changes.

The use of placeholders like X, Y, Z, X1, X2, N, NN, x, n, ?, etc., should not be interpreted as literal values of the final published version. These placeholders will be assigned actual numbers/letters only after final publication approval of the addendum.

### 135-2020bx-1. Add Device Address Proxy functions

#### Rationale

Broadcast Who-Is requests and the resulting I-Am requests can affect the performance of large networks. This proposal provides a mechanism to minimize that traffic.

This addendum describes a mechanism by which a BACnet router can perform I-Am request proxying for any directly connected BACnet network.

[Change **Clause 6.3.2**, p. 69]

### 6.3.2 Broadcast Messages

Three forms of broadcast transmission are provided by BACnet: local, remote, and global. A local broadcast is received by all stations on the local network. A remote broadcast is received by all stations on a single remote network. A global broadcast is received by all stations on all networks comprising the BACnet internetwork.

A local broadcast makes use of the broadcast MAC address appropriate to the local network's LAN technology, i.e. X'FFFFFFFFFFFF' for Ethernet, X'00' for ARCNET, X'FF' for MS/TP, or X'00' in the DstSubnet field of Address Format 0 in LonTalk, X'FFFF' for ZigBee, and an IP address with all ones in the host portion for BACnet/IP.

A remote broadcast is made on behalf of the source device on a specific distant network by a router directly connected to that network. In this case, DNET shall specify the network number of the remote network and DLEN shall be set to zero.

A global broadcast, indicated by a DNET of X'FFFF', is sent to all networks through all routers. Upon receipt of a message with the global broadcast DNET network number, a router shall decrement the Hop Count. If the Hop Count is still greater than zero, then the router shall broadcast the message on all directly connected networks except the network of origin, using the broadcast MAC address appropriate for each destination network. If the Hop Count is zero, then the router shall discard the message. In order for the message to be disseminated globally, the originating device shall use a broadcast MAC address on the originating network so that all attached routers may receive the message and propagate it further.

*If a BACnet router is acting as a device address proxy for one or more networks, broadcast Who-Is requests that would have been routed to those networks shall be processed as defined in Clause 19.9*

If a router has one or more ports that represent PTP connections as defined in Clause 10, global broadcasts shall be processed as follows. If the PTP connection is currently established, that is, the Connection State Machine is in the Connected state (see Clause 10.4.9), then the global broadcast message shall be transmitted through the PTP connection. If the PTP connection is not currently established, then no action shall be taken by the router to transmit the broadcast message through the PTP connection.

[Change **Clause 6.6**, p. 75]

### 6.6 BACnet Routers

BACnet routers are devices that interconnect two or more BACnet networks to form a BACnet internetwork. BACnet routers shall, at a minimum, implement the device requirements as specified in Clause 22.1.5. Table 6-1 specifies the maximum NPDU length and the minimum NPDU length being routed of the different data link layer types. Routers shall be capable of routing the NPDUs between any two of those data link layers supported by the router based on the minimum routed NPDU length defined in Table 6-1.

BACnet/SC to BACnet/SC BACnet routers, referred to as secure connect BACnet routers, shall support at least two BACnet/SC network ports and may support routing and forwarding of NPDUs exceeding 1497 octets, up to 61327 octets maximum between these ports. Secure connect BACnet routers shall support forwarding of the 'data\_attributes' parameter content with the NPDU. Secure connect BACnet routers shall support forwarding of a minimum of 4192 octets of 'data\_attributes' content between all BACnet/SC ports. See Clause AB.1.4

BACnet routers make use of BACnet network layer protocol messages to maintain their routing tables. Routers perform the routing tasks described in Clause 6.5. See Figure 6-12 for a flow chart of router operation.

*If a BACnet router is acting as a device address proxy for one or more networks, broadcast Who-Is requests that would have been routed to those networks shall be processed as defined in Clause 19.9.*

[Change **Table 12-13**, p. 222]

**Table 12-13. Properties of the Device Object Type**

Property Identifier	Property Datatype	Conformance Code
...		
Device_UUID	OCTET STRING (Size(16))	O <sup>21</sup>
Max_Proxied_I_Ams_Per_Second	Unsigned	O <sup>22</sup>
Device_Address_Proxy_Table	BACnetLIST of BACnetDeviceAddressProxyTableEntry	O <sup>23</sup>
...		

<sup>21</sup> This property shall be present if the device supports BACnet/SC network ports.

<sup>22</sup> Required to be present and writable if the device supports device address proxying. See Clause 19.9.

<sup>23</sup> Required to be present if the device supports device address proxying. See Clause 19.9.

[Add new **Clauses 12.11.73 and 12.11.74** to the Device object type, p. 220]

**12.11.73 Max\_Proxied\_I\_Ams\_Per\_Second**

This property of type Unsigned, specifies the maximum number of I-Am unconfirmed requests per second that are permitted to be initiated by the device address proxy function.

This property shall be greater than zero.

**12.11.74 Device\_Address\_Proxy\_Table**

This read-only property, of type BACnetLIST of BACnetDeviceAddressProxyTableEntry, contains the set of devices being proxied by this device as described in Clause 19.9. The value of this property shall be zero or more BACnetDeviceAddressProxyTableEntry entries.

If the value of the Device\_Address\_Proxy\_Enable property is FALSE, all device entries for that port shall be removed except MS/TP subordinate devices. If the value of the Subordinate\_Proxy\_Enable property is FALSE, all MS/TP subordinate devices entries for that port shall be removed.

The Device\_Address\_Proxy\_Table property shall be retained over a device restart.

Each entry has data fields as follows:

- Address                This field, of type BACnetAddress, shall indicate the BACnet address of the device.
  
- I Am                    This field, of type I-Am-Request, consists of the body of the I-Am service. The content of this field is determined using the processes defined in Clause 19.9.
  
- Last I Am Time        This field, of type BACnetDateTime, shall indicate the date and time an I-Am request was last received from the device.

Change **Tables 12-71.1, 12-71.2, 12-71.3, 12-71.4, 12-71.5, 12-71.6, 12-71.7, 12-71.8, 12-71.10, 12-71.11, 12-71.12**, p. 542]

<i>Property Identifier</i>	<i>Property Datatype</i>	<i>BACNET_APPLICATION</i>	<i>PROTOCOL</i>	<i>PHYSICAL</i>
... <i>Device_Address_Proxy_Enable</i> <i>Device_Address_Proxy_Timeout</i> ...	<i>BOOLEAN</i> <i>Unsigned</i>	<i>O<sup>x</sup></i> <i>O<sup>x</sup></i>		

<sup>x</sup> Required to be present and writable if the port supports device address proxying as specified in Clause 19.9.

[Renumber Clause 12.11.73, p. ?]

### 12.11.735 Profile\_Name

[Change Clause 12.56.14, p. 527]

### 12.56.14 Command

...

Any of the following commands may be written to this property:

...

**RESTART\_SUBORDINATE\_DISCOVERY** *If the value of the Subordinate\_Proxy\_Enable is TRUE, the port shall restart the subordinate detection algorithm as described in Clauses ~~12.56.53 through 12.56.56, and 16.10.219.9.2.~~*

If the value of Network\_Type is not MSTP, writing this value shall result in the return of a Result(-) with an 'Error Class' of PROPERTY and an 'Error Code' of VALUE\_OUT\_OF\_RANGE. If the value of Network\_Type is MSTP but the device does not support MS/TP subordinate Proxy functionality, writing this value shall result in the return of a Result(-) with an 'Error Class' of PROPERTY and an 'Error Code' of OPTIONAL\_FUNCTIONALITY\_NOT\_SUPPORTED. The value of the Command property shall return to IDLE as soon as discovery has been initiated. The discovery process will typically require a significant amount of additional time.

...

**RESTART\_PORT**

This port shall attempt to restart and reconnect to the network as if the device were reinitialized. All data that was learned, cached, or otherwise automatically determined for the port's operation shall be cleared. *This includes but is not limited to device address proxying functions.* All initialization, negotiation, and registration functions the port is expected to perform upon device initialization shall be performed again.

If the restart fails, the value of the Reliability property shall be set to RESTART\_FAILURE.

It is a local matter whether the value of this property remains at RESTART\_PORT until the restart has completed (whether in

success or failure), and then returns to IDLE; or whether the property returns to IDLE once the restart process has been initiated and the object is prepared to accept another command.

If the device cannot perform the restart of the port without a reinitialization of the entire device, writing this value shall result in the return of a Result(-) with an 'Error Class' of PROPERTY and an 'Error Code' of OPTIONAL\_FUNCTIONALITY\_NOT\_SUPPORTED.

#### *RESTART\_DEVICE\_DISCOVERY*

*If the value of the Device\_Address\_Proxy\_Enable is TRUE, the port shall restart Device Address Proxying as described in Clause 19.9.1.*

*If the value of the Subordinate\_Proxy\_Enable is TRUE, the port shall restart the subordinate detection algorithm as described in Clause 19.9.2.*

*The device entries in the Device\_Address\_Proxy\_Table property on this port shall be removed.*

*If the port does not support Device Address Proxying functionality, writing this value shall result in the return of a Result(-) with an 'Error Class' of PROPERTY and an 'Error Code' of OPTIONAL\_FUNCTIONALITY\_NOT\_SUPPORTED.*

*The value of the Command property shall return to IDLE as soon as the algorithm has been initiated. The actual process will typically require a significant amount of additional time.*

#### <Proprietary Enum Values>

A vendor may use other proprietary enumeration values to allow command values other than those defined by the standard. For proprietary extensions of this enumeration, see Clause 23.1 of this standard.

A proprietary command failure shall result in the value of the Reliability property being set to PROPRIETARY\_COMMAND\_FAILURE and the value of this property being set to IDLE.

It is a local matter whether the value of this property remains at the proprietary value until the proprietary action has completed (whether in success or failure), and then returns to IDLE; or whether the property returns to IDLE once the action has been initiated and the object is prepared to accept another command.

[Renumber Clause 12.56.14, 12.56.15, and 12.56.16]

[Add new Clause 12.56.V, p. 517]

#### **12.56.13 Device\_Address\_Proxy\_Enable**

This property of type BOOLEAN specifies whether (TRUE) or not (FALSE) this port shall perform device address proxying for devices, other than MS/TP subordinate devices, on this port. The value of this property shall be retained over a device restart. This property shall be present and writable if the device can perform device address proxying on this port. See Clause

19.9.1.

If this property is TRUE and the Network\_Type property is MSTP and a Protocol\_Level property is BACNET\_APPLICATION, this port shall also be capable of performing the functions of a Subordinate-Proxy device. The state of the Subordinate\_Proxy\_Enable property determines if proxying of subordinate devices is performed. See Clause 12.56.53.

[Add new Clause 12.56.W, p. 517]

#### 12.56.14 Device\_Address\_Proxy\_Timeout

This property of type Unsigned specifies the maximum time, in seconds, this port shall take to determine a proxied device is offline. See Clause 19.9.1.2.4. This value shall not exceed 300 seconds.

[Change Clauses 12.56.53 to 12.56.56, pp. 537]

#### 12.56.53 Subordinate\_Proxy\_Enable

This property, of type BOOLEAN, is an indication of whether (TRUE) or not (FALSE) the device will perform Subordinate-Proxy functions, *as described in Clause 19.9.2*, ~~for~~ on this port. This property shall be present and writable if the device is capable of performing the functions of a Subordinate-Proxy device on this port.

#### 12.56.54 Manual\_Subordinate\_Address\_Binding

This property, of type BACnetLIST of BACnetAddressBinding, describes the manually configured set of subordinate devices for which this device is acting as a Subordinate Proxy as described in Clause ~~19.9.2.1.146.10.2~~. This property shall be present and writable if the device is capable of performing the functions of a Subordinate-Proxy device on this port.

~~This property is used to manually configure a set of subordinate devices connected to this port for which this device will be a proxy. This property allows a Subordinate Proxy that does not support automatic subordinate discovery to be configured with a set of subordinates for which this device will be a proxy. It also allows a Subordinate Proxy device to be a proxy for subordinate devices that do not support the special object instance of 4194303 as described in Clause 12. When enabled, the Subordinate Proxy device shall periodically check each device that is in this list, and not in the Subordinate\_Address\_Binding list, by reading the device's Protocol\_Services\_Supported property from the device's Device object using the ReadProperty service. If the device responds and indicates that it does not execute the Who Is service, it shall be added to the Subordinate\_Address\_Binding property. The period at which the devices are checked is a local matter.~~

#### 12.56.55 Auto\_Subordinate\_Discovery

This property, of type BOOLEAN, is an indication whether (TRUE) or not (FALSE) the device will perform automatic subordinate detection functions ~~for~~ on this port. This property shall be present if the device is capable of performing the functions of a Subordinate-Proxy device on this port. *See Clause 19.9.2.1.2.*

~~Subordinate detection shall be accomplished by the proxy device using ReadProperty services to read, at a minimum, the Device object's Protocol\_Services\_Supported property for each MAC address on the network connected to this port. The ReadProperty service shall use the special object instance of 4194303 as described in Clause 12. If the device is found to support execution of the Who Is service, it is ignored; otherwise, the device shall be added to the Subordinate\_Address\_Binding property. The subordinate detection algorithm shall be repeated periodically. The period at which it is repeated is a local matter.~~

#### 12.56.56 Subordinate\_Address\_Binding

This property, of type BACnetLIST of BACnetAddressBinding, describes the set of subordinate devices for which this device is acting as a Subordinate-Proxy on this port as described in Clause ~~19.9.216.10.2~~. This property shall be present if the device is capable of performing the functions of a Subordinate-Proxy device on this port.

The set of devices described by the Subordinate\_Address\_Binding property consists of those devices described in the Manual\_Subordinate\_Address\_Binding and those devices that are automatically discovered. ~~When enabled, the Subordinate~~



~~Proxy device shall periodically check each device in this list by reading the device's Protocol\_Services\_Supported property from the device's Device object using the ReadProperty service. If the device fails to respond or indicates that it executes the Who-Is service, it shall be removed from the list. The period at which the devices are checked is a local matter.~~

[Change **Clause 16.10.2**, pp. 720]

### **16.10.2 Service Procedure**

The sending BACnet-user shall transmit the Who-Is unconfirmed request, normally using a broadcast address. If the 'Device Instance Range Low Limit' and 'Device Instance Range High Limit' parameters are omitted, then all receiving BACnet-users shall return their Device Object\_Identifier in individual responses using the I-Am service. If the 'Device Instance Range Low Limit' and 'Device Instance Range High Limit' parameters are present, then only those receiving BACnet-users whose Device Object\_Identifier instance number falls within the range greater than or equal to 'Device Instance Range Low Limit' and less than or equal to 'Device Instance Range High Limit' shall return their Device Object\_Identifier using the I-Am service.

~~See Clause 19.9 on how device address proxying affects this service. If the receiving BACnet user has a Subordinate\_Proxy\_Enable property and the Subordinate\_Proxy\_Enable for the receiving port is TRUE, then the BACnet user shall respond with an I-Am unconfirmed request for each of the subordinate devices on the MS/TP network that are present in the Subordinate\_Address\_Binding property and that match the device range parameters. The I-Am unconfirmed requests that are generated shall be generated as if the subordinate device originated the service. If the I-Am unconfirmed request is to be placed onto the MS/TP network on which the subordinate device resides, then the MAC address included in the packet shall be that of the subordinate device. In the case where the I-Am unconfirmed request is to be placed onto a network other than that on which the subordinate device resides, then the network layer shall contain SLEN and SNET filled in with the subordinate device's MAC address as if it were routing a packet originally generated by the subordinate device.~~

[Add new **Clause 19.9**, pp. 756]

## **19.9 Device Address Proxying**

Device address proxying provides a mechanism to allow a BACnet-user to proxy I-Am unconfirmed requests for all devices that reside on a directly connected network. This network is a 'proxied network'.

### **19.9.1 Device Proxying**

This clause describes device address proxying of devices except for MS/TP subordinate devices. Clause 19.9.2 describes device address proxying for MS/TP subordinate devices.

When a BACnet client requires information from another device it may learn the other device's BACnet address by broadcasting a global Who-Is request for that device. Without device address proxying, the Who-Is request is routed to all networks in a building control system. A single broadcast Who-Is request is not a concern but repeated Who-Is requests due to offline or unreachable devices can have a significant impact on the entire system.

BACnet device discovery of a large building control system can have an adverse effect on the throughput of constrained or busy networks and, in some cases, device discovery of the entire system can fail if more I-Am requests are received by a BACnet router than can be successfully routed.

Implementing device address proxying in a BACnet router will ensure global Who-Is requests will not be routed to proxied networks and thus mitigate these and other issues. The following clauses describe a process to proxy devices on a proxied network.

#### **19.9.1.1 Process**

If the Network Port object contains the Device\_Address\_Proxy\_Enable property and the value of the Device\_Address\_Proxy\_Enable is FALSE, the BACnet-user shall not proxy any devices, other than MS/TP subordinate devices, on that network and the network layer entity shall route Who-Is requests as specified in Clause 16.10.

If the value of the `Device_Address_Proxy_Enable` property is `TRUE`, the BACnet-user shall respond with a unicast I-Am unconfirmed request for each device on the proxied network that is in the `Device` object's `Device_Address_Proxy_Table` and matches the device range parameters of a Who-Is request. The I-Am unconfirmed requests that are generated shall be generated as if the proxied device originated the service. In the case where the I-Am unconfirmed request is to be placed onto a network other than that on which the proxied device resides; the network layer shall contain `SLEN` and `SNET` filled in with the proxied device's MAC address as if it were routing a packet originally generated by the proxied device.

Since devices residing on a network generate their own I-Am unconfirmed requests, the BACnet-user shall not initiate an I-Am unconfirmed request for a proxied device on its own network. The BACnet-user shall not forward any I-Am unconfirmed requests initiated from devices on its proxied network. The BACnet-user shall provide its own I-Am unconfirmed request for its proxied networks.

If the BACnet-user is homed on a proxied network, an entry shall be included in the `Device_Address_Proxy_Table` with the 'Network' field set to the proxied network, the 'Address' field set to the BACnet-user's BACnet Address for this port, the 'I Am' field containing the I-Am request parameters of the BACnet-user, and the 'Last I Am Time' set to the `Device` object's `Local_Date` and `Local_Time`.

The BACnet-user shall not forward received Who-Is unconfirmed requests to its proxied networks. If a proxied network contains one or more other BACnet routers, and the device range of a received Who-Is request specifies any devices that are not contained in the `Device_Address_Proxy_Table`, or there is no device range provided, the BACnet-user shall generate Who-Is unconfirmed requests matching the received Who-Is request with broadcast `DNET` and a local unicast MAC for those BACnet routers.

The BACnet-user shall forward remote and global Who-Is unconfirmed requests received from a device residing on its proxied network if the Who-Is request specifies any device that is not contained in the `Device_Address_Proxy_Table`, or there is no device range provided.

The BACnet-user shall forward remote and global broadcast I-Am unconfirmed requests received from a BACnet router residing on its proxied network.

The BACnet-user shall forward unicast I-Am unconfirmed requests received from a BACnet router residing on its proxied network that are destined for another network.

### **19.9.1.2 Discovery**

This clause describes the requirements to discover, and monitor proxied devices.

The discovery and offline detection of devices is dependent on the data link being proxied, the capabilities of the proxied device, and the device proxying the network. Mechanisms for discovery and offline detection include but are not limited to:

- Monitoring MAC addresses on MS/TP networks.
- Monitoring traffic on the proxied network.
- For discovery, initiating local broadcast Who-Is requests targeted at device identifier ranges not in the `Device_Address_Proxy_Table`.
- For offline detection, initiating unicast Who-Is requests targeted at the specified device and, if not detected, a local broadcast Who-Is request on the proxied network.

#### **19.9.1.2.1 Adding a New Device**

The BACnet-user shall detect when a device has been added to the proxied network within 10 seconds of the device initiating an I-Am request. The BACnet-user shall add the device to the `Device_Address_Proxy_Table`, populate the entry parameters and proxy the device.

Some devices might not initiate an I-Am request or the I-Am request might have been missed by the BACnet-user. This means it is not guaranteed that a BACnet-user will detect all devices on a proxied network so other mechanisms will need to be used to discover all devices on a proxied network. See Clause 19.9.1.2.

#### **19.9.1.2.2 Revalidating an Existing Device**

If a I-Am request has not been received from a proxied device within 24 hours, the BACnet-user shall initiate a unicast Who-Is request to revalidate the device's parameters in the Device\_Address\_Proxy\_Table and update the 'Last I Am Time' field. If the device has been replaced, the BACnet-user shall update the Device\_Address\_Proxy\_Table parameters and proxy the replacement device. If a I-Am request is not received within 10 seconds, the BACnet-user shall initiate a second unicast Who-Is request. If a I-Am request is not received within 10 seconds, the BACnet-user remove the entry from the Device\_Address\_Proxy\_Table and no longer proxy the device.

If the BACnet-user performs a device restart, the BACnet-user shall revalidate all devices in the Device\_Address\_Proxy\_Table by initiating a unicast Who-Is requests. If a I-Am request is not received from a device within 10 seconds, the BACnet-user shall initiate a second unicast Who-Is request. If a I-Am request is not received within 10 seconds, the BACnet-user shall remove the entry from the Device\_Address\_Proxy\_Table and no longer proxy the device.

#### **19.9.1.2.3 Offline Device Detection**

The BACnet-user shall detect when a device is no longer online within the time specified in Device\_Address\_Proxy\_Timeout. The BACnet-user shall remove the entry from the Device\_Address\_Proxy\_Table and no longer proxy the device. It is a local matter how a BACnet-user detects when a device is no longer online. See Clause 19.9.1.2 for possible mechanisms.

### **19.9.2 MS/TP Subordinate Proxying**

This clause describes device address proxying specifically for MS/TP subordinate devices or performing the Subordinate Proxy function. Clause 19.9.1 describes device address proxying for all other types of BACnet devices.

#### **19.9.2.1 Process**

If the Network Port object contains the Subordinate\_Proxy\_Enable property and the value of the Subordinate\_Proxy\_Enable property is TRUE, then the BACnet-user shall respond with an I-Am unconfirmed request for each of the subordinate devices on the MS/TP network that are present in the Subordinate\_Address\_Binding property and that match the device range parameters of a Who-Is request. The I-Am unconfirmed requests that are generated shall be generated as if the subordinate device originated the service. If the I-Am unconfirmed request is to be placed onto the MS/TP network on which the subordinate device resides, then the MAC address included in the packet shall be that of the subordinate device. In the case where the I-Am unconfirmed request is to be placed onto a network other than that on which the subordinate device resides, then the network layer shall contain SLEN and SNET filled in with the subordinate device's MAC address as if it were routing a packet originally generated by the subordinate device.

If the Device object contains the Device\_Address\_Proxy\_Table property, proxied subordinate devices shall be included in the Device\_Address\_Proxy\_Table, the 'Network' field set to the proxied network, the 'Address' field set to the device's BACnet Address, the 'I Am' field containing the I-Am request parameters corresponding to the subordinate device and the 'Last I Am Time' set to the Device object's Local\_Date and Local\_Time. If a proxied subordinate device is no longer online, the entry shall be removed from the Device\_Address\_Proxy\_Table. Subordinate devices shall not be included in the Device\_Address\_Proxy\_Table until the 'I Am' field has been ascertained.

#### **19.9.2.2 Discovery**

The BACnet-user shall periodically check each device in the Subordinate\_Address\_Binding property by reading the device's Protocol\_Services\_Supported property from the device's Device object using the ReadProperty service. If the device fails to respond, it shall no longer be proxied, shall be removed from the Subordinate\_Address\_Binding list and the Device\_Address\_Proxy\_Table if present. If a device indicates that it executes the Who-Is service, it shall no longer be proxied, shall be removed from the Subordinate\_Address\_Binding list and if the Device\_Address\_Proxy\_Table is present and contains the same device, the device shall be rediscovered using the processes in Clause 19.9.1.

### 19.9.2.2.1 Manual Subordinate Configuration

The Manual\_Subordinate\_Address\_Binding property is used to manually configure a set of subordinate devices connected to the port for which this device will be a proxy. This property allows a BACnet-user that does not support automatic subordinate discovery to be configured with a set of subordinates for which this device will be a proxy. It also allows a BACnet-user to be a proxy for subordinate devices that do not support the special object instance of 4194303 as described in Clause 12. When enabled, the BACnet-user shall periodically check each device that is in this list, and not in the Subordinate\_Address\_Binding list, by reading the device's Protocol\_Services\_Supported property from the device's Device object using the ReadProperty service. If the device responds and indicates that it does not execute the Who-Is service, it shall be added to the Subordinate\_Address\_Binding property.

### 19.9.2.2.2 Auto Subordinate Discovery

If the Auto\_Subordinate\_Discovery property is TRUE, subordinate detection shall be accomplished by the BACnet-user using ReadProperty services to read, at a minimum, the Device object's Protocol\_Services\_Supported property for each MAC address on the network connected to this port. The ReadProperty service shall use the special object instance of 4194303 as described in Clause 12. If the device is found to support execution of the Who-Is service, it is ignored; otherwise, the device shall be added to the Subordinate\_Address\_Binding property. The subordinate detection algorithm shall be repeated periodically.

[Add new ASN.1 Productions in **Clause 21** maintaining the alphabetical order, pp. 812]

```
BACnetDeviceAddressProxyTableEntry ::= SEQUENCE {
    address                [0] BACnetAddress,
    i-am                  [1] I-Am-Request,
    last-i-am-time        [2] BACnetDateTime
}
```

[Update ASN.1 Productions in **Clause 21**, pp. 836]

```
BACnetNetworkPortCommand ::= ENUMERATED {
    ...
    restart-port           (7),
    restart-device-discovery (8)
    ...
}
```

```
BACnetPropertyIdentifier ::= ENUMERATED { -- see below for numerical order
```

```
...
    device-address-binding           (30),
    device-address-proxy-enable      (4194338),
    device-address-proxy-table       (4194339),
    device-address-proxy-timeout     (4194340),
    device-type                       (31),
    ...
    -- see represents                (491),
    -- see device-address-proxy-enable (4194338),
    -- see device-address-proxy-table  (4194339),
    -- see device-address-proxy-timeout (4194340),
    ...
}
```

[Change **Annex A**, pp.964]

**ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE)**

...

BACnet Secure Connect Hub (B-SCHUB)

*BACnet Device Address Proxy (B-DAP)*

BACnet General (B-GENERAL)

...

BACnet Secure Connect (Annex AB)

BACnet Secure Connect Node

If direct connections are supported:

Maximum number of simultaneous direct connections initiated: \_\_\_\_\_

Maximum number of simultaneous direct connections accepted: \_\_\_\_\_

BACnet Secure Connect Hub Function

Maximum number of simultaneous hub connections accepted: \_\_\_\_\_

HTTPS Proxy Support

List the types of HTTPS proxies supported: \_\_\_\_\_

Additional cipher suites supported beyond those required for TLS V1.3

The additional cipher suites supported using the cipher suite names as of the TLS Cipher Suite Registry at IANA (See RFC 8446):

\_\_\_\_\_

Additional Transport Layer Security versions other than V1.3 supported

The TLS versions other than V1.3 that are supported, including the supported cipher suites for the version beyond those required, using the cipher suite names as defined by the TLS version supported:

\_\_\_\_\_

Generates private keys internally and provides matching certificate signing requests.

DNS host name resolution supported (RFC 1123)

mDNS host name resolution supported (RFC 6762)

*BACnet Device Address Proxying (Clause 19.9)*

*Number of entries supported in the Device\_Address\_Proxy\_Table: \_\_\_\_\_*

Other:

...

[Add new BIBBs to **Clause K.5**, pp. 1076]

**K.5.36 BIBB - Device Management-Device Address Proxying-View and Modify-A (DM-DAP-VM-A)**

The A device displays and modifies the proxy related properties in a device capable of proxying.

BACnet Service	Initiate	Execute
ReadProperty	x	
ReadRange	x	
AddListElement	x	
RemoveListElement	x	
WriteProperty	x	

Devices claiming conformance to DM-DAP-VM-A shall be able to read and present the Subordinate\_Proxy\_Enable, Manual\_Subordinate\_Address\_Binding, Auto\_Subordinate\_Discovery, Subordinate\_Address\_Binding and the Device\_Address\_Proxy\_Enable properties of the Network Port object types and the Device\_Address\_Proxy\_Table property of the Device object type.

The Manual\_Subordinate\_Address\_Binding, Subordinate\_Address\_Binding and Device\_Address\_Proxy\_Table properties can contain a very large list of values. For this reason, the A device shall support initiation of the ReadRange service to ensure the retrieval of all values for this property.

The A device shall be capable of configuring the Subordinate\_Proxy\_Enable, Manual\_Subordinate\_Address\_Binding, Auto\_Subordinate\_Discovery, Subordinate\_Address\_Binding and Device\_Address\_Proxy\_Enable properties.

The A device shall be capable of restarting the device discovery process by writing RESTART\_DEVICE\_DISCOVERY to the Command property of the Network Port objects.

A device claiming support for DM-DAP-VM-A is interoperable with devices that support DM-DAP-B.

### K.5.37 BIBB - Device Management-Device Address Proxying-B (DM-DAP-B)

The B device implements proxying functionality and provides I-Am messages on behalf of proxied devices.

BACnet Service	Initiate	Execute
ReadProperty	x	x
ReadRange		x
AddListElement		x
RemoveListElement		x
WriteProperty		x
Who-Is		x
I-Am	x	

Devices claiming conformance to DM-DAP-B shall support the Device\_Address\_Proxy\_Enable property of the Network Port object type and the Device\_Address\_Proxy\_Table property of Device object type. Proxies shall be capable of performing the device address proxying on one or more directly connected networks. Devices claiming conformance to DM-DAP-B shall also support NM-RC-B.

The Device\_Address\_Proxy\_Table shall support a minimum of 128 entries per proxied network.

Devices implementing device proxying functionality for directly connected MS/TP networks shall support the Subordinate\_Proxy\_Enable, Manual\_Subordinate\_Address\_Binding, Auto\_Subordinate\_Discovery and the Subordinate\_Address\_Binding properties of the Network Port object type, be capable of proxying for at least 32 MS/TP subordinate devices per proxied MS/TP network.

The Device\_Address\_Proxy\_Table, Manual\_Subordinate\_Address\_Binding and Subordinate\_Address\_Binding properties can contain a very large list of values. For this reason, the B device shall support execution of the ReadRange service.

A device claiming support for DM-DAP-B is interoperable with devices that support DM-DAP-VM-A.

[Change **Clause L.7**, pp.1131]

### L.7 Miscellaneous Profiles

The following table indicates which BIBBs shall be supported by the device types of this family, for each interoperability area.

#### Data Sharing

<b>B-RTR</b>	<b>B-GW</b>	<b>B-BBMD</b>	<b>B-ACDC</b>	<b>B-ACCR</b>	<b>B-SCHUB</b>	<b>B-DAP</b>
DS-RP-B	DS-RP-B	DS-RP-B	DS-RP-B	DS-RP-B	DS-RP-B	<i>DS-RP-B</i>
DS-WP-B	DS-WP-B	DS-WP-B	DS-WP-B	DS-WP-B		<i>DS-WP-B</i>
				DS-COV-B		
			DS-ACAD-B			
				DS-ACCDI-B		

Alarm & Event Management

B-RTR	B-GW	B-BBMD	B-ACDC	B-ACCR	B-SCHUB	B-DAP

Scheduling

B-RTR	B-GW	B-BBMD	B-ACDC	B-ACCR	B-SCHUB	B-DAP

Trending

B-RTR	B-GW	B-BBMD	B-ACDC	B-ACCR	B-SCHUB	B-DAP

Device & Network Management

B-RTR	B-GW	B-BBMD	B-ACDC	B-ACCR	B-SCHUB	B-DAP
						<i>DM-DDB-A</i>
DM-DDB-B	DM-DDB-B	DM-DDB-B	DM-DDB-B	DM-DDB-B	DM-DDB-B	<i>DM-DDB-B</i>
DM-DOB-B	DM-DOB-B	DM-DOB-B	DM-DOB-B	DM-DOB-B	DM-DOB-B	<i>DM-DOB-B</i>
						<i>DM-LM-B</i>
			DM-DCC-B	DM-DCC-B		
NM-RC-B						<i>NM-RC-B</i>
		NM-BBMD-B				
	GW-EO-B1					
	GW-VN-B1					
					NM-SCH-B	
						<i>DM-DAB-B</i>

<sup>1</sup> One of these BIBBs shall be supported.

[Add a new Profile to **Clause L.7**, pp. 1134]

**L.7.7 BACnet Device Address Proxy (B-DAP)**

A B-DAP is a BACnet network router that provides device address proxying for one or more directly connected networks. It enables specification of the following:

Data Sharing

- Ability to provide the values of any of its BACnet objects
- Ability to allow modification of some or all of its BACnet objects by another device

Alarm and Event Management

- No requirement

Scheduling

- No requirement

Trending

- No requirement

Device and Network Management

- Ability to respond to queries about its status
- Ability to respond to requests for information about any of its objects
- Ability to respond to network layer messages
- Ability to connect two or more data links
- Ability to provide device address proxying for one or more directly connected networks

[Add a new entry to **History of Revisions**, p. 1411]

**HISTORY OF REVISIONS**

...	...	...
1	27	<b>Addendum <i>bx</i> to ANSI/ASHRAE Standard 135-2020</b> Approved by ASHRAE on September 30, 2024; and by the American National Standards Institute on September 30, 2024. 1. Add Device Address Proxy functions



## **POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES**

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ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

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