F.3.11 Data type for MIHF identification

Table F.19.—Data type for MIHF identification

|  |  |  |
| --- | --- | --- |
| Data type name | Derived from | Definition |
| MIHF\_ID | OCTET\_STRING | The MIHF Identifier: MIHF\_ID is a network access identifier (NAI). NAI shall be unique as per IETF RFC 4282. If L3 communication is used and MIHF entity resides in the network node, then MIHF\_ID is  the fully qualified domain name or NAI-encoded IP address (IP4\_ADDR or IP6\_ADDR) of the entity that hosts the MIH Services.  If L2 communication is used then MIHF\_ID is the NAI-encoded linklayer address (LINK\_ADDR) of the entity that hosts the MIH services.  In an NAI-encoded IP address or link-layer address, each octet of binary-encoded IP4\_ADDR, IP6\_ADDR and LINK\_ADDR data is encoded in the username part of the NAI as .“\.” followed by the octet value.  A **broadcast** MIHF identifier is defined as an MIHF ID of zero length. When an MIH protocol message with **broadcast** MIHF ID is transmitted over the L2 data plane, a group MAC address (01-80-C2-  00-00-0E) shall be used (see IEEE P802.1aj/D2.2). The maximum length is 253 octets. |

8.3.1 MIHF ID

MIHF Identifier (MIHF ID) is an identifier that is required to uniquely identify an MIHF entity for

delivering the MIH services. MIHF ID is used in all MIH protocol messages. This enables the MIH protocol to be transport agnostic.

MIHF ID is assigned to the MIHF during its configuration process. The configuration process is outside the scope of the standard.

A **broadcast** MIHF ID can be used when destination MIHF ID is not known to a source MIHF, such as for discovering an MIH peer, or when there are multiple receivers for the message, such as in a broadcast scenario. The following MIH messages can use a **broadcast** MIHF ID:

**a)MIH Messages for Management Service:**

1) MIH\_Capability\_Discover request

**b)MIH Messages for Command Service:**

1) MIH\_Link\_Get\_Parameters request

2) MIH\_Link\_Configure\_Thresholds request

3) MIH\_Net\_HO\_Bcst\_Commit indication

**c)MIH Messages for Information Service:**

1) MIH\_Push\_Information indication

The MIHF ID is of type MIHF\_ID. (See F.3.11.)

8.6 MIH protocol messages

The following subclauses specify different MIH protocol messages in TLV form. The shaded areas represent the MIH protocol header, while the unshaded areas represent the MIH protocol payload. The payload consists of a set of identifiers in TLV form.

The TLV Type assignment for each TLV can be found in Annex L, Table L.2.

TLV type values ranging from 101 to 255 are reserved for experimental TLVs. These values are used by different implementations to evaluate the option of using TLVs not defined by the specification.

When a TLV type value is in the range of experimental TLVs and the data type of the TLV value is unknown or the TLV value is not in the range of valid values, the TLV should be ignored and the rest of the message should be processed. Also, experimental TLVs can be ignored, based on the MIHF information that is communicating with another MIHF with different experimental TLVs implementation.

All MIH messages carry a source MIHF ID followed by a destination MIHF ID as the first two TLVs of the MIH protocol payload part of the message. **Broadcast** MIHF ID can be used in MIH\_Capability\_Discover request and response messages as its destination MIHF ID.

All .“Optional.” fields are optionally sent but the receiver shall properly operate on them if present, i.e., these fields are mandatory in the implementation, but optional in their use.

On receipt of an MIH request message the MIHF shall respond with a corresponding response message.

Any message received that has an invalid MIH header, or does not contain the source/destination MIHF IDs, or has an unrecognizable or invalid MIH Message ID shall be discarded without sending any indication to the source MIH node. Any undefined or unrecognizable TLVs in a received message shall be ignored by the receiver.

8.6.1 MIH messages for service management

8.6.1.1 MIH\_Capability\_Discover request

The corresponding MIH primitive of this message is defined in 7.4.1.1.

If a requesting MIHF entity knows the destination MIHF entity.’s MIHF ID, the requesting MIHF entity fills its destination MIHF ID and sends this message to the peer MIHF over the data plane, either L2 or L3.

If a requesting MIHF entity does not know the destination MIHF entity.’s MIHF ID, the requesting MIHF entity may fill its destination MIHF ID with a **broadcast** MIHF ID to send this capability discover message.

8.6.1.2 MIH\_Capability\_Discover response

The corresponding MIH primitive of this message is defined in 7.4.1.3. This message is sent in response to an MIH\_Capability\_Discover request message that was destined to a single MIHF\_ID or **a broadcast** MIHF ID.

8.2.3.4 Inter-state-machine procedures

a) BOOLEAN Process(MIH\_MESSAGE).—This procedure processes the incoming message passed

as an input variable. A value of TRUE is returned if an outgoing message is available in response to

the incoming message. Otherwise, a value of FALSE is returned.

b) void Transmit(MIH\_MESSAGE).—This procedure transmits the message passed as the input

variable.

c) BOOLEAN IsMulticastMsg(MIH\_MESSAGE).—This procedure outputs TRUE if the input

message has a **broadcast** destination MIHF\_ID. Otherwise, it outputs FALSE.

d) MIHF\_ID SrcMIHF\_ID(MIH\_MESSAGE).—This procedure obtains a Source Identifier TLV

from the message passed as the input and returns the value of the TLV.

e) MIHF\_ID DstMIHF\_ID(MIH\_MESSAGE).—This procedure obtains a Destination Identifier

TLV from the message passed as the input and returns the value of the TLV.

f) void SetMIHF\_ID(MIH\_MESSAGE, MIHF\_ID, MIHF\_ID).—This procedure inserts a Source

Identifier TLV and a Destination Identifier TLV into the MIH message. The first MIHF\_ID is used

as the value of the Source Identifier TLV. The second MIHF\_ID is used as the value of the

Destination Identifier TLV.

8.2.3.7.1 Intra-state-machine variables

a) IsMulticast.—This variable.’s type is BOOLEAN. When its value is TRUE, it indicates that a message has a **broadcast** destination MIHF\_ID. Otherwise, its value is FALSE.

8.2.4.3.4 Solicited MIH capability discovery

An MIHF (the requestor) discovers its peer MIH functions and capabilities by multicasting or unicasting an MIH\_Capability\_Discover request message to either its multicast domain or a known MIHF ID, respectively. Only MIH network entities respond to a multicast MIH\_Capability\_Discover request.

When a peer MIH function (the responder) receives the MIH\_Capability\_Discover request message, it sends MIH\_Capability\_Discover response message back to the requestor. The response is sent by using the same transport type over which the request message was received. When the requestor receives the unicast MIH\_Capability\_Discover response message, it learns the responder.’s MIHF ID by checking the source ID of MIH\_Capability\_Discover response.

For complete operation, the requestor sets a timer at the time of sending an MIH\_Capability\_Discover

request during which time the requestor is in waiting state for a response from the responder. When the

response message is received while the timer is running, the requestor stops the timer and finishes the MIH function and capability discovery procedure. When the timer expires without receiving a response message, the requestor tries the combined MIH function discovery and capability discovery procedure by using a different transport or terminates the MIH function and capability discovery procedure.

If the MIH capability discovery is invoked upon receiving MIH capability advertisement in unauthenticated state through media specific broadcast messages, such as beacon frames and DCD, destination MIHF ID is filled with **broadcast** MIHF ID and this message is transmitted over the control plane using an L2 management frame, such as an IEEE 802.11 management action frame or an IEEE 802.16 MAC management message. This message contains the SupportedMihEventList, SupportedMihCommandList, SupportedISQueryTypeList, SupportedTransportList, and MBBHandoverSupport TLVs to enable the receiving MIHF to discover the sending MIHF.’s capability. Therefore, peer MIHF entities can discover each other.’s MIH capability by one MIH protocol message transaction. When the requestor receives the unicast MIH\_Capability\_Discover response message, which is embedded in the media specific control message, it retrieves the responder.’s MIHF ID by checking the source of the MIH\_Capability\_Discover response

message.