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| Project | **IEEE 802.21 Media Independent Handover Services**  **IEEE 802.21d: Multicast Group Management**  **<**[**http://www.ieee802.org/21/**](http://www.ieee802.org/21/)**>** |
| Title | **Proposal for IEEE 802.21d solution regarding the Generic Link ID parameter** |
| Date Submitted | February 2013 |
| Source(s) |  |
| Re: | IEEE 802.21d TG |
| Authors: | Daniel Corujo (ITAv), Carlos Guimarães (ITAv), Antonio de la Oliva (UC3M), |
| Abstract | This contribution provides a solution for the IEEE 802.21d |
| Purpose | Task Group Discussion and Acceptance |
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**NOTE**

**1 –** In this contribution we provide an example of the application of the Generic Link ID concept, into a MIH\_Event\_Subscribe. The intent is to generate discussion, in order to reach a consensus solution.

In order to support a Generic Link ID concept, there can be the need to specify a group of interfaces/technologies as intended target of the link command. The rationale is explained as follows.

**Multicast Link ID rationale**

A multicast message may be destined to several links from different entities in order to perform the same operation in all of them (e.g. configure a specific threshold in all WLAN interfaces). For that, a new data type, named MULTICAST\_LINK\_ID, was defined, allowing the specification of a group of destination links identified by its technology. The presented solution allows backwards compatibility.

When a message/primitive contains a LinkIdentifieror MulticastLinkIdentifier, one and only one must be presented in the message.

**2** – When the MIHF receives a remote command towards several of it’s Link layers, how does he manage the responses of the separate link layers, in regards to it’s MIH response towards the requester MIHF? To explain the problem, lets assume the following example:

1. The MIHF1 sends a multicast MIH\_Link\_Configure\_Thresholds.request with a Generic Link ID to the MIHF2.
2. The MIHF2 forwards the request to both Link SAPs.



The question is: **How will the MIHF2 handle the responses from the Link SAPs?** The state machines from the destination MIHF do not allow it to send several messages belonging to the same Transaction ID. Also, the available messages do not allow the MIHF to group all responses in a single response message. We identified two possible solutions:

All changes are explicitly marked in bold.

**7.4.15 MIH\_Event\_Subscribe**

**7.4.15.1 General**

The MIH\_Link\_Configure\_Thresholds is issued by an upper layer entity to configure parameter report thresholds of a lower layer. The destination of an MIH\_Link\_Configure\_Thresholds command is local or remote. This command configures one or more thresholds on a link. When a given threshold is crossed, an MIH\_Link\_Parameters\_Report notification shall be sent to all MIH users that are subscribed to this threshold-crossing event.

**7.4.15.2 MIH\_Link\_Configure\_Threshold.request**

**7.4.15.1.1 Function**

This primitive is issued by an MIH user to configure thresholds of a lower layer link.

**7.4.15.1.2 Semantics of service primitive**

MIH\_Link\_Configure\_Thresholds.request (

DestinationIdentifier,

LinkIdentifier,

**MulticastLinkIdentifier**

ConfigureRequestList

)

Parameters:

|  |  |  |
| --- | --- | --- |
| Name | Data type | Description |
| DestinationIdentifier | MIHF\_ID | This identifies the local MIHF or a remote MIHF that will be the destination of this request. |
| LinkIdentifiera | LINK\_TUPLE\_ID | (optional) Identifier of the link to be configured. |
| **MulticastLinkIdentifiera** | **MULTICAST\_LINK\_ID** | **(optional) Identifier of a group of links to be configured** |
| RequestedMIHEventList | LIST(LINK\_CFG\_PARAM) | A list of link threshold parameters. |

**aThe primitive must contain the Link identifier TLV or Multicast link identifier TLV.**

**7.4.15.1.3 When generated**

This primitive is invoked by an MIH user when it attempts to configure thresholds of a local or remote lower layer link.

**7.4.15.1.4 Effect on receipt**

If the destination of the request is the local MIHF itself, the local MIHF issues a Link\_Configure\_Thresholds request to the lower layer link to set the thresholds for the link according to the specified configuration parameters.

If the destination of the request is a remote MIHF, the local MIHF generates and sends an MIH\_Link\_Configure\_Thresholds request message to the remote MIHF. Upon the receipt of the message, the remote MIHF then issues a Link\_Configure\_Thresholds request to the lower layer link to set the thresholds for the link according to the specified configuration parameters.

**7.4.15.3 MIH\_Link\_Configure\_Thresholds.confirm**

**7.4.15.3.1 Function**

This primitive is issued by an MIHF to report the result of an MIH\_Link\_Configure\_Thresholds request.

**7.4.15.3.2 Semantics of service primitive**

MIH\_Link\_Configure\_Thresholds.confirm (

SourceIdentifier,

Status,

LinkIdentifier,

ConfigureResponseList

)

Parameters:

|  |  |  |
| --- | --- | --- |
| Name | Data type | Description |
| SourceIdentifier | MIHF\_ID | This identifies the invoker of this primitive, which can be either the local MIHF or a remote MIHF. |
| Status | STATUS | Status of operation. |
| LinkIdentifier | LINK\_TUPLE\_ID | Identifier of the link configured |
| ConfigureResponseLista | LIST(LINK\_CFG\_STATUS) | A list of the configuration status for each requested link threshold parameter. |

aThis parameter is not included if Status does not indicate “Success.”

**7.4.15.3.3 When generated**

This primitive returns the result of an MIH\_Link\_Configure\_Thresholds request to the requesting MIH user.

**7.4.15.3.4 Effect on receipt**

Upon receipt of the result, the MIH user makes appropriate evaluations and takes any suitable actions. However, if Status does not indicate “Success,” the recipient performs appropriate error handling.

CHANGE SECTION 8 ACCORDINGLY

**8.2.3.7.1 Intra-state-machine procedures**

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

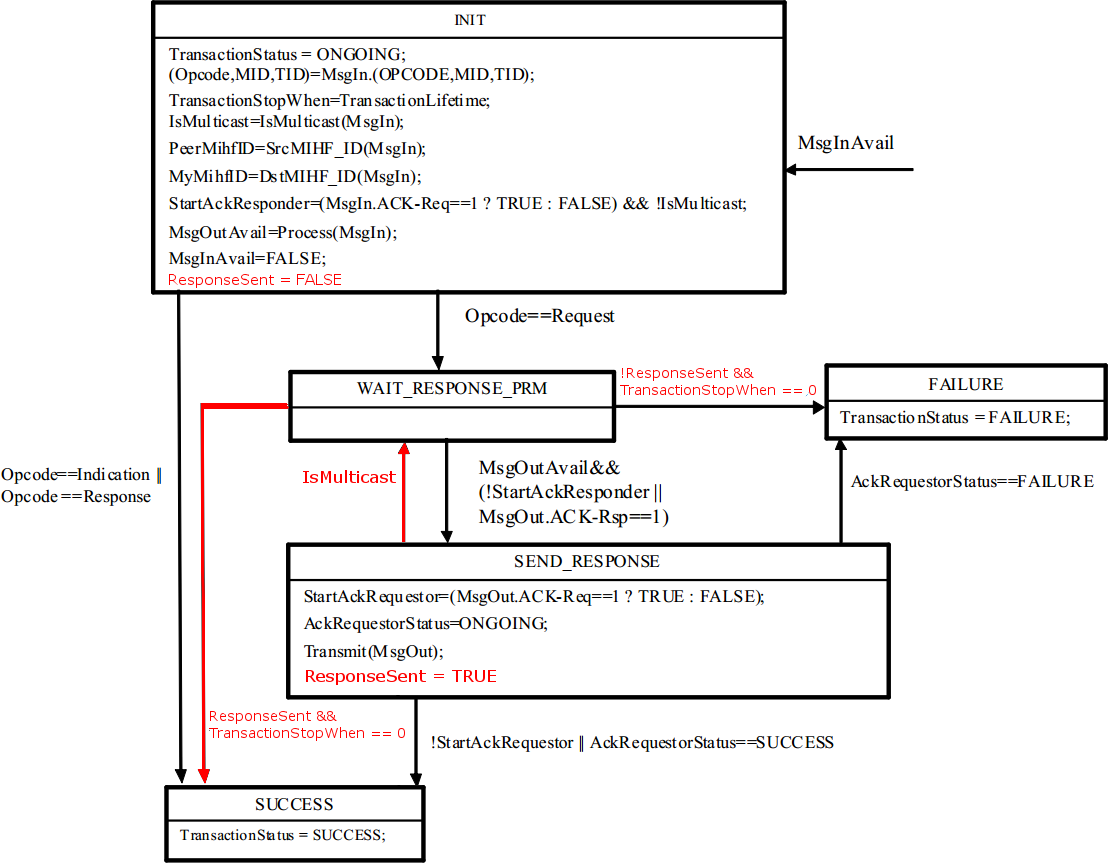
**b) IsBroadcast.—This variable’s type is BOOLEAN. When its value is TRUE, it indicates that a message has a broadcast destination MIHF\_ID. Otherwise, its value is FALSE.**

**c) ResponseSent – This variable’s type is BOOLEAN. When its value is TRUE, it indicates that a Response message has been sent. Otherwise, its value is FALSE.**

**8.2.3.7.4 Transaction destination state machine**

The transaction destination state machine (see Figure 24) is started, and related transaction initiated, when a message related to a new transaction is received (MsgInAvail is TRUE).

The transaction terminates when it transits to the FAILURE state or SUCCESS state and any ACK related state machines, if started, were terminated. An instance of transaction destination state machine can cease to exist once the value of TransactionStatus is set to either SUCCESS or FAILURE.



**8.6.3 MIH messages for command service**

**8.6.3.3 MIH\_Link\_Configure\_Thresholds request**

The corresponding MIH primitive of this message is defined in 7.4.15.2.

This message is used to configure thresholds of the lower layer link. **The message must contain the Link identifier TLV or Multicast link identifier TLV.**

|  |
| --- |
| **MIH Header Fixed Fields (SID=3, Opcode=1, AID=2)** |
| **Source Identifier =** sending MIHF ID  (Source MIHF ID TLV) |
| **Destination Identifier** = receiving MIHF ID  (Destination MIHF ID TLV) |
| LinkIdentifier (optional)  (Link identifier TLV) |
| **MulticastLinkIdentifier (optional)**  **(Mutlicast link identifier TLV)** |
| ConfigureRequestList  (Register request code TLV) |

**8.6.3.4 MIH\_Link\_Configure\_Thresholds response**

The corresponding MIH primitive of this message is defined in 7.4.15.3.

This message returns the status of a thresholds configuration request. The MIHF generating this message generates MIH\_Link\_Parameters\_Report indication message when the configured threshold is crossed.

|  |
| --- |
| **MIH Header Fixed Fields (SID=3, Opcode=2, AID=2)** |
| **Source Identifier =** sending MIHF ID  (Source MIHF ID TLV) |
| **Destination Identifier** = receiving MIHF ID  (Destination MIHF ID TLV) |
| Status  (Status TLV) |
| LinkIdentifier  (Link identifier TLV) |
| ConfigureResponseList (not included if Status does not indicate “Success”)  (Configure response list TLV) |

**Annex F**

(normative)

**Table F.4.—Data types for links (continued)**

|  |  |  |
| --- | --- | --- |
| **Data type name** | **Derived from** | **Definition** |
| **MULTICAST\_LINK\_ID** | **BITMAP(32)**  **(note: the size can be different)** | **The identifier of a group of links. The specific technology is selected if the corresponding bit is set to 1.**  **Bitmap values:**  **Bit 0: Reserved**  **Bit 1: Wireless - GSM**  **Bit 2: Wireless - GPRS**  **Bit 3: Wireless - EDGE**  **Bit 15: Ethernet**  **Bit 18: Wireless - Other**  **Bit 19: Wireless - IEEE 802.11**  **Bit 22: Wireless - CDMA2000**  **Bit 23: Wireless - UMTS**  **Bit 24: Wireless - cdma2000-HRPD**  **Bit 27: Wireless - IEEE 802.16**  **Bit 28: Wireless - IEEE 802.20**  **Bit 29: Wireless - IEEE 802.22** |

**Annex L**

(normative)

***Change Table L.2 as follows:***

**Table L.2—Type values for TLV encoding**

|  |  |  |
| --- | --- | --- |
| **TLV type name** | **TLV**  **type value** | **Data type** |
| Requested resource set | 63 | REQ\_RES\_SET |
| Broadcast multimedia program ID | 76 | BCST\_MMP\_ID |
| Broadcast multimedia service ID | 77 | BCST\_MMS\_ID |
| Target MN group information | 78 | GROUP\_INFO |
| Supported link actions list | 79 | SUPPORTED\_LINK\_ACTIONS\_LIST |
| **Multicast Groups list TLV** | **80** | **LIST(MULTICAST\_GRP)** |
| **Group\_Status TLV** | **81** | LIST(  SEQUENCE(MIHF\_ID,  STATUS,  VALID\_TIMEa)) |
| **Mutlicast link identifier** | **82** | **MULTICAST\_LINK\_ID** |
| (Reserved) | ~~64~~ 82- 99 | (Reserved) |
| Vendor specific TLV | 100 | (Vendor specific) |
| (Reserved for experimental TLVs) | 101 - 255 | (Used for experimental purposes) |