**3GPP TSG-CT WG1 Meeting #129-eC1-21zzzz**

**Electronic meeting, 19-23 April 2021 *was* C1-212095**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.519** | **CR** | **0027** | **rev** | **1** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network | **X** |

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|  | | | | | | | | | | |
| ***Title:*** | Ethernet port | | | | | | | | | |
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| ***Source to WG:*** | ZTE | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | IIoT | | | | |  | ***Date:*** | | | 2021-04-20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) ... Rel-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In Rel-17, the IIoT support both Ethernet PDU session and IP PDU session. So it proposes using DS-TT/NW-TT port rather than DS-TT/NW-TT ethernent port. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Replace "DS-TT ethernet port", "NW-TT ethernet port" with "DS-TT port", "NW-TT port" respectively. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incorrect description. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.2, 4, 5, 6, 7, 8, 9, 10 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* Start of change \* \* \* \*

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5GS 5G System

AF Application function

BMS Bridge Management Service

CNC Centralized Network Configuration

DS-TT Device-Side TSN Translator

PMS Port management service

NW-TT Network-Side TSN Translator

TSC Time Sensitive Communication

TSN Time-Sensitive Networking

# 4 General

For time sensitive communication (TSC), a 5G system (5GS) can be integrated as a bridge in a time-sensitive networking (TSN) network (i.e. a TSN bridge).

The device-side TSN translator (DS-TT) is deployed at the UE-side edge and the network-side TSN translator (NW-TT) is deployed at the network-side edge in order to interface with a TSN network while achieving transparency (see 3GPP TS 23.501 [2]). In addition, the TSN application function (TSN AF) is deployed to exchange TSN bridge information with the centralized network configuration (CNC) as defined in IEEE Std 802.1Qcc-2018 [9]. The TSN bridge information includes port management information and bridge management information. Port management information is related to ports located in the DS-TT and NW-TT. Bridge management information is related to the NW-TT.

In order to support TSN bridge information exchange between TSN AF and CNC, the DS-TT, NW-TT, and TSN AF support procedures for port management and Bridge management. Clause 5 describes details of the elementary procedures between TSN AF and DS-TT for port management. Clause 6 describes details of the elementary procedures between TSN AF and NW-TT for port management (clause 6.2) and Bridge management (clause 6.3).

# 5 Elementary procedures between TSN AF and DS-TT

## 5.1 General

The UE and the network may support transfer of standardized and deployment-specific port management information between a time-sensitive networking (TSN) AF and the DS-TT at the UE, to manage the port used at the DS-TT for a PDU session of "Ethernet" PDU session type, "IPv4" PDU session type, "IPv6" PDU session type or "IPv4v6" PDU session type. The port management messages are included in a Port management information container IE and transported using the UE-requested PDU session establishment procedure, the network-requested PDU session modification procedure or the UE-requested PDU session modification procedure as specified in 3GPP TS 24.501 [5] subclauses 6.4.1.2, 6.3.2 and 6.4.2.

## 5.2 Procedures

### 5.2.1 Network-requested port management procedure

#### 5.2.1.1 General

The purpose of the network-requested port management procedure is to enable the TSN AF to:

a) obtain the list of port management parameters supported by the DS-TT;

b) obtain the current values of port management parameters at the DS-TT port;

c) set the values of port management parameters at the DS-TT port;

d) subscribe to be notified by the DS-TT if the values of certain port management parameters change at the DS-TT port; or

e) unsubscribe to be notified by the DS-TT for one or more port management parameters.

#### 5.2.1.2 Network-requested port management procedure initiation

In order to initiate the network-requested port management procedure, the TSN AF shall:

a) encode the information about the port management parameters values to be read, the port management parameters values to be set, the port management parameters changes to (un)subscribe to and whether the TSN AF requests the list of port management parameters supported by the DS-TT in a port management list IE as specified in clause 9.2 and include it in a MANAGE PORT COMMAND message;

c) send the MANAGE PORT COMMAND message to the UE via the PCF and the SMF as specified in 3GPP TS 23.502 [3]; and

d) start timer T100 (see example in figure 5.2.1.2.1).



Figure 5.2.1.2.1: Network-requested port management procedure

#### 5.2.1.3 Network-requested port management procedure completion

Upon receipt of the MANAGE PORT COMMAND message, for each operation included in the port management list IE, the DS-TT shall:

a) if the operation code is "get capabilities", include the list of port management parameters supported by the DS-TT in the port management capability IE of the MANAGE PORT COMPLETE message;

b) if the operation code is "read parameter", attempt to read the value of the parameter at the DS-TT port, and:

1) if the value of the parameter at the DS-TT port is read successfully, include the parameter and its current value in the port status IE of the MANAGE PORT COMPLETE message; and

2) if the value of the parameter at the DS-TT port was not read successfully, include the parameter and associated port management service cause value in the port status IE of the MANAGE PORT COMPLETE message;

c) if the operation code is "set parameter", attempt to set the value of the parameter at the DS-TT port to the value specified in the operation, and:

1) if the value of the parameter at the DS-TT port is set successfully, include the parameter and its current value in the port update result IE of the MANAGE PORT COMPLETE message; and

2) if the value of the parameter at the DS-TT port was not set successfully, include the parameter and associated port management service cause value in the port update result IE of the MANAGE PORT COMPLETE message;

d) if the operation code is "subscribe-notify for parameter", store the request from the TSN AF to be notified of changes in the value of the corresponding parameter;

e) if the operation code is "unsubscribe for parameter", delete the stored request from the TSN AF to be notified of changes in the value of the corresponding parameter, if any; and

f) send the MANAGE PORT COMPLETE to the TSN AF via the SMF and the PCF as specified in 3GPP TS 23.502 [3].

#### 5.2.1.4 Abnormal cases on the network side

The following abnormal cases can be identified:

a) T100 expired.

The TSN AF shall, on the first expiry of the timer T100, retransmit the MANAGE PORT COMMAND message and shall reset and start timer T100. This retransmission is repeated four times, i.e. on the fifth expiry of timer T100, the TSN AF shall abort the procedure.

#### 5.2.1.5 Abnormal cases in the DS-TT

The following abnormal cases can be identified:

a) Transmission failure of the MANAGE PORT COMPLETE message indication from lower layers.

The DS-TT shall not diagnose an error and consider the network-initiated port management procedure complete.

NOTE: Considering the network-initiated port management procedure complete as a result of this abnormal case does not cause the DS-TT to revert the execution of the operations included in the MANAGE PORT COMMAND message.

### 5.2.2 DS-TT-initiated port management procedure

#### 5.2.2.1 General

The purpose of the DS-TT-initiated port management procedure is to notify the TSN AF of one or more changes in the value of port management parameters for which the TSN AF had requested to be notified of changes via the network-initiated port management procedure.

#### 5.2.2.2 DS-TT-initiated port management procedure initiation

In order to initiate the DS-TT-initiated port management procedure, the DS-TT shall create a PORT MANAGEMENT NOTIFY message and shall:

a) include the port management parameters to be reported to the TSN AF with their current value in the port status IE of the PORT MANAGEMENT NOTIFY message;

b) start timer T200; and

c) send the PORT MANAGEMENT NOTIFY message to the TSN AF via the SMF and the PCF as specified in 3GPP TS 23.502 [3].



Figure 5.2.2.2.1: DS-TT-initiated port management procedure

#### 5.2.2.3 DS-TT-initiated port management procedure accepted by the TSN AF

Upon receipt of the PORT MANAGEMENT NOTIFY message, the TSN AF shall:

a) create a MANAGE PORT MANAGEMENT NOTIFY ACK message; and

b) send the MANAGE PORT MANAGEMENT NOTIFY ACK message to the UE via the PCF and the SMF as specified in 3GPP TS 23.502 [3].

#### 5.2.2.4 DS-TT-initiated port management procedure completion

Upon receipt of the PORT MANAGEMENT NOTIFY ACK message, the DS-TT shall:

a) stop timer T200;

b) create a PORT MANAGEMENT NOTIFY COMPLETE message; and

c) send the PORT MANAGEMENT NOTIFY COMPLETE message to the TSN AF via the SMF and the PCF as specified in 3GPP TS 23.502 [3].

#### 5.2.2.5 Abnormal cases on the network side

The following abnormal cases can be identified:

a) Transmission failure of the PORT MANAGEMENT NOTIFY ACK indication from lower layers.

The TSN AF shall not diagnose an error and consider the DS-TT-initiated port management procedure complete.

#### 5.2.2.6 Abnormal cases in the DS-TT

The following abnormal cases can be identified:

a) T200 expired.

The DS-TT shall, on the first expiry of the timer T200, retransmit the PORT MANAGEMENT NOTIFY message and shall reset and start timer T200. This retransmission is repeated four times, i.e. on the fifth expiry of timer T200, the DS-TT shall abort the procedure.

b) Transmission failure of the PORT MANAGEMENT NOTIFY COMPLETE message indication from lower layers.

The DS-TT shall not diagnose an error and consider the DS-TT-initiated port management procedure complete.

### 5.2.3 DS-TT-initiated port management capability procedure

#### 5.2.3.1 General

The purpose of the DS-TT-initiated port management capability procedure is to provide the DS-TT supported port management capabilities to the TSN AF during PDU session establishment as specified in 3GPP TS 23.502 [3].

#### 5.2.3.2 DS-TT-initiated port management capability procedure

In order to initiate the DS-TT-initiated port management capability procedure, the DS-TT shall create a PORT MANAGEMENT CAPABILITY message and shall:

a) include the DS-TT port management capabilities in the port management capability IE of the PORT MANAGEMENT CAPABILITY message; and

b) send the PORT MANAGEMENT CAPABILITY message to the TSN AF via the SMF and the PCF as specified in 3GPP TS 23.502 [3].



Figure 5.2.3.2.1: DS-TT-initiated port management capability procedure

# 6 Elementary procedures between TSN AF and NW-TT

## 6.1 General

The TSN AF and NW-TT supports transfer of standardized and deployment-specific port management information, to manage the port used at the NW-TT. The TSN AF and NW-TT supports transfer of standardized and deployment-specific Bridge management information, to manage the NW-TT. The port management messages are included in the "PortManagementContainer" data type (as specified in 3GPP TS 29.512 [5B]) and the Port Management Information Container IE (as specified in 3GPP TS 29.244 [5A]) and the Bridge management messages are included in the "BridgeManagementContainer" data type (as specified in 3GPP TS 29.512 [5B]) and the Bridge Management Information Container IE (as specified in 3GPP TS 29.244 [5A]). Both the port management messages and the Bridge management messages are transported using the N4 Session Level Reporting Procedure and the SM policy association modification procedure as specified in 3GPP TS 23.502 [3].

## 6.2 Procedures for port management service

### 6.2.1 TSN AF-requested port management procedure

#### 6.2.1.1 General

The purpose of the TSN AF-requested port management procedure is to enable the TSN AF to:

a) obtain the list of port management parameters supported by the NW-TT;

b) obtain the current values of port management parameters at the NW-TT port;

c) set the values of port management parameters at the NW-TT port; or

d) subscribe to be notified by the NW-TT if the values of certain port management parameters change at the NW-TT port; or

e) unsubscribe to be notified by the NW-TT for one or more port management parameters.

#### 6.2.1.2 TSN AF-requested port management procedure initiation

In order to initiate the TSN AF-requested port management procedure, the TSN AF shall:

a) encode the information about the port management parameters values to be read, the port management parameters values to be set, the port management parameters changes to (un)subscribe to and whether the TSN AF requests the list of port management parameters supported by the NW-TT in a port management list IE as specified in clause 9.2 and include it in a MANAGE PORT COMMAND message;

b) send the MANAGE PORT COMMAND message to the NW-TT via the PCF and the SMF as specified in 3GPP TS 23.502 [3]; and

c) start timer T100 (see example in figure 6.2.1.2.1).



Figure 6.2.1.2.1: TSN AF-requested port management procedure

#### 6.2.1.3 TSN AF-requested port management procedure completion

Upon receipt of the MANAGE PORT COMMAND message, for each operation included in the port management list IE, the NW-TT shall:

a) if the operation code is "get capabilities", include the list of port management parameters supported by the NW-TT in the port management capability IE of the MANAGE PORT COMPLETE message;

b) if the operation code is "read parameter", attempt to read the value of the parameter at the NW-TT port, and:

1) if the value of the parameter at the NW-TT port is read successfully, include the parameter and its current value in the port status IE of the MANAGE PORT COMPLETE message; and

2) if the value of the parameter at the NW-TT port was not read successfully, include the parameter and associated port management service cause value in the port status IE of the MANAGE PORT COMPLETE message;

c) if the operation code is "set parameter", attempt to set the value of the parameter at the NW-TT port to the value specified in the operation, and:

1) if the value of the parameter at the NW-TT port is set successfully, include the parameter and its current value in the port update result IE of the MANAGE PORT COMPLETE message; and

2) if the value of the parameter at the NW-TT port was not set successfully, include the parameter and associated port management service cause value in the port update result IE of the MANAGE PORT COMPLETE message;

d) if the operation code is "subscribe-notify for parameter", store the request from the TSN AF to be notified of changes in the value of the corresponding parameter;

e) if the operation code is "unsubscribe for parameter", delete the stored request from the TSN AF to be notified of changes in the value of the corresponding parameter, if any; and

f) send the MANAGE PORT COMPLETE to the TSN AF via the SMF and the PCF as specified in 3GPP TS 23.502 [3].

#### 6.2.1.4 Abnormal cases in the TSN AF

The following abnormal cases can be identified:

a) T100 expired.

The TSN AF shall, on the first expiry of the timer T100, retransmit the MANAGE PORT COMMAND message and shall reset and start timer T100. This retransmission is repeated four times, i.e. on the fifth expiry of timer T35xx, the TSN AF shall abort the procedure.

#### 6.2.1.5 Abnormal cases in the NW-TT

The following abnormal cases can be identified:

a) Transmission failure of the MANAGE PORT COMPLETE message indication from lower layers.

The NW-TT shall not diagnose an error and consider the TSN AF-initiated port management procedure complete.

NOTE: Considering that the TSN AF-initiated port management procedure complete as a result of this abnormal case does not cause the NW-TT to revert the execution of the operations included in the MANAGE PORT COMMAND message.

### 6.2.2 NW-TT-initiated port management procedure

#### 6.2.2.1 General

The purpose of the NW-TT-initiated port management procedure is to notify the TSN AF of one or more changes in the value of port management parameters for which the TSN AF had requested to be notified of changes via the TSN AF-initiated port management procedure.

#### 6.2.2.2 NW-TT-initiated port management procedure initiation

In order to initiate the NW-TT-initiated port management procedure, the NW-TT shall create a PORT MANAGEMENT NOTIFY message and shall:

a) include the port management parameters to be reported to the TSN AF with their current value in the port status IE of the PORT MANAGEMENT NOTIFY message;

b) start timer T300; and

c) send the PORT MANAGEMENT NOTIFY message to the TSN AF via the SMF and the PCF as specified in 3GPP TS 23.502 [3].



Figure 6.2.2.2.1: NW-TT-initiated port management procedure

#### 6.2.2.3 NW-TT-initiated port management procedure completion

Upon receipt of the PORT MANAGEMENT NOTIFY message, the TSN AF shall:

a) create a PORT MANAGEMENT NOTIFY ACK message; and

b) send the PORT MANAGEMENT NOTIFY ACK message to the NW-TT via the PCF and the SMF as specified in 3GPP TS 23.502 [3].

Upon receipt of the PORT MANAGEMENT NOTIFY ACK message, the NW-TT shall stop timer T300.

#### 6.2.2.4 Abnormal cases in the TSN AF

The following abnormal cases can be identified:

a) Transmission failure of the PORT MANAGEMENT NOTIFY ACK indication from lower layers.

The TSN AF shall not diagnose an error and consider the NW-TT-initiated port management procedure complete.

#### 6.2.2.5 Abnormal cases in the NW-TT

The following abnormal cases can be identified:

a) T300 expired.

The NW-TT shall, on the first expiry of the timer T300, retransmit the PORT MANAGEMENT NOTIFY message and shall reset and start timer T300. This retransmission is repeated four times, i.e. on the fifth expiry of timer T300, the NW-TT shall abort the procedure.

## 6.3 Procedures for Bridge management service

### 6.3.1 TSN AF-requested Bridge management procedure

#### 6.3.1.1 General

The purpose of the TSN AF-requested Bridge management procedure is to enable the TSN AF to:

a) obtain the list of bridge management parameters supported at the NW-TT;

b) obtain the current values of bridge management parameters at the NW-TT;

c) set the values of bridge management parameters at the NW-TT; or

d) subscribe to be notified by the NW-TT if the values of certain bridge management parameters change at the NW-TT; or

e) unsubscribe to be notified by the NW-TT for one or more bridge management parameters.

#### 6.3.1.2 TSN AF-requested Bridge management procedure initiation

In order to initiate the TSN AF-requested Bridge management procedure, the TSN AF shall:

a) encode the information about the bridge management parameters values to be read, the bridge management parameters values to be set, the bridge management parameters changes to (un)subscribe to and whether the TSN AF requests the list of bridge management parameters supported by the NW-TT in an Bridge management list IE as specified in clause 9.5B and include it in a MANAGE BRIDGE COMMAND message;

b) send the MANAGE BRIDGE COMMAND message to the NW-TT via the PCF and the SMF as specified in 3GPP TS 23.502 [3]; and

c) start timer T150 (see example in figure 6.3.1.2.1).



Figure 6.3.1.2.1: TSN AF-requested Bridge management procedure

#### 6.3.1.3 TSN AF-requested Bridge management procedure completion

Upon receipt of the MANAGE BRIDGE COMMAND message, for each operation included in the Bridge management list IE, the NW-TT shall:

a) if the operation code is "get capabilities", include the list of Bridge management parameters supported by the NW-TT in the Bridge management capability IE of the MANAGE BRIDGE COMPLETE message;

b) if the operation code is "read parameter", attempt to read the value of the bridge management parameter at the NW-TT, and:

1) if the value of the parameter at the NW-TT is read successfully, include the parameter and its current value in the Bridge status IE of the MANAGE BRIDGE COMPLETE message; and

2) if the value of the parameter at the NW-TT was not read successfully, include the parameter and associated Bridge management service cause value in the Bridge status IE of the MANAGE BRIDGE COMPLETE message;

c) if the operation code is "set parameter", attempt to set the value of the bridge management parameter at the NW-TT to the value specified in the operation, and:

1) if the value of the parameter at the NW-TT is set successfully, include the parameter and its current value in the Bridge update result IE of the MANAGE BRIDGE COMPLETE message; and

2) if the value of the parameter at the NW-TT was not set successfully, include the parameter and associated Bridge management service cause value in the Bridge update result IE of the MANAGE BRIDGE COMPLETE message;

d) if the operation code is "subscribe-notify for parameter", store the request from the TSN AF to be notified of changes in the value of the corresponding bridge management parameter;

e) if the operation code is "unsubscribe for parameter", delete the stored request from the TSN AF to be notified of changes in the value of the corresponding bridge management parameter, if any; and

f) send the MANAGE BRIDGE COMPLETE to the TSN AF via the SMF and the PCF as specified in 3GPP TS 23.502 [3].

#### 6.3.1.4 Abnormal cases in the TSN AF

The following abnormal cases can be identified:

a) T150 expired.

The TSN AF shall, on the first expiry of the timer T150, retransmit the MANAGE BRIDGE COMMAND message and shall reset and start timer T150. This retransmission is repeated four times, i.e. on the fifth expiry of timer T150, the TSN AF shall abort the procedure.

#### 6.3.1.5 Abnormal cases in the NW-TT

The following abnormal cases can be identified:

a) Transmission failure of the MANAGE BRIDGE COMPLETE message indication from lower layers.

The NW-TT shall not diagnose an error and consider the TSN AF-initiated Bridge management procedure complete.

NOTE: Considering that the TSN AF-initiated Bridge management procedure complete as a result of this abnormal case does not cause the NW-TT to revert the execution of the operations included in the MANAGE BRIDGE COMMAND message.

### 6.3.2 NW-TT-initiated Bridge management procedure

#### 6.3.2.1 General

The purpose of the NW-TT-initiated Bridge management procedure is to notify the TSN AF of one or more changes in the value of Bridge management parameters for which the TSN AF had requested to be notified of changes via the TSN AF-initiated Bridge management procedure.

#### 6.3.2.2 NW-TT-initiated Bridge management procedure initiation

In order to initiate the NW-TT-initiated Bridge management procedure, the NW-TT shall create a BRIDGE MANAGEMENT NOTIFY message and shall:

a) include the Bridge management parameters to be reported to the TSN AF with their current value in the Bridge status IE of the BRIDGE MANAGEMENT NOTIFY message;

b) start timer T350; and

c) send the BRIDGE MANAGEMENT NOTIFY message to the TSN AF via the SMF and the PCF as specified in 3GPP TS 23.502 [3].



Figure 6.3.2.2.1: NW-TT-initiated Bridge management procedure

#### 6.3.2.3 NW-TT-initiated Bridge management procedure completion

Upon receipt of the BRIDGE MANAGEMENT NOTIFY message, the TSN AF shall:

a) create a MANAGE BRIDGE MANAGEMENT NOTIFY ACK message; and

b) send the MANAGE BRIDGE MANAGEMENT NOTIFY ACK message to the NW-TT via the PCF and the SMF as specified in 3GPP TS 23.502 [3].

Upon receipt of the BRIDGE MANAGEMENT NOTIFY ACK message, the NW-TT shall stop timer T350.

#### 6.3.2.4 Abnormal cases in the TSN AF

The following abnormal cases can be identified:

a) Transmission failure of the BRIDGE MANAGEMENT NOTIFY ACK indication from lower layers.

The TSN AF shall not diagnose an error and consider the NW-TT-initiated Bridge management procedure complete.

#### 6.3.2.5 Abnormal cases in the NW-TT

The following abnormal cases can be identified:

a) T350 expired.

The NW-TT shall, on the first expiry of the timer T350, retransmit the BRIDGE MANAGEMENT NOTIFY message and shall reset and start timer T350. This retransmission is repeated four times, i.e. on the fifth expiry of timer T350, the NW-TT shall abort the procedure.

b) Transmission failure of the BRIDGE MANAGEMENT NOTIFY COMPLETE message indication from lower layers.

The NW-TT shall not diagnose an error and consider the NW-TT-initiated Bridge management procedure complete.

# 7 Handling of unknown, unforeseen, and erroneous port management service and bridge management service data

## 7.1 General

The procedures specified in clause 5 and clause 6 apply to those messages which pass the checks described in clause 7.

Clause 7 also specifies procedures for the handling of unknown, unforeseen, and erroneous port management service (PMS) and Bridge management service (BMS) data by the receiving entity. These procedures are called "error handling procedures", but in addition to providing recovery mechanisms for error situations they define a compatibility mechanism for future extensions of the PMS or BMS.

Clauses 7.1 to 7.7 shall be applied in order of precedence.

Detailed error handling procedures in the TSN AF are implementation dependent and may vary from network to network. However, when extensions of PMS or BMS are developed, TSN AFs are assumed to have the error handling which is indicated in this clause as mandatory ("shall") and that is indicated as strongly recommended ("should").

Also, the error handling of the TSN AF is only considered as mandatory or strongly recommended when certain thresholds for errors are not reached during a dedicated connection.

For definition of semantical and syntactical errors see 3GPP TS 24.007 [4], clause 11.4.2.

The procedures specified for TT are applicable for DS-TT or NW-TT.

## 7.2 Message too short or too long

### 7.2.1 Message too short

When a message is received that is too short to contain a complete message type information element, that message shall be ignored, cf. 3GPP TS 24.007 [4].

### 7.2.2 Message too long

The maximum size of an PMS message sent by the DS-TT to the TSN AF or sent by the TSN AF to the DS-TT is 65535 octets. The maximum size of an PMS message sent by the NW-TT to the TSN AF or sent by the TSN AF to the NW-TT is 65523 octets. The maximum size of a BMS message is 65531 octets.

## 7.3 Unknown or unforeseen message type

If the TT or the TSN AF receives a PMS message with message type not defined for the PMS or not implemented by the receiver, it shall ignore the PMS message.

NOTE: A message type not defined for the PMS in the given direction is regarded by the receiver as a message type not defined for the EPMS, see 3GPP TS 24.007 [4].

If the TT receives a message not compatible with the PMS state, the TT shall ignore the PMS message.

If the TSN AF receives a message not compatible with the PMS state, the TSN AF actions are implementation dependent.

If the NW-TT or the TSN AF receives a BMS message with message type not defined for the BMS or not implemented by the receiver, it shall ignore the BMS message. If the DS-TT receives a BMS message with message type defined for the BMS or implemented by the receiver, it shall ingnore the BMS message.

NOTE: A message type not defined for the BMS in the given direction is regarded by the receiver as a message type not defined for the BMS, see 3GPP TS 24.007 [4].

If the NW-TT receives a message not compatible with the BMS state, the NW-TT shall ignore the BMS message.

If the TSN AF receives a message not compatible with the BMS state, the TSN AF actions are implementation dependent.

## 7.4 Non-semantical mandatory information element errors

When on receipt of a message,

a) an "imperative message part" error; or

b) a "missing mandatory IE" error

is diagnosed or when a message containing:

a) a syntactically incorrect mandatory IE;

b) an IE unknown in the message, but encoded as "comprehension required" (see 3GPP TS 24.007 [4]); or

c) an out of sequence IE encoded as "comprehension required" (see 3GPP TS 24.007 [4]) is received,

If the message is a PMS message, the TT shall ignore the PMS message. If the message is a BMS message, the NW-TT shall ignore the BMS message;

the TSN AF shall proceed as follows:

the TSN AF shall:

1) try to treat the message (the exact further actions are implementation dependent); or

2) ignore the message.

## 7.5 Unknown and unforeseen IEs in the non-imperative message part

### 7.5.1 IEIs unknown in the message

The TT shall ignore all IEs unknown in a message which are not encoded as "comprehension required" (see 3GPP TS 24.007 [4]).

The TSN AF shall take the same approach.

### 7.5.2 Out of sequence IEs

The TT shall ignore all out of sequence IEs in a message which are not encoded as "comprehension required" (see 3GPP TS 24.007 [4]).

The TSN AF should take the same approach.

### 7.5.3 Repeated IEs

If an information element with format T, TV, TLV, or TLV-E is repeated in a message in which repetition of the information element is not specified in clause 8, the TT shall handle only the contents of the information element appearing first and shall ignore all subsequent repetitions of the information element. When repetition of information elements is specified, the TT shall handle only the contents of specified repeated information elements. If the limit on repetition of information elements is exceeded, the TT shall handle the contents of information elements appearing first up to the limit of repetitions and shall ignore all subsequent repetitions of the information element.

The TSN AF should follow the same procedures.

## 7.6 Non-imperative message part errors

### 7.6.1 General

This category includes:

a) syntactically incorrect optional IEs; and

b) conditional IE errors.

### 7.6.2 Syntactically incorrect optional IEs

The TT shall treat all optional IEs that are syntactically incorrect in a message as not present in the message.

The TSN AF shall take the same approach.

### 7.6.3 Conditional IE errors

When upon receipt of a PMS message the TT diagnoses a "missing conditional IE" error or an "unexpected conditional IE" error, or when it receives a PMS message containing at least one syntactically incorrect conditional IE, the TT shall ignore the message.

When upon receipt of a BMS message the NW-TT diagnoses a "missing conditional IE" error or an "unexpected conditional IE" error, or when it receives a BMS message containing at least one syntactically incorrect conditional IE, the NW-TT shall ignore the message.

When the TSN AF receives a message and diagnoses a "missing conditional IE" error or an "unexpected conditional IE" error or when it receives a message containing at least one syntactically incorrect conditional IE, the TSN AF shall either:

a) try to treat the message (the exact further actions are implementation dependent); or

b) ignore the message.

## 7.7 Messages with semantically incorrect contents

When a message with semantically incorrect contents is received, the TT shall perform the foreseen reactions of the procedural part of clause 5 and clause 6. If, however no such reactions are specified, the TT shall ignore the message.

The TSN AF should follow the same procedure.

# 8 Message functional definition and contents

## 8.1 Manage port command

### 8.1.1 Message definition

The MANAGE PORT COMMAND message is sent by the TSN AF to the DS-TT or NW-TT to manage the port at the DS-TT or NW-TT, see table 8.1.1.1

Message type: MANAGE PORT COMMAND

Significance: dual

Direction: TSN AF to DS-TT, TSN AF to NW-TT

Table 8.1.1.1: MANAGE PORT COMMAND message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | MANAGE PORT COMMAND message identity | Port management service message type  9.1 | M | V | 1 |
|  | Port management list | Port management list  9.2 | M | LV-E | 3-65534 |

## 8.2 Manage port complete

### 8.2.1 Message definition

The MANAGE PORT COMPLETE message is sent by the DS-TT or NW-TT to the TSN AF to complete the network-initiated port management procedure or the TSN AF-initiated port management procedure, see table 8.2.1.1

Message type: MANAGE PORTCOMPLETE

Significance: dual

Direction: DS-TT to TSN AF, NW-TT to TSN AF

Table 8.2.1.1: MANAGE PORT COMPLETE message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | MANAGE PORT COMPLETE message identity | Port management service message type  9.1 | M | V | 1 |
| 70 | Port management capability | Port management capability  9.3 | O | TLV-E | 5-65534 |
| 71 | Port status | Port status  9.4 | O | TLV-E | 5-65534 |
| 72 | Port update result | Port update result  9.5 | O | TLV-E | 5-65534 |

### 8.2.2 Port management capability

This IE shall be included if the TSN AF has included an operation with operation code set to "get capabilities" in the MANAGE PORT COMMAND message.

### 8.2.3 Port status

This IE shall be included if the TSN AF has included one or more operations with operation code set to "read parameter" in the MANAGE PORT COMMAND message.

### 8.2.4 Port update result

This IE shall be included if the TSN AF has included one or more operations with operation code set to "set parameter" in the MANAGE PORT COMMAND message.

## 8.3 Port management notify

### 8.3.1 Message definition

The PORT MANAGEMENT NOTIFY message is sent by the DS-TT or NW-TT to the TSN AF to notify the TSN AF of one or more changes in the value of port management parameters, see table 8.3.1.1

Message type: PORT MANAGEMENT NOTIFY

Significance: dual

Direction: DS-TT to TSN AF, NW-TT to TSN AF

Table 8.3.1.1: PORT MANAGEMENT NOTIFY message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | PORT MANAGEMENT NOTIFY message identity | Port management service message type  9.1 | M | V | 1 |
|  | Port status | Port status  9.4 | M | LV-E | 4-65533 |

## 8.4 Port management notify ack

### 8.4.1 Message definition

The PORT MANAGEMENT NOTIFY ACK message is sent by the TSN AF to the DS-TT or NW-TT to acknowledge a PORT MANAGEMENT NOTIFY message, see table 8.4.1.1

Message type: PORT MANAGEMENT NOTIFY ACK

Significance: dual

Direction: TSN AF to DS-TT, TSN AF to NW-TT

Table 8.4.1.1: PORT MANAGEMENT NOTIFY ACK message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | PORT MANAGEMENT NOTIFY ACK message identity | Port management service message type  9.1 | M | V | 1 |

## 8.5 Port management notify complete

### 8.5.1 Message definition

The PORT MANAGEMENT NOTIFY COMPLETE message is sent by the DS-TT to the TSN AF to complete the DS-TT-initiated port management procedure, see table 8.5.1.1

Message type: PORT MANAGEMENT NOTIFY COMPLETE

Significance: dual

Direction: DS-TT to TSN AF

Table 8.5.1.1: PORT MANAGEMENT NOTIFY COMPLETE message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | PORT MANAGEMENT NOTIFY COMPLETE message identity | Port management service message type  9.1 | M | V | 1 |

## 8.6 Port management capability

### 8.6.1 Message definition

The PORT MANAGEMENT CAPABILITY message is sent by the DS-TT to provide the DS-TT supported port management capabilities to the TSN AF, see table 8.6.1.1

Message type: PORT MANAGEMENT CAPABILITY

Significance: dual

Direction: DS-TT to TSN AF

Table 8.6.1.1: PORT MANAGEMENT CAPABILITY message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | PORT MANAGEMENT CAPABILITY message identity | Port management service message type  9.1 | M | V | 1 |
|  | Port management capability | Port management capability  9.3 | M | LV-E | 4-65533 |

### 8.6.2 Void

## 8.7 Manage Bridge command

### 8.7.1 Message definition

The MANAGE BRIDGE COMMAND message is sent by the TSN AF to the NW-TT to manage the Bridge functionalities, see table 8.7.1.1

Message type: MANAGE BRIDGE COMMAND

Significance: dual

Direction: TSN AF to NW-TT

Table 8.7.1.1: MANAGE BRIDGE COMMAND message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | MANAGE BRIDGE COMMAND message identity | Bridge management service message type  9.5A | M | V | 1 |
|  | Bridge management list | Bridge management list  9.5B | M | LV-E | 3-65530 |

## 8.8 Manage Bridge complete

### 8.8.1 Message definition

The MANAGE BRIDGE COMPLETE message is sent by the NW-TT to the TSN AF to complete the TSN AF-initiated Bridge management procedure, see table 8.8.1.1

Message type: MANAGE BRIDGE COMPLETE

Significance: dual

Direction: NW-TT to TSN AF

Table 8.8.1.1: MANAGE BRIDGE COMPLETE message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | MANAGE BRIDGE COMPLETE message identity | Bridge management service message type  9.5A | M | V | 1 |
| 70 | Bridge management capability | Bridge management capability  9.5C | O | TLV-E | 5-65530 |
| 71 | Bridget status | Bridge status  9.5D | O | TLV-E | 5-65530 |
| 72 | Bridge update result | Bridge update result  9.5E | O | TLV-E | 5-65530 |

### 8.8.2 Bridge management capability

This IE shall be included if the TSN AF has included an operation with operation code set to "get capabilities" in the MANAGE BRIDGE COMMAND message.

### 8.8.3 Bridge status

This IE shall be included if the TSN AF has included one or more operations with operation code set to "read parameter" in the MANAGE BRIDGE COMMAND message.

### 8.8.4 Bridge update result

This IE shall be included if the TSN AF has included one or more operations with operation code set to "set parameter" in the MANAGE BRIDGE COMMAND message.

## 8.9 Bridge management notify

### 8.9.1 Message definition

The BRIDGE MANAGEMENT NOTIFY message is sent by the NW-TT to the TSN AF to notify the TSN AF of one or more changes in the value of Bridge management parameters, see table 8.9.1.1

Message type: BRIDGE MANAGEMENT NOTIFY

Significance: dual

Direction: NW-TT to TSN AF

Table 8.9.1.1: BRIDGE MANAGEMENT NOTIFY message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | BRIDGE MANAGEMENT NOTIFY message identity | Bridge management service message type  9.5A | M | V | 1 |
|  | Bridge status | Bridge status  9.5D | M | LV-E | 4-65530 |

## 8.10 Bridge management notify ack

### 8.10.1 Message definition

The BRIDGE MANAGEMENT NOTIFY ACK message is sent by the TSN AF to the NW-TT to acknowledge a BRIDGE MANAGEMENT NOTIFY message, see table 8.10.1.1

Message type: BRIDGE MANAGEMENT NOTIFY ACK

Significance: dual

Direction: TSN AF to NW-TT

Table 8.10.1.1: BRIDGE MANAGEMENT NOTIFY ACK message content

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IEI | Information Element | Type/Reference | Presence | Format | Length |
|  | BRIDGE MANAGEMENT NOTIFY ACK message identity | Bridge management service message type  9.5A | M | V | 1 |

# 9 Information elements coding

## 9.1 Port management service message type

Table 9.1.1: Port management service message type

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | | | | |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |  | Reserved |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |  | | MANAGE PORT COMMAND message |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  | | MANAGE PORT COMPLETE message |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |  | | PORT MANAGEMENT NOTIFY message |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |  | | PORT MANAGEMENT NOTIFY ACK message |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |  | | PORT MANAGEMENT NOTIFY COMPLETE message |
| 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |  | | PORT MANAGEMENT CAPABILITY message |
|  | | | | | | | | | | |
| All other values are reserved | | | | | | | | | | |

## 9.2 Port management list

The purpose of the port management list information element is to transfer from the TSN AF to the DS-TT or NW-TT a list of operations related to port management of the DS-TT or NW-TT to be performed at the DS-TT or NW-TT.

The port management list information element is coded as shown in figure 9.2.1, figure 9.2.2, figure 9.2.3, figure 9.2.4, figure 9.2.5, and table 9.2.1.

The port management list information element has a minimum length of 4 octets and a maximum length of 65535 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Port management list IEI | | | | | | | | octet 1 |
| Length of port management list contents | | | | | | | | octet 2  octet 3 |
| Port management list contents | | | | | | | | octet 4  octet z |

Figure 9.2.1: Port management list information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Operation 1 | | | | | | | | octet 4  octet a |
| Operation 2 | | | | | | | | octet a+1\*  octet b\* |
| … | | | | | | | | octet b+1\*  …  octet c\* |
| Operation N | | | | | | | | octet c+1\*  octet z\* |

Figure 9.2.2: Port management list contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Operation code | | | | | | | | octet d |

Figure 9.2.3: Operation for operation code set to "00000001"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Operation code | | | | | | | | octet d |
| Port parameter name | | | | | | | | octet d+1  octet d+2 |

Figure 9.2.4: Operation for operation code set to "00000010", "00000100", or "00000101"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Operation code | | | | | | | | octet d |
| Port parameter name | | | | | | | | octet d+1  octet d+2 |
| Length of port parameter value | | | | | | | | octet d+3 octet d+4 |
| Port parameter value | | | | | | | | octet d+5  octet e |

Figure 9.2.5: Operation for operation code set to "00000011"

Table 9.2.1: Port management list information element

|  |
| --- |
| Value part of the port management list information element (octets 4 to z) |
|  |
| The value part of the port management list information element consists of one or several operations. |
|  |
| Operation |
|  |
| Operation code (octet d) |
| Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 Reserved  0 0 0 0 0 0 0 1 Get capabilities  0 0 0 0 0 0 1 0 Read parameter  0 0 0 0 0 0 1 1 Set parameter (NOTE)  0 0 0 0 0 1 0 0 Subscribe-notify for parameter |
| 0 0 0 0 0 1 0 1 Unsubscribe for parameter |
| All other values are spare. |
|  |
| Port parameter name (octets d+1 to d+2) |
|  |
| This field contains the name of the port parameter to which the operation applies, encoded as follows:  - 0000H Reserved;  - 0001H txPropagationDelay;  - 0002H Traffic class table;  - 0003H GateEnabled;  - 0004H AdminBaseTime;  - 0005H AdminControlListLength;  - 0006H AdminControlList;  - 0007H AdminCycleTime;  - 0008H Tick granularity;  - 0009H  to Spare  - 003FH  - 0040H lldpV2PortConfigAdminStatusV2;  - 0041H lldpV2LocChassisIdSubtype;  - 0042H lldpV2LocChassisId;  - 0043H lldpV2MessageTxInterval;  - 0044H lldpV2MessageTxHoldMultiplier;  - 0045H  to Spare  - 005FH  - 0060H lldpV2LocPortIdSubtype;  - 0061H lldpV2LocPortId;  - 0062H  to Spare  - 009FH  - 00A0H lldpV2RemChassisIdSubtype;  - 00A1H lldpV2RemChassisId;  - 00A2H lldpV2RemPortIdSubtype;  - 00A3H lldpV2RemPortId;  - 00A4H lldpTTL;  - 00A5H  to Spare  - 00CFH  - 00D0H PSFPMaxStreamFilterInstances;  - 00D1H PSFPMaxStreamGateInstances;  - 00D2H PSFPMaxFlowMeterInstances;  - 00D3H PSFPSupportedListMax;  - 00D4H  to Spare  - 00DFH  - 00E0H Stream filter instance table  - 00E1H Stream gate instance table  - 00E2H  to Spare  - 7FFFH  - 8000H  to Reserved for deployment specific parameters  - FFFFH |
| Length of port parameter value (octets d+3 to d+4) |
|  |
| This field contains the binary encoding of the length of the port parameter value |
|  |
| Port parameter value (octet d+5 to e) |
|  |
| This field contains the value to be set for the port parameter.  When the port parameter name indicates txPropagationDelay, the port parameter value field contains the binary representation of the txPropagationDelay as defined in IEEE Std 802.1Qcc [9], expressed in unit of nanoseconds and multiplied by 216, with the LSB bit included in bit 1 of the first octet. If the txPropagationDelay is too big to be represented, all bits of the port parameter value field shall be coded as "1" except the MSB bit. The length of port parameter value indicates a value of 8.  When the port parameter name indicates Traffic class table, the port parameter value field contains the traffic class table as defined in IEEE Std 802.1Q [7], encoded as the value part of the Traffic class information element as specified in clause 9.7.  When the port parameter name indicates GateEnabled, the port parameter value field contains the value of GateEnabled as defined in IEEE Std 802.1Q [7], with a Boolean value of FALSE encoded as "00000000" and a Boolean value of TRUE encoded as "00000001". The length of port parameter value field indicates a value of 1.  When the port parameter name indicates AdminBaseTime, the port parameter value field contains the value of the administrative base time as specified in IEEE Std 802.1Q [7]. The length of port parameter value field indicates a value of 10.  When the port parameter name indicates AdminControlListLength, the port parameter value field contains the value of the AdminControlListLength as specified in IEEE Std 802.1Q [7]. The length of port parameter value field indicates a value of 2.  When the port parameter name indicates AdminControlList, the port parameter value field contains the concatenation of AdminControlListLength entries, each encoded as a GateControlEntry as specified in IEEE Std 802.1Q [7].  When the port parameter name indicates AdminCycleTime, the port parameter value field contains the value of the AdminCycleTime as specified in IEEE Std 802.1Q [7]. The length of port parameter value field indicates a value of 8.  When the port parameter name indicates Tick granularity, the port parameter value field contains the value of the Tick granularity as specified in IEEE Std 802.1Q [7]. The length of port parameter value field indicates a value of 4.  When the port parameter name indicates lldpV2PortConfigAdminStatusV2, the port parameter value field contains values of lldpV2PortConfigAdminStatusV2 as specified in IEEE Std 802.1AB [6] clause 9.2.5.1 with value of txOnly encoded as 01H, rxOnly encoded as 02H, txAndRx encoded as 03H, and disabled encoded as 04H. The length of port parameter value field indicates a value of 1.  When the port parameter name indicates lldpV2LocChassisIdSubtype, the port parameter value field contains values of lldpV2LocChassisIdSubtype as specified in IEEE Std 802.1AB [6] clause 8.5.2.2. The length of port parameter value field indicates a value of 1.  When the port parameter name indicates lldpV2LocChassisId, the port parameter value field contains values of lldpV2LocChassisId in the form of an octet string as specified in IEEE Std 802.1AB [6] clause 8.5.2.3. The length of port parameter value field indicates the length of the octet string with a maximum value of 255.  When the port parameter name indicates lldpV2MessageTxInterval, the port parameter value field contains the value of lldpV2MessageTxInterval as specified in IEEE Std 802.1AB [6] table 11-2. The length of port parameter value field indicates a value of 2.  When the port parameter name indicates lldpV2MessageTxHoldMultiplier, the port parameter value field contains the value of lldpV2MessageTxHoldMultiplier as specified in IEEE Std 802.1AB [6] table 11-2. The length of port parameter value field indicates a value of 1.  When the port parameter name indicates lldpV2LocPortIdSubtype, the port parameter value field contains values of lldpV2LocPortIdSubtype as specified in IEEE Std 802.1AB [6] clause 8.5.3.2. The length of port parameter value field indicates a value of 1.  When the port parameter name indicates lldpV2LocPortId, the port parameter value field contains values of lldpV2LocPortId in the form of an octet string as specified in IEEE Std 802.1AB [6] clause 8.5.3.3. The length of port parameter value field indicates the length of the octet string with a maximum value of 255.  When the port parameter name indicates lldpV2RemChassisIdSubtype, the port parameter value field contains values of lldpV2RemChassisIdSubtype as specified in IEEE Std 802.1AB [6] clause 8.5.2.2. The length of port parameter value field indicates a value of 1.  When the port parameter name indicates lldpV2RemChassisId, the port parameter value field contains values of lldpV2RemChassisId in the form of an octet string as specified in IEEE Std 802.1AB [6] clause 8.5.2.3. The length of port parameter value field indicates the length of the octet string with a maximum value of 255.  When the port parameter name indicates lldpV2RemPortIdSubtype, the port parameter value field contains values of lldpV2RemPortIdSubtype as specified in IEEE Std 802.1AB [6] clause 8.5.3.2. The length of port parameter value field indicates a value of 1.  When the port parameter name indicates lldpV2RemPortId, the port parameter value field contains values of lldpV2RemPortId in the form of an octet string as specified in IEEE Std 802.1AB [6] clause 8.5.3.3. The length of port parameter value field indicates the length of the octet string with a maximum value of 255.  When the port parameter name indicates lldpTTL, the port parameter value field contains the value of TTL as specified in IEEE Std 802.1AB [6] clause 8.5.4. The length of port parameter value field indicates a value of 2.  When the port parameter name indicates PSFPMaxStreamFilterInstances, the parameter value field contains the value of MaxStreamFilterInstances as specified in IEEE Std 802.1Q [7] clause 12.31.1.1. The length of port parameter value field indicates a value of 4.  When the port parameter name indicates PSFPMaxStreamGateInstances, the parameter value field contains the value of MaxStreamGateInstances as specified in IEEE Std 802.1Q [7] clause 12.31.1.2. The length of port parameter value field indicates a value of 4.  When the port parameter name indicates PSFPMaxFlowMeterInstances, the parameter value field contains the value of MaxFlowMeterInstances as specified in IEEE Std 802.1Q [7] clause 12.31.1.3. The length of port parameter value field indicates a value of 4.  When the port parameter name indicates PSFPSupportedListMax, the parameter value field contains the value of SupportedListMax as specified in IEEE Std 802.1Q [7] clause 12.31.1.4. The length of port parameter value field indicates a value of 4.  When the port parameter name indicates Stream filter instance table, the port parameter value field contains a Stream filter instance table as defined in 3GPP TS 23.501 [2] table 5.28.3.1-1, encoded as the value part of the Stream filter instance table information element as specified in clause 9.8.  When the port parameter name indicates Stream gate instance table, the port parameter value field contains a Stream gate instance table as defined in 3GPP TS 23.501 [2] table 5.28.3.1-1, encoded as the value part of the Stream gate instance table information element as specified in clause 9.9.  When the hexadecimal encoding of the port parameter name is in the "8000H" to "FFFFH" range, the encoding of the port parameter value field and the value of the length of port parameter value field are deployment-specific. |
|  |
| NOTE: The "Set parameter" operation shall not be applicable for the following port parameter names: - 0001H txPropagationDelay; - 0008H Tick granularity; - 00A0H lldpV2RemChassisIdSubtype; - 00A1H lldpV2RemChassisId; - 00A2H lldpV2RemPortIdSubtype; - 00A3H lldpV2RemPortId; - 00A4H lldpTTL; - 00D0H PSFPMaxStreamFilterInstances; - 00D1H PSFPMaxStreamGateInstances; - 00D2H PSFPMaxFlowMeterInstances; and - 00D3H PSFPSupportedListMax. |

## 9.3 Port management capability

The purpose of the port management capability information element is to inform the TSN AF of the port parameters supported by the DS-TT or NW-TT.

The port management capability information element is coded as shown in figure 9.3.1, figure 9.3.2, and table 9.31.

The port management capability information element has a minimum length of 5 octets and a maximum length of 65534 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Port management capability IEI | | | | | | | | octet 1 |
| Length of port management capability contents | | | | | | | | octet 2  octet 3 |
| port management capability contents | | | | | | | | octet 4  octet z |

Figure 9.3.1: port management capability information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Supported port parameter name 1 | | | | | | | | octet 4  octet 5 |
| Supported port parameter name 2 | | | | | | | | octet 6  octet 7 |
| … | | | | | | | | octet 8  octet z-2 |
| Supported port parameter name N | | | | | | | | octet z-1  octet z |

Figure 9.3.2: Port management capability contents

Table 9.3.1: Port management capability information element

|  |
| --- |
| Value part of the port management capability information element (octets 4 to z) |
|  |
| The value part of the port management capability information element consists of one or several supported port parameter names, each encoded over 2 octets as specified in table 9.2.1 for the DS-TT or NW-TT to TSN AF direction. |
|  |

## 9.4 Port status

The purpose of the port status information element is to report the values of port parameters of the DS-TT or NW-TT to the TSN AF.

The port status information element is coded as shown in figure 9.4.1, figure 9.4.2, figure 9.4.3, figure 9.4.4, figure 9.4.5, and table 9.4.1.

The port status information element has a minimum length of 5 octets and a maximum length of 65534 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Port status IEI | | | | | | | | octet 1 |
| Length of port status and error contents | | | | | | | | octet 2  octet 3 |
| Port status contents | | | | | | | | octet 4  octet a |
| port error contents | | | | | | | | octet a+1  octet z |

Figure 9.4.1: Port status information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of port parameters successfully read | | | | | | | | octet 4 |
| port parameter status 1 | | | | | | | | octet 5\*  octet b\* |
| port parameter status 2 | | | | | | | | octet b+1\*  octet c\* |
| … | | | | | | | | octet c+1\*  …  octet d\* |
| port parameter status N | | | | | | | | octet d+1\*  octet a\* |

Figure 9.4.2: Port status contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Port parameter name | | | | | | | | octet e  octet e+1 |
| Length of port parameter value | | | | | | | | octet e+2  octet e+3 |
| Port parameter value | | | | | | | | octet e+4  octet f |

Figure 9.4.3: Port parameter status

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of port parameters not successfully read | | | | | | | | octet a+1 |
| Port parameter error 1 | | | | | | | | octet a+2\*  octet a+3\* |
| Port parameter error 2 | | | | | | | | octet a+4\*  octet a+5\* |
| … | | | | | | | | octet a+6\*  …  octet z-2\* |
| Port parameter error N | | | | | | | | octet z-1\*  octet z\* |

Figure 9.4.4: Port error contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Port parameter name | | | | | | | | octet i  octet i+1 |
| Port management service cause | | | | | | | | octet i+2 |

Figure 9.4.5: Port parameter error

Table 9.4.1: Port status information element

|  |
| --- |
| Value part of the port status information element (octets 4 to z) |
|  |
| Port status contents (octets 4 to a)  This field consists of zero or several port parameter statuses.  Port parameter status  Port parameter name (octets e to e+1) |
|  |
| This field contains the name of the port parameter which could be read successfully, encoded over 2 octets as specified in table 9.2.1 for the DS-TT or NW-TT to TSN AF direction. |
| Length of port parameter value (octets e+2 to e+3) |
|  |
| This field contains the binary encoding of the length of the port parameter value |
|  |
| Port parameter value (octets e+4 to f) |
|  |
| This field contains the value for the port parameter, encoded as specified in table 9.2.1. |
| Port error contents (octets a+1 to z)  This field consists of zero or several port parameter errors.  Port parameter error  Port parameter name (octets i to i+1) |
|  |
| This field contains the name of the port parameter whose value could not be read successfully, encoded over 2 octets as specified in table 9.2.1 for the DS-TT or NW-TT to TSN AF direction. |
| Port management service cause (octet i+2)  This field contains the port management service cause indicating the reason why the value of the port parameter could not be read successfully, encoded as follows:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 Reserved  0 0 0 0 0 0 0 1 Port parameter not supported  0 0 0 0 0 0 1 0 Invalid port parameter value  0 1 1 0 1 1 1 1 Protocol error, unspecified  The receiving entity shall treat any other value as 0110 1111, "protocol error, unspecified". |

## 9.5 Port update result

The purpose of the port update result information element is to report to the TSN AF the outcome of the request from the TSN AF to set one or more port parameters to a specific value.

The port update result information element is coded as shown in figure 9.5.1, figure 9.5.2, figure 9.5.3, figure 9.5.4, figure 9.5.5, and table 9.5.1.

The port update result information element has a minimum length of 5 octets and a maximum length of 65534 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Port update result IEI | | | | | | | | octet 1 |
| Length of port update and update error contents | | | | | | | | octet 2  octet 3 |
| Port update contents | | | | | | | | octet 4  octet a |
| Port update error contents | | | | | | | | octet a+1  octet z |

Figure 9.5.1: Port update result information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of port parameters successfully updated | | | | | | | | octet 4 |
| Port parameter update 1 | | | | | | | | octet 5\*  octet b\* |
| Port parameter update 2 | | | | | | | | octet b+1\*  octet c\* |
| … | | | | | | | | octet c+1\*  …  octet d\* |
| Port parameter update N | | | | | | | | octet d+1\*  octet a\* |

Figure 9.5.2: Port update contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Port parameter name | | | | | | | | octet e  octet e+1 |
| Length of port parameter value | | | | | | | | octet e+2 |
| port parameter value | | | | | | | | octet e+3  octet f |

Figure 9.5.3: Port parameter update

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of port parameters not updated successfully | | | | | | | | octet a+1 |
| Port parameter error 1 | | | | | | | | octet a+2\*  octet a+3\* |
| Port parameter error 2 | | | | | | | | octet a+4\*  octet a+5\* |
| … | | | | | | | | octet a+6\*  …  octet z-2\* |
| Port parameter error N | | | | | | | | octet z-1\*  octet z\* |

Figure 9.5.4: Port update error contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Port parameter name | | | | | | | | octet i  octet i+1 |
| Port management service cause | | | | | | | | octet i+2 |

Figure 9.5.5: Port parameter error

Table 9.5.1: Port update result information element

|  |
| --- |
| Value part of the port update result information element (octets 4 to z) |
|  |
| Port update contents (octets 4 to a)  This field consists of zero or several port parameter updates.  Port parameter update  Port parameter name (octets e to e+1) |
|  |
| This field contains the name of the port parameter which could be set successfully, encoded over 2 octets as specified in table 9.2.1 for the DS-TT or NW-TT to TSN AF direction. |
| Length of port parameter value (octet e+2) |
|  |
| This field contains the binary encoding of the length of the port parameter value |
|  |
| Port parameter value (octets e+3 to f) |
|  |
| Port error contents (octets a+1 to z)  This field consists of zero or several port parameter errors.  Port parameter error  Port parameter name (octets i to i+1) |
|  |
| This field contains the name of the port parameter whose value could not be set successfully, encoded over 2 octets as specified in table 9.2.1 for the DS-TT or NW-TT to TSN AF direction. |
| Port management service cause (octet i+2)  This field contains the port management service cause indicating the reason why the value of the port parameter could not be set successfully, encoded as follows:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 Reserved  0 0 0 0 0 0 0 1 Port parameter not supported  0 0 0 0 0 0 1 0 Invalid port parameter value  0 1 1 0 1 1 1 1 Protocol error, unspecified  The receiving entity shall treat any other value as 0110 1111, "protocol error, unspecified". |

## 9.5A Bridge management service message type

Table 9.5A.1: Bridge management service message type

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Bits | | | | | | | | | | |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | |  |  |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |  | Reserved |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |  | | MANAGE BRIDGE COMMAND message |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |  | | MANAGE BRIDGE COMPLETE message |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |  | | BRIDGE MANAGEMENT NOTIFY message |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |  | | BRIDGE MANAGEMENT ACK message |
|  | | | | | | | | | | |
| All other values are reserved | | | | | | | | | | |

## 9.5B Bridge management list

The purpose of the Bridge management list information element is to transfer from the TSN AF to the NW-TT a list of operations related to Bridge management of the NW-TT to be performed at the NW-TT.

The Bridge management list information element is coded as shown in figure 9.5B.1, figure 9.5B.2, figure 9.5B.3, figure 9.5B.4, figure 9.5B.5, and table 9.5B.1.

The Bridge management list information element has a minimum length of 4 octets and a maximum length of 65530 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Bridge management list IEI | | | | | | | | octet 1 |
| Length of Bridge management list contents | | | | | | | | octet 2  octet 3 |
| Bridge management list contents | | | | | | | | octet 4  octet z |

Figure 9.5B.1: Bridge management list information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Operation 1 | | | | | | | | octet 4  octet a |
| Operation 2 | | | | | | | | octet a+1\*  octet b\* |
| … | | | | | | | | octet b+1\*  …  octet c\* |
| Operation N | | | | | | | | octet c+1\*  octet z\* |

Figure 9.5B.2: Bridge management list contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Operation code | | | | | | | | octet d |

Figure 9.5B.3: Operation for operation code set to "00000001"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Operation code | | | | | | | | octet d |
| Bridge parameter name | | | | | | | | octet d+1  octet d+2 |

Figure 9.5B.4: Operation for operation code set to "00000010", "00000100", or "00000101"

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Operation code | | | | | | | | octet d |
| Bridge parameter name | | | | | | | | octet d+1  octet d+2 |
| Length of Bridge parameter value | | | | | | | | octet d+3 octet d+4 |
| Bridge parameter value | | | | | | | | octet d+5  octet e |

Figure 9.5B.5: Operation for operation code set to "00000011"

Table 9.5B.1: Bridge management list information element

|  |
| --- |
| Value part of the Bridge management list information element (octets 4 to z) |
|  |
| The value part of the Bridge management list information element consists of one or several operations. |
|  |
| Operation |
|  |
| Operation code (octet d) |
| Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 Reserved  0 0 0 0 0 0 0 1 Get capabilities  0 0 0 0 0 0 1 0 Read parameter  0 0 0 0 0 0 1 1 Set parameter (NOTE 1)  0 0 0 0 0 1 0 0 Subscribe-notify for parameter |
| 0 0 0 0 0 1 0 1 Unsubscribe for parameter |
| All other values are spare. |
|  |
| Bridge parameter name (octets d+1 to d+2) |
|  |
| This field contains the name of the Bridge parameter to which the operation applies, encoded as follows:  - 0000H Reserved;  - 0001H Bridge Address;  - 0002H Spare (NOTE 2)  - 0003H Bridge ID;  - 0004H NW-TT port numbers;  - 0005H  to Spare  - 0009H  - 0010H Spare (NOTE 3)  - 0010H Spare (NOTE 4)  - 0012H Static filtering entries;  - 0013H  to Spare  - 0019H  - 0020H lldpV2PortConfigAdminStatusV2;  - 0021H lldpV2LocChassisIdSubtype;  - 0022H lldpV2LocChassisId;  - 0023H lldpV2MessageTxInterval;  - 0024H lldpV2MessageTxHoldMultiplier;  - 0025H  to Spare  - 004FH  - 0050H DS-TT port neighbor discovery configuration for DS-TT ports  - 0051H Discovered neighbor information for DS-TT ports  - 0052H  to Spare  - 006FH  - 0070H PSFPMaxStreamFilterInstances;  - 0071H PSFPMaxStreamGateInstances;  - 0072H PSFPMaxFlowMeterInstances;  - 0073H PSFPSupportedListMax;  - 0074H  to Spare  - 7FFFH  - 8000H  to Reserved for deployment specific parameters  - FFFFH |
| Length of Bridge parameter value (octets d+3 to d+4) |
|  |
| This field contains the binary encoding of the length of the Bridge parameter value |
|  |
| Bridge parameter value (octet d+5 to e) |
|  |
| This field contains the value to be set for the Bridge parameter.  When the Bridge parameter name indicates Bridge Address, the Bridge parameter value field contains the values of Bridge Address as defined in IEEE Std 802.1Q [7] clause 8.13.8. The length of Bridge parameter value field indicates a value of 6.  When the Bridge parameter name indicates Bridge ID, the Bridge parameter value field contains the values of Bridge Identifier as defined in IEEE Std 802.1Q [7] clause 14.2.5. The length of Bridge parameter value field indicates a value of 8.  When the Bridge parameter name indicates NW-TT port numbers, the Bridge parameter value field contains NW-TT port numbers as defined in 3GPP TS 23.501 [2] table 5.28.3.1-2, encoded as the value part of the NW-TT port numbers information element as specified in clause 9.14.  When the Bridge parameter name indicates Static filtering entries, the Bridge parameter value field contains Static filtering entries as defined in 3GPP TS 23.501 [2] table 5.28.3.1-2, encoded as the value part of the Static filtering entries information element as specified in clause 9.6.  When the Bridge parameter name indicates lldpV2PortConfigAdminStatusV2, the Bridge parameter value field contains values of lldpV2PortConfigAdminStatusV2 as specified in IEEE Std 802.1AB [6] clause 9.2.5.1 with value of txOnly encoded as 01H, rxOnly encoded as 02H, txAndRx encoded as 03H, and disabled encoded as 04H. The length of Bridge parameter value field indicates a value of 1.  When the Bridge parameter name indicates lldpV2LocChassisIdSubtype, the Bridge parameter value field contains values of lldpV2LocChassisIdSubtype as specified in IEEE Std 802.1AB [6] clause 8.5.2.2. The length of Bridge parameter value field indicates a value of 1.  When the Bridge parameter name indicates lldpV2LocChassisId, the Bridge parameter value field contains values of lldpV2LocChassisId in the form of an octet string as specified in IEEE Std 802.1AB [6] clause 8.5.2.3. The length of Bridge parameter value field indicates the length of the octet string with a maximum value of 255.  When the Bridge parameter name indicates lldpV2MessageTxInterval, the Bridge parameter value field contains the value of lldpV2MessageTxInterval as specified in IEEE Std 802.1AB [6] table 11-2. The length of Bridge parameter value field indicates a value of 2.  When the Bridge parameter name indicates lldpV2MessageTxHoldMultiplier, the Bridge parameter value field contains the value of lldpV2MessageTxHoldMultiplier as specified in IEEE Std 802.1AB [6] table 11-2. The length of Bridge parameter value field indicates a value of 1.  When the Bridge parameter name indicates DS-TT port neighbor discovery configuration for DS-TT ports, the Bridge parameter value field contains DS-TT port neighbor discovery configuration for DS-TT ports as defined in 3GPP TS 23.501 [2] table 5.28.3.1-2, encoded as the value part of the DS-TT port neighbor discovery configuration for DS-TT ports information element as specified in clause 9.10.  When the Bridge parameter name indicates Discovered neighbor information for DS-TT ports, the Bridge parameter value field contains Discovered neighbor information for DS-TT ports as defined in 3GPP TS 23.501 [2] table 5.28.3.1-2, encoded as the value part of the Discovered neighbor information for DS-TT ports information element as specified in clause 9.11.  When the Bridge parameter name indicates MaxStreamFilterInstances, the Bridge parameter value field contains the value of PSFPMaxStreamFilterInstances as specified in IEEE Std 802.1Q [7] clause 12.31.1.1. The length of Bridge parameter value field indicates a value of 4.  When the Bridge parameter name indicates PSFPMaxStreamGateInstances, the Bridge parameter value field contains the value of MaxStreamGateInstances as specified in IEEE Std 802.1Q [7] clause 12.31.1.1. The length of Bridge parameter value field indicates a value of 4.  When the Bridge parameter name indicates PSFPMaxFlowMeterInstances, the Bridge parameter value field contains the value of MaxFlowMeterInstances as specified in IEEE Std 802.1Q [7] Table 12-31. The length of Bridge parameter value field indicates a value of 4.  When the Bridge parameter name indicates PSFPSupportedListMax, the Bridge parameter value field contains the value of SupportedListMax as specified in IEEE Std 802.1Q [7] clause 12. 31.1.4. The length of Bridge parameter value field indicates a value of 4.  When the hexadecimal encoding of the Bridge parameter name is in the "8000H" to "FFFFH" range, the encoding of the Bridge parameter value field and the value of the length of Bridge parameter value field are deployment-specific. |
|  |
| NOTE 1: The "Set parameter" operation shall not be applicable for the following bridge parameter names: - 0001H Bridge Address; - 0003H Bridge ID; - 0004H NW-TT port numbers; - 0051H Discovered neighbor information for DS-TT ports; - 0070H PSFPMaxStreamFilterInstances; - 0071H PSFPMaxStreamGateInstances; - 0072H PSFPMaxFlowMeterInstances; and - 0073H PSFPSupportedListMax.  NOTE 2: Implementations compliant with earlier versions of this release of the specification can interpret these values as signalling the Bridge Name.  NOTE 3: Implementations compliant with earlier versions of this release of the specification can interpret these values as signalling the Chassis ID subtype.  NOTE 4: Implementations compliant with earlier versions of this release of the specification can interpret these values as signalling the Chassis ID. |

## 9.5C Bridge management capability

The purpose of the Bridge management capability information element is to inform the TSN AF of the Bridge parameters supported by the NW-TT.

The Bridge management capability information element is coded as shown in figure 9.5C.1, figure 9.5C.2, and table 9.5C.1.

The Bridge management capability information element has a minimum length of 5 octets and a maximum length of 65530 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Bridge management capability IEI | | | | | | | | octet 1 |
| Length of Bridge management capability contents | | | | | | | | octet 2  octet 3 |
| Bridge management capability contents | | | | | | | | octet 4  octet z |

Figure 9.5C.1: Bridge management capability information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Supported Bridge parameter name 1 | | | | | | | | octet 4  octet 5 |
| Supported Bridge parameter name 2 | | | | | | | | octet 6  octet 7 |
| … | | | | | | | | octet 8  octet z-2 |
| Supported Bridge parameter name N | | | | | | | | octet z-1  octet z |

Figure 9.5C.2: Bridge management capability contents

Table 9.5C.1: Bridge management capability information element

|  |
| --- |
| Value part of the Bridge management capability information element (octets 4 to z) |
|  |
| The value part of the Bridge management capability information element consists of one or several supported Bridge parameter names, each encoded over 2 octets as specified in table 9.5B.1 for the NW-TT to TSN AF direction. |
|  |

## 9.5D Bridge status

The purpose of the Bridge status information element is to report the values of Bridge parameters of the NW-TT to the TSN AF.

The Bridge status information element is coded as shown in figure 9.5D.1, figure 9.5D.2, figure 9.5D.3, figure 9.5D.4, figure 9.5D.5, and table 9.5D.1.

The Bridge status information element has a minimum length of 5 octets and a maximum length of 65530 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Bridge status IEI | | | | | | | | octet 1 |
| Length of Bridge status and error contents | | | | | | | | octet 2  octet 3 |
| Bridge status contents | | | | | | | | octet 4  octet a |
| Bridge error contents | | | | | | | | octet a+1  octet z |

Figure 9.5D.1: Bridge status information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of Bridge parameters successfully read | | | | | | | | octet 4 |
| Bridge parameter status 1 | | | | | | | | octet 5\*  octet b\* |
| Bridge parameter status 2 | | | | | | | | octet b+1\*  octet c\* |
| … | | | | | | | | octet c+1\*  …  octet d\* |
| Bridge parameter status N | | | | | | | | octet d+1\*  octet a\* |

Figure 9.5D.2: Bridge status contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Bridge parameter name | | | | | | | | octet e  octet e+1 |
| Length of Bridge parameter value | | | | | | | | octet e+2  octet e+3 |
| Bridge parameter value | | | | | | | | octet e+4  octet f |

Figure 9.5D.3: Bridge parameter status

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of Bridge parameters not successfully read | | | | | | | | octet a+1 |
| Bridge parameter error 1 | | | | | | | | octet a+2\*  octet a+3\* |
| Bridge parameter error 2 | | | | | | | | octet a+4\*  octet a+5\* |
| … | | | | | | | | octet a+6\*  …  octet z-2\* |
| Bridge parameter error N | | | | | | | | octet z-1\*  octet z\* |

Figure 9.5D.4: Bridge error contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Bridge parameter name | | | | | | | | octet i  octet i+1 |
| Bridge management service cause | | | | | | | | octet i+2 |

Figure 9.5D.5: Bridge parameter error

Table 9.4.1: Bridge status information element

|  |
| --- |
| Value part of the Bridge status information element (octets 4 to z) |
|  |
| Bridge status contents (octets 4 to a)  This field consists of zero or several Bridge parameter statuses.  Bridge parameter status  Bridge parameter name (octets e to e+1) |
|  |
| This field contains the name of the Bridge parameter which could be read successfully, encoded over 2 octets as specified in table 9.2.1 for the NW-TT to TSN AF direction. |
| Length of Bridge parameter value (octets e+2 to e+3) |
|  |
| This field contains the binary encoding of the length of the Bridge parameter value |
|  |
| Bridge parameter value (octets e+4 to f) |
|  |
| This field contains the value for the Bridge parameter, encoded as specified in table 9.2.1. |
| Bridge error contents (octets a+1 to z)  This field consists of zero or several Bridge parameter errors.  Bridge parameter error  Bridge parameter name (octets i to i+1) |
|  |
| This field contains the name of the Bridge parameter whose value could not be read successfully, encoded over 2 octets as specified in table 9.2.1 for the NW-TT to TSN AF direction. |
| Bridge management service cause (octet i+2)  This field contains the Bridge management service cause indicating the reason why the value of the Bridge parameter could not be read successfully, encoded as follows:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 Reserved  0 0 0 0 0 0 0 1 Bridge parameter not supported  0 0 0 0 0 0 1 0 Invalid Bridge parameter value  0 1 1 0 1 1 1 1 Protocol error, unspecified  The receiving entity shall treat any other value as 0110 1111, "protocol error, unspecified". |

## 9.5E Bridge update result

The purpose of the Bridge update result information element is to report to the TSN AF the outcome of the request from the TSN AF to set one or more Bridge parameters to a specific value.

The Bridge update result information element is coded as shown in figure 9.5E.1, figure 9.5E.2, figure 9.5E.3, figure 9.5E.4, figure 9.5E.5, and table 9.5E.1.

The Bridge update result information element has a minimum length of 5 octets and a maximum length of 65530 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Bridge update result IEI | | | | | | | | octet 1 |
| Length of Bridge update and update error contents | | | | | | | | octet 2  octet 3 |
| Bridge update contents | | | | | | | | octet 4  octet a |
| Bridge update error contents | | | | | | | | octet a+1  octet z |

Figure 9.5E.1: Bridge update result information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of Bridge parameters successfully updated | | | | | | | | octet 4 |
| Bridge parameter update 1 | | | | | | | | octet 5\*  octet b\* |
| Bridge parameter update 2 | | | | | | | | octet b+1\*  octet c\* |
| … | | | | | | | | octet c+1\*  …  octet d\* |
| Bridge parameter update N | | | | | | | | octet d+1\*  octet a\* |

Figure 9.5E.2: Bridge update contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Bridge parameter name | | | | | | | | octet e  octet e+1 |
| Length of Bridge parameter value | | | | | | | | octet e+2 |
| Bridge parameter value | | | | | | | | octet e+3  octet f |

Figure 9.5E.3: Bridge parameter update

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of Bridge parameters not updated successfully | | | | | | | | octet a+1 |
| Bridge parameter error 1 | | | | | | | | octet a+2\*  octet a+3\* |
| Bridge parameter error 2 | | | | | | | | octet a+4\*  octet a+5\* |
| … | | | | | | | | octet a+6\*  …  octet z-2\* |
| Bridge parameter error N | | | | | | | | octet z-1\*  octet z\* |

Figure 9.5E.4: Bridge update error contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Bridge parameter name | | | | | | | | octet i  octet i+1 |
| Bridge management service cause | | | | | | | | octet i+2 |

Figure 9.5E.5: Bridge parameter error

Table 9.5E.1: Bridge update result information element

|  |
| --- |
| Value part of the Bridge update result information element (octets 4 to z) |
|  |
| Bridge update contents (octets 4 to a)  This field consists of zero or several Bridge parameter updates.  Bridge parameter update  Bridge parameter name (octets e to e+1) |
|  |
| This field contains the name of the Bridge parameter which could be set successfully, encoded over 2 octets as specified in table 9.5B.1 for the NW-TT to TSN AF direction. |
| Length of Bridge parameter value (octet e+2) |
|  |
| This field contains the binary encoding of the length of the Bridge parameter value |
|  |
| Bridge parameter value (octets e+3 to f) |
|  |
| Bridge error contents (octets a+1 to z)  This field consists of zero or several Bridge parameter errors.  Bridge parameter error  Bridge parameter name (octets i to i+1) |
|  |
| This field contains the name of the Bridge parameter whose value could not be set successfully, encoded over 2 octets as specified in table 9.5B.1 for the NW-TT to TSN AF direction. |
| Bridge management service cause (octet i+2)  This field contains the Bridge management service cause indicating the reason why the value of the Bridge parameter could not be set successfully, encoded as follows:  Bits  **8 7 6 5 4 3 2 1**  0 0 0 0 0 0 0 0 Reserved  0 0 0 0 0 0 0 1 Bridge parameter not supported  0 0 0 0 0 0 1 0 Invalid Bridge parameter value  0 1 1 0 1 1 1 1 Protocol error, unspecified  The receiving entity shall treat any other value as 0110 1111, "protocol error, unspecified". |

## 9.6 Static filtering entries

The purpose of the Static filtering entries information element is to convey Static filtering entries as defined in 3GPP TS 23.501 [2] table 5.28.3.1-2.

The Static filtering entries information element is coded as shown in figure 9.6.1, figure 9.6.2 and table 9.6.1.

The Static filtering entries information element has a minimum length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Static filtering entries IEI | | | | | | | | octet 1 |
| Length of Static filtering entries contents | | | | | | | | octet 2  octet 3 |
| Static filtering entry 1 | | | | | | | | octet 4  octet 13 |
| … | | | | | | | |  |
| Static filtering entry n | | | | | | | | octet 10n-6  octet 10n+3 |

Figure 9.6.1: Static filtering entries information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| MacAddress value | | | | | | | | octet 4  octet 9 |
| VID value | | | | | | | | octet 10  octet 11 |
| Port value | | | | | | | | octet 12  octet 13 |

Figure 9.6.2: Static filtering entry

Table 9.6.1: Static filtering entries

|  |
| --- |
| Value part of the Static filtering entries information element (octets 4 to 10n+3) |
|  |
| Static filtering entries contents (octets 4 to 10n+3)  This field consists of zero or more Static filtering entries. |
|  |
| Static filtering entry (octets 4 to 13) |
|  |
| MacAddress value (octets 4 to 9)  MacAddress value contains the value of MAC address as specified in IEEE Std 802.1Q [7] clause 8.8.1. |
|  |
| VID value (octets 10 to 11)  VID value contains the value of VID specification as specified in IEEE Std 802.1Q [7] clause 8.8.1. |
|  |
| Port value (octets 12 to 13)  Port value contains the value of outbound Port as specified in IEEE Std 802.1Q [7] clause 8.8.1. |

## 9.7 Traffic class table

The purpose of the Traffic class table information element is to convey a traffic class table as defined in IEEE Std 802.1Q [7].

The Traffic class table information element is coded as shown in figure 9.7.1, figure 9.7.2, figure 9.7.3, and table 9.7.1.

The Traffic class table information element has a minimum length of 3 octets and a maximum length of 19 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Traffic class table IEI | | | | | | | | octet 1 |
| Length of traffic class table contents | | | | | | | | octet 2 |
| Traffic class table contents | | | | | | | | octet 3  octet 2n+3 |

Figure 9.7.1: Traffic class table information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0  Spare | 0  Spare | 0  Spare | 0  Spare | Number of traffic classes | | | | octet 3 |
| Information for traffic class 1 | | | | | | | | octet 4\*  octet 5\* |
| … | | | | | | | | octet 6\*  octet n+2\* |
| Information for traffic class N | | | | | | | | octet 2n+2\*  octet 2n+3\* |

Figure 9.7.2: Traffic class table contents

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 0  Spare | 0  Spare | 0  Spare | 0  Spare | Traffic class value | | | | octet m |
| PriorityValue7 | PriorityValue6 | PriorityValue5 | PriorityValue4 | PriorityValue3 | PriorityValue2 | PriorityValue1 | PriorityValue0 | octet m+1 |

Figure 9.7.3: Information for traffic class

Table 9.7.1: Traffic class information

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number of traffic classes (bit 1 to bit 3 of octet 3) | | | | | |
| Bits | | | | | |
| 4 | 3 | 2 | 1 |  |
| 0 | 0 | 0 | 0 | No traffic class information is included |
| 0 | 0 | 0 | 1 | Information on one traffic class is included |
| 0 | 0 | 1 | 0 | Information on two traffic classes is included |
| 0 | 0 | 1 | 1 | Information on three traffic classes is included |
| 0 | 1 | 0 | 0 | Information on four traffic classes is included |
| 0 | 1 | 0 | 1 | Information on five traffic classes is included |
| 0 | 1 | 1 | 0 | Information on six traffic classes is included |
| 0 | 1 | 1 | 1 | Information on seven traffic classes is included |
| 1 | 0 | 0 | 0 | Information on eight traffic classes is included |
| 1 | 0 | 0 | 1 |  |
| to | | | | Reserved |
| 1 | 1 | 1 | 1 |  |
|  | | | | | |
| Traffic class value (bit 1 to bit 3 of octet m) | | | | | |
| Bits | | | | | |
| 3 | 2 | 1 |  | |
| 0 | 0 | 0 | The value of the traffic class is 0 | |
| 0 | 0 | 1 | The value of the traffic class is 1 | |
| 0 | 1 | 0 | The value of the traffic class is 2 | |
| 0 | 1 | 1 | The value of the traffic class is 3 | |
| 1 | 0 | 0 | The value of the traffic class is 4 | |
| 1 | 0 | 1 | The value of the traffic class is 5 | |
| 1 | 1 | 0 | The value of the traffic class is 6 | |
| 1 | 1 | 1 | The value of the traffic class is 7 | |
|  | | | | | |
| PriorityValue0 (bit 1 of octet m+1)  Bit | | | | | |
| 1 |  | | | | |
| 0 | Priority value 0 is not assigned to the traffic class | | | | |
| 1 | Priority value 0 is assigned to the traffic class | | | | |
|  | | | | | |
| PriorityValue1 (bit 2 of octet m+1)  Bit | | | | | |
| 2 |  | | | | |
| 0 | Priority value 1 is not assigned to the traffic class | | | | |
| 1 | Priority value 1 is assigned to the traffic class | | | | |
|  | | | | | |
| PriorityValue2 (bit 3 of octet m+1)  Bit | | | | | |
| 3 |  | | | | |
| 0 | Priority value 2 is not assigned to the traffic class | | | | |
| 1 | Priority value 2 is assigned to the traffic class | | | | |
|  | | | | | |
| PriorityValue3 (bit 4 of octet m+1)  Bit | | | | | |
| 4 |  | | | | |
| 0 | Priority value 3 is not assigned to the traffic class | | | | |
| 1 | Priority value 3 is assigned to the traffic class | | | | |
|  | | | | | |
| PriorityValue4 (bit 5 of octet m+1)  Bit | | | | | |
| 5 |  | | | | |
| 0 | Priority value 4 is not assigned to the traffic class | | | | |
| 1 | Priority value 4 is assigned to the traffic class | | | | |
|  | | | | | |
| PriorityValue5 (bit 6 of octet m+1)  Bit | | | | | |
| 6 |  | | | | |
| 0 | Priority value 5 is not assigned to the traffic class | | | | |
| 1 | Priority value 5 is assigned to the traffic class | | | | |
|  | | | | | |
| PriorityValue6 (bit 7 of octet m+1)  Bit | | | | | |
| 7 |  | | | | |
| 0 | Priority value 6 is not assigned to the traffic class | | | | |
| 1 | Priority value 6 is assigned to the traffic class | | | | |
|  | | | | | |
| PriorityValue7 (bit 8 of octet m+1)  Bit | | | | | |
| 8 |  | | | | |
| 0 | Priority value 7 is not assigned to the traffic class | | | | |
| 1 | Priority value 7 is assigned to the traffic class | | | | |

## 9.8 Stream filter instance table

The purpose of the Stream filter instance table information element is to convey a Stream filter instance table as defined 3GPP TS 23.501 [2] table 5.28.3.1-1.

The Stream filter instance table information element is coded as shown in figure 9.8.1, figure 9.8.2, figure 9.8.3, figure 9.8.4, figure 9.8.5, and table 9.8.1.

The Stream filter instance table is a type 6 information element with a minimum length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Stream filter instance table IEI | | | | | | | | octet 1 |
| Length of Stream filter instance table contents | | | | | | | | octet 2  octet 3 |
| Stream filter instance 1 | | | | | | | | octet 4\*  octet m\* |
| … | | | | | | | |  |
| Stream filter instance n | | | | | | | | octet n\*  octet o\* |

Figure 9.8.1: Stream filter instance table information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of Stream filter instance contents | | | | | | | | octet 4 |
| PrioritySpec value | | | | | | | | octet 5  octet 8 |
| StreamGateInstanceID value | | | | | | | | octet 9  octet 12 |
| tsnStreamIdIdentificationType value | | | | | | | | octet 13  octet 16 |
| tsnStreamIdParameters | | | | | | | | octet 17  octet m-4 |
| StreamFilterInstanceIndex value | | | | | | | | octet m-3\*  octet m\* |

Figure 9.8.2: Stream filter instance

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of tsnStreamIdParameters contents | | | | | | | | octet 17 |
| tsnCpeNullDownDestMac value | | | | | | | | octet 18  octet 23 |
| tsnCpeNullDownTagged value | | | | | | | | octet 24 |
| tsnCpeNullDownVlan value | | | | | | | | octet 25  octet 26 |

Figure 9.8.3: tsnStreamIdParameters for tsnStreamIdIdentificationType = 00-80-C2 01

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of tsnStreamIdParameters contents | | | | | | | | octet 17 |
| tsnCpeSmacVlanDownSrcMac value | | | | | | | | octet 18  octet 23 |
| tsnCpeSmacVlanDownTagged value | | | | | | | | octet 24 |
| tsnCpeSmacVlanDownVlan value | | | | | | | | octet 25  octet 26 |

Figure 9.8.4: tsnStreamIdParameters for tsnStreamIdIdentificationType = 00-80-C2 02

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of tsnStreamIdParameters contents | | | | | | | | octet 17 |
| tsnCpeDmacVlanDownDestMac value | | | | | | | | octet 18  octet 23 |
| tsnCpeDmacVlanDownTagged value | | | | | | | | octet 24 |
| tsnCpeDmacVlanDownVlan value | | | | | | | | octet 25  octet 26 |
| tsnCpeDmacVlanDownPriority value | | | | | | | | octet 27 |
| tsnCpeDmacVlanUpDestMac value | | | | | | | | octet 28  octet 33 |
| tsnCpeDmacVlanUpTagged value | | | | | | | | octet 34 |
| tsnCpeDmacVlanUpVlan value | | | | | | | | octet 35  octet 36 |
| tsnCpeDmacVlanUpPriority value | | | | | | | | octet 37 |

Figure 9.8.5: tsnStreamIdParameters for tsnStreamIdIdentificationType = 00-80-C2 03

Table 9.8.1: Stream filter instance table

|  |
| --- |
| Value part of the Stream filter instance table information element (octets 4 to o) |
|  |
| Stream filter instance table contents (octets 4 to o)  This field consists of zero or more Stream filter instances. |
|  |
| Stream filter instance (octets 4 to m) |
|  |
| Length of Stream filter instance contents (octet 4)  Length of Stream filter instance contents contains the length of the value part of Stream filter instance in octets. |
|  |
| PrioritySpec value (octets 5to 8)  PrioritySpec value contains the value of PrioritySpec as specified in IEEE Std 802.1Q [7] table 12-32. |
|  |
| StreamGateInstanceID value (octets 9 to 12)  StreamGateInstanceID value contains the value of StreamGateInstanceID as specified in IEEE Std 802.1Q [7] table 12-32.  tsnStreamIdIdentificationType value (octets 13 to 16)  tsnStreamIdIdentificationType value contains the value of tsnStreamIdIdentificationType in the form of four octets as specified in IEEE Std 802.1CB [10] clause 9.1.1.6. The first 3 octets contain the binary encoding of Organizationally Unique Identifier (OUI) or Company ID (CID). The 4th octet contains the binary encoded value of type number. In this document only OUI/CID value 00-80-C2 with type number value 1, 2 and 3 are specified. Other type number values are reserved. Other OUI/CID values are outside the scope of the present document.  tsnStreamIdParameters (octets 17 to m-4)  Length of tsnStreamIdParameters (octet 17)  Length of tsnStreamIdParameters contents contains the length of the value part of tsnStreamIdParameters in octets.  tsnCpeNullDownDestMac value (octets 18 to 23)  tsnCpeNullDownDestMac value contains the value of tsnCpeNullDownDestMac as specified in IEEE Std 802.1CB [10] clause 9.1.2.1.  tsnCpeNullDownTagged value (octet 24)  tsnCpeNullDownTagged value contains an enumerated value of tsnCpeNullDownTagged as specified in IEEE Std 802.1CB [10] clause 9.1.2.2 in the form of a binary encoded octet. Value “tagged” is encoded as binary 0, value “priority” is encoded as binary 1, and value “all” is encoded as binary 2. All other values are reserved.  tsnCpeNullDownVlan value (octets 25 to 26)  tsnCpeNullDownVlan value contains the value of tsnCpeNullDownVlan as specified in IEEE Std 802.1CB [10] clause 9.1.2.3.  tsnCpeSmacVlanDownSrcMac value (octets 18 to 23)  tsnCpeSmacVlanDownSrcMac value contains the value of tsnCpeSmacVlanDownSrctMac as specified in IEEE Std 802.1CB [10] clause 9.1.3.1. tsnCpeSmacVlanDownTagged value (octet 24)  tsnCpeSmacVlanDownTagged value contains an enumerated value of tsnCpeSmacVlanDownTagged as specified in IEEE Std 802.1CB [10] clause 9.1.3.2 in the form of a binary encoded octet. Value “tagged” is encoded as binary 0, value “priority” is encoded as binary 1, and value “all” is encoded as binary 2. All other values are reserved.  tsnCpeSmacVlanDownVlan value (octets 25 to 26)  tsnCpeSmacVlanDownVlan value contains the value of tsnCpeSmacVlanDownVlan as specified in IEEE Std 802.1CB [10] clause 9.1.3.3.  tsnCpeDmacVlanDownDestMac value (octets 18 to 23)  tsnCpeDmacVlanDownDestMac value contains the value of tsnCpeDmacVlanDownDestMac as specified in IEEE Std 802.1CB [10] clause 9.1.4.1.  tsnCpeDmacVlanDownTagged value (octet 24)  tsnCpeDmacVlanDownTagged value contains an enumerated value of tsnCpeDmacVlanDownTagged as specified in IEEE Std 802.1CB [10] clause 9.1.4.2 in the form of a binary encoded octet. Value “tagged” is encoded as binary 0, value “priority” is encoded as binary 1, and value “all” is encoded as binary 2. All other values are reserved.  tsnCpeDmacVlanDownVlan value (octets 25 to 26)  tsnCpeDmacVlanDownVlan value contains the value of tsnCpeDmacVlanDownVlan as specified in IEEE Std 802.1CB [10] clause 9.1.4.3.  tsnCpeDmacVlanDownPriority value (octet 27)  tsnCpeDmacVlanDownPriority value contains the value of tsnCpeDmacVlanDownPriority as specified in IEEE Std 802.1CB [10] clause 9.1.4.4.  tsnCpeDmacVlanUpDestMac value (octets 28 to 33)  tsnCpeDmacVlanUpDestMac value contains the value of tsnCpeDmacVlanUpDestMac as specified in IEEE Std 802.1CB [10] clause 9.1.4.5.  tsnCpeDmacVlanUpTagged value (octet 34)  tsnCpeDmacVlanUpTagged value contains an enumerated value of tsnCpeDmacVlanUpTagged as specified in IEEE Std 802.1CB [10] clause 9.1.4.6 in the form of a binary encoded octet. Value “tagged” is encoded as binary 0, value “priority” is encoded as binary 1, and value “all” is encoded as binary 2. All other values are reserved.  tsnCpeDmacVlanUpVlan value (octets 35 to 36)  tsnCpeDmacVlanUpVlan value contains the value of tsnCpeDmacVlanUpVlan as specified in IEEE Std 802.1CB [10] clause 9.1.4.7.  tsnCpeDmacVlanUpPriority value (octet 37)  tsnCpeDmacVlanUpPriority value contains the value of tsnCpeDmacVlanUpPriority as specified in IEEE Std 802.1CB [10] clause 9.1.4.8. |
| StreamFilterInstanceIndex value (octet m-3 to m)  StreamFilterInstanceIndex value contains the value of StreamFilterInstance as specified in IEEE Std 802.1Q [7] table 12-32. |
| NOTE: A sender compliant with this release of the specification shall include the StreamFilterInstanceIndex value in the Stream filter instance of the Stream filter instance table information element. A sender compliant with earlier versions of this specification does not include the StreamFilterInstanceIndex value in the Stream filter instance of the Stream filter instance table information element. |

## 9.9 Stream gate instance table

The purpose of the Stream gate instance table information element is to convey a Stream gate instance table as defined in 3GPP TS 23.501 [2] table 5.28.3.1-1.

The Stream gate instance table information element is coded as shown in figure 9.9.1, figure 9.9.2, and table 9.9.1.

The Stream gate instance table is a type 6 information element with a minimum length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Stream gate instance table IEI | | | | | | | | octet 1 |
| Length of Stream gate instance table contents | | | | | | | | octet 2  octet 3 |
| Stream gate instance 1 | | | | | | | | octet 4\*  octet a\* |
| … | | | | | | | |  |
| Stream gate instance N | | | | | | | | octet b\*  octet c\* |

Figure 9.9.1: Stream gate instance table information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of Stream gate instance contents | | | | | | | | octet 4  octet 5 |
| StreamGateInstance | | | | | | | | octet 6  octet 9 |
| PSFPAdminBaseTime value | | | | | | | | octet 10  octet 19 |
| PSFPAdminCycleTime value | | | | | | | | octet 20  octet 27 |
| PSFPTickGranularity value | | | | | | | | octet 28  octet 31 |
| PSFPAdminControlListLength value | | | | | | | | octet 32  octet 33 |
| PSFPAdminControlList contents | | | | | | | | octet 34  octet a |

Figure 9.9.2: Stream gate instance

Table 9.9.1: Stream gate instance table

|  |
| --- |
| Value part of the Stream gate instance table information element (octets 4 to c) |
|  |
| Stream gate instance table contents (octets 4 to c)  This field consists of zero or more Stream gate instances. |
|  |
| Stream gate instance (octets 4 to a) |
|  |
| Length of Stream gate instance (octets 4 to 5)  Length of Stream gate instance contents contains the length of the vale part of Stream gate instance in octets. |
|  |
| StreamGateIndexInstance value (octets 6 to 9)  StreamGateIndexInstance value contains the value of StreamGateInstance as specified in IEEE Std 802.1Q [7] table 12-33. |
|  |
| PSFPAdminBaseTime value (octets 10 to 19)  PSFPAdminBaseTime value contains the value of PSFPAdminBaseTime as specified in IEEE Std 802.1Q [7] table 12-33. |
|  |
| PSFPAdminCycleTime value (octets 20 to 27)  PSFPAdminCycleTime value contains the value of PSFPAdminCycleTime as specified in IEEE Std 802.1Q [7] table 12-33. |
|  |
| PSFPTickGranularity value (octets 28 to 31)  PSFPTickGranularity value contains the value of PSFPTickGranularity as specified in IEEE Std 802.1Q [7] table 12-33. |
|  |
| PSFPAdminControlListLength value (octets 32 to 33)  PSFPAdminControlListLength value contains the value of PSFPAdminControlListLength as specified in IEEE Std 802.1Q [7] table 12-33. |
|  |
| PSFPAdminControlList contents (octets 34 to a)  This field contains the concatenation of entries, each encoded as a PSFPGateControlEntry as specified in IEEE Std 802.1Q [7] table 12-33. PSFPAdminControlListLength value indicates number of entries in this field. |
|  |

## 9.10 DS-TT port neighbor discovery configuration for DS-TT ports

The purpose of the DS-TT port neighbor discovery configuration for DS-TT ports information element is to convey DS-TT port neighbor discovery configuration for DS-TT ports as defined in 3GPP TS 23.501 [2] table 5.28.3.1-2.

The DS-TT port neighbor discovery configuration for DS-TT ports information element is coded as shown in figure 9.10.1, figure 9.10.2 and table 9.10.1.

The DS-TT port neighbor discovery configuration for DS-TT ports information element has a minimum length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| DS-TT port neighbor discovery configuration for DS-TT ports IEI | | | | | | | | octet 1 |
| Length of DS-TT port neighbor discovery configuration for DS-TT ports contents | | | | | | | | octet 2  octet 3 |
| DS-TT port neighbor discovery configuration for DS-TT ports instance 1 | | | | | | | | octet 4\*  octet x\* |
| … | | | | | | | |  |
| DS-TT port neighbor discovery configuration for DS-TT ports instance n | | | | | | | | octet y\*  octet z\* |

Figure 9.10.1: DS-TT port neighbor discovery configuration for DS-TT ports information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of DS-TT port neighbor discovery configuration for DS-TT ports instance | | | | | | | | octet 4  octet 5 |
| DS-TT port number value | | | | | | | | octet 6  octet 7 |
| lldpV2LocPortIdSubtype value | | | | | | | | octet 8 |
| Length of lldpV2LocPortId value | | | | | | | | octet 9 |
| lldpV2LocPortId value | | | | | | | | octet 10  octet x |

Figure 9.10.2: DS-TT port neighbor discovery configuration for DS-TT ports instance

Table 9.10.1: DS-TT port neighbor discovery configuration for DS-TT ports

|  |
| --- |
| Value part of the DS-TT port neighbor discovery configuration for DS-TT ports information element (octets 4 to z) |
|  |
| DS-TT port neighbor discovery configuration for DS-TT ports contents (octets 4 to z)  This field consists of zero or more DS-TT port neighbor discovery configuration for DS-TT ports instances. |
|  |
| DS-TT port neighbor discovery configuration for DS-TT ports instance (octets 4 to x) |
|  |
| Length of DS-TT port neighbor discovery configuration for DS-TT ports instance (octets 4 to 5)  Length of DS-TT port neighbor discovery configuration for DS-TT ports instance contains the length of the vale part of DS-TT port neighbor discovery configuration for DS-TT ports instance in octets. |
|  |
| DS-TT port number value (octets 6 to 7)  DS-TT port number value contains the value of Port Number as specified in IEEE Std 802.1Q [7]. |
|  |
| lldpV2LocPortIdSubtype value (octet 8)  lldpV2LocPortIdSubtype value contains the value of lldpV2LocPortIdSubtype as specified in IEEE Std 802.1AB [6] clause 8.5.3.2. |
|  |
| Length of lldpV2LocPortId value (octet 9)  Length of lldpV2LocPortId value contains the binary coded length in octets of lldpV2LocPortId value. |
|  |
| lldpV2LocPortId value (octets 10 to x)  lldpV2LocPortId value contains the value of lldpV2LocPortId in the form of an octet string as specified in IEEE Std 802.1AB [6] clause 8.5.3.3. |
|  |

## 9.11 Discovered neighbor information for DS-TT ports

The purpose of the Discovered neighbor information for DS-TT ports information element is to convey Discovered neighbor information for DS-TT ports as defined in 3GPP TS 23.501 [2] table 5.28.3.1-2.

The Discovered neighbor information for DS-TT ports information element is coded as shown in figure 9.11.1, figure 9.11.2 and table 9.11.1.

The Neighbor discovery information information element has a minimum length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Discovered neighbor information for DS-TT ports IEI | | | | | | | | octet 1 |
| Length of Discovered neighbor information for DS-TT ports contens | | | | | | | | octet 2  octet 3 |
| Discovered neighbor information for DS-TT ports instance 1 | | | | | | | | octet 4\*  octet x\* |
| … | | | | | | | |  |
| Discovered neighbor information for DS-TT ports instance n | | | | | | | | octet y\*  octet z\* |

Figure 9.11.1: Discovered neighbor information for DS-TT ports information element

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of Discovered neighbor information for DS-TT ports instance | | | | | | | | octet 4  octet 5 |
| DS-TT port number value | | | | | | | | octet 6  octet 7 |
| lldpTTL value | | | | | | | | octet 8  octet 9 |
| lldpV2RemChassisIdSubtype value | | | | | | | | octet 10 |
| Length of lldpV2RemChassisId value | | | | | | | | octet 11 |
| lldpV2RemChassisId value | | | | | | | | octet 12  octet a |
| lldpV2RemPortIdSubtype value | | | | | | | | octet a+1 |
| Length of lldpV2RemPortId value | | | | | | | | octet a+2 |
| lldpV2RemPortId value | | | | | | | | octet a+3  octet x |

Figure 9.11.2: Discovered neighbor information for DS-TT ports instance

Table 9.11.1: Discovered neighbor information for DS-TT ports

|  |
| --- |
| Value part of the Discovered neighbor information for DS-TT ports information element (octets 4 to z) |
|  |
| Neighbor discovery information contents (octets 4 to z)  This field consists of zero or more Neighbor discovery information instances. |
|  |
| Neighbor discovery information instance (octets 4 to x) |
|  |
| Length of Discovered neighbor information for DS-TT ports instance (octets 4 to 5)  Length of Discovered neighbor information for DS-TT ports instance contains the length of the vale part of Discovered neighbor information for DS-TT ports instance in octets. |
|  |
| DS-TT port number value (octets 6 to 7)  DS-TT port number value contains the value of Port Number as specified in IEEE Std 802.1Q [7]. |
|  |
| lldpTTL value (octets 8 to 9)  lldpTTL value contains the value of TTL as specified in IEEE Std 802.1AB [6] clause 8.5.4. |
|  |
| lldpV2RemChassisIdSubtype value (octet 10)  lldpV2RemChassisIdSubtype value contains the value of lldpV2RemChassisIdSubtype as specified in IEEE Std 802.1AB [6] clause 8.5.2.2. |
|  |
| Length of lldpV2RemChassisId value (octet 11)  Length of lldpV2RemChassisId value contains the binary coded length in octets of lldpV2RemChassisId value. |
|  |
| lldpV2RemChassisId value (octets 12 to a)  lldpV2RemChassisId value contains the value of lldpV2RemChassisId in the form of an octet string as specified in IEEE Std 802.1AB [6] clause 8.5.2.3. |
|  |
| lldpV2RemPortIdSubtype value (octet a+1)  lldpV2RemPortIdSubtype value contains the value of lldpV2RemPortIdSubtype as specified in IEEE Std 802.1AB [6] clause 8.5.3.2. |
|  |
| Length of lldpV2RemPortId value (octet a+2)  Length of lldpV2RemPortId value contains the binary coded length in octets of lldpV2RemPortId value. |
|  |
| lldpV2RemPortId value (octets a+3 to x)  lldpV2RemPortId value contains the value of lldpV2RemPortId in the form of an octet string as specified in IEEE Std 802.1AB [6] clause 8.5.3.3. |
|  |

## 9.12 TSN AF feature support

The purpose of the TSN AF feature support information element is to indicate whether certain features are supported by the TSN AF.

The TSN AF feature support information element is coded as shown in figure 9.12.1 and table 9.12.1.

The TSN AF feature support is a type 4 information element with a length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| TSN AF feature support IEI | | | | | | | | octet 1 |
| Length of TSN AF feature support contents | | | | | | | | octet 2 |
| 0 Spare | 0 Spare | 0 Spare | 0 Spare | 0 Spare | 0 Spare | 0 Spare | Per-Inst | octet 3 |

Figure 9.12.1: TSN AF feature support information element

Table 9.12.1: TSN AF feature support information element

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Per-instance parameter handling for stream filter instance table indicator (Per-Inst) (octet 3, bit 1) | | | | |
| This bit indicates the support of per-instance parameter handling for stream filter instance table. | | | | |
| Bit | | | | |
| 1 |  |  |  |  |
| 0 |  |  |  | Per-instance parameter handling for stream filter instance table not supported |
| 1 |  |  |  | Per-instance parameter handling for stream filter instance table supported |
|  | | | | |

## 9.13 TT feature support

The purpose of the TT feature support information element is to indicate whether certain features are supported by the DS-TT or NW-TT.

The TT feature support information element is coded as shown in figure 9.13.1 and table 9.13.1.

The TT feature support is a type 4 information element with a length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| TT feature support IEI | | | | | | | | octet 1 |
| Length of TT feature support contents | | | | | | | | octet 2 |
| 0 Spare | 0 Spare | 0 Spare | 0 Spare | 0 Spare | 0 Spare | 0 Spare | Per-Inst | octet 3 |

Figure 9.13.1: TT feature support information element

Table 9.13.1: TT feature support information element

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Per-instance parameter handling for stream filter instance table indicator (Per-Inst) (octet 3, bit 1) | | | | |
| This bit indicates the support of per-instance parameter handling for stream filter instance table. | | | | |
| Bit | | | | |
| 1 |  |  |  |  |
| 0 |  |  |  | Per-instance parameter handling for stream filter instance table not supported |
| 1 |  |  |  | Per-instance parameter handling for stream filter instance table supported |
|  | | | | |

## 9.14 NW-TT port numbers

The purpose of the NW-TT port numbers information element is to convey NW-TT port numbers as defined in 3GPP TS 23.501 [2] table 5.28.3.1-2.

The NW-TT port numbers information element is coded as shown in figure 9.14.1 and table 9.14.1.

The NW-TT port numbers information element has a minimum length of 3 octets.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| NW-TT port numbers IEI | | | | | | | | octet 1 |
| Length of NW-TT port numbers contents | | | | | | | | octet 2  octet 3 |
| NW-TT port number 1 value | | | | | | | | octet 4  octet 5 |
| … | | | | | | | |  |
| NW-TT port number n value | | | | | | | | octet n-1  octet n |

Figure 9.14.1: NW-TT port numbers information element

Table 9.14.1: NW-TT port numbers

|  |
| --- |
| Value part of the NW-TT port numbers information element (octets 4 to n) |
|  |
| NW-TT port numbers contents (octets 4 to n)  This field consists of zero or more NW-TT port numbers. |
|  |
| NW-TT port number (octets 4 to 5)  NW-TT port number value contains the value of Port Number as specified in IEEE Std 802.1Q [7]. |
|  |

# 10 Timers of port management service

Timers of port management service are shown in table 10.1, table 10.2, table 10.3, table 10.4 and table 10.5.

Table 10.1: Timers of port management service – TSN AF side

| TIMER NUM. | TIMER VALUE | CAUSE OF START | NORMAL STOP | ON  THE 1st, 2nd, 3rd, 4th EXPIRY |
| --- | --- | --- | --- | --- |
| T100 | NOTE | Transmission of MANAGE PORT COMMAND message | MANAGE PORT COMPLETE message received | Retransmission of MANAGE PORT COMMAND message |
| NOTE: The value of this timer is network dependent. | | | | |

Table 10.2: Timers of Bridge management service – TSN AF side

| TIMER NUM. | TIMER VALUE | CAUSE OF START | NORMAL STOP | ON  THE 1st, 2nd, 3rd, 4th EXPIRY |
| --- | --- | --- | --- | --- |
| T150 | NOTE | Transmission of MANAGE BRIDGE COMMAND message | MANAGE BRIDGE COMPLETE message received | Retransmission of MANAGE BRIDGE PORT COMMAND message |
| NOTE: The value of this timer is network dependent. | | | | |

Table 10.3: Timers of port management service – DS-TT side

| TIMER NUM. | TIMER VALUE | CAUSE OF START | NORMAL STOP | ON  THE 1st, 2nd, 3rd, 4th EXPIRY |
| --- | --- | --- | --- | --- |
| T200 | NOTE | Transmission of PORT MANAGEMENT NOTIFY message | PORT MANAGEMENT NOTIFY ACK message received | Retransmission of PORT MANAGEMENT NOTIFY message |
| NOTE: The value of this timer is DS-TT dependent. | | | | |

Table 10.4: Timers of port management service – NW-TT side

| TIMER NUM. | TIMER VALUE | CAUSE OF START | NORMAL STOP | ON  THE 1st, 2nd, 3rd, 4th EXPIRY |
| --- | --- | --- | --- | --- |
| T300 | NOTE | Transmission of PORT MANAGEMENT NOTIFY message | PORT MANAGEMENT NOTIFY ACK message received | Retransmission of PORT MANAGEMENT NOTIFY message |
| NOTE: The value of this timer is NW-TT dependent. | | | | |

Table 10.5: Timers of Bridge management service – NW-TT side

| TIMER NUM. | TIMER VALUE | CAUSE OF START | NORMAL STOP | ON  THE 1st, 2nd, 3rd, 4th EXPIRY |
| --- | --- | --- | --- | --- |
| T350 | NOTE | Transmission of BRIDGE MANAGEMENT NOTIFY message | BRIDGE MANAGEMENT NOTIFY ACK message received | Retransmission of BRIDGE MANAGEMENT NOTIFY message |
| NOTE: The value of this timer is NW-TT dependent. | | | | |

\* \* \* End of changes \* \* \* \*