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Source(s)	Joël Demarty, Ambroise Popper SEQUANS Communications mailto:joel@sequans.com mailto:ambroise@sequans.com
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Corrections and Clarifications on Service Flow Error Sets

1 Current text ambiguities and inconsistencies

There are inconsistencies in the text of the specification on Dynamic Services that originate from suppressed TLVs with respect to DOCSIS RFI:

- The Service Flow Error Set TLV has been removed from the Standard. The whole specification is not up to date with this change. Some sections of §6.3.2.3 (MAC Management Messages) are still referring this TLV.
- The Classifier Parameter Error Set TLV and the PHS Error Set TLV have not been removed from the Standard. However, there is not a single reference to any of these parameters outside of section §11.13 (Service Flow Management Encodings).

Due to this inconsistency, it is practically impossible to determine whether a station has to encode or not errors in a DSX MAC management message and how it should encode it.

Yet, it could be interesting to have the errored TLVs in the DSx response for QoS parameters. For instance, a subscriber station could start a DSA transaction with an ideal QoS (very low latency for instance), and could react to BS rejection with another DSA transaction with less strict QoS requirements (higher latency), while at the same time changing its codec/buffer accordingly.

Unfortunately, with the suppressed TLVs, there is no way to encode parameters in error as there are no TLVs to encode the CC at the parameter level. How shall the station encode multiple errored parameters and missing required parameters? There are obviously solutions to these problems but they would require a lot of changes which go in the opposite direction of the suppression of the Service Flow Error Set TLV.

Moreover, detailing an error caused by errored classifiers or PHS with the level of precision required by PHS Error Set TLV and Classifier Error Set TLV doesn't bring much operational interest. As this level of information is only needed to troubleshoot a failed DSX, it's up to the vendor to provide the level of details needed to debug a specific DSx failure efficiently, e.g. with syslogs or SNMP traps or any other way which may seem appropriate.

As a consequence, we propose to remove all references to Error Sets from the spec and avoid requiring a station to detail the error in error sets. The next section describes the proposed changes.

2 Proposed Text Changes

[Modify §6.3.2.3.11]

If the transaction is successful, the DSA-RSP may contain the following:

Service Flow Parameters (see 11.13)

The complete specification of the service flow shall be included in the DSA-RSP if it includes a newly assigned CID or an expanded Service Class Name ~~or to point to specific parameter that caused rejection of connection creation (only in the case CC = "reject-not-supported-parameter-value" or "reject-not-supported-parameter.~~

~~If the transaction is unsuccessful, the DSA-RSP shall include:~~

~~**Service Flow Error Set** (see 11.13)~~

~~A Service Flow Error Set and identifying service flow reference/SFID shall be included for every failed service flow in the corresponding DSA-REQ message. Every Service Flow Error Set shall include every specific failed QoS Parameter of the corresponding service flow (see 11.13). This parameter shall be omitted if the entire DSA-REQ is successful.~~

[Modify §6.3.2.3.11.1]

~~If the transaction is unsuccessful, the BS shall use the original service flow reference to identify the failed parameters in the DSA-RSP.~~

[Remove §6.3.2.3.11.2]

~~**6.3.2.3.11.2 BS-Initiated DSA**~~

~~If the transaction is unsuccessful, the SS shall use the SFID to identify the failed parameters in the DSA-RSP.~~

[Modify §6.3.2.3.12]

~~**Service Flow Error Set** (see 11.13)~~

~~The Service Flow Error Set of the DSA-ACK message encodes specifics of any failed service flows in the DSA-RSP message. A Service Flow Error Set and identifying service flow reference shall be included for every failed QoS Parameter of every failed service flow in the corresponding DSA-REQ message (see 11.13). This parameter shall be omitted if the entire DSA-REQ is successful.~~

[Modify §6.3.2.3.14]

~~If the transaction is unsuccessful, the DSC-RSP shall contain the following:~~

~~**Service Flow Error Set (see 11.13)**~~

~~A Service Flow Error Set and identifying CID shall be included for every failed service flow in the corresponding DSC-REQ message. Every Service Flow Error Set shall include every specific failed QoS Parameter of the corresponding service flow (see 11.13). This parameter shall be omitted if the entire DSC-REQ is successful.~~

[Modify §6.3.2.3.15]

~~**Service Flow Error Set (see 11.13)**~~

~~The Service Flow Error Set of the DSC-ACK message encodes specifics of any failed service flows in the DSC-RSP message. A Service Flow Error Set and identifying SFID shall be included for every failed QoS Parameter of each failed service flow in the corresponding DSC-RSP message (see 11.13). This parameter shall be omitted if the entire DSC-RSP is successful.~~

[Modify §11.13]

The CC indicates the status for the dynamic service (DSx-xxx) messages. The value ~~may~~ appear[s] in the Confirmation Code field of a DSx message~~ or as the value of a TLV-encoded error parameter~~.

[…]

~~In the case CC = "reject-not-supported-parameter" or CC = "reject-not-supported-parameter-value", the corresponding TLV(s) may be returned to caller in DSx-RSP message. In the case of CC = "reject-not-supported-parameter-value" the value field of the returned TLV should contain the closest value that is supported.~~

[Remove §11.13.19.3.3 - Classifier error parameter set]
[Remove §11.13.19.3.3.1- Errored parameter]
[Remove §11.13.19.3.3.2 - Error code]
[Remove §11.13.19.3.3.3 - Error message]
[Remove §11.13.19.3.6 - PHS error parameter set]
[Remove §11.13.19.3.6.1 - Errored parameter]
[Remove §11.13.19.3.6.2 - Error code]
[Remove §11.13.19.3.6.3 - Error message]
[Remove §11.13.19.4.4 - ATM Classifier Error Parameter Set]

[Modify §12.1.1.3]

12.1.1.3 Conventions for MAC Management messages for profiles profM1 and profM2

The following rules shall be followed when reporting parameters in MAC Management messages:
— Service Class Names should not be used.
— No TLVs besides ~~Error Encodings and~~ HMAC Tuples shall be reported back in DSA-RSP and DSC-RSP messages.
— No TLVs besides HMAC Tuples shall be reported back in DSA-ACK messages.

— DSC-REQ messages shall not contain Request/Transmission Policy, Fixed vs. Variable Length SDU Indicator, SDU Size, ATM Switching, or Convergence Sublayer Specification TLVs.

[Modify §12.1.1.4.20]

12.1.1.4.20 DSA-RSP—BS Initiated Service Addition

— Uplink Service Parameters
~~— Service Flow Error Parameter Set(s) (one per errored parameter)~~
~~— Errored Parameter~~
~~— Error Code~~
~~— Error Message (optional)~~
— Downlink Service Parameter(s)
~~— Service Flow Error Parameter Set(s) (one per errored parameter)~~
~~— Errored Parameter~~
~~— Error Code~~
~~— Error Message (optional)~~
— HMAC Tuple

[Modify §12.1.1.4.23]

12.1.1.4.23 DSC-RSP—BS Initiated Service Addition

— Uplink Service Parameters
~~— Service Flow Error Parameter Set(s) (one per errored parameter)~~
~~— Errored Parameter~~
~~— Error Code~~
~~— Error Message (optional)~~
— Downlink Service Parameter(s)
~~— Service Flow Error Parameter Set(s) (one per errored parameter)~~
~~— Errored Parameter~~
~~— Error Code~~
~~— Error Message (optional)~~
— HMAC Tuple

[Modify §12.1.1.6.2]

12.1.1.6.2 Packet CS Parameters for DSA-RSP—BS Initiated
— Packet Classification Rule(s) (uplink service flows only, default is no classification)
~~— Classifier Error Parameter Set(s) (one per errored parameter)~~
~~— Classifier Rule ID~~
~~— Errored Parameter~~
~~— Error Code~~
~~— Error Message (optional)~~
— PHS Rule(s)
~~— PHS Error Parameter Set(s) (one per errored parameter)~~
~~— PHSI~~
~~— Errored Parameter~~
~~— Error Code~~
~~— Error Message (optional)~~

[Modify §12.1.1.6.4]

12.1.1.6.4 Packet CS Parameters for DSC-RSP—BS Initiated
— Packet Classification Rule(s) (uplink service flows only, default is no classification)
~~— Classifier Error Parameter Set(s) (one per errored parameter)~~
~~— Classifier Rule ID~~
~~— Errored Parameter~~
~~— Error Code~~
~~— Error Message (optional)~~
— PHS Rule(s)
~~— PHS Error Parameter Set(s) (one per errored parameter)~~
~~— PHSI~~
~~— Errored Parameter~~
~~— Error Code~~
~~— Error Message (optional)~~

[Modify §12.4.2.1.1]

12.4.2.1.1 Conventions for MAC Management Messages

The following rules shall be followed when reporting parameters in MAC Management messages:

— Service Class Names should not be used.

— No TLVs besides ~~Error Encodings and~~ HMAC Tuples shall be reported back in DSA-RSP and DSC-RSP messages.

— No TLVs besides HMAC Tuples shall be reported back in DSA-ACK messages.

— DSC-REQ messages shall not contain Request/Transmission Policy, Fixed vs. Variable Length SDU Indicator, SDU Size, ATM Switching, or Convergence Sublayer Specification TLVs.