TODAY'S
TOPIC

CONTENT

DIAGNOSTIC COMMUNICATION OVER CAN

What is DTC aging Counter && aging?

DTC Aging Counter counts the driving cycles elapsed since the last occurrence of a fault.
The aging counter reaches its minimum value of (-128) when a new operation cycle commences, and the status of the “Test Not Complete This Operation Cycle” bit transitions from 1 to 0.

The aging in DTC is a process by which a certain ECU evaluates the past results of each internal diagnostic to determine if a confirmed DTC can be cleared from Non-Volatile Memory (NVM).

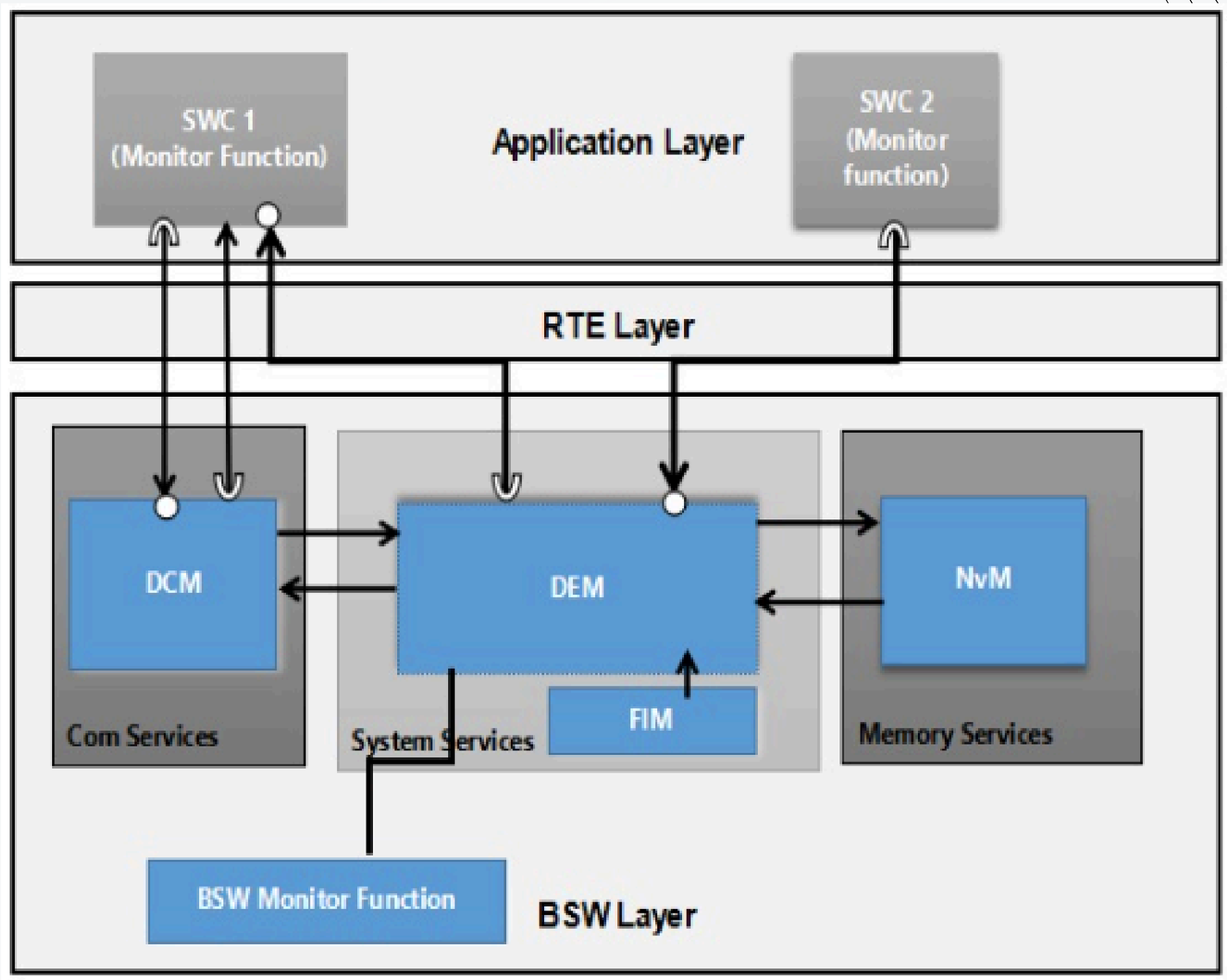
DIAGNOSTIC COMMUNICATION OVER CAN

Diagnostic Stack?

In Service Layer.

In order?

CAN message -> CAN Interface -> CAN TP -> PDUR -> DCM -> SWC



DIAGNOSTIC COMMUNICATION OVER CAN

What is DCM?

Diagnostic Communication Manager (DCM)

DCM module accepts incoming request service from tester tool validates service and take proper action related to service and send Positive response or Negative Response Code (NRCs) based on validation of incoming request and processing of request.

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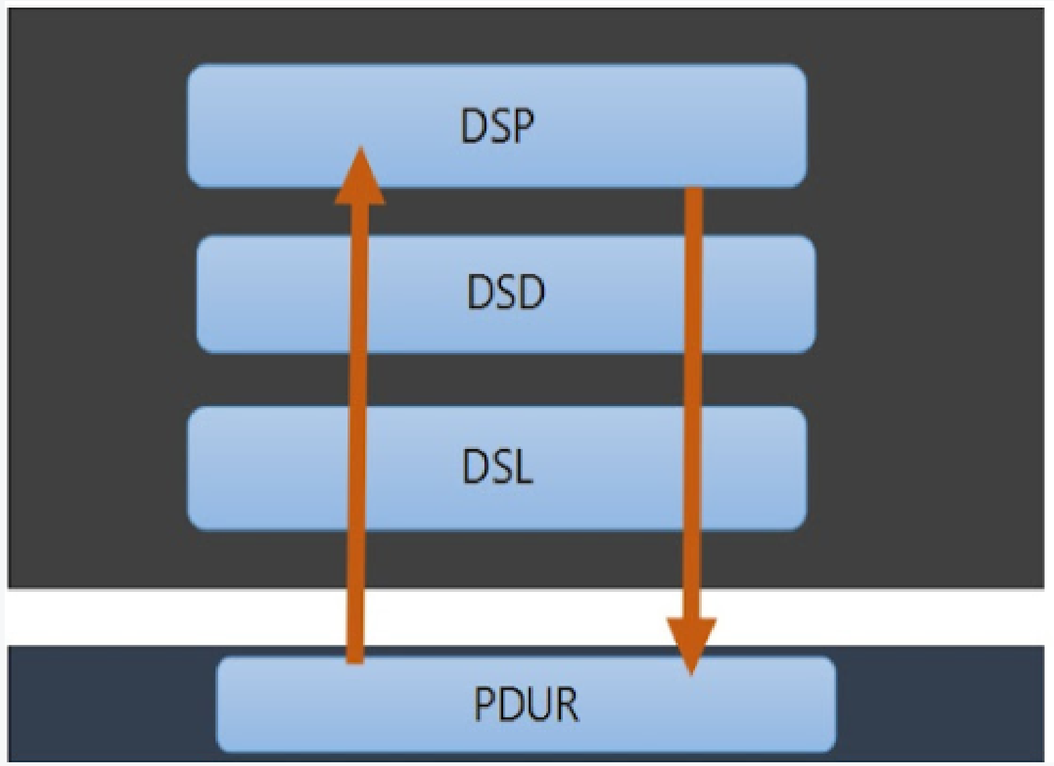
Inside DCM?



DIAGNOSTIC COMMUNICATION OVER CAN

Role of DSP?

Diagnostic Service Processor

Validates minimum length check of request message and sub-function support

Assemble response

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Role of DSD?

Diagnostic Service Dispatcher

Check DSI

Vertify diagnostic session service security level

Handling of suppression of positive response

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Role of DSL?

Diagnostic Session Layer

DSL manage the security level

supervise timing P2MAX P2*AMX S3Server time

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P2MAX ?

P2 and P2 extended timings that specify the maximum time the server (ECU) or client (tester) has to wait or respond to the UDS request.

P2 specifies the default timing that should be used for the response from the server (ECU).

However, the ECU has the option to send a negative response code (NRC) 0x78 instead of providing an immediate response.

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P2*MAX ?

When the ECU sends NRC 0x78, it indicates that it needs more time to process the request and generate a response. In this case, the extended timing value, also known as P2* comes into play.

The P2* value specifies the maximum allowable additional time the ECU requires to generate the response.

The diagnostic tester should wait for the extended time (P2*) before considering the request as timed out and assuming no response is forthcoming.

DIAGNOSTIC COMMUNICATION OVER CAN

What is S3 server?

The S3 server parameter is the server (ECU) side timing parameter implemented in each ECUs. The main function of the S3 server parameter is to auto-return into the default session from the non-default session (programming, Extended, Safety system session) after the timeout. The timeout value is based on the S3 parameter only.

DIAGNOSTIC COMMUNICATION OVER CAN

0x22 / 0x2E NRC priority?

0x11 (Service Not Supported)

0x12 (Sub-Function Not Supported)

0x13 (Incorrect Message Length or Invalid Format)

0x22 (Conditions Not Correct)

0x31 (Request Out Of Range)

0x33 (Security Access Denied)

0x78 (Response Pending)