Understanding the weightage:

1. **Conceptual knowledge: 50%**
2. **Possible Request and Positive Response Frame:20%**
3. **Supported NRC& Usage w.r.t Service :15%**
4. **Tool Usage: 15%**

Topics to be covered!!

Diagnostics Session Control (0x11)

1) **Purpose**

2) **Short Description**

3) **Sub-functions supported**

4) **Detailed Description**

5) **Request message frame**

6) **Positive Response message frame**

7) **Supported NRC's**

8) **Negative response frame**

"Purpose: Switch from one session to another"

Unified Diagnostic Services uses **different operating states or sessions**, which can be switched to one session to another based upon the usage or standards or recommendations or Original Equipment Manufacturer (OEM's)

Sub function	Description
00	Reserved
01	Default Session
02	Programming Session
03	Extended Diagnostic Session
04	Safety System Diagnostic Session
05-3F	Reserved
40-5F	Vehicle Manufacturer Specific
60-7E	System Supplier Specific
7F	Reserved

Description:

This service enables a data link layer **(consider as 2nd layer in OSI)** dependent set of timing parameters.

There should be **only one session active at a time**.

If no other session has enabled after **power-up** then server will continue with default session only.

ECU should be capable of providing diagnostic functionality under **normal operating conditions** and in other operating conditions defined by the **vehicle manufacturer / System supplier** specific or others.

If the tester requested a diagnostic session (01, 02, 03 or 04) which is **already running**, then the server shall send a **positive response** message and behave as per the session characteristics!!

Whenever the tester request for new diagnostic session then server will send the **positive response message before the timings of the new session become active in the server**.

Transition:

When the server is in the **default Session** and the client requests to start the default Session, then the server shall **re-initialize** the default Session completely

But this will not impact NVM

When the server transitions from the default Session to any other session than the default Session, then the server shall only reset the events that have been configured in the server
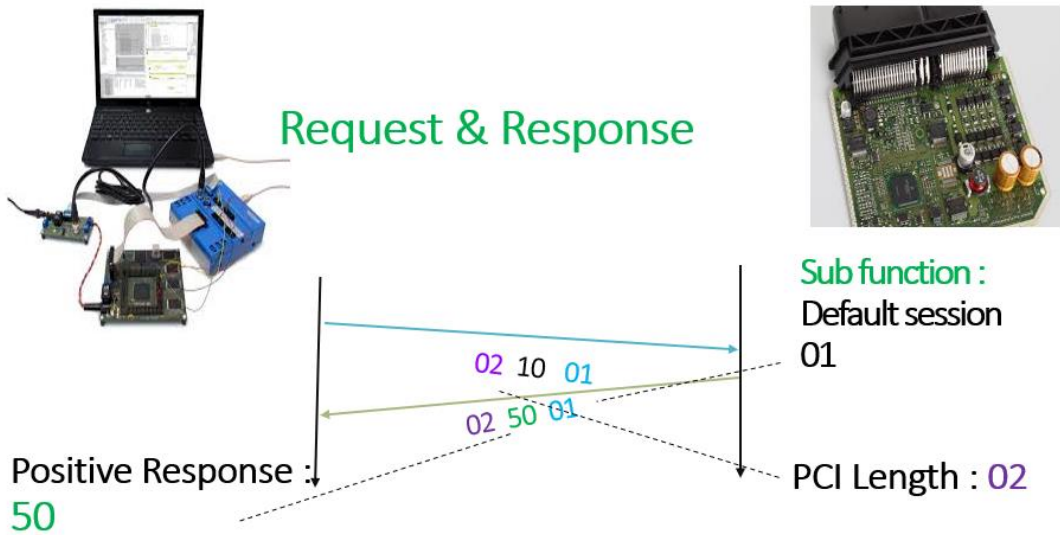
Any configured **periodic scheduler** shall remain active when transitioning from one non-default Session to another or the same non-default Session.

The states of the Communication Control & Control DTC Setting services shall not be affected, which means, for example, that normal communication shall remain disabled when it is disabled at the point in time at which the session is switched.
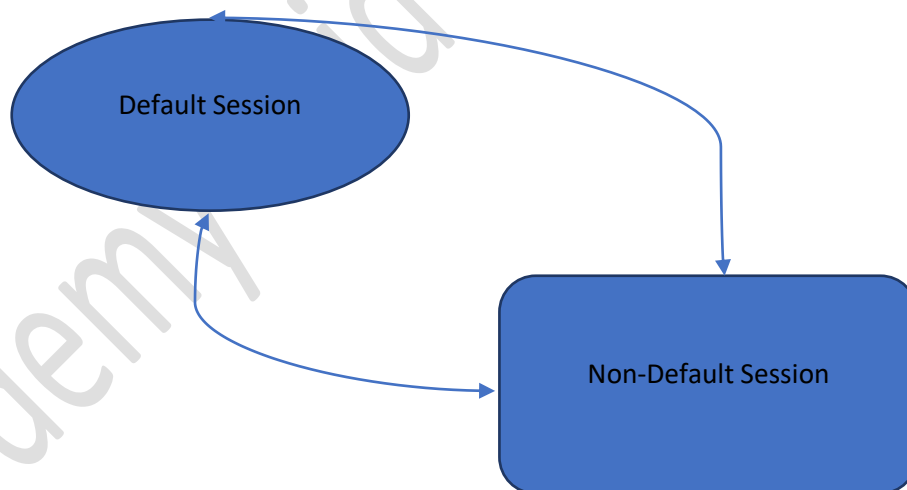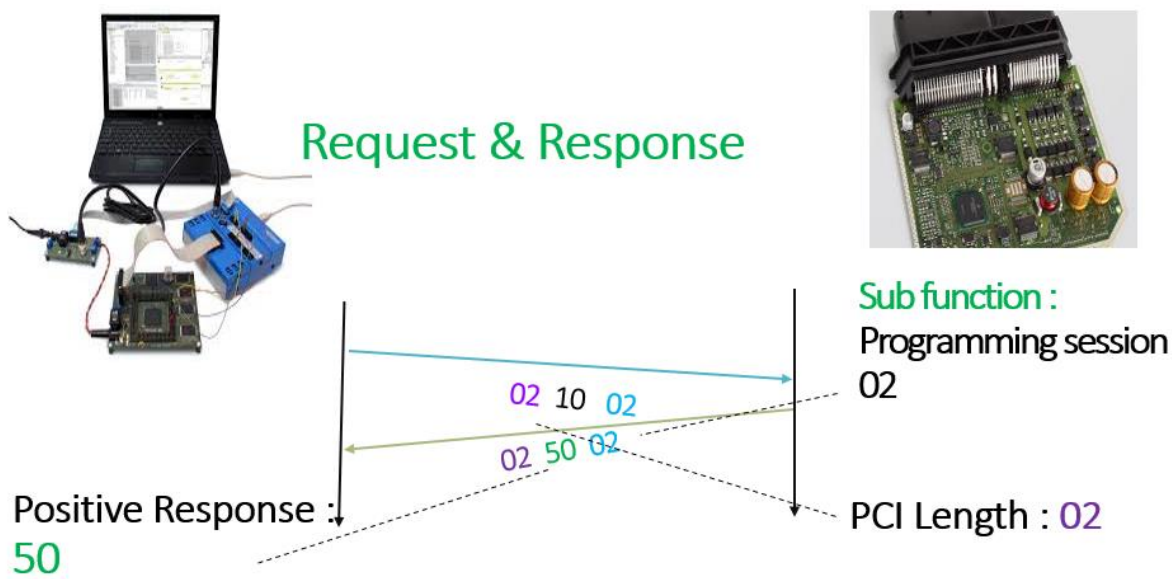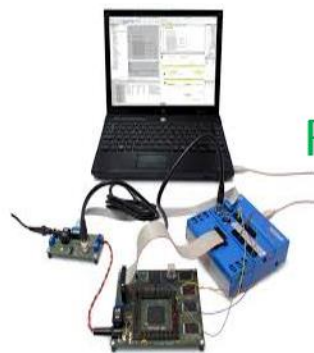
Valid Request and Positive Response
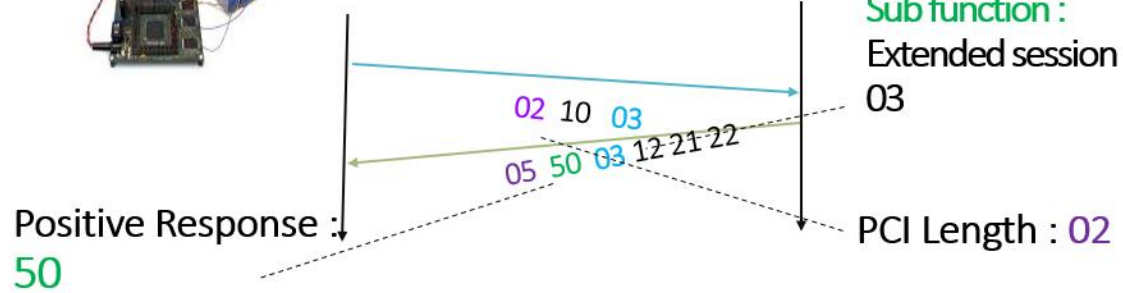
Default Session:

Request & Response

Sub function :
Default session
01

02 10 01

02 50 01

Positive Response :
50

PCI Length : 02

Programming Session:

Request & Response

Sub function :
Programming session
02

02 10 02

02 50 02

Positive Response :
50

PCI Length : 02

Extended Session:

Request & Response

Sub function :
Extended session
03

02 10 03

05 50 03 12 21 22

Positive Response :
50

PCI Length : 02

Safety Session:

Request & Response

Sub function :
Safety session
04

02 10 04

02 50 04

Positive Response :
50

PCI Length : 02
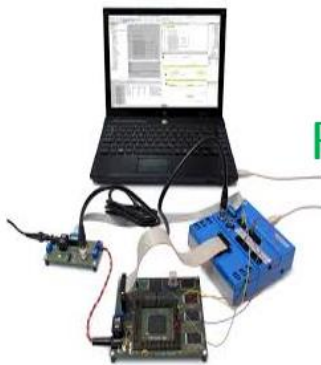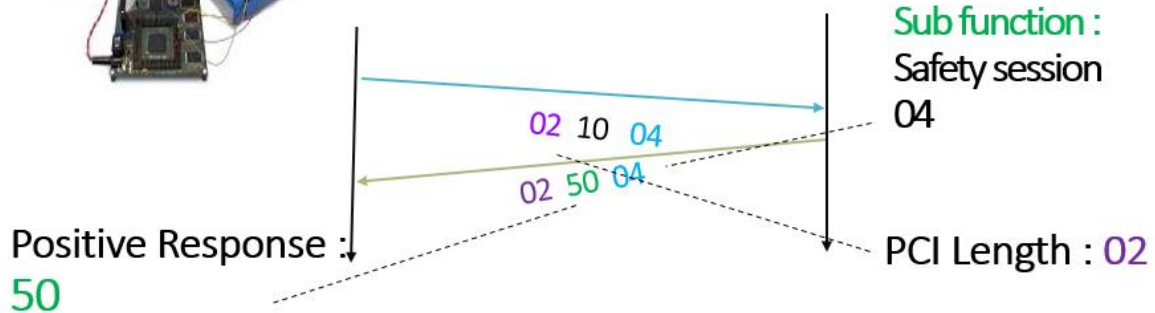
Invalid Request and Negative Response

Supported NRC for 0x10

12 – Sub Function Not Supported

If you send any non-implemented or wrong sub-function then the response message you will get is sub-function not supported.

13 – Incorrect Message Length or Invalid Format in PCI length Declaration

The length which is consider as PCI if we requested as wrong/invalid then the it will give you negative response as 13.
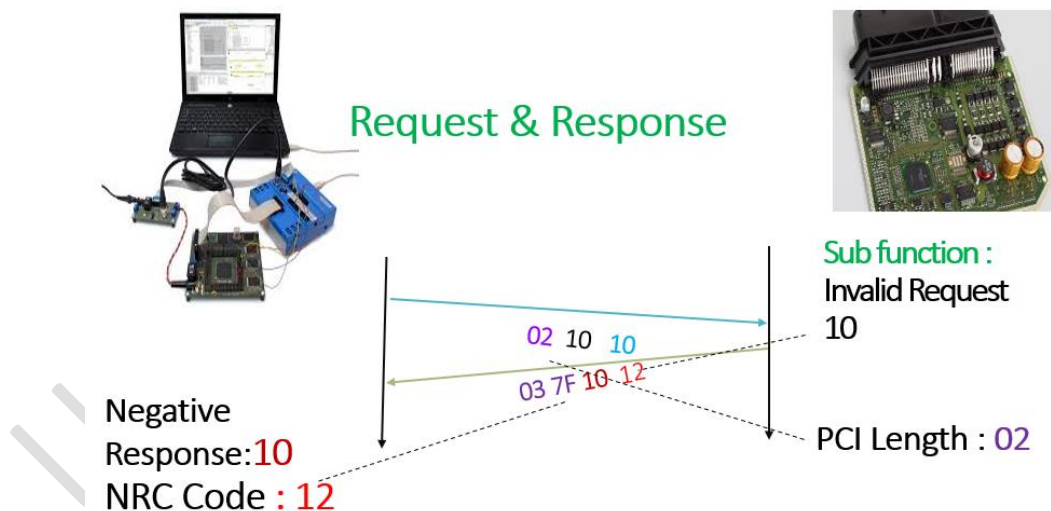
22- conditions Not Correct

This code shall be returned if the criteria for the request Diagnostic Session Control are not met.
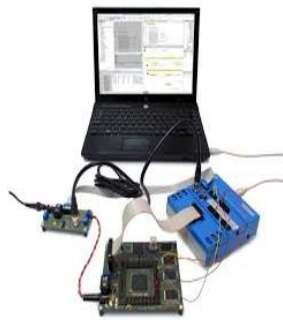
NRC Frame Format:

PCI Length	Negative Response	Service ID	NRC Code

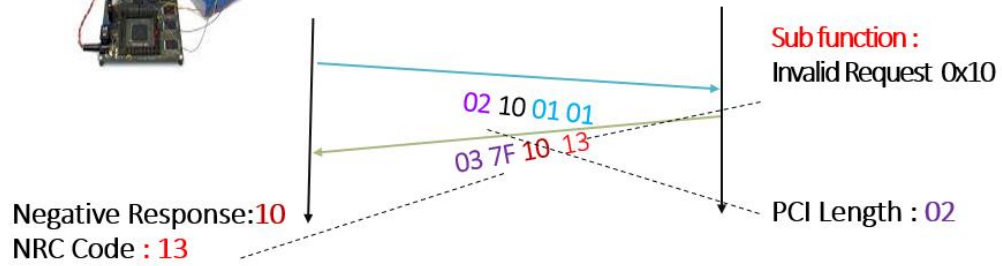**NRC 12: Sub-Function Not Supported**

NRC 13: Incorrect Length

Request & Response

02 10 01 01

03 7F 10 13

Sub function :
Invalid Request 0x10

PCI Length : 02

Negative Response: 10
NRC Code : 13

NRC 22: Conditions Not Correct

Request & Response

02 10 02

03 7F 10 22

Sub function :
Invalid Request 0x02
when condition not correct

PCI Length : 02

Negative Response: 10
NRC Code : 22