
MAPS™ - M2UA Conformance Testing

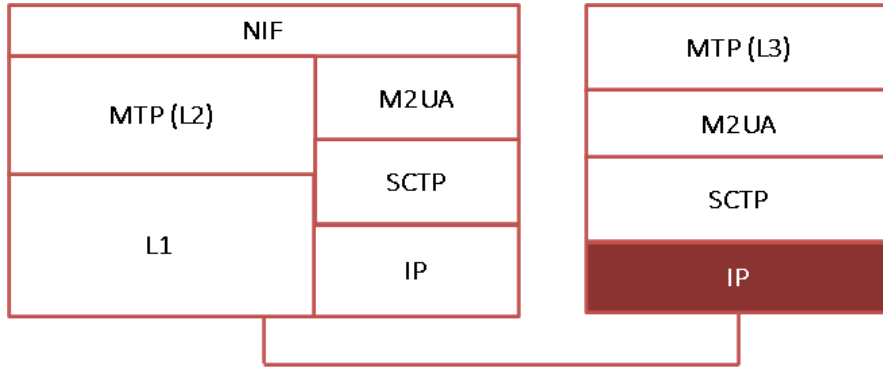


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Features

- Emulates ASP and SGP nodes
- Generates and process M2UA (valid and invalid) messages
- Insertion of impairments to create invalid messages
- Supports customization of call flow and message templates using Script and Message Editor
- Ready-to-use scripts for quick testing
- Supports scripted call generation and automated call reception
- Provides Call Statistics and Events Status
- Automation, Remote access, and Schedulers to run tests 24/7

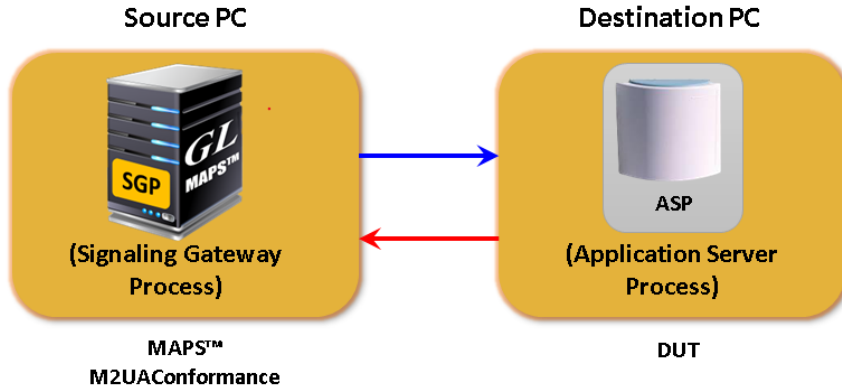
Protocol Stack Specification



Supported Protocols	Standard / Specification Used
NIF - Nodal Interworking Function	TS 102 380 [1]
M2UA	RFC 3331
SCTP - Stream Control Transmission Protocol	RFC 4960
MTP2 - Message Transfer Part 2	Q.703, ITU-T Blue Book
MTP3 - Message Transfer Part 3	Q.703, ITU-T Blue Book

MAPS™ M2UA Conformance Testing – Use Cases

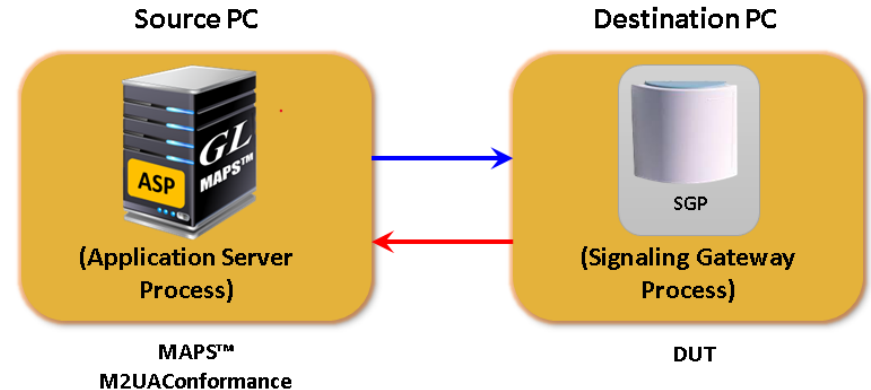
ASP Testing



- In SGP Testing, SGP node is the device under test and the other node ASP interacting with the SGP node is acting as MAPS™ M2UA Conformance

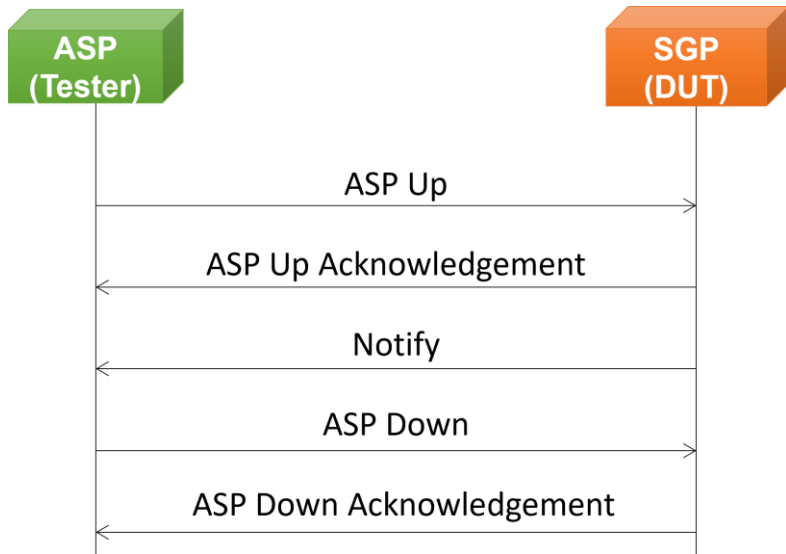
- In ASP Testing, ASP node is the device under test and the other node SGP interacting with the ASP node is acting as MAPS™ M2UA Conformance

SGP Testing

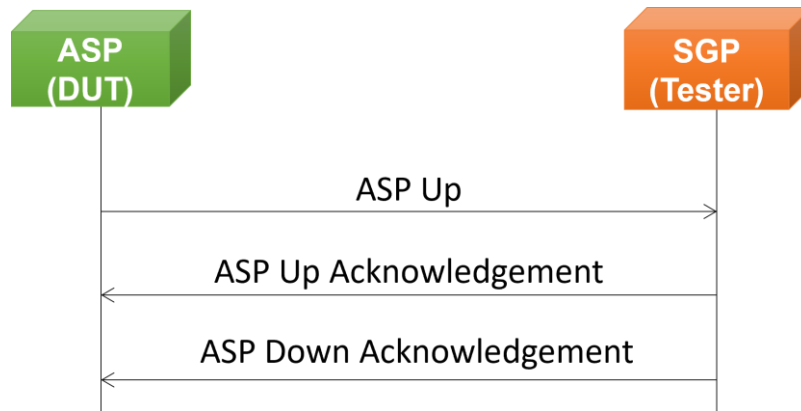


MAPS™ M2UA Conformance Call Scenarios

M2UA_Conformance_ASP Testcase



M2UA_Conformance_SGP Testcase



Testbed Configurations

MAPS (Message Automation Protocol Simulation) ASP (M2UAConformance ITU) - [Testbed Setup - TestBe...

Configurations Emulator Reports Editor Debug Tools Windows Help

Config Value

Config	Value	Enable
ASP Configuration		<input checked="" type="checkbox"/>
ASP Simulation Mode	Simulation Mode	
ASPs	1	
ASPs 1		
SCTP Association		
ASP SCTP Mode	Client	
ASP IP Address	192.168.12.47	
ASP Source Port	2904	
SGP IP Address	192.168.12.55	
SGP Port	2904	
ASP Identifier Configuration		
Include ASP Identifier	False	
ASP Identifier	1	
Traffic Mode Configuration		
Include Traffic Mode Type	True	
Traffic Mode Type	Load-Share	
AS Configuration		
Interface Id Type	Integer	
Dynamic Registration	True	
Include InterfaceID in ASP Active	True	
SS7 Link Configuration		
SS7 Links	1	
SS7 Links 1		
Interface Id for Integer Type	1	
Interface Id for Text Type	IIDtxt1	
Local LK Identifier	2	
Signaling Data Terminal Identifier	3	
Signaling Data Link Identifier	4	
Conformance Test Configuration	ASP_Conformance_Profile.xml	

Start Edit

Initialisation Errors Error Events

Profile Configurations

The screenshot displays the MAPS (Message Automation Protocol Simulation) ASP (M2UAConformance ITU) - [Profile Editor -ASP_Conformance_Profile] window. The window title bar includes the GL logo and the text "MAPS (Message Automation Protocol Simulation) ASP (M2UAConformance ITU) - [Profile Editor -ASP_Conformance_Profile]". The menu bar contains "Configurations", "Emulator", "Reports", "Editor", "Debug Tools", "Windows", and "Help". The toolbar includes icons for settings, save, print, help, and refresh.

The main area is divided into three sections:

- Profiles (Edit-F2):** A list of profiles from 1 to 9, with "M2UASGPASTMV01" selected.
- Config:** A tree view showing the configuration for the selected profile. The root is "M2UASGPASTMV01", which contains "M2UA Conformance". Under "M2UA Conformance", there are two sub-items: "Test Case Name" (value: M2UA_SGP_ASPM_V_01) and "Invalid Parameters for Invalid and Error handling". Under "Invalid Parameters for Invalid and Error handling", there are two sub-items: "ASP Identifier" (value: 100) and "Interface Id" (value: 500).
- Properties:** A panel on the right with a checked "Enable" checkbox and buttons for "Add", "Insert", "Delete", and "Properties".

At the bottom of the window, there are three status bars: "Initialisation Errors", "Error Events", and "Captured Errors", each with a circular indicator. A "Lir" button is also visible in the bottom right corner.

Global Configuration

The screenshot shows the 'Global Configuration' window in the MAPS software. The window title is 'MAPS (Message Automation Protocol Simulation) ASP (M2UAConformance ITU) - [Global ...]'. The menu bar includes 'Configurations', 'Emulator', 'Reports', 'Editor', 'Debug Tools', 'Windows', and 'Help'. The toolbar contains various icons for configuration, simulation, and help.

The main area displays a tree view of configuration options under 'Global Configuration':

- M2UA Parameters
 - Alignment: Normal
 - Dynamic Registration: Not Required
- M2UA Specific Timers
 - TackTimer in msec: 2000
 - TbeatTimer in msec: 30000
 - EstReqTimer in msec: 2000
 - EstConTimer in msec: 20000

On the right side, there is a checkbox labeled 'Enable' which is checked. Below the table, there are 'Apply' and 'Edit' buttons.

At the bottom of the window, there are two status indicators: 'Initialisation Errors' and 'Error Events', both with a grey circle icon.

Incoming Call Handler Configuration

MAPS (Message Automation Protocol Simulation) ASP (M2UAConformance ITU) - [Incoming Call Handlers Configuration - default]

Configurations Emulator Reports Editor Debug Tools Windows Help

Message Name	Script Name
ASP Up	Conformance.gls
ASP Down	Conformance.gls
ASP Active	Conformance.gls
ASP Inactive	Conformance.gls
Establish Request	Conformance.gls

Scripts (Check to Hide)

- Conformance.gls

Sequence
 Random

Up
Down

Add Delete

Add Delete Apply Scripts Clear Scripts

Initialisation Errors Error Events Captured Errors

Script Editor

The screenshot shows the Script Editor application window. The title bar reads "ScriptEditor - [C:\Users\Prabhavathi\Desktop\Bhavaya\MAPS-M2UAConformance\MAPS\M2UAConformance\ITU\ASP\Scripts\M2UA_ASP.gls]". The menu bar includes "File", "View", "Edit", "Shortcuts", "Tools", and "Help". The toolbar contains icons for file operations and settings. On the left, a "Command Window" pane is open, displaying a tree view of actions and functions. The main editor area shows a script for "M2UA_ASP" with the following code:

```
1  ///##M2UA_Profiles.xml##
2  //***** M2UA Procedures *****
3
4  // Initialize Variables
5
6  KeyIdentifier: ConnectionId;
7  HeartbeatData=(hexstring)0x5634523;
8  ASPIId=1;
9  RecvM2UAInterfaceId=0;
10 ASPState = "ASP_DOWN";
11 MsgHandler : "M2UA MessageHandler";
12 Status = "Waiting For SCTP status UP";
13 ASPAckUEAdded=0;
14 ASPUP_M2UA_SGP_ASPM_IO_01=0;
15 ASPActive_M2UA_SGP_ASPM_IO_03=0;
16 ASPUP_M2UA_SGP_ASPM_IO_04=0;
17 ReAttempt_ASPUPFlag=0;
18
19 if(_ConformanceMode=="True")
20     goto "GetTestCaseDescription";
21 endif
22 if (MsgReceived)
23     if(_ConformanceMode=="True")
24         exit;
25     endif
26     wait;
27 else
28     if(Invoked==1)
```

The status bar at the bottom indicates "Ready", "Line Count - 1024 | Line : 1 Col : 1", and "NUM".

Message Editor

Message Editor - ASPActive

File View Direction Tools Help

MTP2 User Adaptation

- Version
- Message Class
- ASPTM Message Type
- Message Length
- InformationElements
 - Interface Identifier(integer)
 - Interface-Identifier[integer] Tag
 - Length
 - Interface Identifier (integer)

ASP Traffic Maintenance (ASPTM) = 4
Management (MGMT) = 0
Transfer = 1
SS7 Signalling Network Management (SSNM) = 2
ASP State Maintenance (ASPSM) = 3
ASP Traffic Maintenance (ASPTM) = 4
Q.921/Q.931 Boundary Primitives Transport (QPTM) = 5
MTP2 User Adaptation (MAUP) = 6
Connectionless = 7
Connection-Oriented = 8
Routing Key Management (RKM) = 9
Interface Identifier Management (IIM) = 10

```
===== MTP2 User Adaptation Layer =====  
0000 Version = 00000001 Release 1.0  
0002 Message Class = 00000100 ASP Traffic Maintenance (ASPTM)  
0003 ASPTM Message Type = 00000001 ASP Active  
0004 Message Length = 16 (x00000010)  
    Interface Identifier(integer) =  
        Interface-Identifier[integer] Tag = x0001 Interface-Identifier(integer)-Id  
        Length = 8 (x0008)  
        Interface Identifier (integer) = 0 (x00000000)
```

Ready NUM

MAPS™ M2UA Conformance – Call Emulation

Call Generation

The screenshot displays the MAPS (Message Automation Protocol Simulation) ASP (M2UAConformance ITU) - [Call Generation] application. The interface includes a menu bar (Configurations, Emulator, Reports, Editor, Debug Tools, Windows, Help), a toolbar, and a main workspace. The workspace is divided into three sections: a table of test results, a message sequence diagram, and a log of MTP2 User Adaptation Layer messages.

Sr No	Script Name	Profile	Call Info	Script Execution	Status	Events	Result	Total Iterations	Completed Iter
1	M2UA_Conformance_ASP.gls	M2UASGPASPMV01	1	Start	ASP Down	None	Pass	1	1
2	M2UA_Conformance_ASP.gls	M2UASGPASPMV02		Start		None	Unknown	1	0
3	M2UA_Conformance_ASP.gls	M2UASGPASPMV03		Start		None	Unknown	1	0
4	M2UA_Conformance_ASP.gls	M2UASGPASPMV04		Start		None	Unknown	1	0
5	M2UA_Conformance_ASP.gls	M2UASGPASPMV05		Start		None	Unknown	1	0

Below the table, there are buttons for Add, Delete, Insert, Refresh, Start, Start All, Stop, Stop All, Abort, and Abort All. There are also input fields for Save, Column Width, and Show Latest.

The message sequence diagram shows the interaction between ASP and SGP. The sequence is as follows:

- ASP Up (11:30:20.639000)
- ASP Up Ack (11:30:20.741000)
- Notify (11:30:20.741000)
- ASP Down (11:30:20.743000)
- ASP Down Ack (11:30:20.819000)

The log of MTP2 User Adaptation Layer messages is as follows:

```
===== MTP2 User Adaptation Layer ===== =
0000 Version = 00000001
0002 Message Class = 00000011
0003 ASPSM Message Type = 00000001
0004 Message Length = 8 (x000000)
```

MAPS™ M2UA Conformance – Call Emulation

Call Reception

GL MAPS (Message Automation Protocol Simulation) SGP (M2UAConformance ITU) - [Call Reception]

Configurations Emulator Reports Editor Debug Tools Windows Help

Sr No	Script Name	Profile	Call Info	Script Execution	Status	Events	Events Profile	Results
1	Check_SCTP_Status.gls			Stop		None		Unknown
2	M2UA_SGP.gls		1000	Stop	ASP Down			Pass

Stop Stop All Abort Abort All Show Records Select Active Call Auto Trash Trash

Save Column Width Show Latest

ASP SGP

```

sequenceDiagram
    participant ASP
    participant SGP
    ASP->>SGP: ASP Up 11:30:20.690000
    SGP-->>ASP: ASP Up Ack 11:30:20.690000
    SGP-->>ASP: Notify 11:30:20.690000
    ASP->>SGP: ASP Down 11:30:20.787000
    SGP-->>ASP: ASP Down Ack 11:30:20.788000
    
```

Find

```

===== MTP2 User Adaptation Layer =====
0000 Version = 00000001 Re
0002 Message Class = 00000011 AS
0003 ASPSM Message Type = 00000001 AS
0004 Message Length = 8 (x00000000)
    
```

Scripts **Message Sequence** Event Config Script Flow M2UA ASP Conformance Report

● Initialisation Errors ● Error Events ● Captured Errors ● Link Status

Thank you