



Test Tools for IMPS and MMS – Request for Information

Approved Version – 2nd September 2004

Open Mobile Alliance
OMA-BOD-IOP-2004-0056R03-Test-Tool-RFI

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1. Scope

The mission of the Open Mobile Alliance (OMA) is to facilitate global user adoption of mobile data services by specifying market driven mobile service Enablers that ensure service interoperability across devices, geographies, service providers, operators, and networks, while allowing businesses to compete through innovation and differentiation.

OMA would like to understand from Test Tool Vendors the types of Test Tools that are available to support two specific Enablers that have been developed by the Alliance. These are the Instant Messaging and Presence Service (IMPS) and the Multimedia Messaging Service (MMS).

This document requests information from Test Tool Vendors to enable OMA to evaluate the type and capabilities of Test Tools that will help OMA in fulfilling its mission of better interoperability of mobile devices being provided to the marketplace.

OMA is also interested to understand the different commercial models that could apply for the development and provision of tools to its members and in support of the interoperability test fest events that it organises.

The end goal of this initiative is for OMA is to select one or more Test Tool vendors through which to license or provide recommendations for licensing of these Test Tools for or by OMA Member companies, such that interoperability testing and resolution of test issues can be improved for those members developing implementations of the Enablers and also enhancing the quality of the OMA specifications.

Should your company wish to provide a response to this document please send an email indicating your intent to respond to OMA-Test-Tools@mail.openmobilealliance.org by 17th September 2004. Submitting an intent to respond does not obligate your company to make a response. Failure to submit an intent to respond by the 17th September 2004 will not prevent your company from responding to this RFI. However, you may not receive the responses to any questions asked, if OMA are not aware of your intention to respond.

If you have any questions regarding this RFI please send an email to the above address by 24th September 2004. OMA will respond to any questions asked by this date – circulating anonymous responses to all companies who have indicated an intent to respond to this RFI. OMA cannot guarantee to respond to any questions asked after 24th September 2004, but if such answers are possible, an anonymous response will be sent to all companies who have submitted an intent to respond.

Your final response is requested to be submitted by **Email to OMA-Test-Tools@mail.openmobilealliance.org by 5pm GMT on 22nd October 2004**. All responses should be submitted as a password protected PDF or DOC file that allows printing of the document, but prevents any modification of the document. Additionally, it is required that a paper copy of the submission is to be sent to OMA with a postmark, no later than 5pm on the 11th October.

Test Tool vendors may respond to this document with relevant information related to one enabler or both enablers. Both enablers are described in this document for the convenience of OMA.

As part of the RFI evaluation process, it maybe required for the vendors to do a presentation or demonstration of the tool to the OMA members at one of the already scheduled OMA meetings. The vendor shall be responsible for all travel costs associated with this presentation.

Nothing in this document should be construed as providing any commitment by OMA to enter into any license or purchase agreement with any respondent to this request for information.

Any information provided will be treated in confidence by a group of OMA member company participants that are not directly part of the test industry and will not be used for any purpose other than the evaluation of Test Tools in support of the IMPS and MMS Enablers.

1.1 Instructions to Respondents

1.1.1 Response period and address

It is expected that all communication be in the English language. The response should be submitted as:

- One (1) hard copy of all documents, and
- One (1) password protected PDF or Word document (Password to prevent modification of the document).

The response shall be marked “RFI. IMPS TEST TOOL” or “RFI MMS TEST TOOL”, as appropriate, and it is to be addressed to:

Open Mobile Alliance Ltd.
 Attn.: Howard Greenwell
 Director of Interoperability Programs
 7 The Chase
 Newbury, Berkshire, UK RG14 3AQ

Tel: (+44) 163 552 8012

Fax: (+44) 870 133 0063

E-mail: hgreenwell@omaorg.org

Response by Email should be submitted no later than **5pm GMT on 22nd October 2004**, at the latest.
 Hard Copy responses should be postmarked no later than the above date and time.

Suppliers whose responses have not been selected for further evaluation will be advised thereof in writing.

1.1.2 Time schedule

Initial Expression of Interest to Respond to this RFI	17 th September 2004
Date for last questions where a response will be guaranteed	24 th September 2004
Publication of All Questions asked about the RFI	1 st October 2004
Closing Date for all Responses to this RFI	22 nd October 2004 – 5pm GMT

1.1.3 Evaluation finalized

The evaluation of the quotation will be finalised by 12th November 2004 and each supplier will be advised in writing.

1.2 The OMA Contact Persons are:

1.2.1 Technical matters:

For any technical questions you may have related to the tools, you may contact the chair of the appropriate Interoperability Working Group:

IMPS Enabler:

IMPS IOP WG Chair,
Hank Chavers
E-mail: hank.chavers@nokia.com

MMS Enabler:

MMS IOP WG Chair,
Jeffery Cooke
E-mail: jeffrey.cooke@ericsson.com

1.2.2 Commercial matters:

For any licensing or commercial questions you may have, please contact:

Open Mobile Alliance
Attn.: Howard Greenwell
Director of Interoperability Programs
7 The Chase
Newbury, Berkshire, UK RG14 3AQ
Tel: (+44) 163 552 8012
Fax: (+44) 870 133 0063
E-mail: hgreenwell@omaorg.org

1.3 Criteria for Evaluation.

The information will be evaluated from the following perspective (in alphabetical order):

- Commercial terms and conditions
- Supplier criteria
- Technical criteria

1.4 Company profile

OMA would like to receive overall information about your company as:

- Organisation structure
- Owner structure
- Partnering within telecommunication
- Size of development, support
- Result from the last years

2. References

2.1 Normative References

- [OMAIOPPROC] OMA Interoperability Policy and Process, <http://www.openmobilealliance.org/>
[OMAIMPSCONF] OMA IMPS Conformance Requirements, <http://www.openmobilealliance.org/>
[OMAMMSCONF] OMA MMS Conformance Requirements, <http://www.openmobilealliance.org/>

2.2 Informative References

None.

3. Terminology and Conventions

3.1 Conventions

This is an informative document, i.e. the document does not intend to contain normative statements.

3.2 Definitions

OMA IOP WG	The OMA Working Group in charge of Interoperability issues concerning the OMA specifications
OMA IOP IMPS	A sub-working group of the OMA IOP WG responsible for issues relating directly to the OMA IMPS test specifications.
OMA IOP MMS	A sub-working group of the OMA IOP WG responsible for issues relating directly to the OMA MMS test specifications.
IMPS Test Tool	The OMA IMPS Protocol Test Tool
MMS Test Tool	The OMA MMS Protocol Test Tool
TestFest	An interoperability event where different manufacturers' servers and clients are tested towards each other to verify that they can interoperate correctly according to test classes
Vendor	The author/supplier of the Test Tool

3.3 Abbreviations

CSP	Client to Server Protocol
ETP	Enabler Test Plan
ETS	Enabler Test Specification
EICS	Enabler Implementation Conformance Statement
HTTP	Hyper Text Transfer Protocol
IMPS	Instant Messaging and Presence Services
IOP	Interoperability
IUT	Implementation Under Test
MMS	Multimedia Messaging Service
MMSC	Multimedia Messaging Service Center
OMA	Open Mobile Alliance
PR	Problem Report
PAP	Push Access Protocol
RFI	Request For Information
SAP	Service Access Point
SCR	Static Conformance Requirement
SICS	Server Implementation Conformance Statement
SMPP	Short Message Peer to Peer
SMSC	Short Message Service Center
SMS	Short Message Service
SSP	Server to Server Protocol

4. General Test Tool Requirements

This section describes the general requirements that will be necessary of any Test Tool that is recommended for use by the member companies of OMA. Detailed sections on the specifics of a Test Tool for IMPS or MMS are described later in this document.

The Test Tool(s) are to be used for conformance testing. The reports and test results generated by the Test Tool will be used in conformance testing as defined in the IOP Process [OMAIOPPROC].

The Test Tool needs to have the ability to be used for debugging and development purposes, as well as an aid in member preparation for a TestFest. An OMA TestFest is an event where engineers from many companies implementing products designed to comply with the Enabler specification may meet in a single location to test the interoperability of their implementations across many different manufacturers. Conformance testing is a pre-requisite for participation in an OMA TestFest and the Test Tool shall help the members to fulfil this requirement.

4.1 Installation Instructions

The vendor will be required to supply installation instructions for a recommended operating environment. If the Test Tool is supplied in a form that can be installed on different environments, installations instructions for the additional environments is also required.

4.2 Operation Instructions

The vendor is required to supply general operating instructions. This must include descriptions of the user interface and any command line executables with parameters.

4.3 Operating Environment

The test tool should be able to be executable in most common Operating System environments (MS Windows, Linux, SUN Solaris etc). At the time of creating this RFI, a recommended environment has not been determined. The choice of environment will be decided by OMA and information from vendors on the merits of their selected environments would be helpful.

4.4 Software Licensing

Whether the Test Tool is purchased by OMA outright, leased to member companies on an as need or usage bases, or whatever model is negotiated, the license must be made available royalty free. Respondents to the RFI are asked to provide details of their preferred licensing model. Budgetary indicative costs should be included for the various models that are proposed.

4.4.1 Warranty

Clearly specify the offered warranty period and condition for the Test Tool Products, Services or Applications.

4.4.2 Software License Grant

Clearly specify the offered license grants conditions for the Software, (Source code and/or Object Code etc.).

4.4.3 Distribution Rights

Clearly specify if your company has any limitations on the distribution to certain countries for the offered products.

4.5 Upgrade Path

As new versions of the OMA Enablers are released, the Test Tool must have the ability to be upgraded to be applicable to the new specifications. Information is requested on how this could be achieved, either by the test tool vendor, or by OMA or a third party

The Test Tool vendor is expected to give details of how upgrades to the tool may be accomplished if they are no longer willing or able to perform an upgrade to the tool (eg. Escrow Provision, Open Source solution, etc.).

4.6 Upgrade to include Additional Enabler Types

At this stage OMA is specifically interested in tools for the MMS and IMPS enablers. However, in the future further tools may be needed for other technologies and enabler types. Information is requested on whether the tool design may be extendable such that additional enabler tests could be supported, for example by reusing parts of the tool or having a common platform approach.

A list of all enablers can be found at http://www.openmobilealliance.org/release_program/enabler_descriptions.html

4.7 Escrow

Respondents to this RFI are asked to clearly specify their Escrow policy. OMA will require the Test Tools to be placed into escrow.

4.8 Time-line of Test Tool

Respondents to the RFI are required to indicate the level of conformance to the detailed tool requirements in the following sections in their response to this RFI. A line-by-line response is required. If additional functionality may be required in the Test Tool in order to be fully compliant, then the time-line of the implementation of this additional functionality must be provided in the response to this RFI.

4.9 Bug Fixes

As OMA members or OMA authorized users, using the Test Tool encounters problems, the vendor is required to fix or have fixed the bugs in a reasonable time. A formal process for submitting bug fixes, if needed, is yet to be defined.

As a problem is reported to the vendor, the vendor is required to respond within a week with one of these four responses:

1. Bug in Test Tool: Must include time to fix. May include background to problem and work around.
2. Interpretation Difference: Must include interpretation details in question. Shall provide time to fix upon request. May include work around.
3. Ambiguous / Non-deterministic Specification: Must include specification(s) in question and description of problem. Shall provide interpretation details and reasoning. May include work around.
4. No Problem with Test Tool: Must include satisfactory reason as agreed with the chair of the OMA IOP SWG. Shall provide interpretation details upon request.

4.10 Explanations of Interpretations

This is provided in anticipation of questions regarding Bug Fix response number 2. As Member Companies develop OMA Enabler Implementations, they will interpret the specification to their understanding. If such interpretations differ with the interpretation of the Test Tool, the vendor must explain their understanding of the different interpretations. This interpretation difference may have a side effect of the OMA members revising the Enabler specification and requesting a change to the Test Tool. Several dependences will govern whether this change is made.

The dependencies are:

1. The scope of the requested fix assuming no fundamental change to base specifications.
2. The fix can be accomplished within an acceptable period of time.
3. The proper maintenance agreements are in place provided the fix is outside the scope as defined in dependency 1.

5. IMPS Test Tool Specific Requirements

5.1 Test Tool Logical Breakdown

The Test Tool is divided into two distinct operating modes, Protocol Analyzer and Client / Server Emulator. The Protocol Analyzer portion of the Test Tool is broken down into two logical functions, the Proxy Tap Tool and the Analysis Test Tool. The Client /Server Emulator is broken down into three parts, the Analysis Test Tool, the Client / Server Emulator itself, and an API driver interface for the Emulator. Each logical function will be defined further below.

The Test Tool is expected to have the ability to be used for debugging and development purposes. Whereas these uses are not necessarily seen as beneficial to the IOP IMPS group, the IOP IMPS group does recognize and promote these features on behalf of the member companies in OMA, to whom these fetures would be beneficial.

5.2 Requirements for the Proxy Tap Tool

The Proxy Tap Tool is used to capture and copy the OMA IMPS Protocol Interactions/transactions to the Analysis Test Tool. It must not change the protocol that is being captured. The capture of the underlining protocol, where it may be inevitable, is not required and the storage of it is immaterial to this Test Tool functionality.

5.2.1 Specify CSP and SSP capturing.

The Proxy Tap Tool shall be able to capture all possible bindings as specified in the OMA IMPS protocol.

5.3 Requirements for Analysis Test Tool

5.3.1 User interface

The Analysis Test Tool must have a user interface that is able to handle file storage and retrieval and display content.

5.3.2 Capture and Display OMA IMPS Protocol

The OMA IMPS Protocol interactions / transactions has to be displayed in Human readable format, broken down into primitives. This content will have to be able to be stored and retrieved.

5.3.3 Analysis Test Suite

The captured content will be compared to the OMA IMPS protocol specifications to report both non-conformant and out-of-sequence primitives. These primitives must be displayed with the non-conformant and out-of-sequence entities highlighted.

5.4 Requirements for Server and Client Emulator

5.4.1 User Interface

The User Interface of client and server must be a generic window/view. Need to define what the interface needs to be able to be done and to presented. Separate out between Client and Server.

5.4.2 Respond as a Client or Server

This functionality is restated for redundancy. The Test Tool must be able to act as both a Client and a Server. When acting as a server, the Test Tool must also be the end point. This means the server also responds as a client responding to the server's commands (example, in Server emulation, the Test Tool would respond to an InviteRequest as the receiving client would respond). Multiple simultaneous client emulations, where not required, is also not forbidden. The mechanism to switch between Client and Server modes is left up to the vendor.

5.4.3 Create and Monitor Error Conditions

The Server and Client Emulator must be able to introduce and monitor error conditions. These error conditions include but are not limited variable limit violations, sequencing problems, recoverable primitive errors, and other errors which the protocol can attempt to correct.

5.4.4 SSP and CSP requirements

The tool shall be able to provide all the functionality of SSP and CSP. The tool shall also be able to test all SSP and CSP primitives in the OMA IMPS specification.

5.5 Requirement for API Driver Interface

The tool shall provide an API so that the test tool could be executed via scripts and for adding functionality.

5.5.1 Documentation

The vendor must supply documentation for the API Driver Interface. This includes all functions, function parameters, executables, and executable parameters.

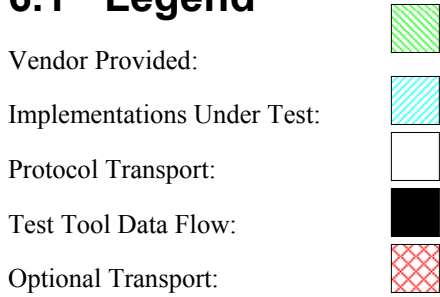
5.5.2 API Functions

The Client and Server API functions are meant to be able to automate the operation of the Client and Server Emulator. The function definitions of the API are left up to the vendor to define. Scripts and test cases to be written.

6. IMPS Test Tool Diagrams

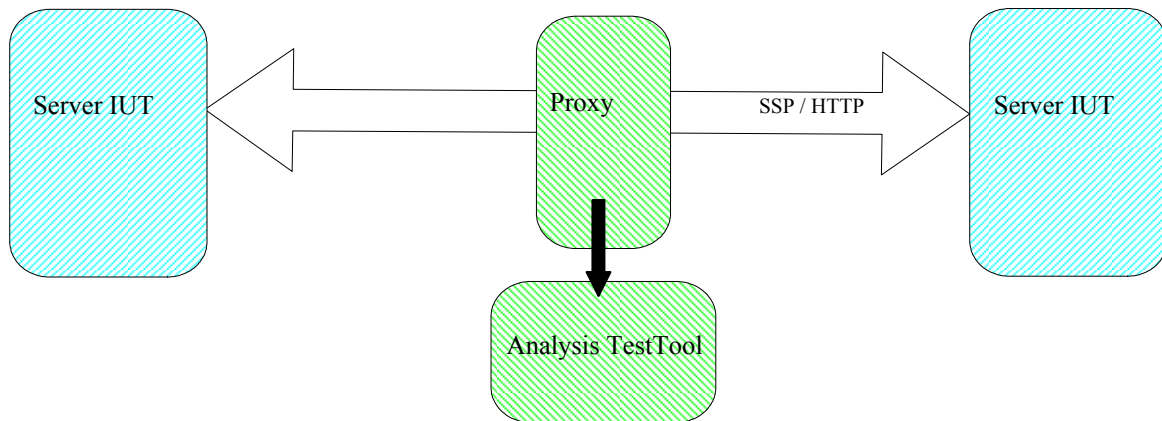
The following diagrams provide a pictorial representation of the Test Tools Architecture expected by the IMPS Test Tool. A respondent to this Request For Information (RFI) may propose a different architecture, provided the reasons for such an alternative approach are well documented for the members of OMA to appreciate.

6.1 Legend

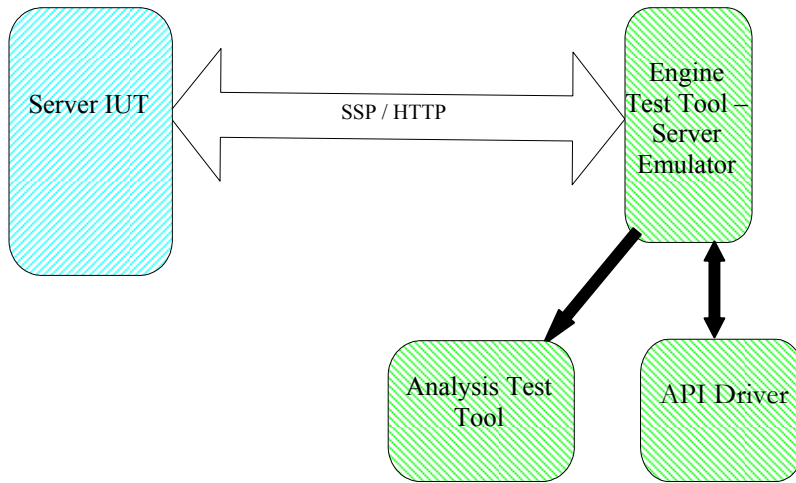


6.2 SSP/HTTP setup

6.2.1 SSP Setup – Proxy Tap Tool

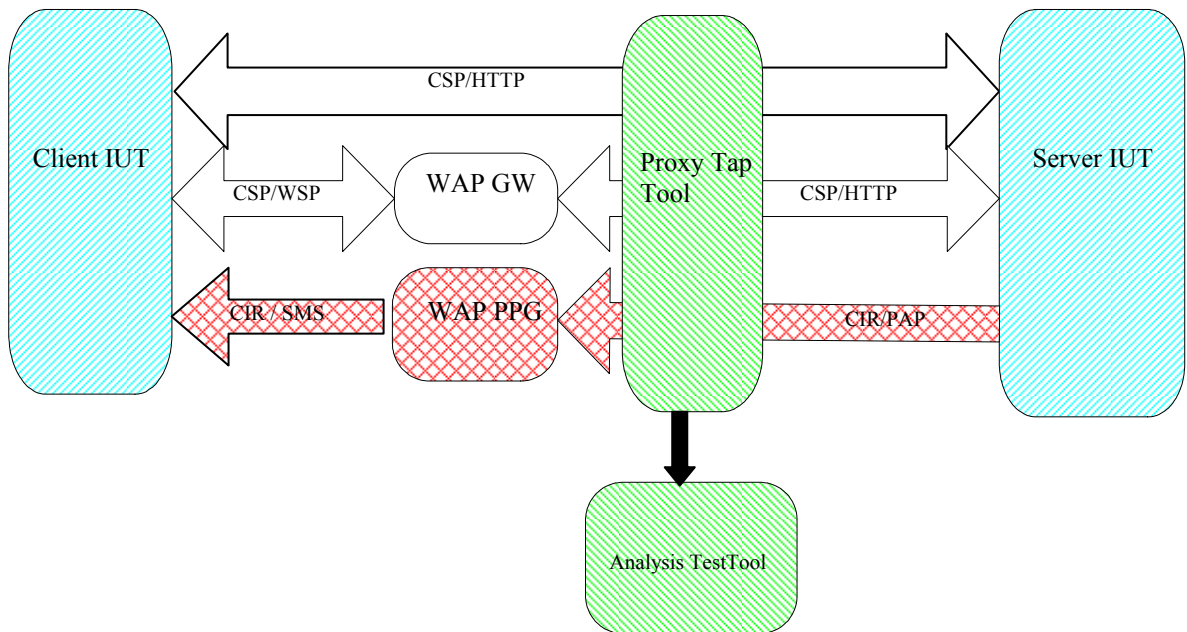


6.2.2 SSP Setup – Server Emulator

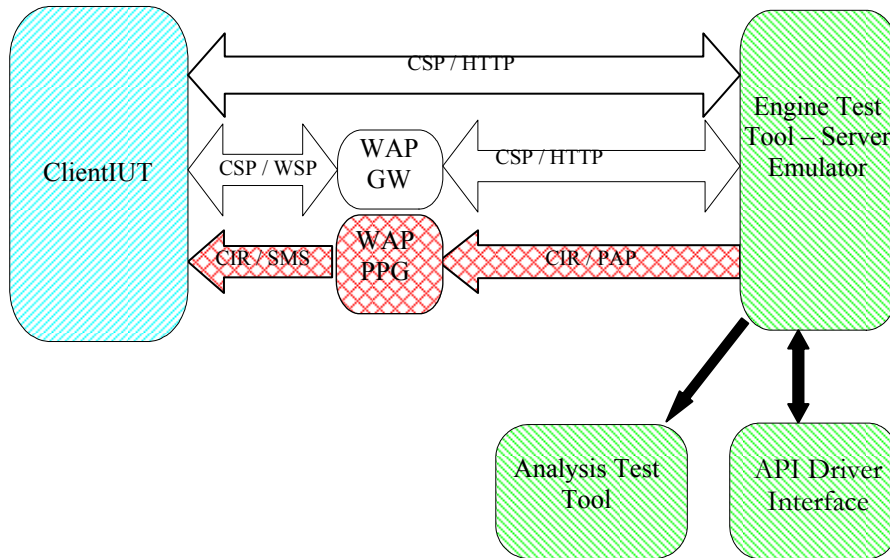


6.3 CSP/HTTP SETUP

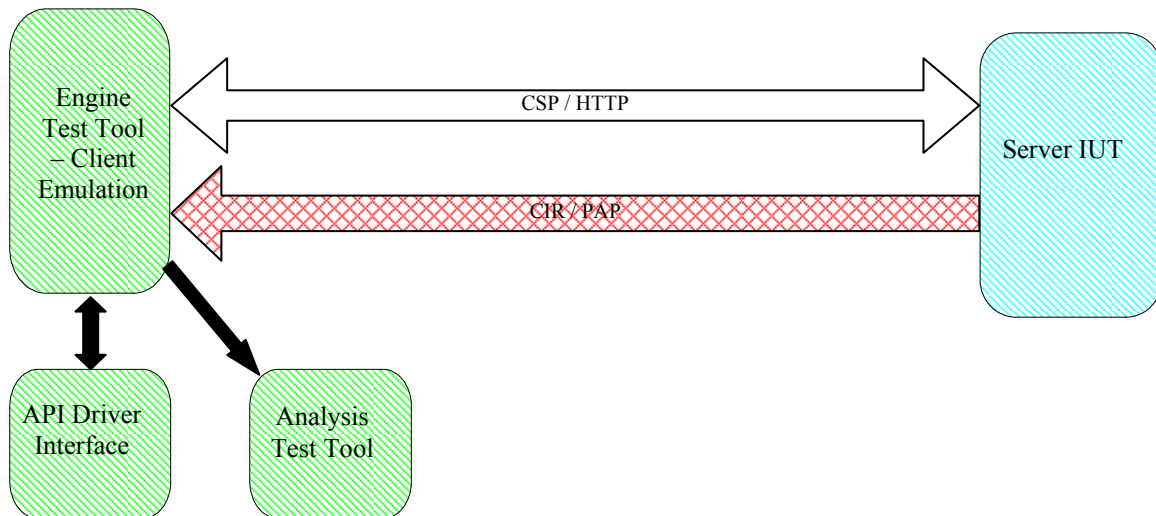
6.3.1 CSP-WSP/HTTP Setup – Proxy Tap Tool



6.3.2 CSP-WSP/HTTP Setup – Server Emulator

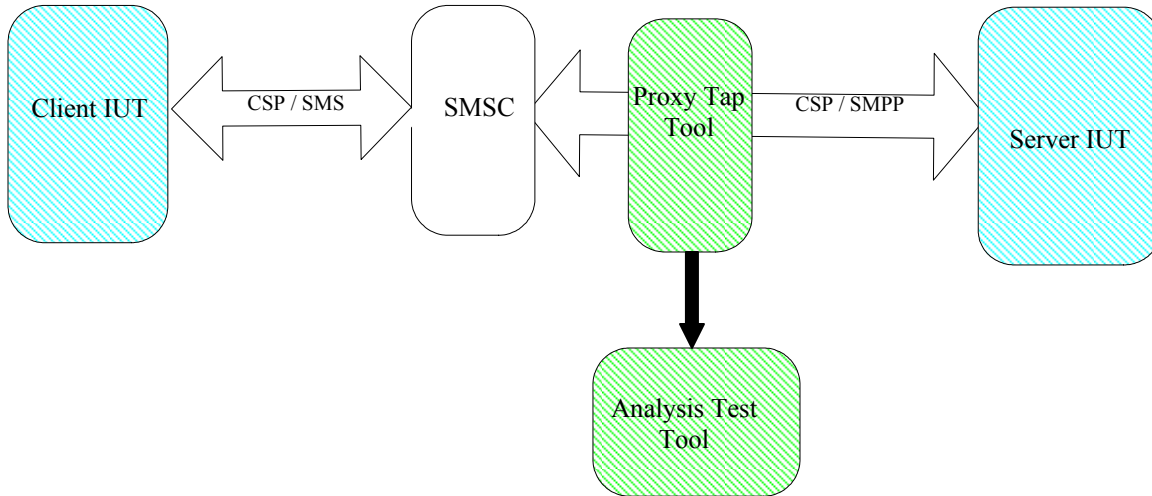


6.3.3 CSP-WSP/HTTP Setup – Client Emulator

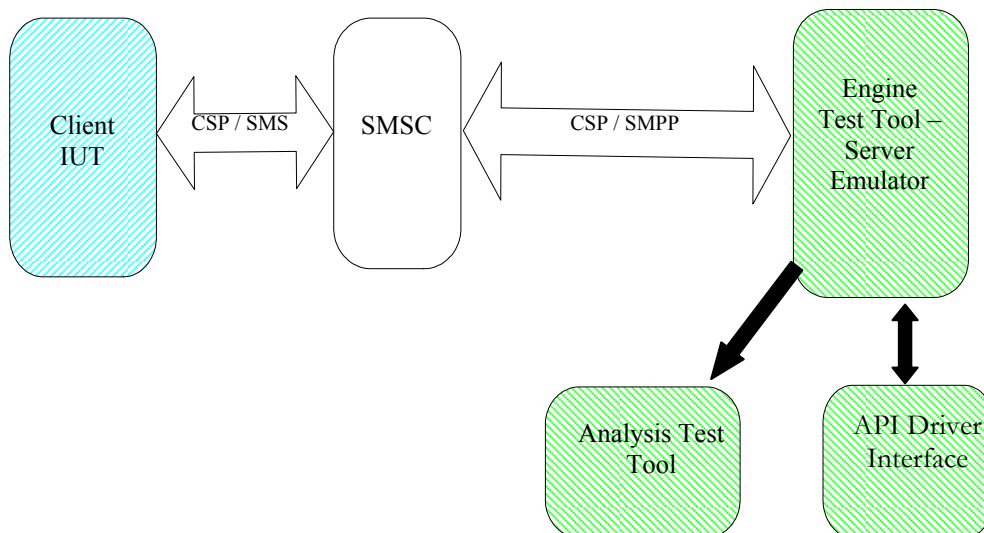


6.4 CSP/SMS setup

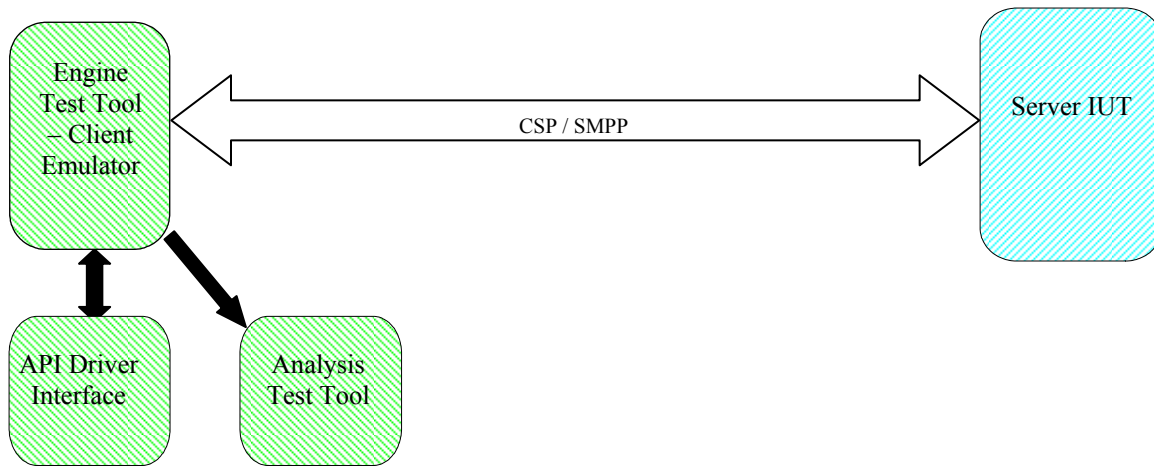
6.4.1 CSP-SMS Setup – Proxy Tap Tool



6.4.2 CSP-SMS Setup – Server Emulator



6.4.3 CSP-SMS Setup – Client Emulator



7. MMS Test Tool Requirements

7.1 Coverage

The objects that the MMS Test Tool is expected to be able to cover are, in priority order:

- MMS clients (MM1)
- MMS proxy relays with integral MMS servers (MM1 only)
- MMS proxy relays with integral MMS servers (MM1 and MM4)

Testing of the interface between the MMS proxy relay and the MMS server (MM2) is out of scope, as are MM5, MM6 and MM8.

7.2 Test Tool Logical Breakdown

The Test Tool is divided into two distinct components, Protocol Analyzer and Client / Server Emulator. The Protocol Analyzer portion of the Test Tool is broken down into two logical functions, the capture Tool and the Analysis Tool. The Client /Server Emulator is broken down into three parts, the Test Result Analysis Tool, the Client / Server Emulator itself, and an API driver interface or test notation interpreter for the Emulator. Each logical function will be defined further below.

7.3 Multi Session Capability (desired but optional)

To support interoperability TestFests, the client test tools should be available in a form capable of testing multiple clients simultaneously. The protocol capture and logging tool must support multiple simultaneous test sessions.

7.4 Multi User Capability (desired but optional)

The test tools must be able to run concurrent user sessions without interference with each other. Users' information test results and logs must be protected so that no user can gain access to another users account or logs without authorization.

7.5 Client Test System

Clients will be tested by emulating all the parts of the MMS environment needed to receive and send MMS messages to and from the client under test. The test system will automate the construction of messages sent to the client under test. For testing the client's ability to originate MMS messages the test system will either prompt an operator to initiate the sending of messages or automate the process.

The Client test system should be available in a form that does not include a WAP gateway, a W-HTTP proxy or PPG as these will be available in the environment established for running the test system (e.g. at a TestFest).

CSP/MM1 over HTTP is assumed. If the client uses CSP/SMS we should assume that protocol conversion is carried out by the SMSC or by other means.

The test system will:

1. Interpret test scripts that define the test purpose, test steps and pass/fail criteria.

2. Construct and send all MMS messages to the client under test as defined in the CSP according to the test scripts.
3. Receive MMS messages from the client under test.
4. Analyze MMS messages received from the client under test for conformance to the target MMS specifications:
 - o Construction
 - o Sequence, to the extent practicable
5. Analyze content of MMS messages originated by the client under test using automated or manual means as appropriate, including parsing and display of the multimedia content.
6. Inject errors into transmitted protocol or content as defined by test scripts and analyze the responses.
7. Provide a means for the test operator to be prompted when manual action is required by a test.
8. Provide means for the test operator to enter observations/result information into the test system when prompted.
9. Log all transactions and results.
10. Present results and logs to the operator.
11. Provide the operator with management tools for test tool configuration and parameterization, test selection etc.
12. Optional/nice to have: Provide a means for synchronization with handset user interface test automation tools, including results capture and logging.

7.6 MMSC/Server Test System

This is for testing an MMS proxy relay combined with an MMS server – MMS server in this document.

MMS servers will be tested by emulating all the parts of the MMS environment needed to receive and send MMS messages to and from the MMS Server under test. The test system will automate the construction of messages sent to the MMS Server under test and will, when needed, act as several clients to be able to perform tests that use multiple recipients.

The initial priority is for testing the CSP/MM1 interface only over HTTP.

The second priority will be to add server emulation capability to allow testing of an MMSC over both the MM1 and MM4 interfaces.

The test system will not include a WAP gateway, a W-HTTP proxy or PPG. These are required to be available in the environment established for running the test system.

The test system will:

1. Interpret test scripts that define the test purpose, test steps and pass/fail criteria.
2. Construct and send all MMS messages to the MMS server under test as defined in the CSP according to the test scripts, over the MM1 interface and the email interface using SMTP.
3. Receive MMS messages from the MMS server under test over the MM1 interface.
4. Analyze MMS messages received from the MMS server under test for conformance to the target MMS specifications:
 - o Construction
 - o Sequence, to the extent practicable
5. Analyze content of MMS messages from the MMS server under test using automated or manual means as appropriate, including parsing and display of the multimedia content.
6. Compare MMS messages before and after Content Adaptation.
7. Inject errors into transmitted protocol or content as defined by test scripts and analyze the responses.

8. Provide a means for the test operator to be prompted when manual action is required by a test.
9. Provide means for the test operator to enter observations/result information into the test system when prompted.
10. Log all transactions and results.
11. Present results and logs to the operator.
12. Provide the operator with management tools for test tool configuration and parameterization, test selection etc.

7.7 Protocol Analyzer

7.7.1 Capture Tool

The capture Tool is used to capture and log the OMA MMS Protocol Interactions/transactions. It must not change the protocol that is being captured. The capture of the underlining protocol, where it may be inevitable, is not required and the storage of it is immaterial to this Test Tool functionality.

The tool must be capable of operating stand-alone, without a client or server emulator present.

Sessions may be identified by client IP address, MSISDN or MDN

The session capture process must be able to be started and stopped by operator action

7.7.1.1 Protocol capturing

The Capture and Analysis Tools must be able to capture and analyze message flows over several of the defined MMS interfaces and with several of the possible protocol bindings. In priority order they are;

- MM1: CSP/HTTP over IP
- MM4: SMTP/MIME over IP

7.7.2 Analysis Tool

The analysis tool is to be a single user client application that retrieves and processes logs from the capture tool.

7.7.2.1 User interface

The Analysis Tool must have a user interface that is able to handle file storage and retrieval and display of logs. The user must be able to analyze logs in whole or in part.

7.7.2.2 Display OMA MMS Protocol

The OMA MMS Protocol interactions / transactions must be displayed in Human readable format, broken down into primitives. This content must be able to be stored and retrieved for use in email or for pasting into a document. Message origin, destination, and sequencing must be clearly displayed.

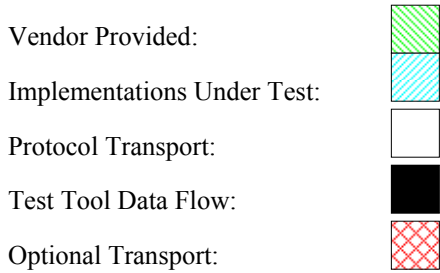
7.7.2.3 Protocol Testing

The captured content will be compared to the OMA MMS protocol specifications to report both non-conformant and out-of-sequence primitives, to the extent practicable. Non-conformant and out-of-sequence entities should be highlighted.

8. MMS Test Tool Diagrams

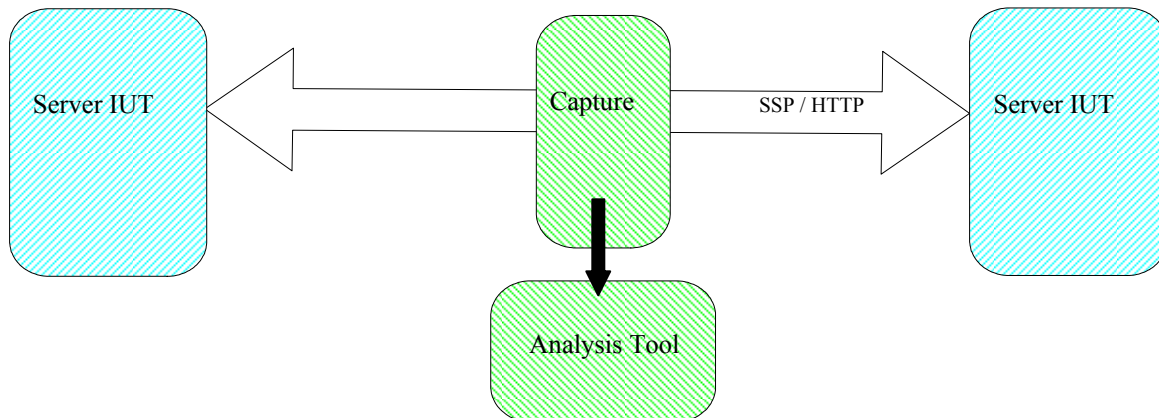
The following diagrams provide a pictorial representation of the Test Tools Architecture expected by the MMS Test Tool. A respondent to this Request For Information (RFI) may propose a different architecture, provided the reasons for such an alternative approach are well documented for the members of OMA to appreciate.

8.1 Legend

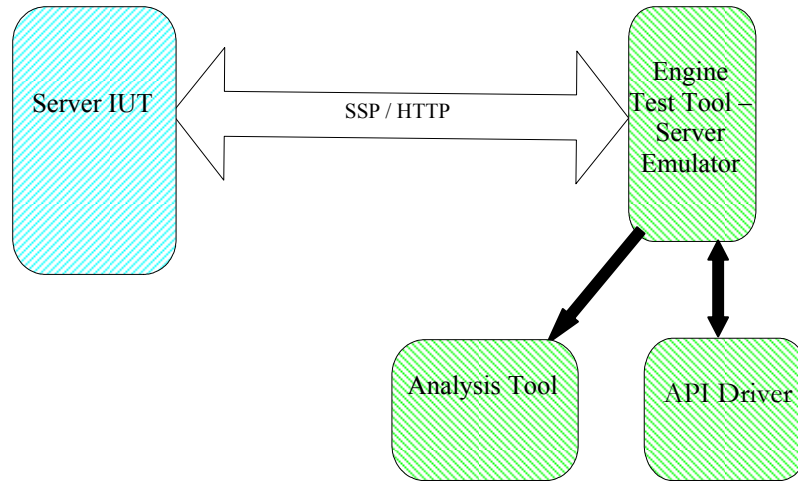


8.2 SSP/HTTP setup

8.2.1 SSP Setup – Capture Tool

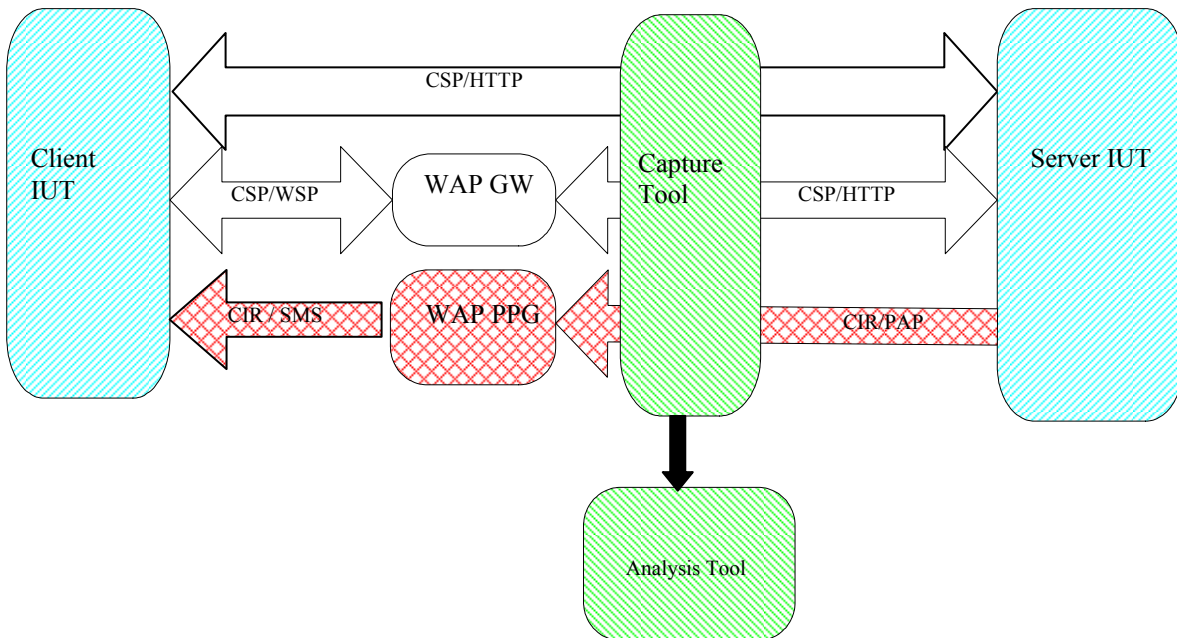


8.2.2 SSP Setup – Server Emulator

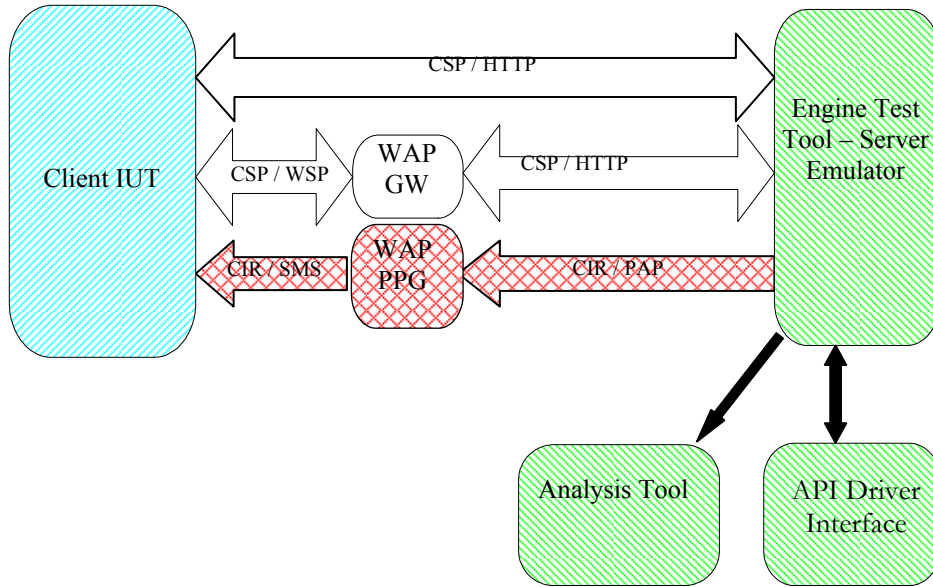


8.3 CSP/HTTP SETUP

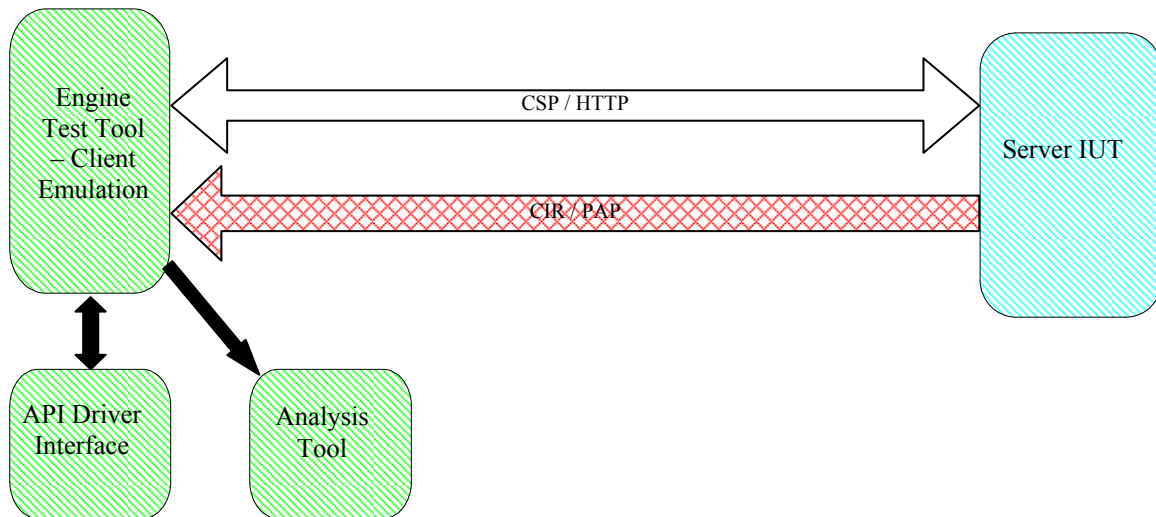
8.3.1 CSP-WSP/HTTP Setup – Capture Tool



8.3.2 CSP-WSP/HTTP Setup – Server Emulator

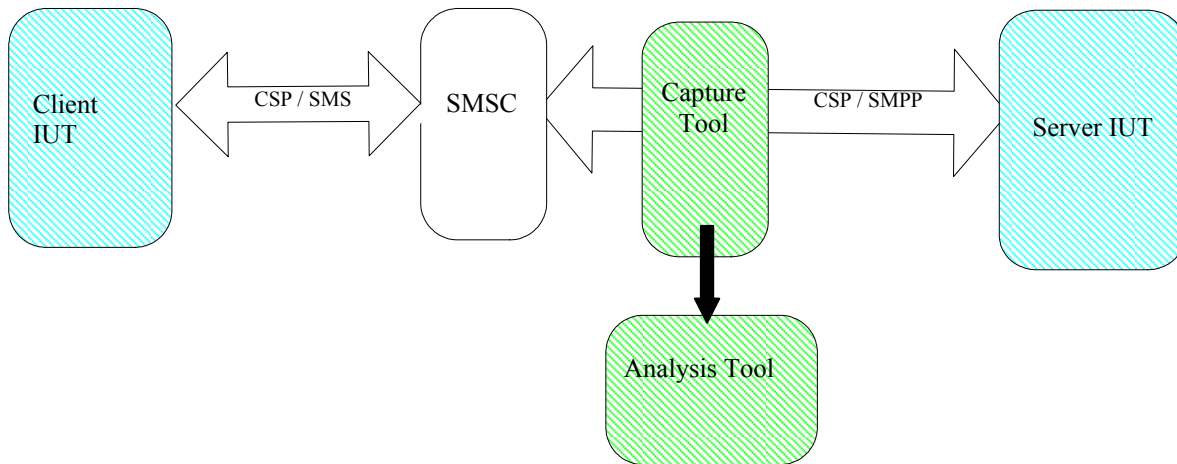


8.3.3 CSP-WSP/HTTP Setup – Client Emulator

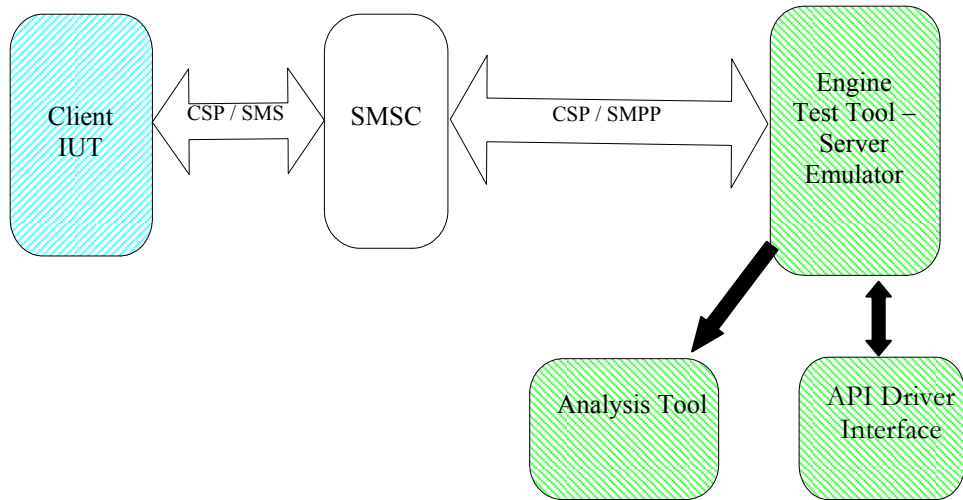


8.4 CSP/SMS setup

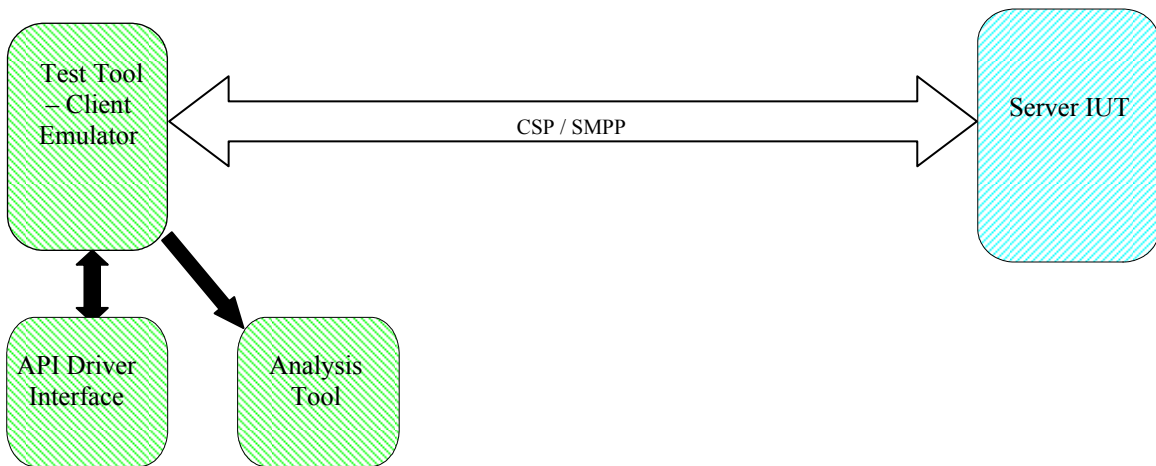
8.4.1 CSP-SMS Setup – Capture Tool



8.4.2 CSP-SMS Setup – Server Emulator



8.4.3 CSP-SMS Setup – Client Emulator



Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-BOD-IOP-0051-Test-Tool-RFI	3 rd September 2004	Approved on CC on 25 th August after 1 week review.

A.2 Draft Version History

Document Identifier	Date	Sections	Description
OMA-BOD-IOP-2004-0051-Test-Tool-RFI	11 th August 2004		Initial version of this document