



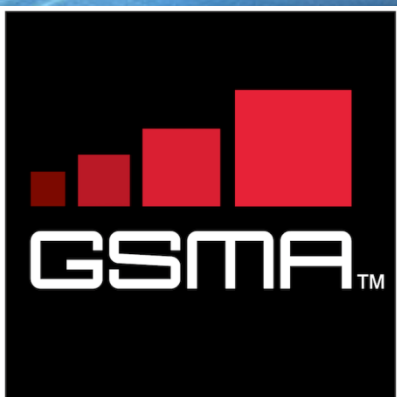
ETSI TC INT ACTIVITIES IN THE FIELD OF IMS STANDARDIZATION AND TESTING

Giulio Maggiore

ETSI TC INT Chairman

Martin Brand


ETSI TC INT Vice Chairman



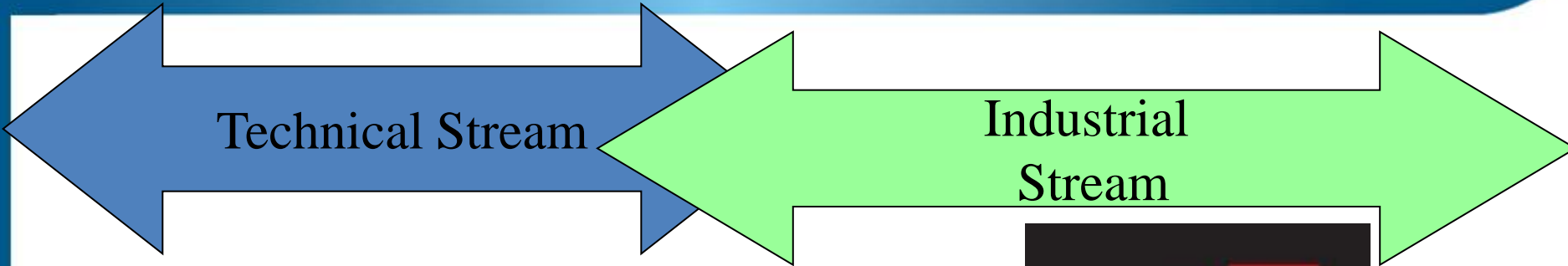
Outline of presentation



- Core Network Testing – 3GPP specs and TC INT tests
- Working mode between 3GPP and GSMA Trials
- TC INT - status of work and way forward
- IMS Plugtests What – When – How

- 
- Two large, semi-transparent red arrows are positioned horizontally across the slide. One arrow points from the left towards the right, and the other points from the right towards the left, creating a bidirectional flow effect.
- Develop Core Network test specifications (interoperability, conformance, network integration etc.) from 3GPP specifications and ETSI TC STQ specifications
 - Develop of Benchmarking specifications
 - Initiate /assist/supervise/follow up of IMS Plugtests
 - Coordinate IMS interoperability efforts with other organisations OMA, MSF, IMS Forum, GSMA, etc
 - Endorsement of test specifications to other technical bodies e.g., ITU.

ETSI TC INT (IMS Network Testing)



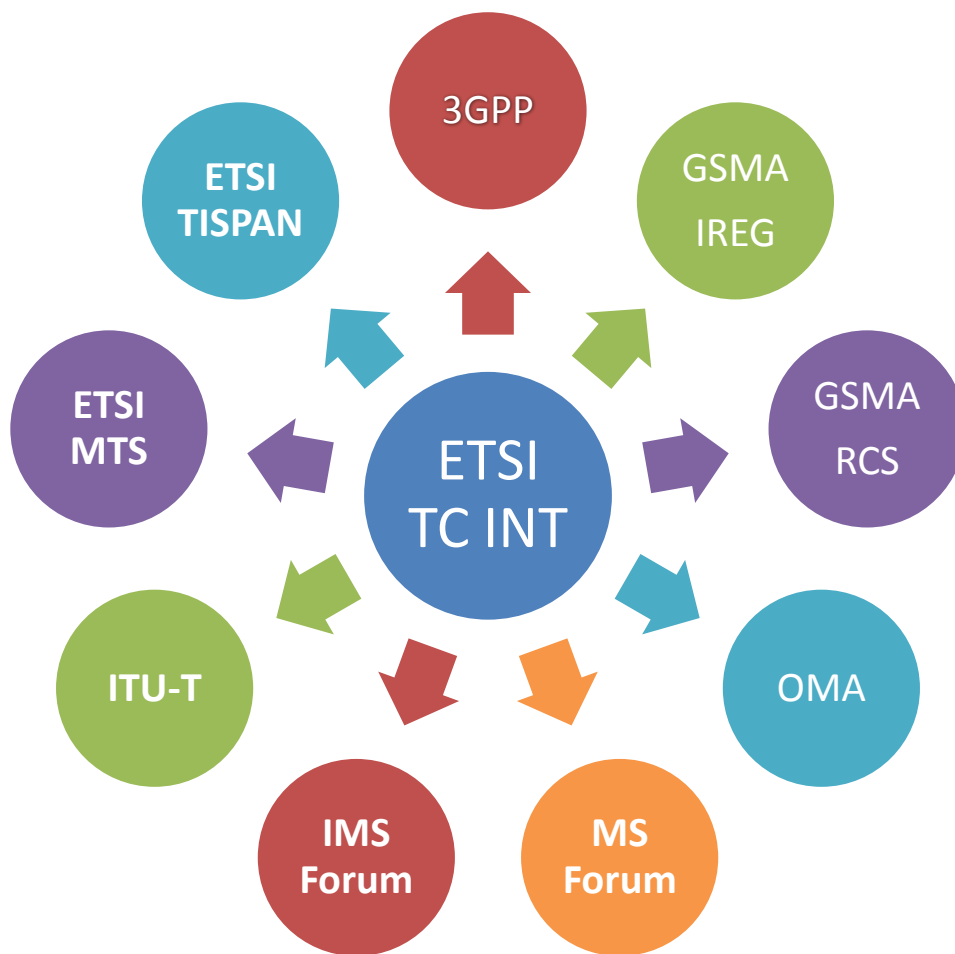
IMS
Network
Testing



The central box contains the 'int' logo in a light grey font, with a red double-headed arrow above it. Below the logo, the text 'IMS Network Testing' is written in purple and black.




Fora and Organization
Dealing with IMS IOP
Demonstrations

IMS Testing Ecosystem



- 
- Two large, semi-transparent red arrows are positioned horizontally across the upper half of the slide. One arrow points to the right, and the other points to the left, creating a sense of bidirectional flow or interaction.
-  TC INT has produced IMS NNI interoperability and conformance test specifications :
 - 3GPP R6/TISPAN R1
 - 3GPP R7/TISPAN R2
 - 3GPP R8

- 
- A decorative graphic featuring a large, light gray number '5' in the background. Overlaid on this are two thick, dark red arrows: one pointing to the right at the top and one pointing to the left below it. The entire graphic is set against a light blue gradient background.
- TC INT has produced Interoperability Test Specification on ISC Interface on request of GSMA RCS
 - TC INT is working in Liaison with GSMA IREG for the NNI R8 Interoperability which is the base for the VoLTE profile.
 - TC INT acts as steering committee for the IMS Interoperability Event organization.

Doc. Nb. [TS 186 018](#)
Ref. [RTS/INT-00041](#)
Technical Body: [INT](#)

Technical Committee for IMS Network Testing (INT);
IMS Network Testing (INT); Malicious Communication Identification (MCID)
Conformance Testing;

Doc. Nb. [TS 186 017](#)
Ref. [RTS/INT-00038](#)
Technical Body: [INT](#)

Technical Committee for IMS Network Testing (INT);
Anonymous Communication Rejection (ACR) and Communication Barring (CB)
conformance testing;

Doc. Nb. [TS 186 016](#)
Ref. [RTS/INT-00039](#)
Technical Body: [INT](#)

Technical Committee for IMS Network Testing (INT);
Closed User Group (CUG); Conformance Testing;

Doc. Nb. [TS 186 011](#)
Ref. [RTS/INT-00032](#)
Technical Body: [INT](#)

Technical Committee for IMS Network Testing (INT);
IMS NNI Interoperability Test Specifications;

Doc. Nb. [TS 186 009](#)
Ref. [RTS/INT-00022](#)
Technical Body: [INT](#)

Technical Committee for IMS Network Testing (INT);
SIP-ISUP Interworking between the IP Multimedia (IM) Core Network (CN) subsystem
and Circuit Switched (CS) networks;
Conformance Tests for SIP-ISUP based on the 29.163 Rel.7

- Doc. Nb. [TS 186 005](#) Technical Committee for IMS Network Testing (INT);
Ref. [RTS/INT-00007](#) Terminating Identification Presentation (TIP) and Terminating Identification Restriction (TIR)
Technical Body: [INT](#) Conformance Testing;
- Doc. Nb. [TS 186 001](#) IMS Network Testing (INT);
Ref. [RTS/INT-00042](#) Network Integration Testing; for SIP-SIP
Technical Body: [INT](#)
- Doc. Nb. [TS 102 901](#) IMS Network Testing (INT);
Ref. [DTS/INT-00033](#) IMS NNI Interoperability Test Specifications;
Technical Body: [INT](#) IMS NNI interoperability test descriptions for RCS
IMS NNI & ISC interoperability test descriptions for RCS
- Doc. Nb. [TS 102 891](#) Technical Committee for IMS Network Testing (INT);
Ref. [DTS/INT-00023](#) Message Waiting Indication (MWI) using IP Multimedia (IM) Core Network (CN) subsystem;
Technical Body: [INT](#)
- Doc. Nb. [TS 102 790](#) Technical Committee for IMS Network Testing (INT);
Ref. [DTS/INT-00024](#) Network Integration Testing; IMS specific use of Session Initiation Protocol (SIP) and Session
Technical Body: [INT](#) Description Protocol (SDP); Conformance Testing;
Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP)
- Doc. Nb. [TS 102 722](#) Technical Committee for IMS Network Testing (INT);
Ref. [DTS/INT-00001](#) Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR);
Technical Body: [INT](#)

Doc. Nb. [TS 102 722](#) **Technical Committee for IMS Network Testing (INT);**
Ref. **DTS/INT-00001** **Technical**
Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR);
Body: [INT](#)

Doc. Nb. [TS 102 710](#) **IMS Network Testing (INT);**
Ref. **DTS/INT-00019** **Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit**
Technical Body: [INT](#) **Switched (CS) networks (Release 8);**
Conformance Tests for SIP-ISUP based on the 29.163 Rel.8

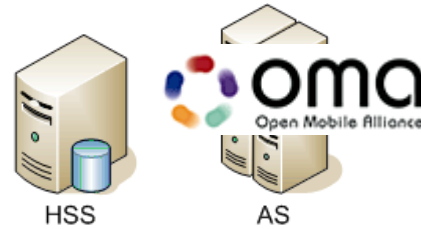
Doc. Nb. [TS 102 709](#) **Technical Committee for IMS Network Testing (INT);**
Ref. **DTS/INT-00034** **Interworking between the 3GPP Cs domain with BICC or ISUP as signalling protocol and**
Technical Body: [INT](#) **external SIP-I networks;**

Who is Who in IMS Testing?

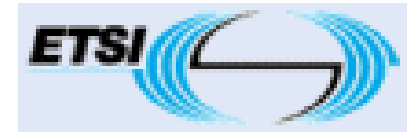
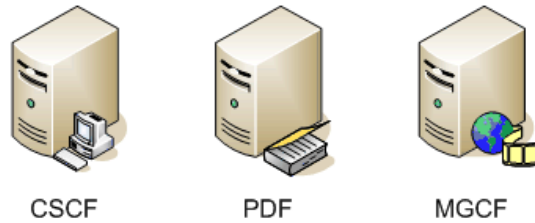


IMS Forum[®]
The Voice of IP Convergence

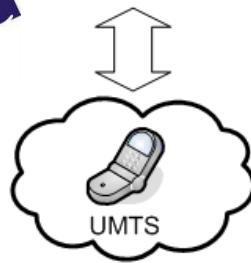
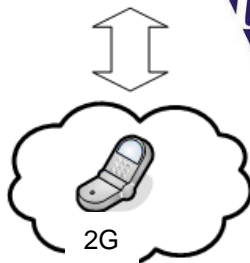
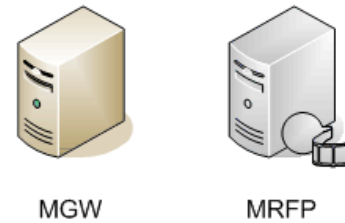
Application Layer



Session Control Layer



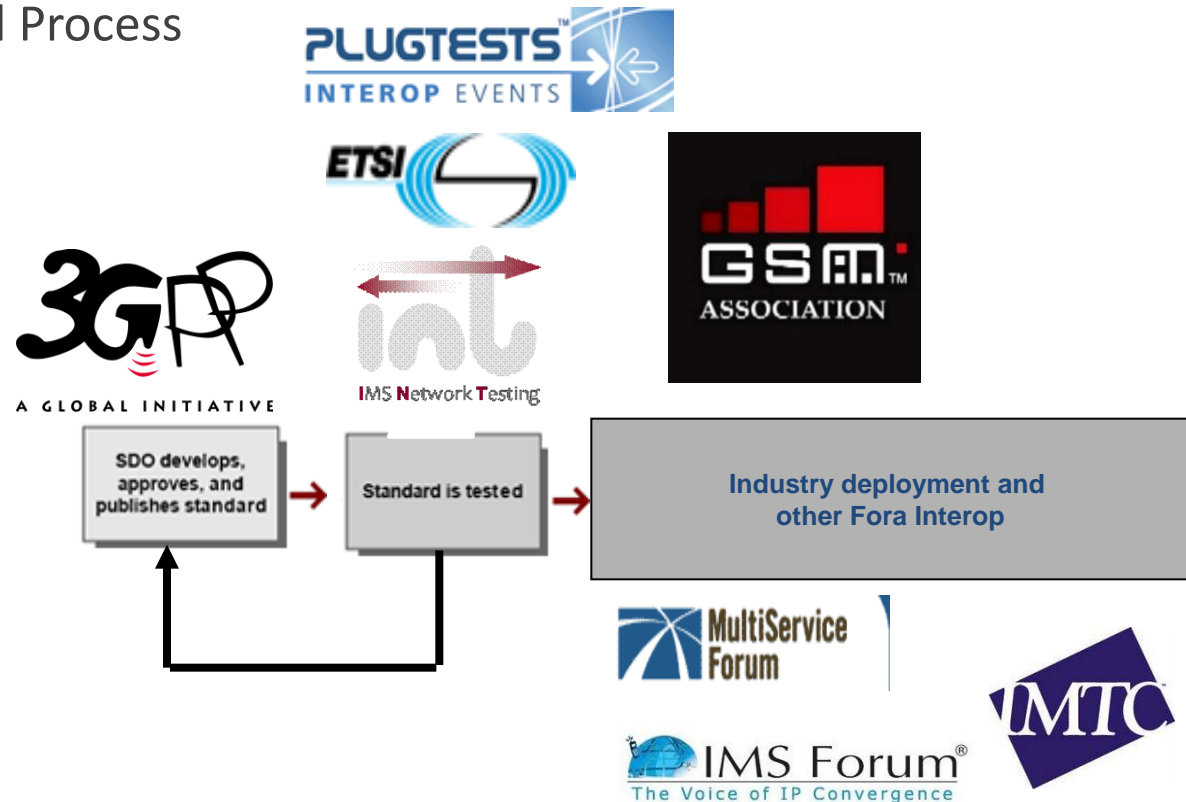
Access & Transport Layer



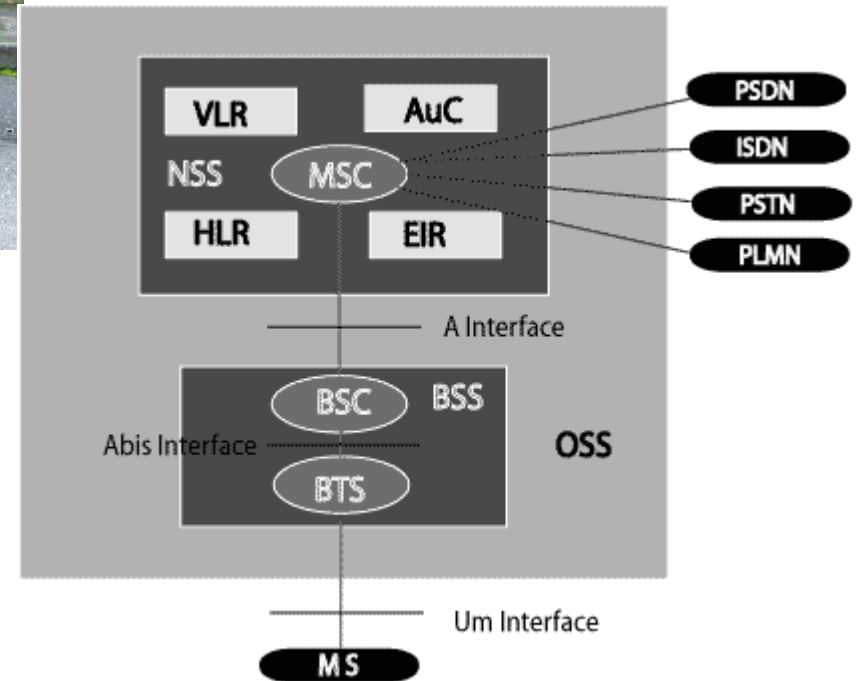
When IMS Interoperability Testing?



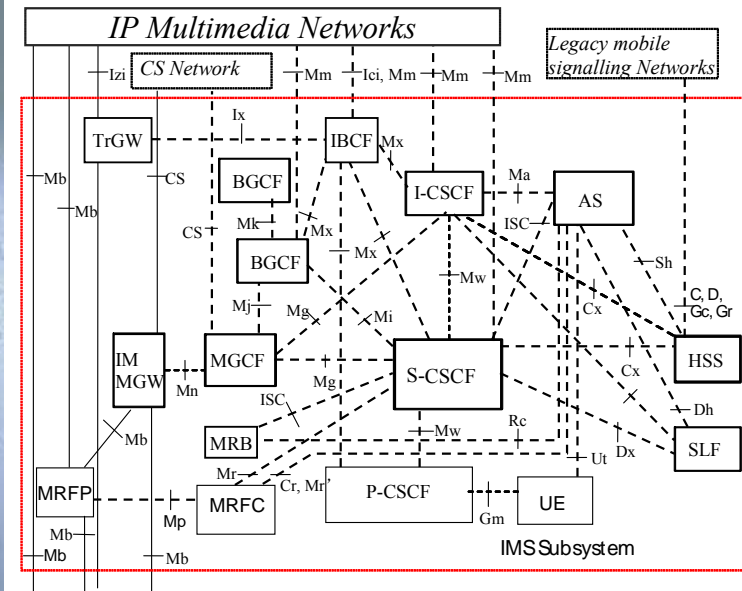
- The New Core Network is made by a lot of “Standard” Interfaces
- Interoperability is a key element for new Standard Process



Core Network System in the Past

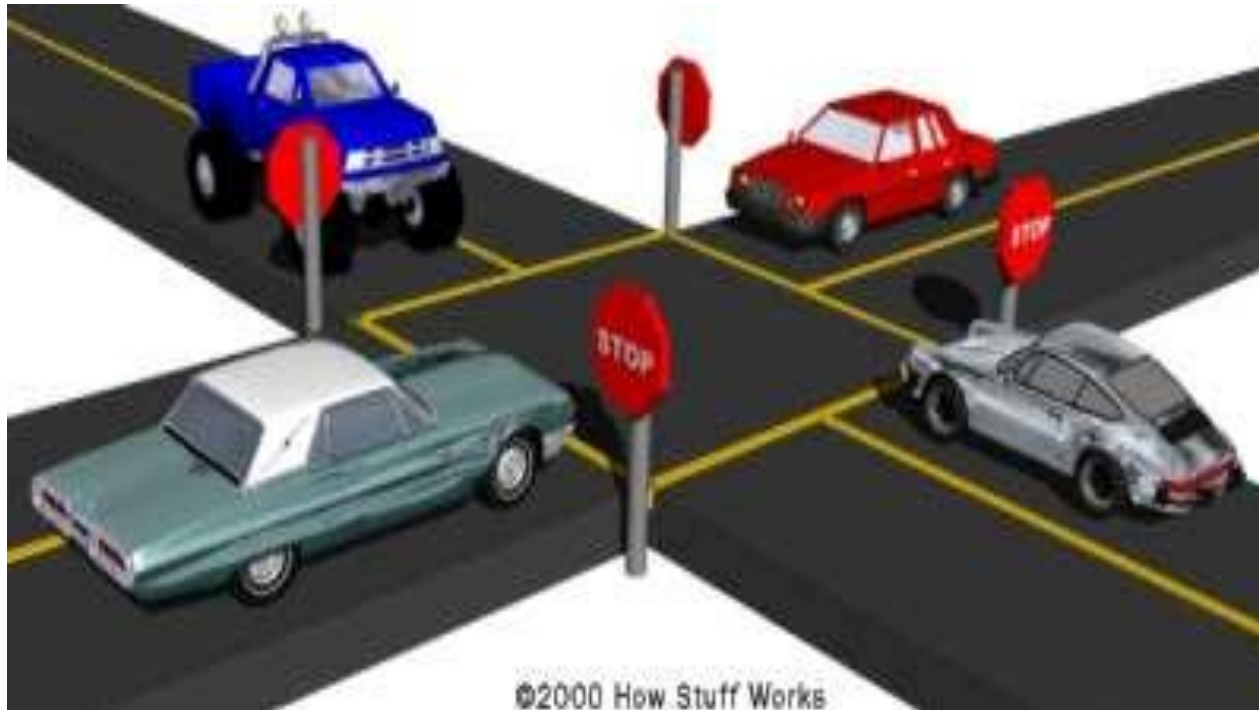


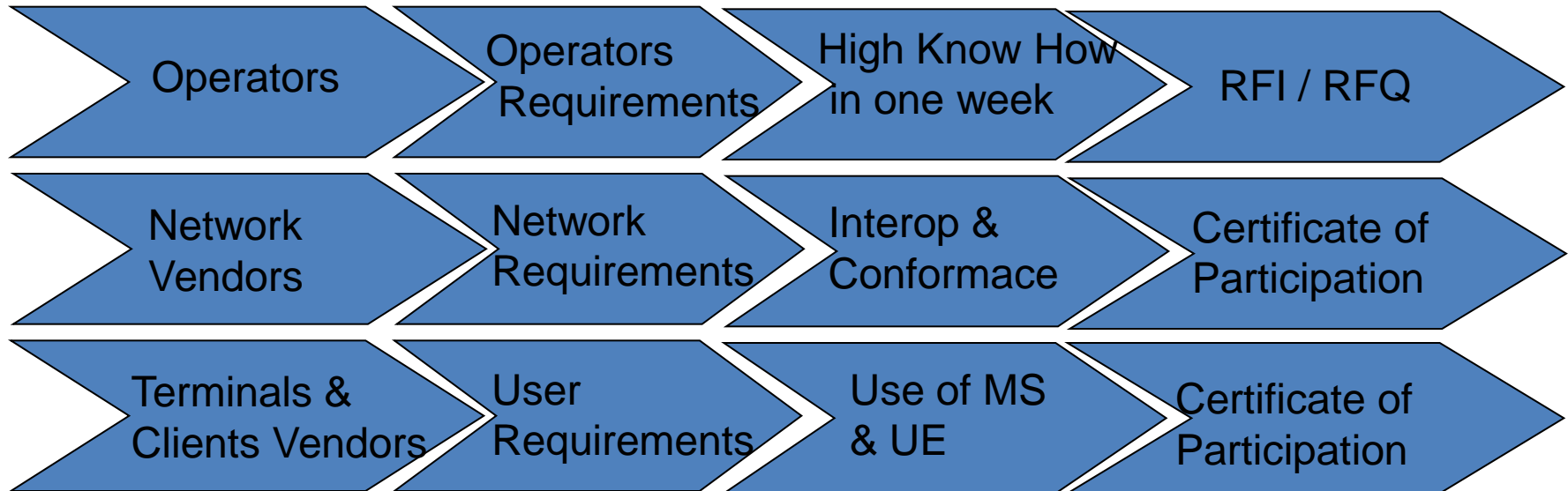
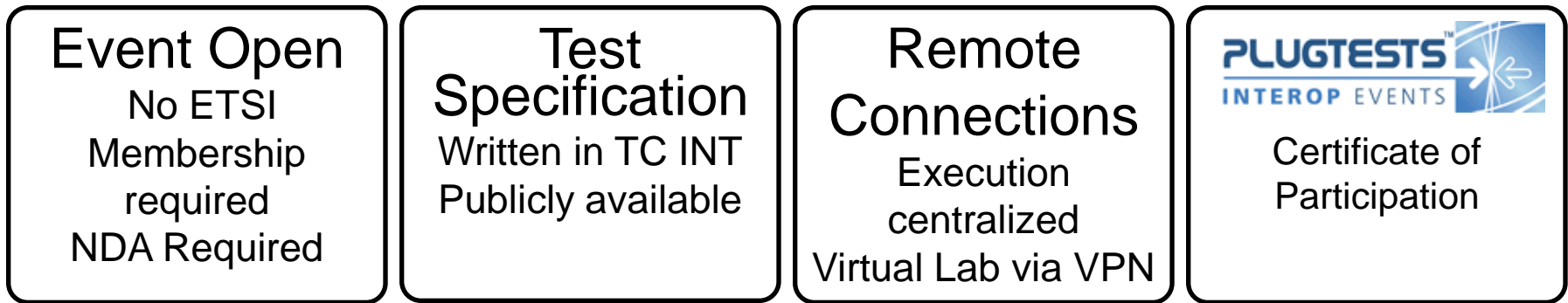
Present Core Network System



Reference Architecture of the IP Multimedia Core Network Subsystem

Too many options...





ETSI IMS Interoperability Event: IMS Plugtests



- The events are open for participation for IMS equipment vendors and operators, as well as ETSI members and non-members.
- Test Specifications are publicly available and written by ETSI TC INT.
- Formal TTCN3 verification is carried out on Interoperability and Conformance

ETSI IMS Interoperability Event:

IMS Plugtests



- Vendor participating to ETSI Plugtests can have Plugtests Participation certificate towards their customers
- Vendors have the opportunity to show selected demonstrations of the latest IMS services and applications like rich communication services (RCS), also potentially involving mobile devices, as well as IMS testing tools.
- Operators have the opportunity to get information to apply in internal RFI/RFQ

Pre-event information

Plugtests preparation



- Network environment set-up by ETSI and testable prior to the event
- Regular conference calls to coordinate the preparation between the participants
- On site pre-testing before the event to avoid delays during the test sessions
- The test specifications, test architecture and configurations are available and editable by the participants

- ENUM Test Cases according to IR.67
 - Pathfinder Test Lab remotely connected
- VoLTE Test Cases according to IR.92
 - Chapter 2 : IMS feature Set (Supp. Services)
 - Chapter 3 : IMS media
- IMS / EPC Test Cases to be added in 2012 (Chapter 4 of IR.92)
- RCS-e 1.x ISC Interface Test Specification



- Scheduled peer-to-peer sessions between all participants
- Test session chair at each matching station
- Dedicated Test Reporting Tool
- Wrap up sessions after each test session
- Final Report produced



Peer-to-Peer Session on a matching station

IMS Plugtests

- Event Organization
- Overall Results

- More Detailed Interoperability Results
- More Detailed Conformance Results

- Comments on Interoperability
- Comments on Conformance

Table 1: Overall interoperability and conformance event results for IMS NNI testing

Specification under test	ETSI TS 124 229 (V7.14.0), [3GPP TS 24.229 Release 7 (Version 7.14.0), modified]
Test Specification used	ETSI 186 011-2 2.3.1
Number of participating IMS core network vendors	8
Number of test sessions	56
Number of tests executed	495 of 2805
Average number of tests executed per session	8 of 52 (Minimum 0 tests, Maximum 35 tests)
Overall percentage of IOP OK	89.1%
Overall percentage of IOP not OK	10.9%
Overall percentage of IOP Not Applicable (over total possible)	12.9%
Overall percentage of IOP Out Of Time (over total possible)	69.4%
Conformance testing	
Overall percentage of Pass Verdicts	55.2%
Overall percentage of Fail Verdicts	37.2%
Overall percentage of Inconclusive Verdicts	7.6%

Interoperability/Conformance Results

Group	Test Id	OK	Not OK	NA	OT	Runs
Registration	TD IMS REG_0001	41 (89.1%)	5 (10.9%)	0 (0.0%)	8 (14.8%)	46 (85.2%)
	TD IMS REG_0003	26 (100.0%)	0 (0.0%)	10 (18.5%)	18 (33.3%)	26 (48.1%)
	TD IMS REG_0005	18 (94.7%)	1 (5.3%)	9 (16.7%)	26 (48.1%)	19 (35.2%)
	TD IMS REG_0002	1 (20.0%)	4 (80.0%)	10 (18.5%)	39 (72.2%)	5 (9.3%)
	TD IMS REG_0006	4 (100.0%)	0 (0.0%)	19 (35.2%)	31 (57.4%)	4 (7.4%)
Basic Call	TD IMS CALL_0007	26 (72.2%)	10 (27.8%)	0 (0.0%)	18 (33.3%)	36 (66.7%)
	TD IMS CALL_0009	26 (100.0%)	0 (0.0%)	0 (0.0%)	28 (51.9%)	26 (48.1%)
	TD IMS CALL_0003	20 (95.2%)	1 (4.8%)	6 (11.1%)	27 (50.0%)	21 (38.9%)
	TD IMS CALL_0004	26 (96.3%)	1 (3.7%)	3 (5.6%)	24 (44.4%)	27 (50.0%)
	TD IMS CALL_0005	24 (92.3%)	2 (7.7%)	3 (5.6%)	25 (46.3%)	26 (48.1%)
	TD IMS CALL_0006	14 (93.3%)	1 (6.7%)	7 (13.0%)	32 (59.3%)	15 (27.8%)
	TD IMS CALL_0014	23 (92.0%)	2 (8.0%)	3 (5.9%)	23 (45.1%)	25 (49.0%)
	TD IMS CALL_0016	10 (90.9%)	1 (9.1%)	13 (24.1%)	30 (55.6%)	11 (20.4%)
Messaging	TD IMS MESS_0002	22 (91.7%)	2 (8.3%)	8 (14.8%)	22 (40.7%)	24 (44.4%)
	TD IMS MESS_0006	17 (100.0%)	0 (0.0%)	8 (14.8%)	29 (53.7%)	17 (31.5%)
	TD IMS MESS_0007	15 (100.0%)	0 (0.0%)	10 (18.5%)	29 (53.7%)	15 (27.8%)
	TD IMS MESS_0001	7 (100.0%)	0 (0.0%)	14 (25.9%)	33 (61.1%)	7 (13.0%)
Media Stream	TD IMS CALL_0019	1 (33.3%)	2 (66.7%)	9 (16.7%)	42 (77.8%)	3 (5.6%)
	TD IMS CALL_0020	1 (100.0%)	0 (0.0%)	10 (18.5%)	43 (79.6%)	1 (1.9%)
	TD IMS CALL_0021	1 (100.0%)	0 (0.0%)	10 (18.5%)	43 (79.6%)	1 (1.9%)
	TD IMS CALL_0022	1 (100.0%)	0 (0.0%)	9 (16.7%)	44 (81.5%)	1 (1.9%)
Application Server	TD IMS PRES_0002	1 (50.0%)	1 (50.0%)	7 (13.0%)	45 (83.3%)	2 (3.7%)
	TD IMS PRES_0003	1 (100.0%)	0 (0.0%)	8 (14.8%)	45 (83.3%)	1 (1.9%)
	TD IMS PRES_0005	0 (0.0%)	0 (0.0%)	7 (13.0%)	47 (87.0%)	0 (0.0%)
	TD IMS SS_0001	2 (33.3%)	4 (66.7%)	9 (16.7%)	39 (72.2%)	6 (11.1%)
	TD IMS SS_0003	7 (100.0%)	0 (0.0%)	8 (14.8%)	39 (72.2%)	7 (13.0%)
	TD IMS SS_0005	6 (85.7%)	1 (14.3%)	8 (14.8%)	39 (72.2%)	7 (13.0%)
	TD IMS SS_0007	3 (100.0%)	0 (0.0%)	9 (16.7%)	42 (77.8%)	3 (5.6%)
	TD IMS SS_0009	1 (50.0%)	1 (50.0%)	10 (18.5%)	42 (77.8%)	2 (3.7%)

ETSI/GSMA 4° IMS Plugtests



- **Event:** 9-16 November 2011
- **Location:** Berlin, Germany
- **Pre-Testing (Mandatory):** 9-10 November
- **Recorded Official test Sessions:** 11-16 November
- **Registration Deadline:** 7 October 2011



- **Technical support** 
- **Sponsored** 



Website <http://www.etsi.org/plugtests/IMS/IMS4.htm>

Scope :

- 3GPP R8 NNI (base for VoLTE)
- RCS-e 1.x Interoperability on ISC interface
- use of IPV6 and IPv4/IPv6 interworking
- ENUM Queries
- IMS Interactions with Legacy PSTN systems
- VoLTE Features, Services and Medias



PLUGTESTSTM
INTEROP EVENTS

4th IMS Interoperability Event

Focusing on:

- > 3GPP R8 IMS NNI Interworking
- > Voice Supplementary Services (HOLD, CONF, OIP/OIR, ACR, CFU, ...)
- > ENUM Queries according to GSMA IR67
- > RCS 2.0 Services Interoperability on ISC interface
- > IMS Interworking with Legacy PSTN Network
- > Use of IPv6 on the relevant interfaces (Gm, Icl, ISC)

- ▶ Assess the level of interoperability of IMS implementations and IMS-based applications
- ▶ Improve the quality of 3GPP IMS specifications
- ▶ Ease the introduction of IMS systems
- ▶ Optimise your IMS implementations
- ▶ Meet in a neutral place
- ▶ Network with your partners, competitors and other experts
- ▶ Solve Interoperability problems before widespread deployment

Technical Partner  **Fraunhofer FOKUS**

Registration Deadline: 7 October 2011

<http://www.etsi.org/plugtests/IMS/IMS4.htm>

9-16 NOVEMBER 2011
BERLIN, GERMANY

 **ETSI**
World Class Standards 

- Comprehensive coverage of 3GPP Release 8 (V8.10.0) with Registration, Messaging, Call establishment/Call release, Supplementary Services (OIP/OIR, HOLD, ACR, CDIV, ...) and the RCS-e services in interworking scenarios and scenarios with roaming subscribers in visited networks
- Connection to ENUM server with test of the number resolution functionalities (GSMA IR67)
- Connection between IMS and PSTN (ISUP) networks and complete end-to-end check
- Checking of functionality related to the AGCF.

- Concentration on the NNI interfaces (Izi, ISC, Mx, ...) and VoLTE requirements NOT on radio aspects (handover etc.)
- Test descriptions with step-by-step test instructions, detailed message flows and interoperability check criteria available
- Offline conformance checks on all SIP messages on the Ici and ISC interfaces during the Plugtests event

- Interoperability Test Update to 3GPP Release 9
- Interoperability of RCS Enhanced on ISC, MW and Ici interfaces
- EPC&IMS Interoperability
- IMS & MMTel interconnection tests



Conclusions



- ETSI IMS Plugtests gives to GSMA Interop Program the value coming from formal interoperability and conformance verification compared to others' fora interoperability demonstrations.
- IMS Network Testing (INT) is the Technical Committee in charge of developing Core Network Testing on 3GPP mandate;
- TC INT is between 3GPP specifications and GSMA pre-commercial Trials
- TC INT produced 3GPP R8 NNI and GSMA RCS-e 1.x ISC Interoperability Test Specifications and 4th IMS Plugtests will be organized 9-16 November in Berlin
- TC INT is currently working on IMS&EPC 3GPP R9 Interoperability





THANK YOU

FOR YOUR ATTENTION!