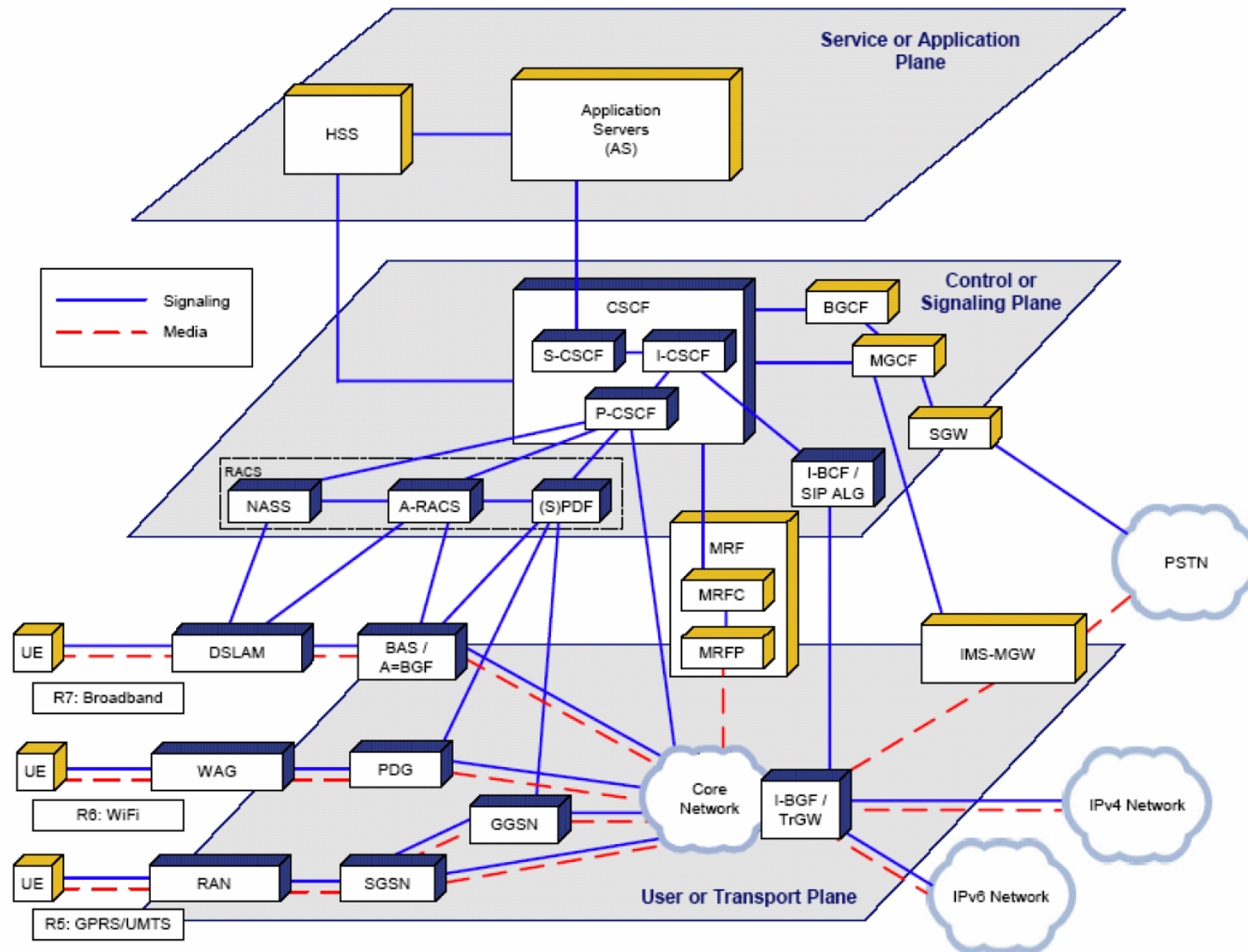
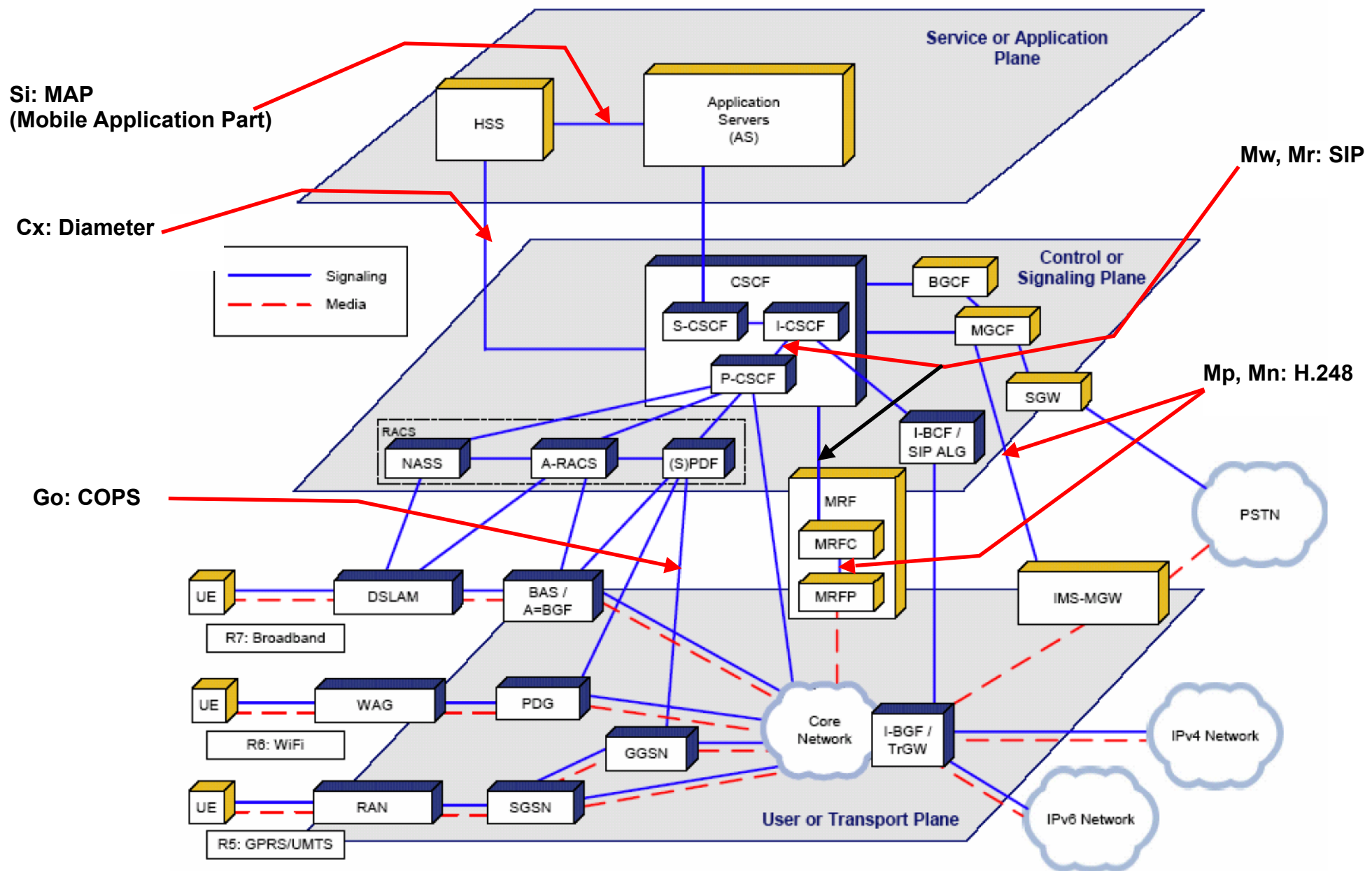


- **Motivation**
- **Testing Methods with Controlled Stimulation**
 - **Conformance Testing**
 - **Interoperability Testing**
 - **Comparison**
- **Post-hoc Analysis (Example: IMPACT)**
- **Summary and Future Prospects**

Overview Testing of Protocols



Why testing?



Protocols Used in the IMS at Certain Reference Points (Examples)

Definition 1 (Wikipedia)

The ability of systems, units, or forces to provide services to and accept services from other systems, units or forces and to use the services exchanged to enable them to operate effectively together.

Definition 2 (Wikipedia)

The condition achieved among communications-electronics systems or items of communications-electronics equipment when information or services can be exchanged directly and satisfactorily between them and/or their users. The degree of interoperability should be defined when referring to specific cases.

Definition 3 (IEEE):

Interoperability is the ability of two or more systems or components to exchange information and to use the information that has been exchanged.

Definition 4 (ETSI TISPAN):

Interoperability is the ability of equipment from different manufacturers (or different systems) to communicate together on the same infrastructure (same system), or on another while roaming.

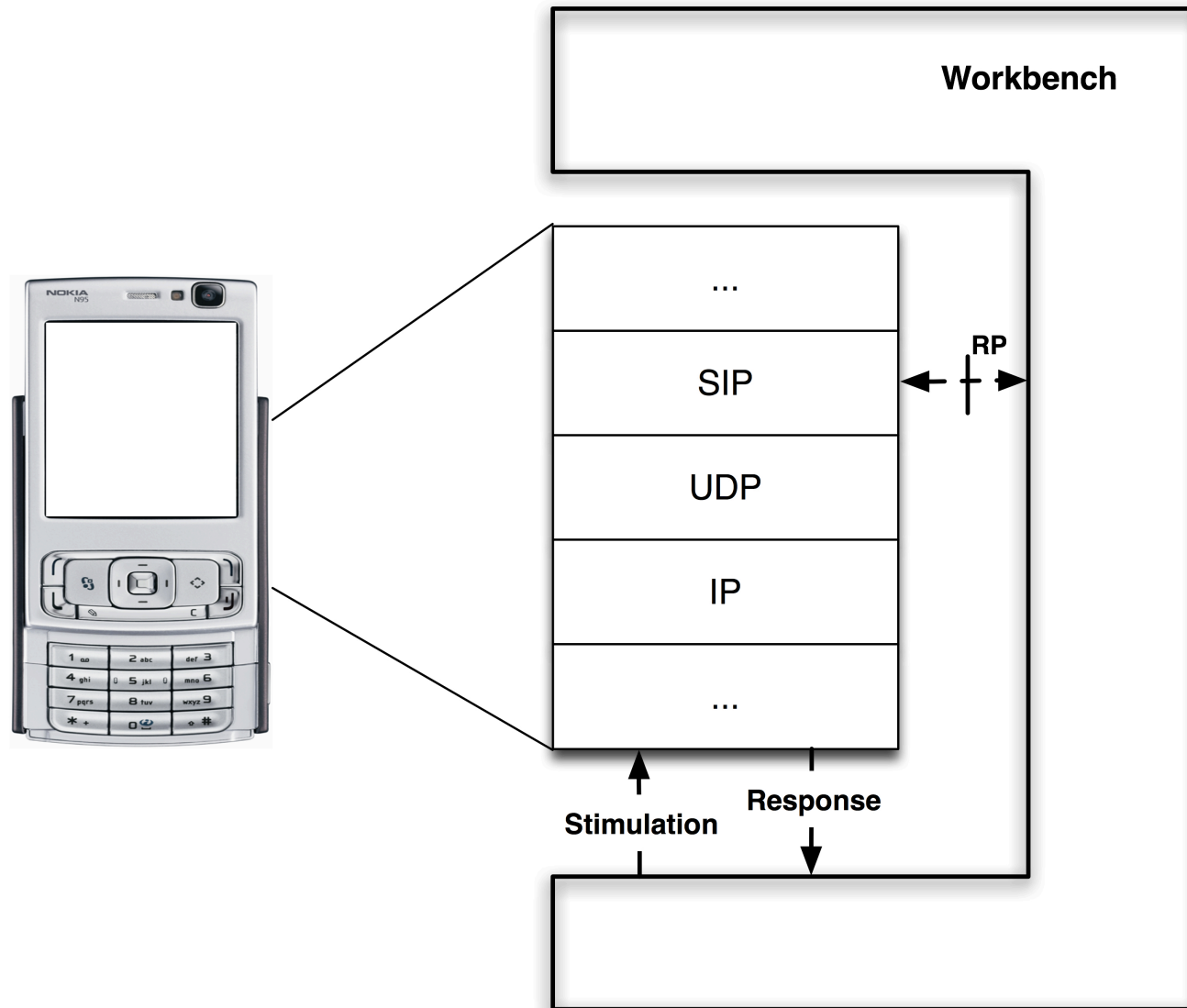
Definition 5 (ETSI TIPHON):

Interoperability is the ability of two systems to interoperate using the same protocol.

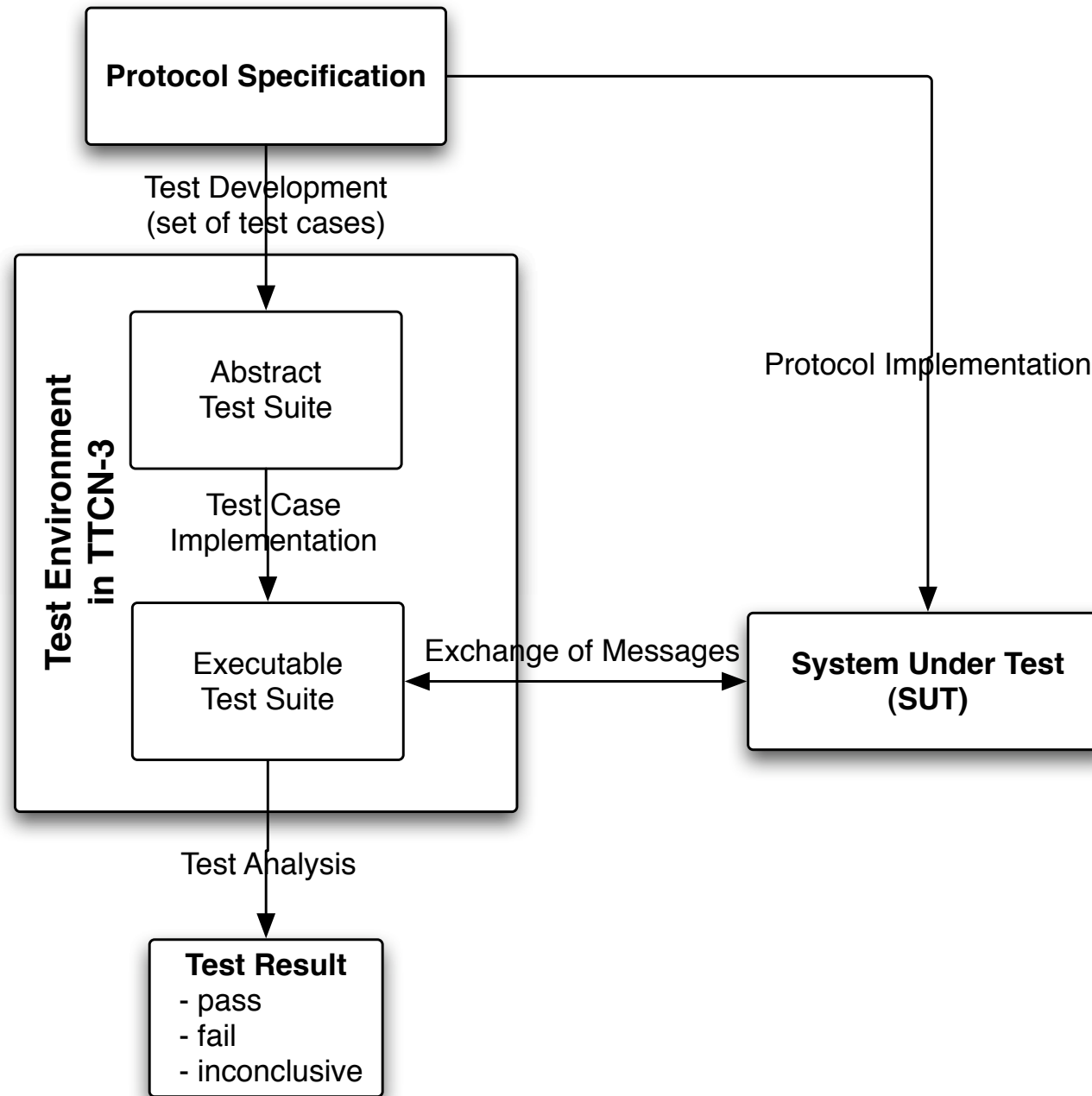
Definition 6 (3GPP):

Interoperability is the ability of two or more systems or components to exchange data and use information.

Definitions of Interoperability



Conformance Testing



Conformance Test Development Process

3.3.4. Dialog creation and termination

If an initial SUBSCRIBE request is not sent on a pre-existing dialog, the subscriber will wait for a response to the SUBSCRIBE request or a matching NOTIFY.

Responses are matched to such SUBSCRIBE requests if they contain the same the same "Call-ID", the same "From" header "tag", and the same "CSeq". Rules for the comparison of these headers are described in SIP [1]. If a 200-class response matches such a SUBSCRIBE request, it creates a new subscription and a new dialog (unless they have already been created by a matching NOTIFY request; see below).

Roach	Standards Track	[Page 18]
□		
RFC 3265	SIP-Specific Event Notification	June 2002

NOTIFY requests are matched to such SUBSCRIBE requests if they contain the same "Call-ID", a "To" header "tag" parameter which matches the "From" header "tag" parameter of the SUBSCRIBE, and the same "Event" header field. Rules for comparisons of the "Event" headers are described in section 7.2.1. If a matching NOTIFY request contains a "Subscription-State" of "active" or "pending", it creates a new subscription and a new dialog (unless they have already been created by a matching response, as described above).

Section of the Protocol Specification (RFC 3265)

SIP_SUBNOT_TE_V_004

Beschreibung:

Ensure that the IUT, having received a SUBSCRIBE with all mandatory headers, and answered with a 200 OK, sends a NOTIFY with the same event-type as in the SUBSCRIBE-message.

Testablauf:

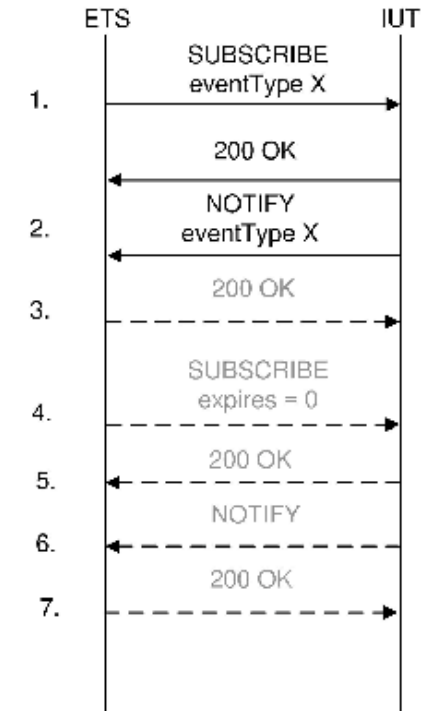
Testablauf wie in SIP_SUBNOT_TE_V001 allerdings wird bei 3. der Event-Type-Header-Wert mit dem in 1. gesendeten Event-Type-Header-Wert verglichen.

Sonstiges:

Status:

implementiert: ja
getestet: ja

Sequenzdiagramm:



Referenzen:

RFC 3265, section 3.3.4

Testcase: Description

```

testcase SIP_SUBNOT_TE_V_004() runs on SipTcComponent system SipInterfaces {
  initPort(mtc, system);
  loc_CSeq_s.method := "SUBSCRIBE";

  SIPP.send (SUBSCRIBE_Request_s_1(v_ReqUri, v_CallId, loc_CSeq_s, v_Contact, v_From, v_To, v_Via)) to sent_label;

  Tack.start (PX_TACK);
  alt {
    [] SIPP.receive {
      SUBSCRIBE_Response_200_r_1(v_CallId, loc_CSeq_s) -> value loc_response {
        Tack.stop;
        setverdict (pass);
      }
    [] SIPP.receive {
      all timer.stop;
      setverdict (fail);
      stop;
    }
    [] Tack.timeout {
      setverdict (fail);
      stop;
    }
  }
}

loc_CSeq_s.method := "NOTIFY";

TWait.start (PX_TWAIT);
alt {
  [] SIPP.receive {
    NOTIFY_Request_r_2(loc_CSeq_s) -> value v_NOTIFY_Request sender sent_label {
      TWait.stop;
      setverdict (pass);

      v_CSeq.method := "NOTIFY";
      SIPP.send (Response_200_s_1(v_CallId, v_CSeq, v_From, v_To, v_Via)) to sent_label;
    }
  [] SIPP.receive {
    all timer.stop;
    setverdict (fail);
    stop;
  }
  [] TWait.timeout {
    setverdict (fail);
    stop;
  }
}
}
}

```

Testcase: TTCN-3 Code (simplified)

TTCN-3 Execution Management - TTWorkBench Professional

File Edit Navigate Search Project Run Window Help

Management View Meta Campaign View

SIP_SUBNOT_TE_V_004

Test Case	Runs	Failure Action	Retries	Module
3265_IMS				
SIP_RG_RT_V_002	1	CONTINUE	0	SIP_Re
SIP_SUBNOT_TE_V_001	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_004	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_005	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_006	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_007	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_008	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_009	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_010	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_011	1	CONTINUE	0	SIP_Te
SIP_SUBNOT_TE_V_013	1	CONTINUE	0	SIP_Te

Expected TTCN-3 Template

User Type	Name	Value
WWWAuthenti...	wwwAuthentic...	*
UndefinedHea...	undefinedHea...	*
RAck	rAck	*
RSeq	rSeq	*
AllowEvents	allowEvents	*
Event	event	*
	fieldName	EVENT_E
EventType	eventType	presence
SemicolonPar...	eventParams	omit
SubscriptionSt...	subscriptionSt...	?
PMediaAuthori...	pMediaAuthori...	*
PAssertedId	pAssertedId	*
PPreferredId	pPreferredId	*
SIPETag	sipETag	*
SIPIMatch	sipIMatch	*
ReferTo	referTo	*
Privacy	privacy	*
Reason	reason	*
Path	nath	*

Data

User Type	Name	Value
WWWAuthenti...	wwwAuthentic...	omit
UndefinedHea...	undefinedHea...	omit
RAck	rAck	omit
RSeq	rSeq	omit
AllowEvents	allowEvents	omit
Event	event	omit
	fieldName	EVENT_E
EventType	eventType	presence
SemicolonPar...	eventParams	omit
SubscriptionSt...	subscriptionSt...	omit
	fieldName	SUBSCRIPTION_STATE_E
SubState	subState	pending
SemicolonPar...	substateParams	omit
GenericParam	0	omit
charstring	id	expires
charstring	paramValue	3600
PMediaAuthori...	pMediaAuthori...	omit
PAssertedId	pAssertedId	omit
PPreferredId	pPreferredId	omit
SIPETag	sipETag	omit

Time:

Properties View Parameter View

Property Value Description

ID 3265_IMS

Verdict

Details

Ready

Your username is: tester1

Calls & Contacts

Always Available

Contacts

New Contact Request

TESTER1 (sip:tester1@141.41.40.180) has requested permission to be able to see if you are online or not.

Would you like to allow this?

Allow and add to my Contact List Allow Deny

Powered by COUNTERPATH

TTCN-3 Graphical Logging TTCN-3 Textual Logging 100%

SIP_TestCasesRFC3265_IMS.SIP_SUBNOT_TE_V_004

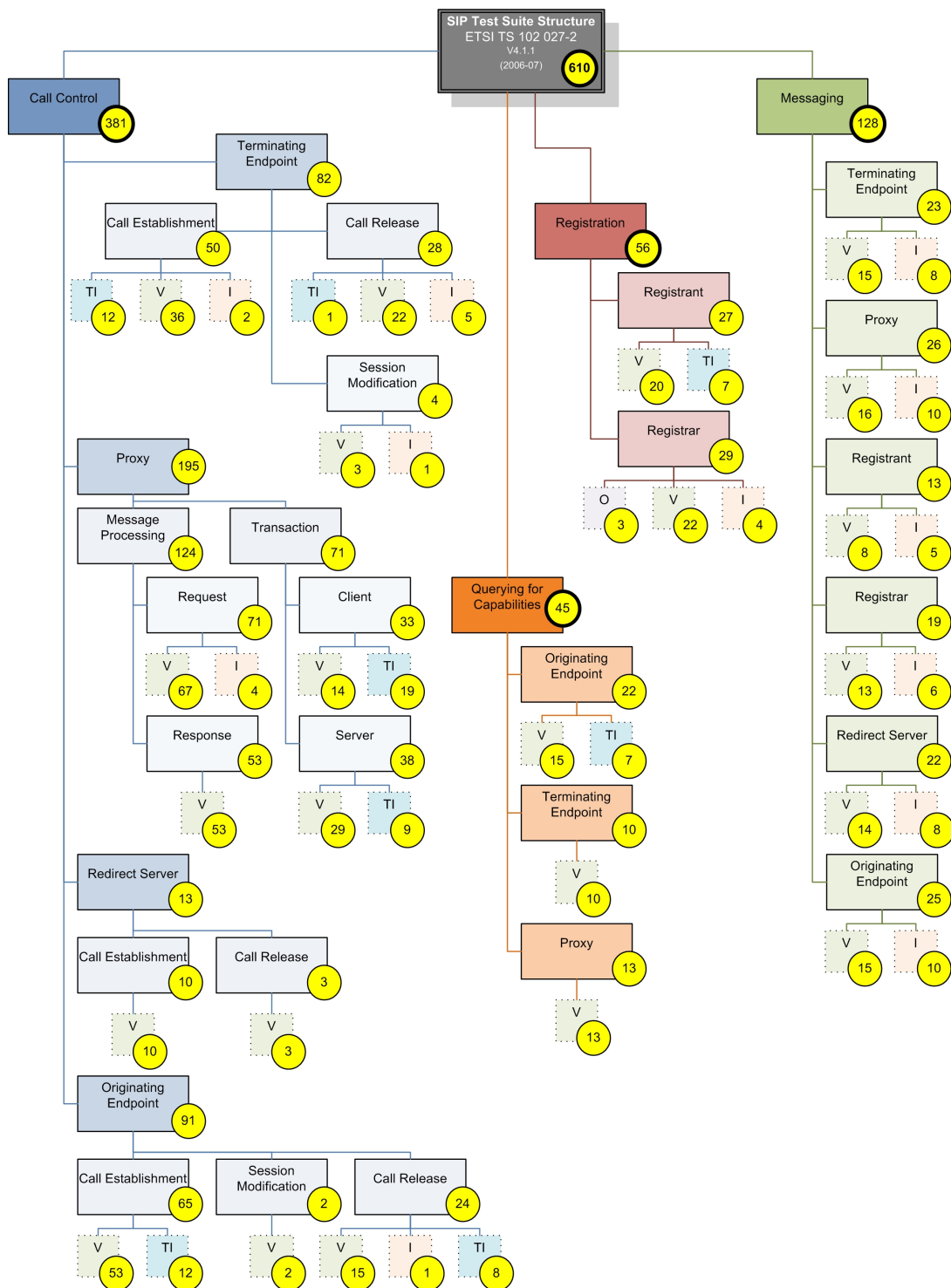
Start : 2007-10-05 15:18:55.995

End : 2007-10-05 15:18:57.327

```

sequenceDiagram
    participant MTC as MTC  
SIP_Type...
    participant SYSTEM as SYSTEM  
SIP_Type...
    MTC->>SYSTEM: send SUBSCRIBE_Request
    SYSTEM-->>MTC: receive
    MTC->>SYSTEM: receive
    SYSTEM-->>MTC: mismatch Response
    MTC->>SYSTEM: match Response
    MTC->>SYSTEM: Tack(0.287)
    SYSTEM-->>MTC: TWait(30.0)
    MTC->>SYSTEM: match NOTIFY_Request
    SYSTEM-->>MTC: receive
    MTC->>SYSTEM: TWait(0.155)
    MTC->>SYSTEM: "Used Port: 5061"
    MTC->>SYSTEM: send Response
    SYSTEM-->>MTC: pass
    MTC->>SYSTEM: pass
  
```

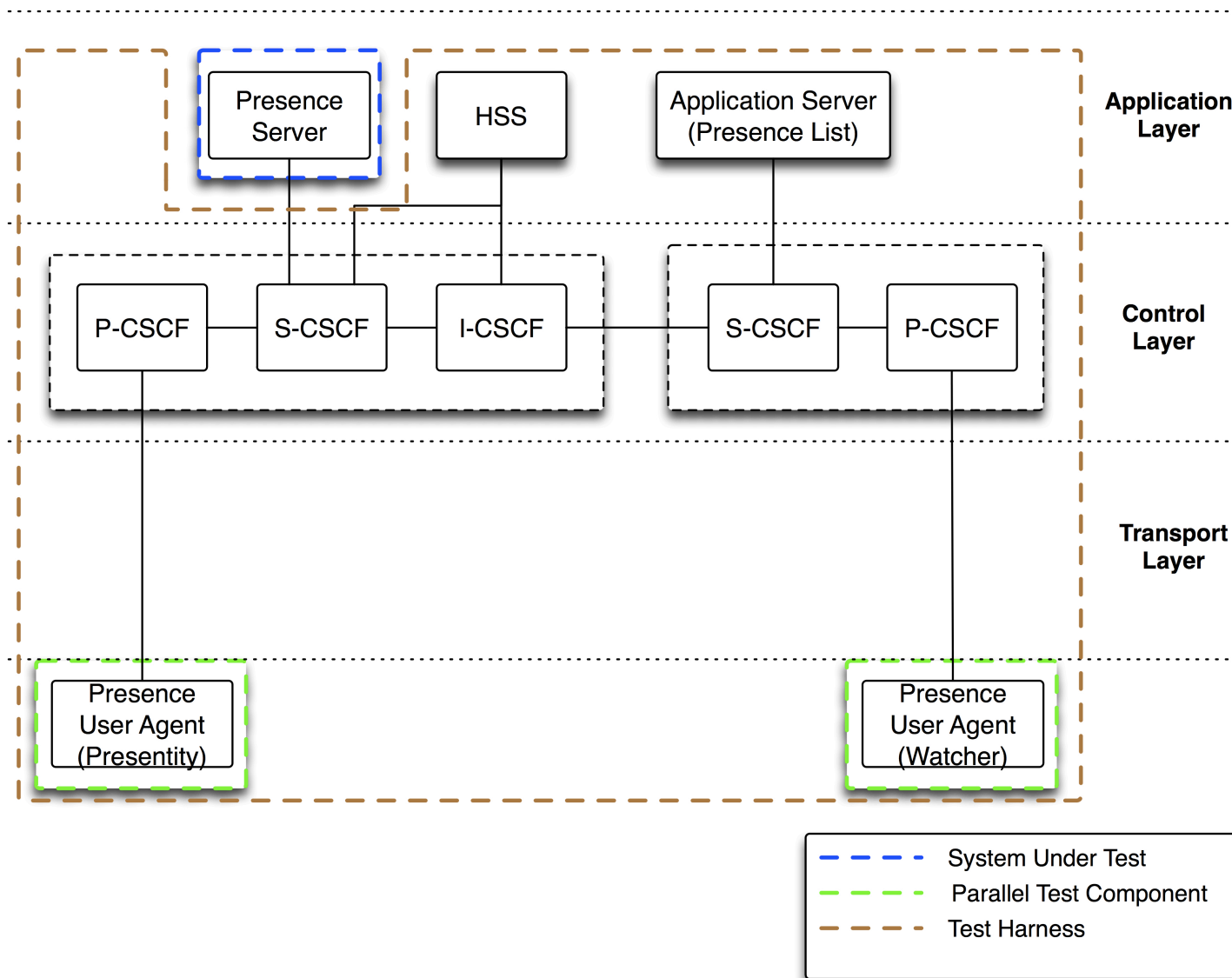
Demonstration of a Presence Conformance Test Case



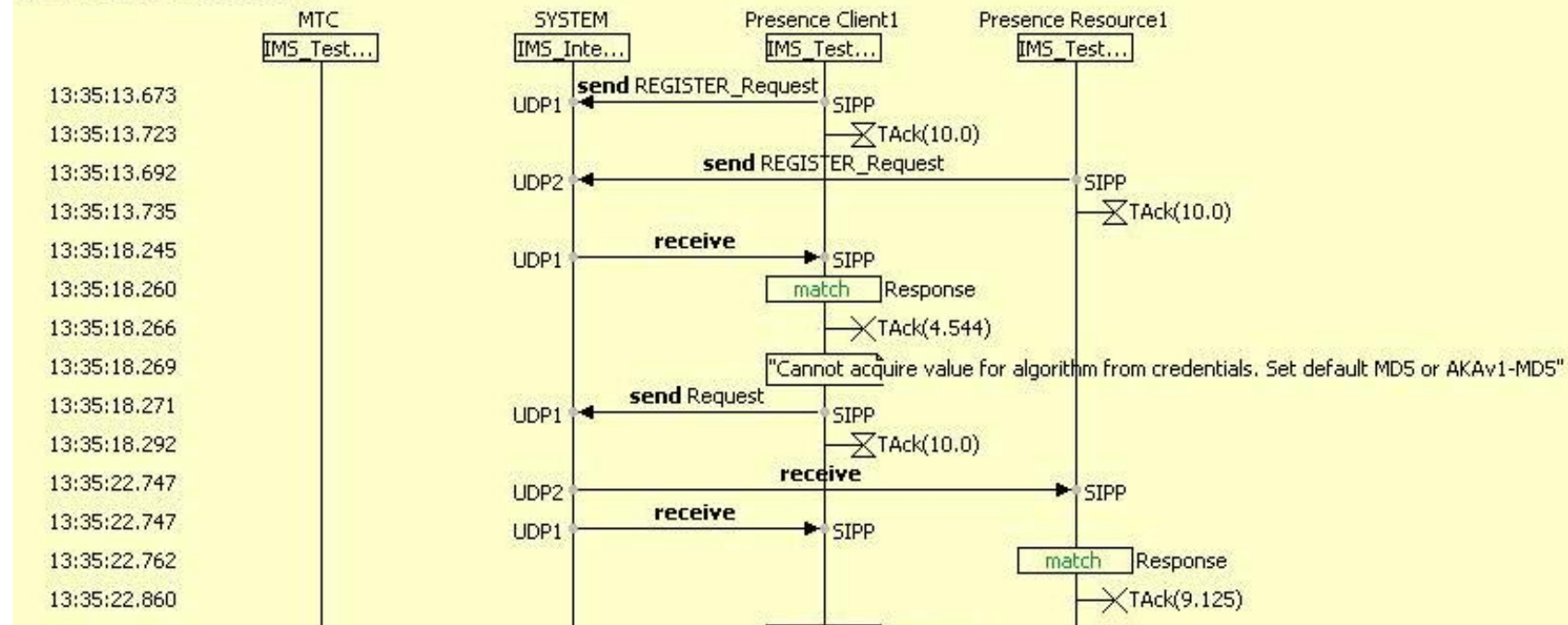
Number and Structure TTCN3 Testcases for SIP Standard (RFC 3261)

- **Protocol entities can be checked whether they implement the protocol specification correctly**
- **Powerful pattern matcher when using TTCN-3**
- **SUT's behavior is checked with valid and invalid messages**
- **SUTs with multiple interfaces can be tested using Parallel Test Components**
- **For the evaluation of conformance tests reference implementations are needed**
- **Testing of hybrid network elements is possible**

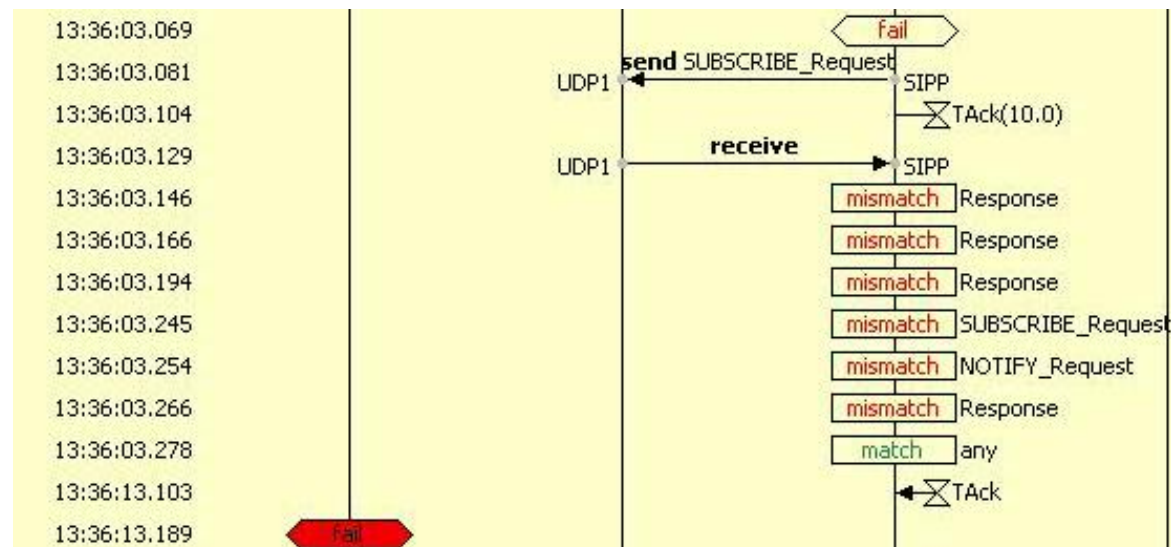
Aspects of Conformance Testing



Conformance Testing with Multiple Components (Example: SIP Presence)



...

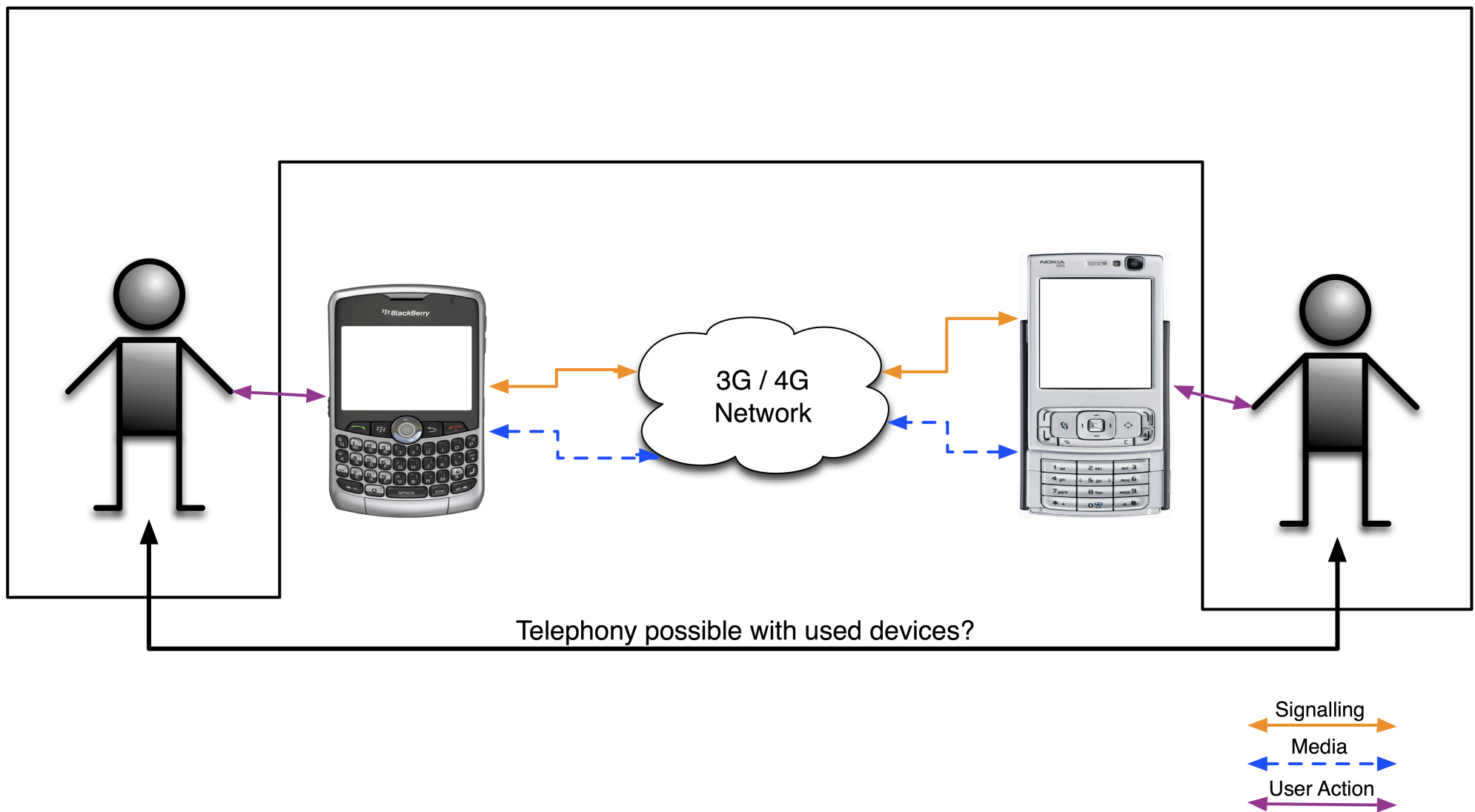


Conformance Test Example (TTCN-3)

"Interoperability testing checks whether a function is implemented end-to-end between two or more network elements"



What is Interoperability Testing?



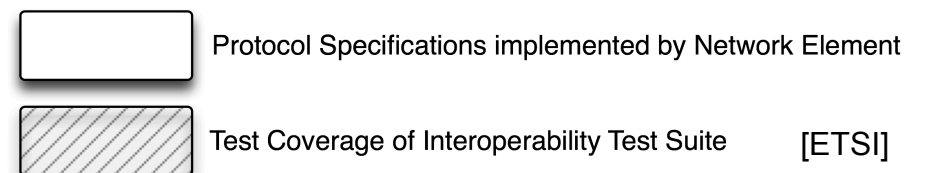
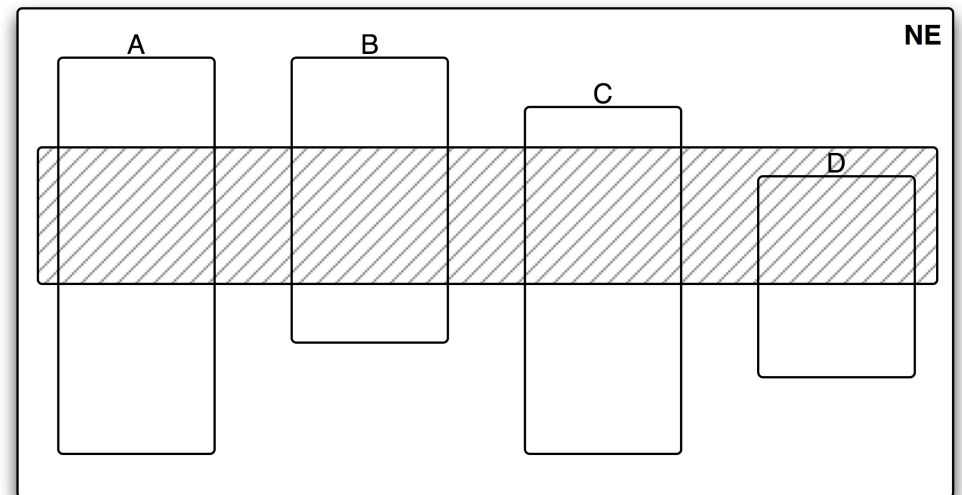
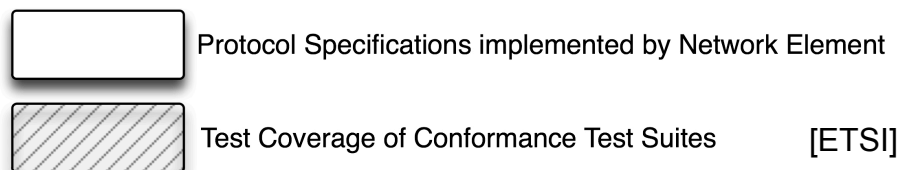
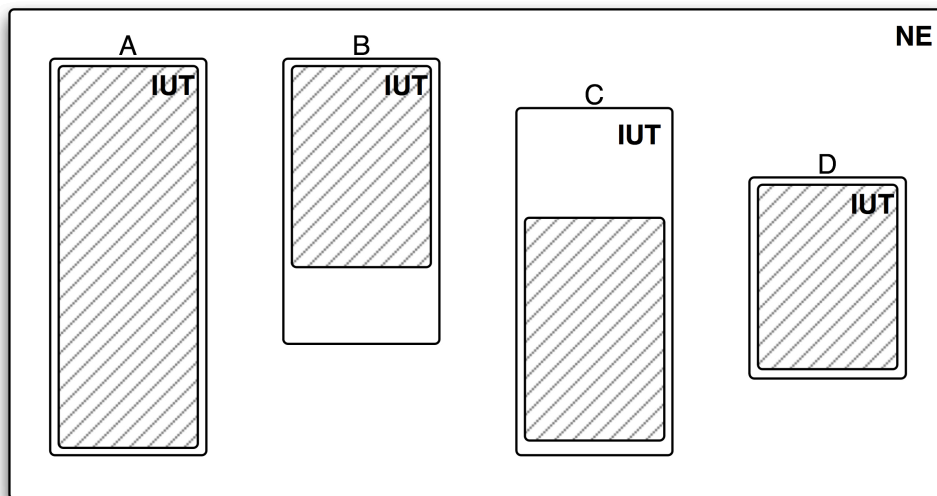
Interoperability Testing

Test: 01			
Title:	Voice Call Establishment from User A to User B		
Test Purpose:	To verify that a call can be established successfully to User 8 by User A and that speech communication is possible between User A and User B		
Pre-test conditions:	Configure Network Elements to support at least Codec G.711		
Step	Test Description	Verdict	
		pass	fail
1	Initiate a new call from User A to User B	-	-
2	A: Is dial tone heard?	Yes	No
3	B: Is the phone ringing?	Yes	No
4	User B answers the phone	-	-
5	A: Is dial tone heard?	No	Yes
6	B: Is the phone ringing?	No	Yes
7	User A talks	-	-
8	B: Can User A be heard by User B?	Yes	No
9	user B talks	-	-
10	A: Can User B be heard by User A?	Yes	No
11	Clear the call	-	-

Interoperability Test Case

- **Interoperability testing checks if network elements of different vendors interact correctly**
- **Functions are tested end-to-end**
- **Conformity to the protocol specification is NOT tested**
- **Interoperability testing isn't limited to a single protocol specification**

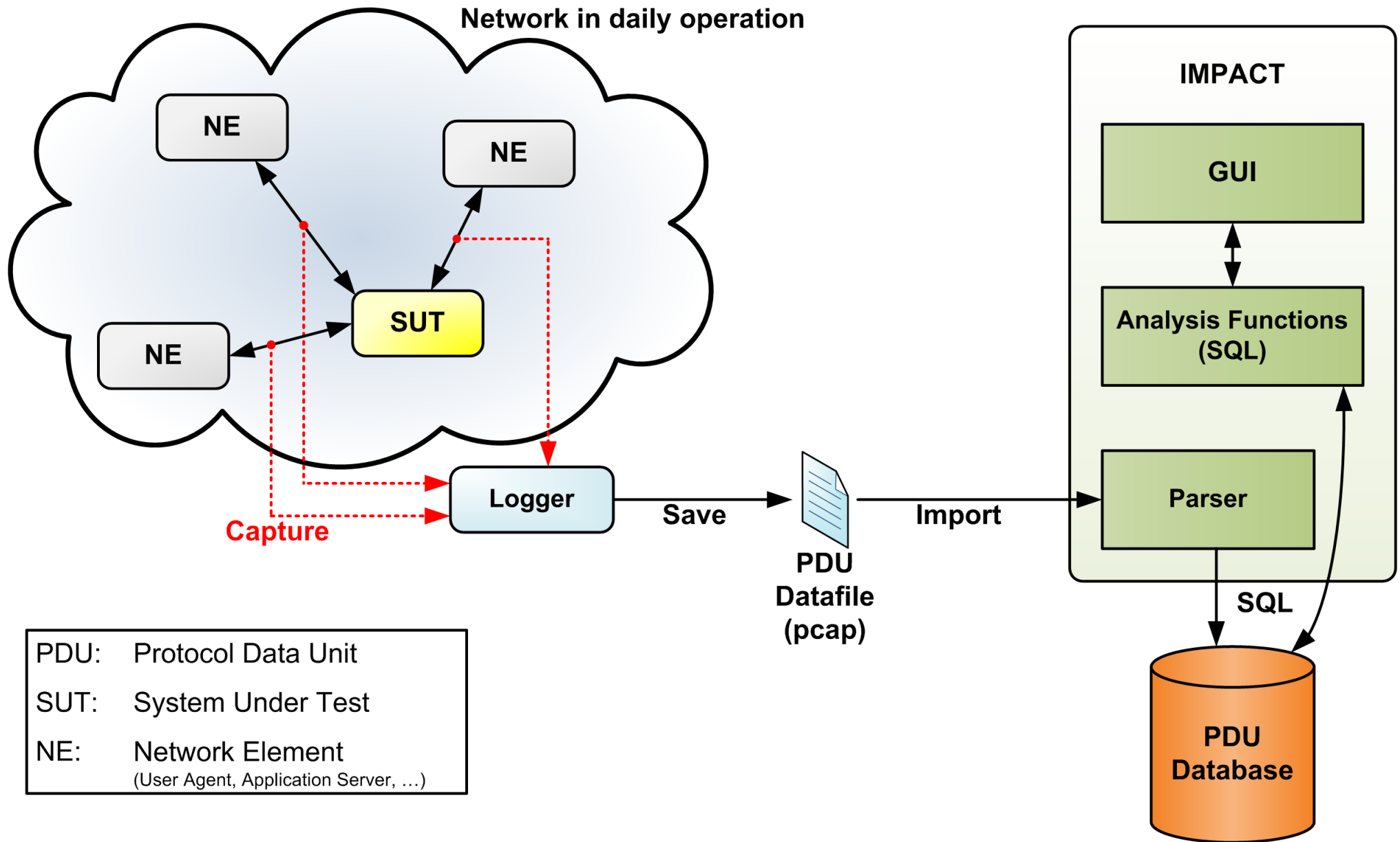
Aspects of Interoperability Testing



Comparison of Conformance and Interoperability Testing (1)

Criteria	Conformance Testing	Interoperability Testing
Test Setup	Test between dedicated test system and protocol entity	Test between several network elements from different vendors end-to-end
Interoperability?	Guaranteed only with 100% test coverage (unrealistic)	only between tested network elements
Fokus des Tests	Unit Testing - focused only on a single protocol instance	System Testing - wider focus: interaction between several protocol instances in a network element is tested (i.e. telephonie: signaling and user data)
SUT	Protocol entity (IUT)	EUT, comprising several interacting IUTs
Test Types	Valid, invalid and timing behavior can be tested. Through invalid tests robustness of SUT is tested as well.	Only valid behavior can be tested
Test Execution	High degree of control (protocol messages can be designed as needed)	Only input through the devices' user interfaces
Test Evaluation	High transparency due to powerful pattern matcher	Cause of errors can only be detected by analyzing the trace

Comparison of Conformance and Interoperability Testing (2)

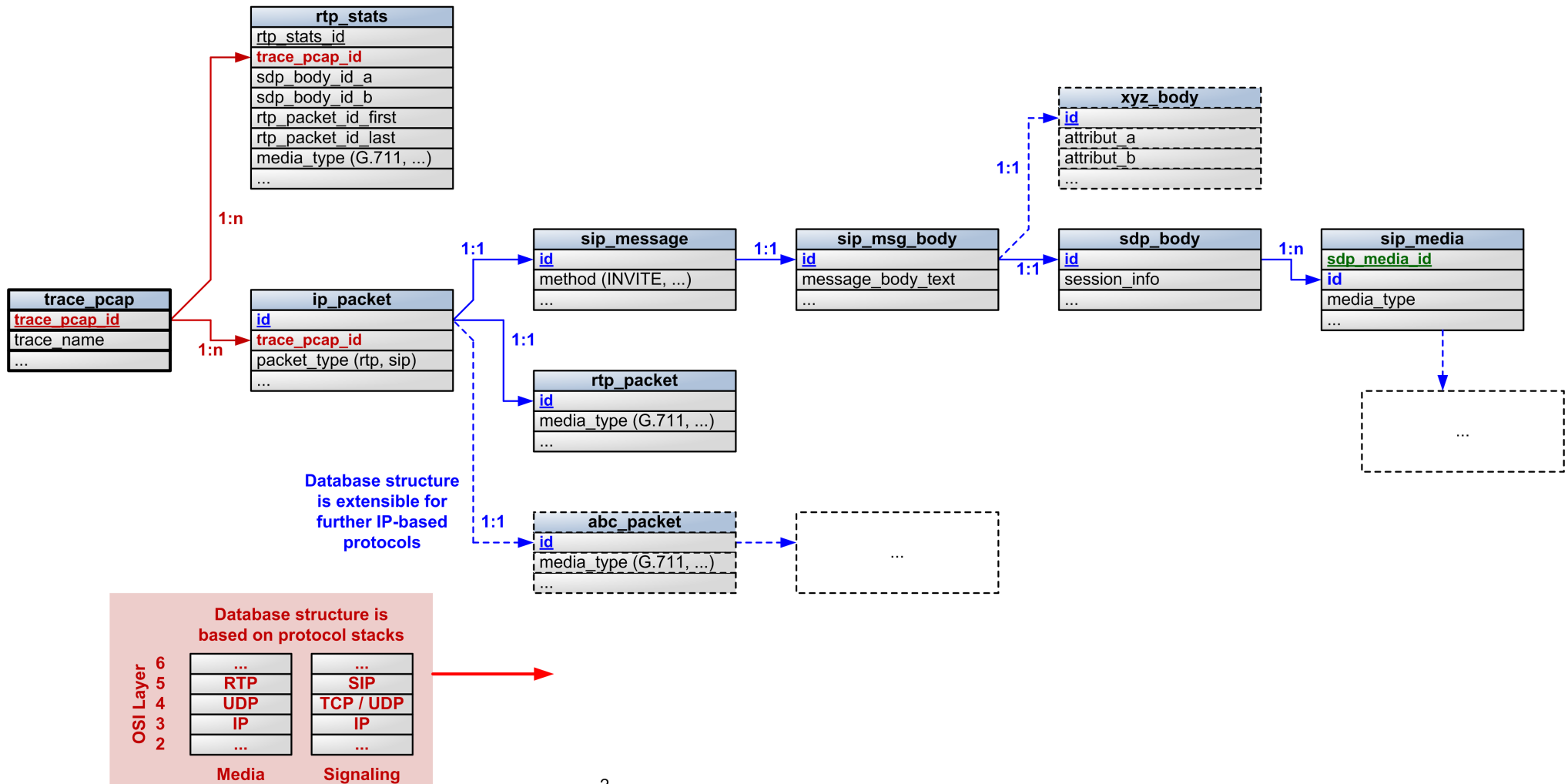


Logging / Parsing of PDUs with IMPACT

IP-based **M**ulti Protocol **P**ost-hoc **A**nalyzer and **C**onformance **T**ester

- IMPACT is developed at Communication System Lab
- PDUs are stored in a database
- Search for faulty message sequences with analysis functions in SQL
- Implementation of conformance and interoperability test cases in IMPACT
- Applicable to all kinds of IP-based protocols
 - Currently utilization for smart metering / smart grid devices under work

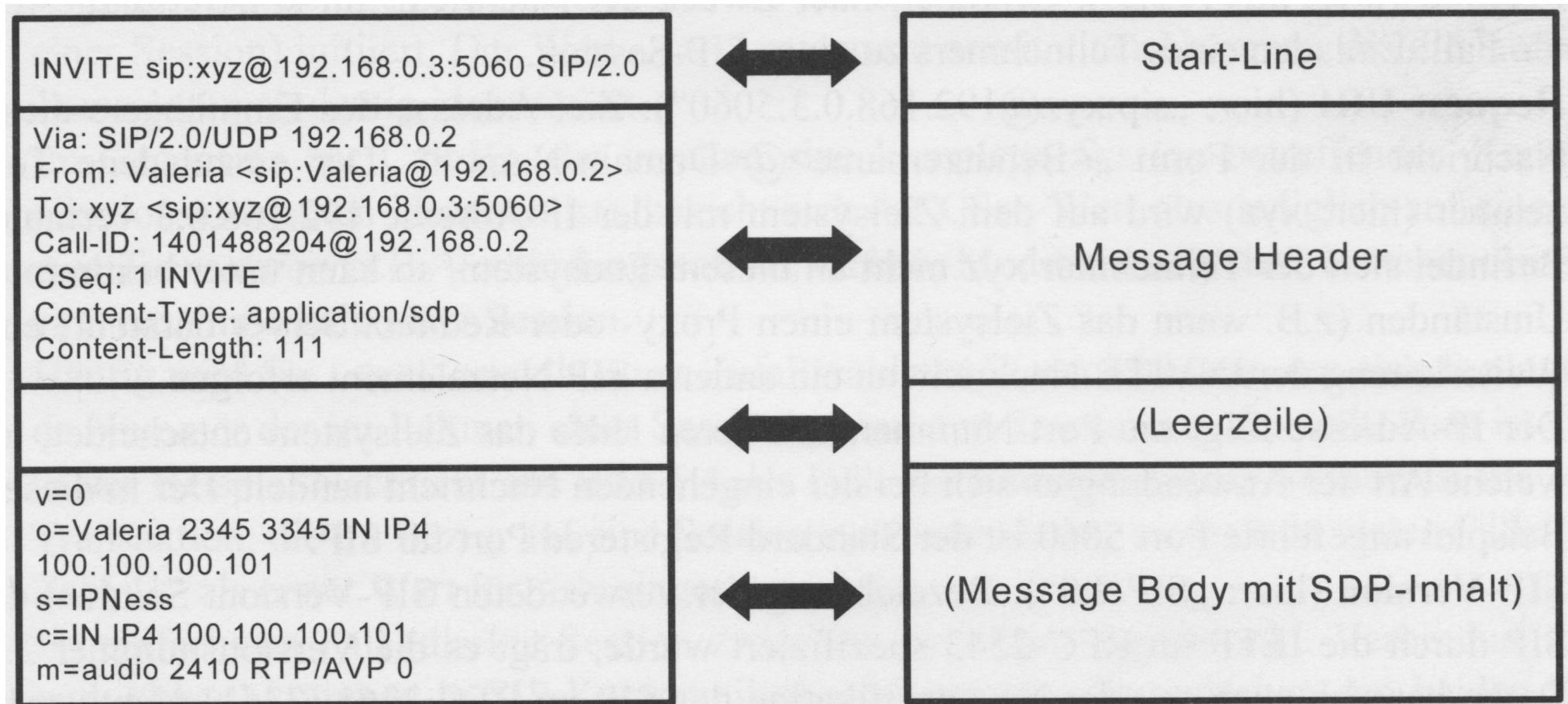
Post-hoc Analysis Using IMPACT



2

2

Database Structure of IMPACT



SIP Message Structure

Thursday, Oct 15, 2009
Manage Traces ▾
Analysis ▾
Configuration ▾
About

IMPACT
Search ▾
Errors ▾
General ▾
Interoperability ▾
Payload Data ▾

2100 rows in Trace ID 28.

Move to: Begin -100 +100 -300 +300 -1000 +1000 End

sn	ip_timestamp	msg_line	cseq	call_id
275	2009-06-03 08:27:58.596154	200 Ok	38 NOTIFY	3c81452d6675-pt5n33j9ltq4
276	2009-06-03 08:28:02.481128	SUBSCRIBE sip:207@voip.ikt-bs.de	1503 SUBSCRIBE	3c26701756ae-wkhlozed464
277	2009-06-03 08:28:02.494208	401 Unauthorized	1503 SUBSCRIBE	3c26701756ae-wkhlozed464
278	2009-06-03 08:28:02.533227	SUBSCRIBE sip:207@voip.ikt-bs.de	1504 SUBSCRIBE	3c26701756ae-wkhlozed464
279	2009-06-03 08:28:02.684086	202 Accepted	1504 SUBSCRIBE	3c26701756ae-wkhlozed464
280	2009-06-03 08:28:02.689527	NOTIFY sip:207@141.41.40.179:5060;line=13ema5pf	753 NOTIFY	3c26701756ae-wkhlozed464
281	2009-06-03 08:28:02.733025	200 Ok	753 NOTIFY	3c26701756ae-wkhlozed464
282	2009-06-03 08:28:07.854166	NOTIFY sip:141.41.40.232:55652;transport=udp	30 NOTIFY	s-0995c251be649724-816
283	2009-06-03 08:28:07.867287	200 OK	30 NOTIFY	s-0995c251be649724-816
284	2009-06-03 08:28:07.947552	BYE sip:208@141.41.40.160:5060;line=kyse55am	3 BYE	3c322e77b718-yvzlvtsrskm6
285	2009-06-03 08:28:07.954606	BYE sip:208@141.41.40.160:5060;line=kyse55am	3 BYE	3c322e77b718-yvzlvtsrskm6
286	2009-06-03 08:28:08.172704	BYE sip:204@141.41.40.158:5060;line=tlqkj8ob	1 BYE	3c322e77b718-yvzlvtsrskm6
287	2009-06-03 08:28:08.182244	BYE sip:204@141.41.40.158:5060;line=tlqkj8ob	1 BYE	3c322e77b718-yvzlvtsrskm6
288	2009-06-03 08:28:08.227016	481 Call Leg/Transaction Does Not Exist	1 BYE	3c322e77b718-yvzlvtsrskm6
289	2009-06-03 08:28:08.228712	481 Call Leg/Transaction Does Not Exist	1 BYE	3c322e77b718-yvzlvtsrskm6
290	2009-06-03 08:28:08.234756	481 Call Leg/Transaction Does Not Exist	3 BYE	3c322e77b718-yvzlvtsrskm6
291	2009-06-03 08:28:08.236328	481 Call Leg/Transaction Does Not Exist	3 BYE	3c322e77b718-yvzlvtsrskm6
292	2009-06-03 08:28:09.12135	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
293	2009-06-03 08:28:09.136906	PUBLISH sip:204@141.41.40.158:5060;line=tlqkj8ob	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
294	2009-06-03 08:28:09.406759	482 Loop Detected	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
295	2009-06-03 08:28:09.436582	405 Method Not Allowed	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
296	2009-06-03 08:28:09.483796	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e9d5fd2-i3mda9iywq6l
297	2009-06-03 08:28:09.499087	PUBLISH sip:204@141.41.40.158:5060;line=tlqkj8ob	1 PUBLISH	3c322e9d5fd2-i3mda9iywq6l
298	2009-06-03 08:28:09.672132	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
299	2009-06-03 08:28:09.67377	405 Method Not Allowed	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
300	2009-06-03 08:28:09.809711	482 Loop Detected	1 PUBLISH	3c322e9d5fd2-i3mda9iywq6l
301	2009-06-03 08:28:09.839613	405 Method Not Allowed	1 PUBLISH	3c322e9d5fd2-i3mda9iywq6l
302	2009-06-03 08:28:09.9835	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e9dda71-ikiitissg825
303	2009-06-03 08:28:09.999014	PUBLISH sip:204@141.41.40.158:5060;line=tlqkj8ob	1 PUBLISH	3c322e9dda71-ikiitissg825
304	2009-06-03 08:28:10.57062	482 Loop Detected	1 PUBLISH	3c322e9dda71-ikiitissg825
305	2009-06-03 08:28:10.87651	405 Method Not Allowed	1 PUBLISH	3c322e9dda71-ikiitissg825
306	2009-06-03 08:28:10.461286	INVITE sip:206@voip.ikt-bs.de;user=phone	1 INVITE	3c322e9c8a7c-pgh311setzzk
307	2009-06-03 08:28:10.464318	100 Trying	1 INVITE	3c322e9c8a7c-pgh311setzzk
308	2009-06-03 08:28:10.479352	SUBSCRIBE sip:206@voip.ikt-bs.de;user=phone	1 SUBSCRIBE	3c322e9e5efa-il43al9sq27r

IP-based Multi Protocol Post-hoc Analyzer And Conformance Tester

sn	ip_timestamp	msg_line	cseq	call_id
275	2009-06-03 08:27:58.596154	200 Ok	38 NOTIFY	3c81452d6675-pt5n33j9ltq4
276	2009-06-03 08:28:02.481128	SUBSCRIBE sip:207@voip.ikt-bs.de	1503 SUBSCRIBE	3c26701756ae-wkhlozed464
277	2009-06-03 08:28:02.494208	401 Unauthorized	1503 SUBSCRIBE	3c26701756ae-wkhlozed464
278	2009-06-03 08:28:02.533227	SUBSCRIBE sip:207@voip.ikt-bs.de	1504 SUBSCRIBE	3c26701756ae-wkhlozed464
279	2009-06-03 08:28:02.684086	202 Accepted	1504 SUBSCRIBE	3c26701756ae-wkhlozed464
280	2009-06-03 08:28:02.689527	NOTIFY sip:207@141.41.40.179:5060;line=13ema5pf	753 NOTIFY	3c26701756ae-wkhlozed464
281	2009-06-03 08:28:02.733025	200 Ok	753 NOTIFY	3c26701756ae-wkhlozed464
282	2009-06-03 08:28:07.854166	NOTIFY sip:141.41.40.232:55652;transport=udp	30 NOTIFY	s-0995c251be649724-816
283	2009-06-03 08:28:07.867287	200 OK	30 NOTIFY	s-0995c251be649724-816
284	2009-06-03 08:28:07.947552	BYE sip:208@141.41.40.160:5060;line=kyse55am	3 BYE	3c322e77b718-yvzlvtsrskm6
285	2009-06-03 08:28:07.954606	BYE sip:208@141.41.40.160:5060;line=kyse55am	3 BYE	3c322e77b718-yvzlvtsrskm6
286	2009-06-03 08:28:08.172704	BYE sip:204@141.41.40.158:5060;line=tlqkj8ob	1 BYE	3c322e77b718-yvzlvtsrskm6
287	2009-06-03 08:28:08.182244	BYE sip:204@141.41.40.158:5060;line=tlqkj8ob	1 BYE	3c322e77b718-yvzlvtsrskm6
288	2009-06-03 08:28:08.227016	481 Call Leg/Transaction Does Not Exist	1 BYE	3c322e77b718-yvzlvtsrskm6
289	2009-06-03 08:28:08.228712	481 Call Leg/Transaction Does Not Exist	1 BYE	3c322e77b718-yvzlvtsrskm6
290	2009-06-03 08:28:08.234756	481 Call Leg/Transaction Does Not Exist	3 BYE	3c322e77b718-yvzlvtsrskm6
291	2009-06-03 08:28:08.236328	481 Call Leg/Transaction Does Not Exist	3 BYE	3c322e77b718-yvzlvtsrskm6
292	2009-06-03 08:28:09.12135	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
293	2009-06-03 08:28:09.136906	PUBLISH sip:204@141.41.40.158:5060;line=tlqkj8ob	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
294	2009-06-03 08:28:09.406759	482 Loop Detected	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
295	2009-06-03 08:28:09.436582	405 Method Not Allowed	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
296	2009-06-03 08:28:09.483796	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e9d5fd2-i3mda9iywq6l
297	2009-06-03 08:28:09.499087	PUBLISH sip:204@141.41.40.158:5060;line=tlqkj8ob	1 PUBLISH	3c322e9d5fd2-i3mda9iywq6l
298	2009-06-03 08:28:09.672132	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
299	2009-06-03 08:28:09.67377	405 Method Not Allowed	1 PUBLISH	3c322e9d0710-33k6dkf4d30c
300	2009-06-03 08:28:09.809711	482 Loop Detected	1 PUBLISH	3c322e9d5fd2-i3mda9iywq6l
301	2009-06-03 08:28:09.839613	405 Method Not Allowed	1 PUBLISH	3c322e9d5fd2-i3mda9iywq6l
302	2009-06-03 08:28:09.9835	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e9dda71-ikiitissg825
303	2009-06-03 08:28:09.999014	PUBLISH sip:204@141.41.40.158:5060;line=tlqkj8ob	1 PUBLISH	3c322e9dda71-ikiitissg825
304	2009-06-03 08:28:10.57062	482 Loop Detected	1 PUBLISH	3c322e9dda71-ikiitissg825
305	2009-06-03 08:28:10.87651	405 Method Not Allowed	1 PUBLISH	3c322e9dda71-ikiitissg825
306	2009-06-03 08:28:10.461286	INVITE sip:206@voip.ikt-bs.de;user=phone	1 INVITE	3c322e9c8a7c-pgh311setzzk
307	2009-06-03 08:28:10.464318	100 Trying	1 INVITE	3c322e9c8a7c-pgh311setzzk
308	2009-06-03 08:28:10.479352	SUBSCRIBE sip:206@voip.ikt-bs.de;user=phone	1 SUBSCRIBE	3c322e9e5efa-il43al9sq27r

IMPACT GUI (detail)

The following list shows errors found in daily operation,
but it lacks detailed information about their cause.
(calls with a duration of 0 seconds)

Anrufer	Angerufener	Anfang	Dauer	Status
Matthias Bormann - 204	207	03.06.09 08:24	0 Sekunden	Fehler
Matthias Bormann - 204	207	03.06.09 08:24	4 Sekunden	Abgeschlossen
Daniel Hartmann - 207	208	03.06.09 08:25	1 Minute, 19 Sekunden	Abgeschlossen
Matthias Bormann - 204	207	03.06.09 08:27	0 Sekunden	Fehler
Matthias Bormann - 204	207	03.06.09 08:27	9 Sekunden	Abgeschlossen
Matthias Bormann - 204	208	03.06.09 08:27	29 Sekunden	Abgeschlossen
Matthias Bormann - 204	206	03.06.09 08:28	0 Sekunden	Fehler
Pankratz 208 - 208	204	03.06.09 08:28	4 Sekunden	Abgeschlossen
Matthias Bormann - 204	203	03.06.09 08:28	4 Sekunden	Abgeschlossen
Pankratz 208 - 208	207	03.06.09 08:28	2 Minuten, 9 Sekunden	Abgeschlossen
Matthias Bormann - 204	300	03.06.09 08:28	0 Sekunden	Fehler
Matthias Bormann - 204	208	03.06.09 08:28	10 Sekunden	Abgeschlossen
Matthias Bormann - 204	403	03.06.09 08:29	8 Sekunden	Abgeschlossen
Matthias Bormann - 204	200	03.06.09 08:29	7 Sekunden	Abgeschlossen
Matthias Bormann - 204	209	03.06.09 08:30	2 Sekunden	Abgeschlossen
Vigo Sandhaus - 200	204	03.06.09 08:31	1 Minute, 16 Sekunden	Abgeschlossen
Daniel Hartmann - 207	209	03.06.09 08:31	20 Sekunden	Abgeschlossen
Matthias Bormann - 204	206	03.06.09 08:34	0 Sekunden	Fehler
Matthias Bormann - 204	500	03.06.09 08:35	0 Sekunden	Fehler
Jan Schumacher - 203	204	03.06.09 08:40	42 Sekunden	Abgeschlossen

IMPACT GUI:
Analysis function „Find canceled sessions“

Result of the analysis (SQL statement) is a
table showing only PDUs of canceled session

ip_timestamp	sn	msg_line	cseq	call_id	ip_src	ip_dst
2009-06-03 08:27:09.119376	55	INVITE sip:207@voip.ikt-bs.de;user=phone	1	INVITE 3c322e5ed140-r7pflmbq6x4	141.41.40.158	141.41.40.232
2009-06-03 08:27:09.122563	56	100 Trying	1	INVITE 3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:09.19175	59	INVITE sip:207@141.41.40.179:5060;line=13emaSpf	1	INVITE 3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:09.254787	64	180 Ringing	1	INVITE 3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:09.259523	65	180 Ringing	1	INVITE 3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:09.46601	70	PRACK sip:207@141.41.40.179:5060;line=13emaSpf	2	PRACK 3c322e5ed140-r7pflmbq6x4	141.41.40.158	141.41.40.232
2009-06-03 08:27:09.471941	71	PRACK sip:207@141.41.40.179:5060;line=13emaSpf	2	PRACK 3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.179
2009-06-03 08:27:09.599005	74	200 OK	2	PRACK 3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:09.600431	75	200 OK	2	PRACK 3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:09.989057	76	CANCEL sip:207@voip.ikt-bs.de;user=phone	1	CANCEL 3c322e5ed140-r7pflmbq6x4	141.41.40.158	141.41.40.232
2009-06-03 08:27:09.994229	78	200 OK	1	CANCEL 3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:09.994764	79	CANCEL sip:207@141.41.40.179:5060;line=13emaSpf	1	CANCEL 3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.179
2009-06-03 08:27:10.1052	81	200 OK	1	CANCEL 3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:10.20924	82	487 Request Terminated	1	INVITE 3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:10.22366	83	ACK sip:207@141.41.40.179:5060;line=13emaSpf	1	ACK 3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.179
2009-06-03 08:27:10.2279	84	408 Request timeout	1	INVITE 3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:10.30866	91	ACK sip:207@voip.ikt-bs.de;user=phone	1	ACK 3c322e5ed140-r7pflmbq6x4	141.41.40.158	141.41.40.232

Example Scenario of Using IMPACT (Filtering Mode)

ip_timestamp	sn	msg_line	cseq	call_id	ip_src	ip_dst
2009-06-03 08:27:09.119376	55	INVITE sip:207@voip.ikt-bs.de;user=phone	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.158	141.41.40.232
2009-06-03 08:27:09.122563	56	100 Trying	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:09.19175	59	INVITE sip:207@141.41.40.179:5060;line=13ema5pf	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:09.254787	64	180 Ringing	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:09.259523	65	180 Ringing	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:09.46601	70	PRACK sip:207@141.41.40.179:5060;line=13ema5pf	2 PRACK	3c322e5ed140-r7pflmibq6x4	141.41.40.158	141.41.40.232
2009-06-03 08:27:09.471941	71	PRACK sip:207@141.41.40.179:5060;line=13ema5pf	2 PRACK	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.179
2009-06-03 08:27:09.599005	74	200 Ok	2 PRACK	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:09.600431	75	200 Ok	2 PRACK	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:09.989057	76	CANCEL sip:207@voip.ikt-bs.de;user=phone	1 CANCEL	3c322e5ed140-r7pflmibq6x4	141.41.40.158	141.41.40.232
2009-06-03 08:27:09.994229	78	200 OK	1 CANCEL	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:09.994764	79	CANCEL sip:207@141.41.40.179:5060;line=13ema5pf	1 CANCEL	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.179
2009-06-03 08:27:10.1052	81	200 OK	1 CANCEL	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:10.20924	82	487 Request Terminated	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
2009-06-03 08:27:10.22366	83	ACK sip:207@141.41.40.179:5060;line=13ema5pf	1 ACK	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.179
2009-06-03 08:27:10.2778	84	408 Request timeout	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
2009-06-03 08:27:10.30866	91	ACK sip:207@voip.ikt-bs.de;user=phone	1 ACK	3c322e5ed140-r7pflmibq6x4	141.41.40.158	141.41.40.232

Example Scenario of Using IMPACT (result)

The following list shows errors found in daily operation,
but it lacks detailed information about their cause.
(calls with a duration of 0 seconds)

Anrufer	Angerufener	Anfang	Dauer	Status
Matthias Bormann - 204	207	03.06.09 08:24	0 Sekunden	Fehler
Matthias Bormann - 204	207	03.06.09 08:24	4 Sekunden	Abgeschlossen
Daniel Hartmann - 207	208	03.06.09 08:25	1 Minute, 19 Sekunden	Abgeschlossen
Matthias Bormann - 204	207	03.06.09 08:27	0 Sekunden	Fehler
Matthias Bormann - 204	207	03.06.09 08:27	9 Sekunden	Abgeschlossen
Matthias Bormann - 204	208	03.06.09 08:27	29 Sekunden	Abgeschlossen
Matthias Bormann - 204	206	03.06.09 08:28	0 Sekunden	Fehler
Pankratz 208 - 208	204	03.06.09 08:28	4 Sekunden	Abgeschlossen
Matthias Bormann - 204	203	03.06.09 08:28	4 Sekunden	Abgeschlossen
Pankratz 208 - 208	207	03.06.09 08:28	2 Minuten, 9 Sekunden	Abgeschlossen
Matthias Bormann - 204	300	03.06.09 08:28	0 Sekunden	Fehler
Matthias Bormann - 204	208	03.06.09 08:28	10 Sekunden	Abgeschlossen
Matthias Bormann - 204	403	03.06.09 08:29	8 Sekunden	Abgeschlossen
Matthias Bormann - 204	200	03.06.09 08:29	7 Sekunden	Abgeschlossen
Matthias Bormann - 204	209	03.06.09 08:30	2 Sekunden	Abgeschlossen
Vigo Sandhaus - 200	204	03.06.09 08:31	1 Minute, 16 Sekunden	Abgeschlossen
Daniel Hartmann - 207	209	03.06.09 08:31	20 Sekunden	Abgeschlossen
Matthias Bormann - 204	206	03.06.09 08:34	0 Sekunden	Fehler
Matthias Bormann - 204	500	03.06.09 08:35	0 Sekunden	Fehler
Jan Schumacher - 203	204	03.06.09 08:40	42 Sekunden	Abgeschlossen

IMPACT GUI:
Analysis function „Find canceled sessions“

Analysis: Find canceled sessions

Trace ID: 28 --> Sipx daily logging 2009-06-03

Analysis Parameters
[%analysis_parameters%]

Analysis Method
☐ Only show found lines
☒ Show all lines and mark found lines

Execute Reset

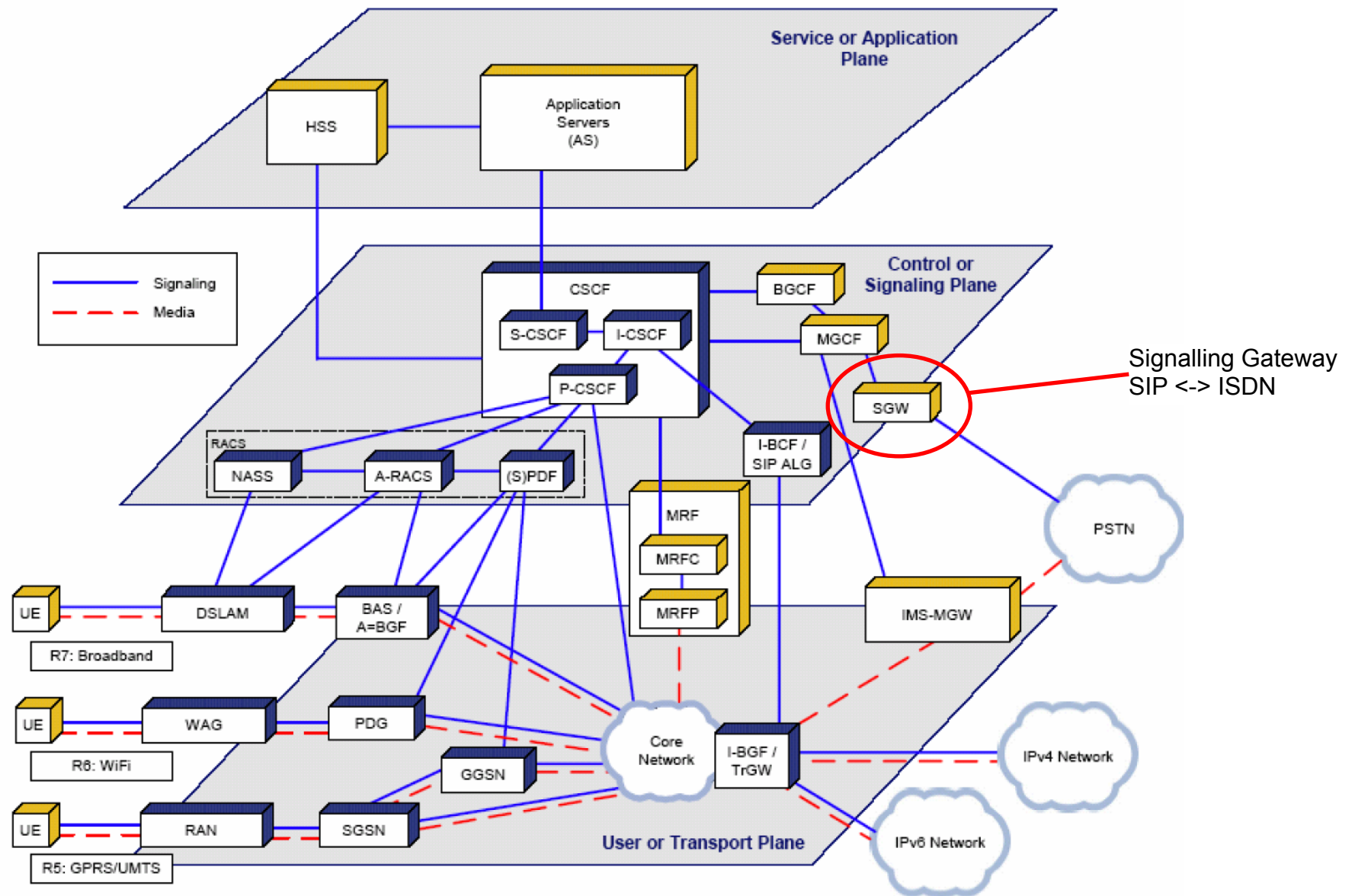
Result of the analysis (SQL statement)
is a table with marked PDUs

ip_timestamp	sn	msg_line	cseq	call_id	ip_src	ip_dst
009-06-03 08:27:07.640219	47	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e5f85d7-vufo04672d4	141.41.40.158	141.41.40.232
009-06-03 08:27:07.655915	48	PUBLISH sip:204@141.41.40.158:5060;line=tlqj8ob	1 PUBLISH	3c322e5f85d7-vufo04672d4	141.41.40.232	141.41.40.158
009-06-03 08:27:07.67662	49	482 Loop Detected	1 PUBLISH	3c322e5f85d7-vufo04672d4	141.41.40.158	141.41.40.232
009-06-03 08:27:08.6793	50	405 Method Not Allowed	1 PUBLISH	3c322e5f85d7-vufo04672d4	141.41.40.232	141.41.40.158
009-06-03 08:27:08.132675	51	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e600ad8-rfsdkk5fc2g	141.41.40.158	141.41.40.232
009-06-03 08:27:08.149426	52	PUBLISH sip:204@141.41.40.158:5060;line=tlqj8ob	1 PUBLISH	3c322e600ad8-rfsdkk5fc2g	141.41.40.232	141.41.40.158
009-06-03 08:27:08.207426	53	482 Loop Detected	1 PUBLISH	3c322e600ad8-rfsdkk5fc2g	141.41.40.158	141.41.40.232
009-06-03 08:27:08.237875	54	405 Method Not Allowed	1 PUBLISH	3c322e600ad8-rfsdkk5fc2g	141.41.40.232	141.41.40.158
009-06-03 08:27:09.119376	55	INVITE sip:207@voip.ikt-bs.de:user=phone	1 INVITE	3c322e5ed140-r7pflmbq6x4	141.41.40.158	141.41.40.232
009-06-03 08:27:09.122563	56	100 Trying	1 INVITE	3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:09.137361	57	SUBSCRIBE sip:207@voip.ikt-bs.de:user=phone	1 SUBSCRIBE	3c322e610b4e-nu0b2fghsnu	141.41.40.158	141.41.40.232
009-06-03 08:27:09.170333	58	SUBSCRIBE sip:207@141.41.40.179:5060;line=13ema5pf	1 SUBSCRIBE	3c322e610b4e-nu0b2fghsnu	141.41.40.232	141.41.40.179
009-06-03 08:27:09.19175	59	INVITE sip:207@141.41.40.179:5060;line=13ema5pf	1 INVITE	3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:09.19175	60	200 OK	1 SUBSCRIBE	3c322e610b4e-nu0b2fghsnu	141.41.40.179	141.41.40.232
009-06-03 08:27:09.193324	61	200 OK	1 SUBSCRIBE	3c322e610b4e-nu0b2fghsnu	141.41.40.232	141.41.40.158
009-06-03 08:27:09.203423	62	NOTIFY sip:204@141.41.40.158:5060;line=tlqj8ob	1 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.179	141.41.40.232
009-06-03 08:27:09.210332	63	NOTIFY sip:204@141.41.40.158:5060;line=tlqj8ob	1 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.232	141.41.40.158
009-06-03 08:27:09.254787	64	180 Ringing	1 INVITE	3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:09.259523	65	180 Ringing	1 INVITE	3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:09.268917	66	NOTIFY sip:204@141.41.40.158:5060;line=tlqj8ob	2 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.179	141.41.40.232
009-06-03 08:27:09.275402	67	NOTIFY sip:204@141.41.40.158:5060;line=tlqj8ob	2 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.232	141.41.40.158
009-06-03 08:27:09.456059	68	200 OK	1 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.158	141.41.40.232
009-06-03 08:27:09.457463	69	200 OK	1 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.232	141.41.40.179
009-06-03 08:27:09.46601	70	PRACK sip:207@141.41.40.179:5060;line=13ema5pf	2 PRACK	3c322e5ed140-r7pflmbq6x4	141.41.40.158	141.41.40.232
009-06-03 08:27:09.471941	71	PRACK sip:207@141.41.40.179:5060;line=13ema5pf	2 PRACK	3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.179
009-06-03 08:27:09.577496	72	200 OK	2 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.158	141.41.40.232
009-06-03 08:27:09.57893	73	200 OK	2 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.232	141.41.40.179
009-06-03 08:27:09.599005	74	200 OK	2 PRACK	3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:09.600431	75	200 OK	2 PRACK	3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:09.989057	76	CANCEL sip:207@voip.ikt-bs.de:user=phone	1 CANCEL	3c322e5ed140-r7pflmbq6x4	141.41.40.158	141.41.40.232
009-06-03 08:27:09.990491	77	SUBSCRIBE sip:207@141.41.40.179:5060;line=13ema5pf	2 SUBSCRIBE	3c322e610b4e-nu0b2fghsnu	141.41.40.158	141.41.40.232
009-06-03 08:27:09.994229	78	200 OK	1 CANCEL	3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:09.994764	79	CANCEL sip:207@141.41.40.179:5060;line=13ema5pf	1 CANCEL	3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.179
009-06-03 08:27:10.4706	80	SUBSCRIBE sip:207@141.41.40.179:5060;line=13ema5pf	2 SUBSCRIBE	3c322e610b4e-nu0b2fghsnu	141.41.40.232	141.41.40.179
009-06-03 08:27:10.1052	81	200 OK	1 CANCEL	3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:10.20924	82	487 Request Terminated	1 INVITE	3c322e5ed140-r7pflmbq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:10.22366	83	ACK sip:207@141.41.40.179:5060;line=13ema5pf	1 ACK	3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.179
009-06-03 08:27:10.22778	84	408 Request timeout	1 INVITE	3c322e5ed140-r7pflmbq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:10.34365	85	NOTIFY sip:204@141.41.40.158:5060;line=tlqj8ob	3 NOTIFY	3c322e610b4e-nu0b2fghsnu	141.41.40.179	141.41.40.232

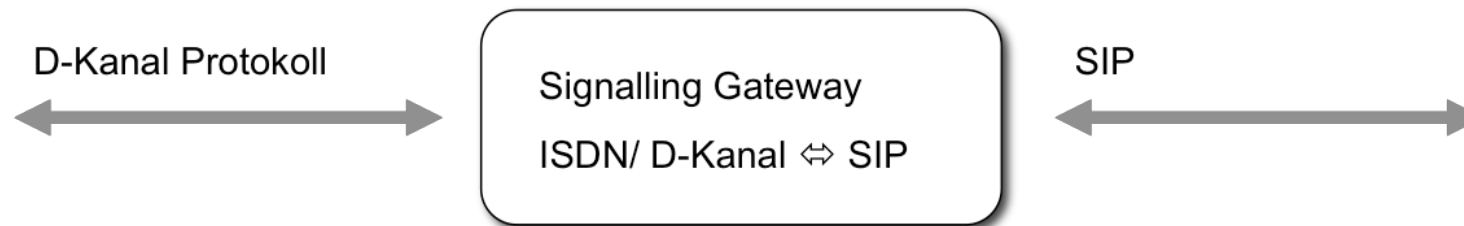
Example Scenario of Using IMPACT (Marker Mode)

ip_timestamp	sn	msg_line	cseq	call_id	ip_src	ip_dst
009-06-03 08:27:06.755513	46	401 Call Leg/ transaction Does Not Exist	3 BYE	3c322e5f85d7-ivuf004672d4	141.41.40.232	141.41.40.179
009-06-03 08:27:07.640219	47	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e5f85d7-ivuf004672d4	141.41.40.158	141.41.40.232
009-06-03 08:27:07.655915	48	PUBLISH sip:204@141.41.40.158:5060;line=tlqkj8ob	1 PUBLISH	3c322e5f85d7-ivuf004672d4	141.41.40.232	141.41.40.158
009-06-03 08:27:07.97662	49	482 Loop Detected	1 PUBLISH	3c322e5f85d7-ivuf004672d4	141.41.40.158	141.41.40.232
009-06-03 08:27:08.6793	50	405 Method Not Allowed	1 PUBLISH	3c322e5f85d7-ivuf004672d4	141.41.40.232	141.41.40.158
009-06-03 08:27:08.132675	51	PUBLISH sip:204@voip.ikt-bs.de	1 PUBLISH	3c322e600ad8-r9fsdkk5fc2g	141.41.40.158	141.41.40.232
009-06-03 08:27:08.149426	52	PUBLISH sip:204@141.41.40.158:5060;line=tlqkj8ob	1 PUBLISH	3c322e600ad8-r9fsdkk5fc2g	141.41.40.232	141.41.40.158
009-06-03 08:27:08.207426	53	482 Loop Detected	1 PUBLISH	3c322e600ad8-r9fsdkk5fc2g	141.41.40.158	141.41.40.232
009-06-03 08:27:08.237875	54	405 Method Not Allowed	1 PUBLISH	3c322e600ad8-r9fsdkk5fc2g	141.41.40.232	141.41.40.158
009-06-03 08:27:09.119376	55	INVITE sip:207@voip.ikt-bs.de;user=phone	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.158	141.41.40.232
009-06-03 08:27:09.122563	56	100 Trying	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:09.137361	57	SUBSCRIBE sip:207@voip.ikt-bs.de;user=phone	1 SUBSCRIBE	3c322e610b4e-nu0b2cfghsnu	141.41.40.158	141.41.40.232
009-06-03 08:27:09.170333	58	SUBSCRIBE sip:207@141.41.40.179:5060;line=13ema5pf	1 SUBSCRIBE	3c322e610b4e-nu0b2cfghsnu	141.41.40.232	141.41.40.179
009-06-03 08:27:09.19175	59	INVITE sip:207@141.41.40.179:5060;line=13ema5pf	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:09.19175	60	200 OK	1 SUBSCRIBE	3c322e610b4e-nu0b2cfghsnu	141.41.40.179	141.41.40.232
009-06-03 08:27:09.193324	61	200 OK	1 SUBSCRIBE	3c322e610b4e-nu0b2cfghsnu	141.41.40.232	141.41.40.158
009-06-03 08:27:09.203423	62	NOTIFY sip:204@141.41.40.158:5060;line=tlqkj8ob	1 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.179	141.41.40.232
009-06-03 08:27:09.210332	63	NOTIFY sip:204@141.41.40.158:5060;line=tlqkj8ob	1 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.232	141.41.40.158
009-06-03 08:27:09.254787	64	180 Ringing	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:09.259523	65	180 Ringing	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:09.268917	66	NOTIFY sip:204@141.41.40.158:5060;line=tlqkj8ob	2 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.179	141.41.40.232
009-06-03 08:27:09.275402	67	NOTIFY sip:204@141.41.40.158:5060;line=tlqkj8ob	2 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.232	141.41.40.158
009-06-03 08:27:09.456059	68	200 Ok	1 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.158	141.41.40.232
009-06-03 08:27:09.457463	69	200 Ok	1 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.232	141.41.40.179
009-06-03 08:27:09.46601	70	PRACK sip:207@141.41.40.179:5060;line=13ema5pf	2 PRACK	3c322e5ed140-r7pflmibq6x4	141.41.40.158	141.41.40.232
009-06-03 08:27:09.471941	71	PRACK sip:207@141.41.40.179:5060;line=13ema5pf	2 PRACK	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.179
009-06-03 08:27:09.577496	72	200 Ok	2 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.158	141.41.40.232
009-06-03 08:27:09.57893	73	200 Ok	2 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.232	141.41.40.179
009-06-03 08:27:09.599005	74	200 Ok	2 PRACK	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:09.600431	75	200 Ok	2 PRACK	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:09.989057	76	CANCEL sip:207@voip.ikt-bs.de;user=phone	1 CANCEL	3c322e5ed140-r7pflmibq6x4	141.41.40.158	141.41.40.232
009-06-03 08:27:09.990491	77	SUBSCRIBE sip:207@141.41.40.179:5060;line=13ema5pf	2 SUBSCRIBE	3c322e610b4e-nu0b2cfghsnu	141.41.40.158	141.41.40.232
009-06-03 08:27:09.994229	78	200 OK	1 CANCEL	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:09.994764	79	CANCEL sip:207@141.41.40.179:5060;line=13ema5pf	1 CANCEL	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.179
009-06-03 08:27:10.4706	80	SUBSCRIBE sip:207@141.41.40.179:5060;line=13ema5pf	2 SUBSCRIBE	3c322e610b4e-nu0b2cfghsnu	141.41.40.232	141.41.40.179
009-06-03 08:27:10.1052	81	200 OK	1 CANCEL	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:10.20924	82	487 Request Terminated	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.179	141.41.40.232
009-06-03 08:27:10.22366	83	ACK sip:207@141.41.40.179:5060;line=13ema5pf	1 ACK	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.179
009-06-03 08:27:10.2778	84	408 Request timeout	1 INVITE	3c322e5ed140-r7pflmibq6x4	141.41.40.232	141.41.40.158
009-06-03 08:27:10.39365	85	NOTIFY sip:204@141.41.40.158:5060;line=tlqkj8ob	3 NOTIFY	3c322e610b4e-nu0b2cfghsnu	141.41.40.179	141.41.40.232

Example Scenario of Using IMPACT (result)



Gateway Testing in the IMS



D-Kanal								SIP				
LfdNr	Timestamp	DIR	SoBus	TEI	CallRef	Message Type	Layer3	Source IP	Destination IP	Method / Status	To	From
1	09:30:55	T	132	82	o / 5	Setup	CGN:203 CDN:0040123456					
2	09:30:55	N	132	82	d / 5	Setup ACK						
3	09:30:56							192.168.100.250	141.41.40.232	Invite	040123456@myprovider.de	user@myprovider.de
4	09:30:56							141.41.40.232	192.168.100.250	100 Trying		
5	09:30:56							141.41.40.232	192.168.100.250	183 Session Pr.	040123456@myprovider.de	user@myprovider.de
6	09:30:56							141.41.40.232	192.168.100.250	RTP G.711u		
7	09:30:56	N	132	82	d / 5	Call Proceeding						
8	09:30:56	N	132	82	d / 5	Alerting						
9	09:31:01							141.41.40.232	192.168.100.250	200 OK	040123456@myprovider.de	user@myprovider.de
10	09:31:01							192.168.100.250	141.41.40.232	ACK		
11	09:31:01	N	132	82	d / 5	Connect	CON: 0040123456					
12	09:31:01	T	132	82	o / 5	Connect ACK						
13	09:31:01							192.168.100.250	141.41.40.232	RTP G.711u		
...												
30	09:40:10	T	132	82	o / 5	Disconnect	CAU: Normal call clearing					
31	09:40:10	N	132	82	d / 5	Release	CAU... AOCE...					
32	09:40:11							192.168.100.250	141.41.40.232	BYE		
33	09:40:11							141.41.40.232	192.168.100.250	200 OK		
34	09:40:11	T	132	82	o / 5	Release Complete	CAU: Normal call clearing					

Gateway Testing with IMPACT

- **Conformance testing with sufficient coverage gives a sound basis for ensure interoperability ... but it's expensive and time consuming**
- **Interoperability testing means combinatoric explosion of testing needs, the more vendors and operators a market has**
- **Post-hoc analysis to identify ultimate causes for interoperability problems in daily operation becomes ever more important**
- **Increasing number of hybrid network elements (Gateways etc.) makes testing more complex**
- **New application areas like smart grid / smart meters in a multi-vendor / multi-operator environment bring new, demanding needs for testing of communication protocols**

Summary and Future Prospects