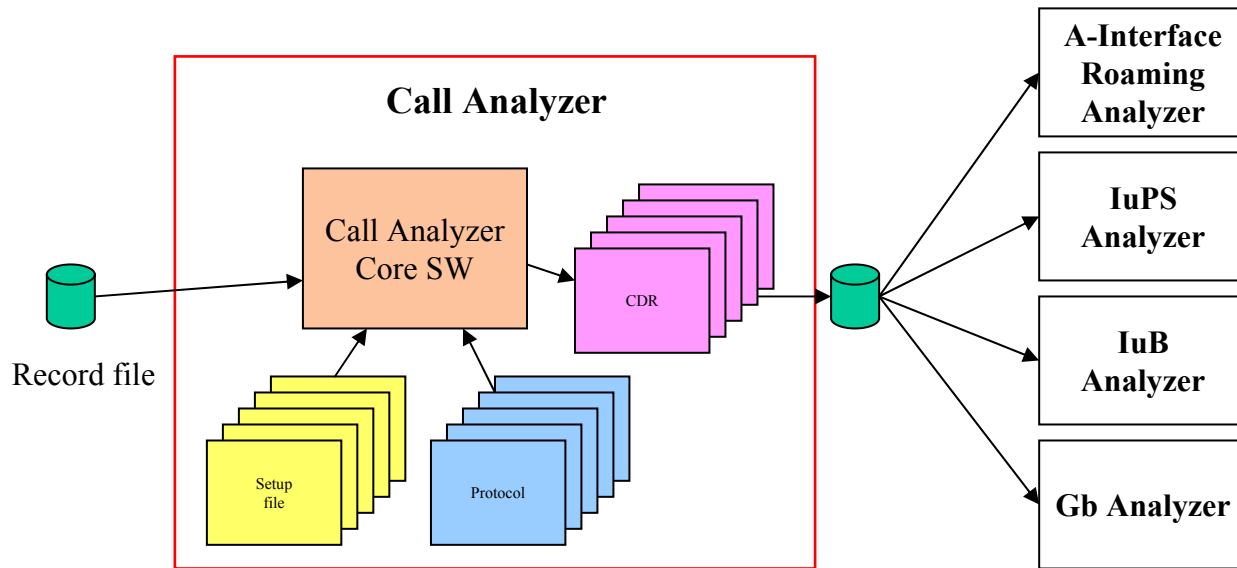


Call Analyser

Independent tool for advanced analysis of protocol data



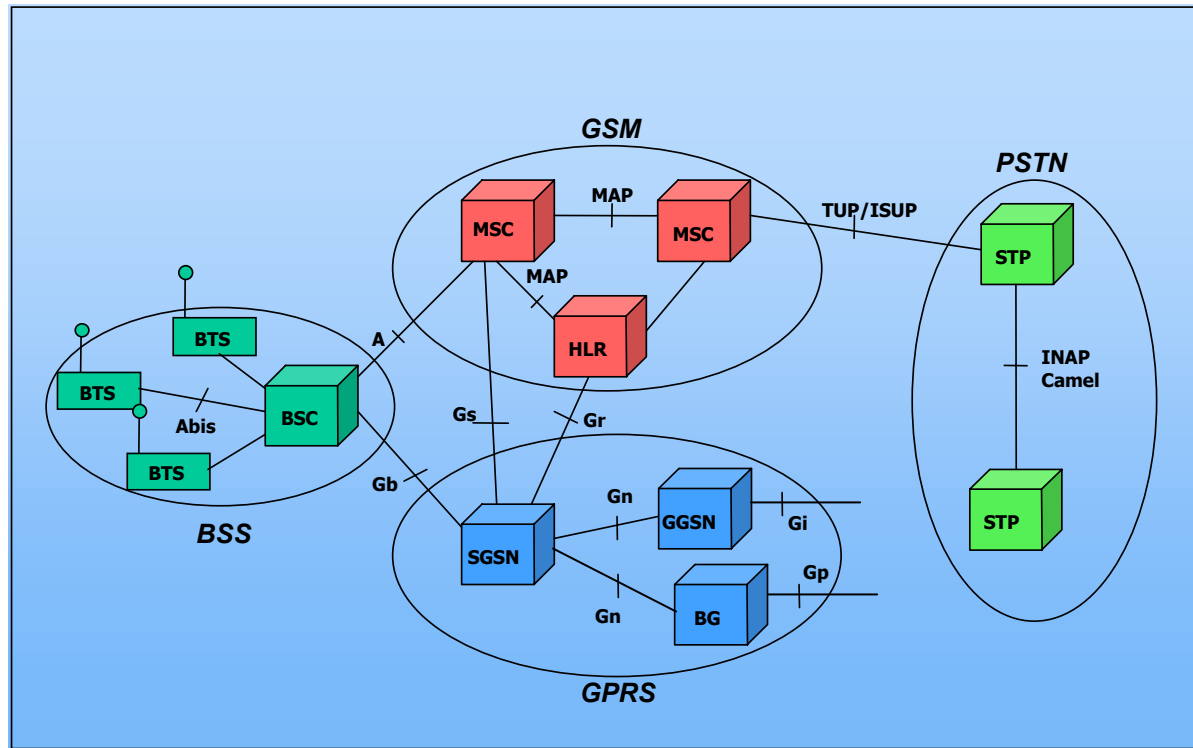
Call Analyser product family



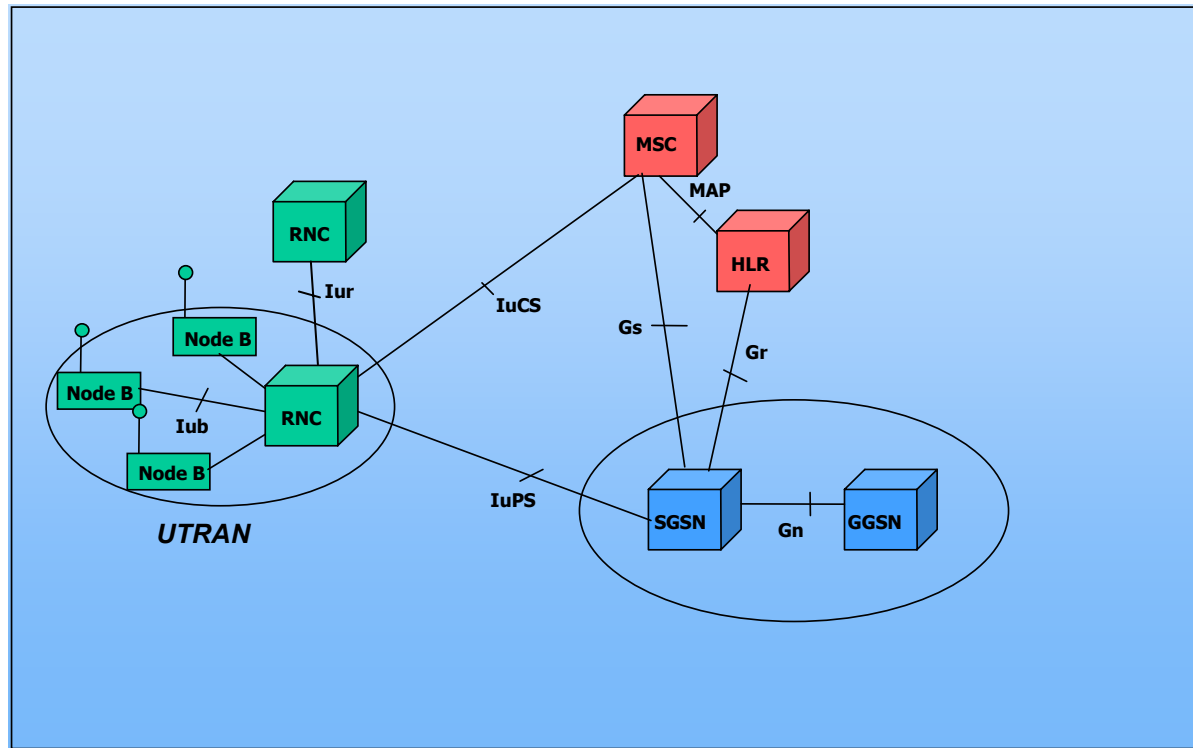
Call Analyser is much more than protocol decode

- Analysis of data based on **sequences of messages**
- Timing measurements between any events within a call
- Fully flexible user-defined statistics based on sequences - e.g.
 - Calls with more than xx handovers
 - Number of times a specific message appear at a certain time
 - At what point in a call it is dropped
 - Statistics for e.g specific OPCs or DPCs
- Call trace across several interfaces
- Graphical presentation of call flows
- Generation of user-defined CDRs
- For SS7, GSM, GPRS, UMTS and CDMA protocols

Supported interfaces - GSM/GPRS



Supported interfaces - UMTS



Currently supported instruments

- **Ethereal**
- **Tektronix**
- **Acterna**
- **Ocean**
- **Agilent**
- **Nettest (MPA and Quest)**
- **Nethawk**
- **Temia**
- **Complis**
- **TEMS**
- **Sunrise**
- **Others on request**

Zoom functions

To call trace

Call Analyzer 1.0 - C:\Rec\A-T-M.r5

File Protocol Mode Select Decode Message Flow Results Define Options Help

05:20:16'5 BSC DT1 CLCHP 6231,6228

05:20:16'5 BSC DT1 CLCHP 6223,6228

05:20:16'5 BSC DT1 BISC 6232,6228,normal call clearing (16)

05:20:16'5 MSC DT1 CLCHD 6228,6218,Call control (9)

05:20:16'5 BSC DT1 CICHM 6231,6228

05:20:16'5 ??? MCM 11,47,1511,charge (1),Subscriber free (1),not forwarded (0)

05:20:16'5 BSC CR CL31 PARGRES 6211,6228,22007,32621

05:20:16'5 MSC DT1 CLCHD 6228,6218,Call control (9)

05:20:16'5 BSC DT1 CLCHP 6218,6228

05:20:16'5 BSC DT1 CICHM 6218,6228

05:20:16'5 ??? MCM 11,48,1547,charge (1),Subscriber free (1),not forwarded (0)

05:20:16'5 BSC DT1 CLCHP 6217,6228

05:20:16'5 MSC RLSB 6228,6218,end user originated (0)

05:20:16'5 ??? WDT CON 851763,851760,ReturnResult_Last (162)

05:20:16'5 BSC DT1 BSCMP 6223,6228,normal event (0)

05:20:16'5 MSC DT1 CLCHD 6228,6217,Call control (9)

05:20:16'5 BSC DT1 AVTRES 6232,6228

05:20:16'5 ??? MCM 11,36,1163,charge (1),Subscriber free (1),not forwarded (0)

05:20:16'5 ??? WDT CON 851760,851763,Invoke (161),InsertSubscriberData (1)

05:20:16'5 ??? MCM 9,1,41,charge (1),No indication (0),not forwarded (0)

05:20:16'5 ??? IRI 8,50,1608,14,008695457174835,11,139501972895

05:20:16'5 ??? IRI 9,48,1545,11,13908968394,10,5586468133

05:20:16'5 MSC DT1 LWCC 6228,6223

05:20:16'5 BSC DT1 CLCHD 6232,6228

05:20:16'5 BSC DT1 CLUPB 6218,6228

05:20:16'5 MSC CC LWCC 6228,6223

05:20:16'5 MSC DT1 CPBDC 6228,6223

05:20:16'5 ??? WDT END 851760,851763,ReturnError (163),AbsentSubscriberData (1)

05:20:16'5 ??? WDT BEG 851763,851760,Invoke (161),SendParameters (9)

05:20:16'5 MSC RLSB 6228,6231,end user originated (0)

05:20:16'5 MSC RLSB 6228,6223,end user originated (0)

05:20:16'5 BSC CR CL31 LWREQ 6232,6228,22013,35032

05:20:16'5 BSC DT1 AVTRES 6217,6228

05:20:16'5 MSC CC LWCC 6228,6218

05:20:16'5 BSC DT1 SETUP 6217,6228,called (1),13956789564

05:20:16'5 BSC DT1 ASREQ 6228,6223

05:20:16'5 ??? CEL 28,32,1052

05:20:16'5 ??? WDT CON 851763,851760,ReturnResult_Last (162)

05:20:16'5 MSC RLSB 6228,6218,end user originated (0)

Single message mode Protocol: A-T-M.stk Setup: A-T-M1.set

To message decode

Call Analyzer 1.0 - C:\Rec\A-T-M.r5

Line: 45: Pos 1

05:20:16'5 ??? UDT BEG 851763,851763,Invoke (161),InsertSubscriberData (1)

05:20:16'5 ??? UDT BEG 11,7,205,31,13908968394,10,5586468133

05:20:16'5 MSC WDT WGTCH 6228,6217,1040000000,6400000000000,12045

05:20:16'5 BSC CR CL31 PARGRES 6217,6228,22005,30511

05:20:16'5 ??? MCM 6228,6217

05:20:16'5 BSC DT1 CICHM 6217,6228

05:20:16'5 BSC DT1 BSWP 6228,6217,calling (0),85189591650

05:20:16'5 BSC DT1 CCHM 6217,6228

05:20:16'5 BSC DT1 BREQ 6228,6217

05:20:16'5 BSC DT1 BICMP 6217,6228,normal_event (0)

05:20:16'5 BSC DT1 BREQ 6217,6228

05:20:16'5 ??? MCM 11,7,205,charge (1),Subscriber free (1),not forwarded (0)

05:20:16'5 BSC DT1 CCHM 6217,6228

05:20:16'5 BSC DT1 BREQ 6228,6217

05:20:16'5 ??? MCM 11,7,205

05:20:16'5 BSC DT1 BREQ 6217,6228,SetFor call (12),22005,30448

05:20:16'5 BSC DT1 BREQ 6217,6228,Update strength (1),22005,30511

Call Analyzer - Decoded message : 05:20:17'4 ??? UDT BEG

File Edit Search

```

0000---- Message Handling          no special options
00000011 Ptr to Called address party 3
00000101 Ptr to Calling address party 5
00000111 Ptr to Data parameter      7
Called party address parameter
00000010 Parameter Length          2
-----0 Point Code Indicator      PC not present
-----1- Subsystem No. Indicator  SSN present
--0000-- Global Title Indicator    No global title included
-1----- Routing Indicator        Route on DPC + Subsystem No.
0----- For national use         0
00000110 Subsystem Number        HLR (Home location register)
Calling party address parameter
00000010 Parameter Length          2
-----0 Point Code Indicator      PC not present
-----1- Subsystem No. Indicator  SSN present
--0000-- Global Title Indicator    No global title included
-1----- Routing Indicator        Route on DPC + Subsystem No.
0----- For national use         0
00000111 Subsystem Number        VLR (Visitor location register)
Data parameter
01010000 Parameter Length        80
    
```

Line: 45: Pos 1

Decode example - CDMA

Call Analyzer 1.1 - C:\CDMA\csmsmt.rf5

File Protocol Mode Select Decode Message Flow Results Define Options Help

15:05:35'9 ??? SMSREQ ,131647,132924,226,199,232,55
15:05:36'0 ??? SMSREQ ,132924,131647,228,199,232,55
15:05:36'0 ??? SMPPP ,131647,132926,226,199,232,53

Call Analyzer - Decoded message : 15:05:35'9 ??? SMSREQ

File Edit Search

00011011	Length	27
11101001	Component Tag	Invoke(Last)
00011001	Length	25
11001111	Tag	Component ID
00000001	Length	1
*****	Component ID	37
11010001	Tag	National Operation Code Tag
00000010	Length	2
00001001	Group Code	IS41
00110111	Operation Code	SMSRequest
11110010	Tag	Parameter Set Tag
00010000	Length	16
10001000	Parameter name	MobileIdentificationNumber
00000101	Length	5
----1000	Digit	8
0101----	Digit	5
----0010	Digit	2
0011----	Digit	3
----0010	Digit	2
0001----	Digit	1
----0111	Digit	7
0000----	Digit	0

Line : 82: Pos 1

Single message mode Protocol : IS41D.stk Setup : TDC-Abis-A-ISUP-MAP-Interface Frame : 4

Examples of GPRS data

```

Call Analyzer 1.2 - C:\CA record\MesVg29_gb_sgsnZ_gr_2_small.rtd
File Protocol Mode Select Decode Message Flow Results Define Options View Tools Help
[Icons] [0%]
16:26:39'0 BSC WVT REG 786201,786180,Invoke (161),Update GPRS Location (23),46080731318976,138613908168405,483D88F3
16:26:39'0 BSC WVT REG 786201,786181,Invoke (161),Update GPRS Location (23),46080731318976,138613908168405,483D88F3
16:26:39'0 SGSN WVT REG 786180,786201,Invoke (161),Cancel Location (3)
16:26:39'0 BSC WVT END 786201,786181,ReturnResultant (162)
16:26:39'0 BSC WVT REG
16:26:39'0 SGSN WVT REG
16:26:39'0 BSC WVT REG
16:26:39'0 SGSN WVT REG
16:26:39'0 BSC WVT REG
16:26:39'0 SGSN WVT REG
16:26:39'0 BSC WVT REG
16:26:39'0 SGSN WVT REG
16:26:39'0 BSC WVT REG
16:26:39'0 SGSN WVT REG
16:26:39'0 BSC WVT REG
16:26:39'0 SGSN WVT REG
16:26:39'0 BSC WVT REG
16:26:39'0 SGSN WVT REG
16:26:39'0 BSC WVT END
16:26:39'0 SGSN WVT END
16:26:40'0 BSC WVT END
16:26:40'0 BSC WVT END
16:26:40'0 BSC WVT END
16:26:40'0 SGSN WVT SWSP
16:26:40'0 BSC FLSW
16:26:40'0 BSC WVT REG
16:26:40'1 BSC WVT END
16:26:40'1 SGSN WVT RBY
16:26:40'1 BSC WVT WVDY ERCDP
16:26:40'1 SGSN FLSW
16:26:40'1 SGSN WVT RBY
16:26:40'2 BSC WVT SWSP
16:26:40'2 BSC WVT REG
16:26:40'3 BSC FLSW
16:26:40'3 SGSN WVT FLWLLA
16:26:40'4 BSC WVT CON
16:26:40'4 BSC WVT CON
16:26:40'4 SGSN WVT WVDY ERQD
16:26:40'4 BSC WVT BLVDT ERMC
16:26:40'4 ??? WVT WVDY WDF DTGR
16:26:40'5 ??? FLSW
787,31,389533144
786272,786201,Invoke (161),Insert Subscriber Data (7),8613817361393
786201,786181,ReturnResultant (162)
786180,786201,ReturnResultant (162),Update GPRS Location (23),8613817361393
786332,786201,Invoke (161),Insert Subscriber Data (7),8613817211176
786272,786201,ReturnResultant (162),Update GPRS Location (23),8613817361393
786201,786181,ReturnResultant (162),Insert Subscriber Data (7)
786201,786380,Invoke (161),Purge MS (47)
778,0,-1389437406
786201,786181,Invoke (161),Purge MS (47)
786332,786201,ReturnResultant (162),Update GPRS Location (23),8613817361393
786296,786201,
799,9,-888895990
786272,786201,
769,0,297278939
786201,786181,Invoke (161),Update GPRS Location (23),460807317813942,138613908168405,483D88F3
769,0,-1848172838
786181,786201,Invoke (161),Insert Subscriber Data (7),8613817212038
786201,786181,ReturnResultant (162)
777,31,-1365613350
775,11,-1365613350,46080163937812
771,35,1807162842,10,71,1,1394,66,210,17,86,28128240

```

Gb And Gr

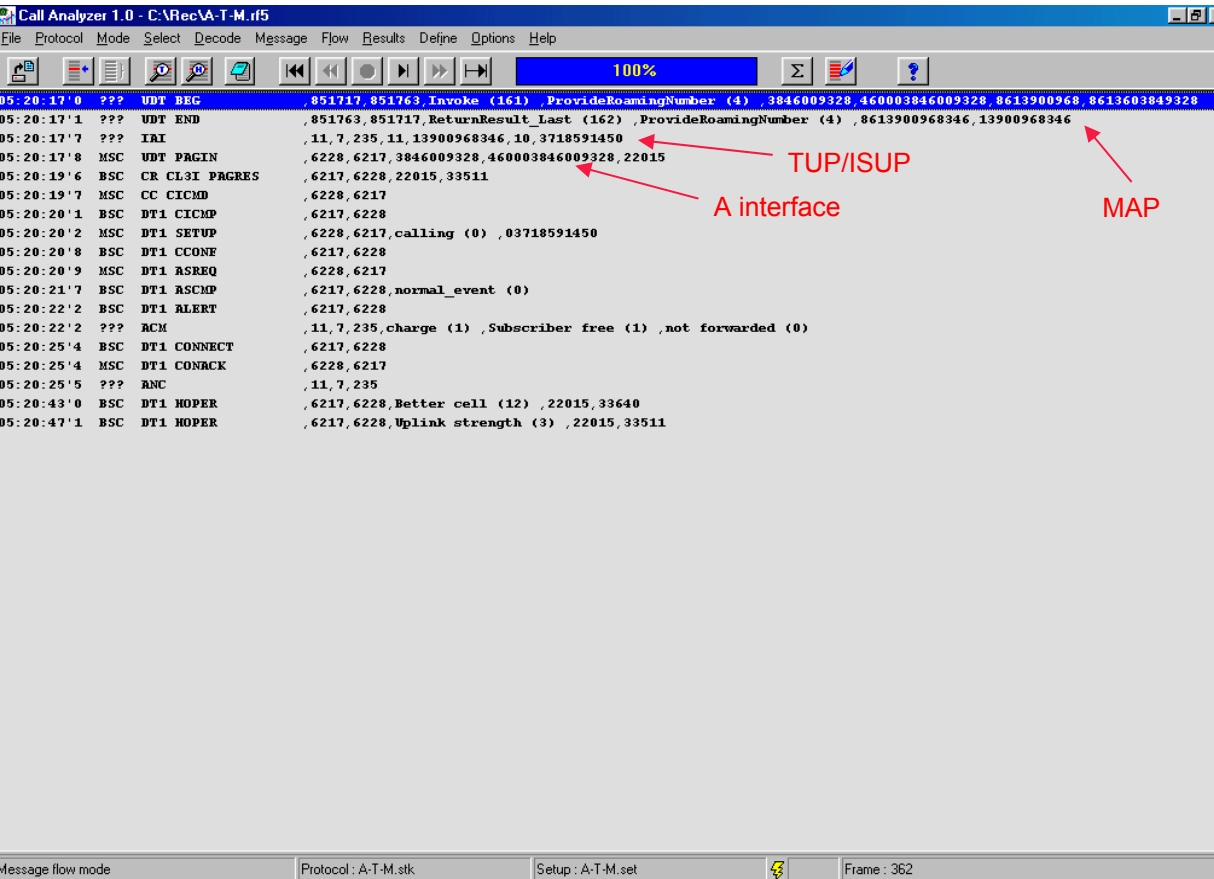
```

Call Analyzer 1.2 - C:\CA record\MesVg29_gb_sgsnZ_gr_2_small.rtd
File Protocol Mode Select Decode Message Flow Results Define Options View Tools Help
[Icons] [23%]
16:27:25'0 ??? SYR 0
16:27:25'0 ??? SYR 0
16:27:25'1 ??? SYR 0
16:27:25'1 ??? SYR 0
16:27:25'1 ??? SYR 0
16:27:25'1 ??? SYR 0
16:27:25'1 ??? WVDY WDF DTGR 794,22,-185596686,10,71,0,246,210,22,176,180,1322
16:27:25'1 ??? WVDY WDF DTGR 794,22,-185596686,46080564101774,210,22,176,180,71,0,246,2883486381,1235
16:27:25'1 ??? SYR 0
16:27:25'1 ??? SYR 0
16:27:25'1 ??? WVDY WDF DTGR 773,35,1807162842,4608008401806167,66,210,217,1394,10,71,1,1394,-357197787,49352602
16:27:25'2 ??? SYR 0
16:27:25'2 ??? SYR 0
16:27:25'2 ??? WVDY 775
16:27:25'2 ??? ALV 775
16:27:25'2 ??? WVDY ERQD 794,12,1071862746
16:27:25'2 ??? ALV 795
16:27:25'2 ??? WVDY ERMC 794,12,1071862746,46080731318976
16:27:25'3 ??? WVDY ERCDP 756,0,-384828966
16:27:25'4 ??? WVDY ERQD 792,24,-586808366
16:27:25'4 ??? WVDY ERMC 793,24,-586808366,460807556187356
16:27:25'4 ??? WVDY SWSP 795,0,3945978922
16:27:25'4 ??? WVDY 778,14,-266457930
16:27:25'4 ??? WVDY FLWLL 788,0,-266457930,5888
16:27:25'5 ??? WVDY SWSP 757,0,-706732838
16:27:25'5 ??? WVDY FLWLLA 788,0,-266457930
16:27:25'5 ??? WVDY ERCDP 767,6,448895928
16:27:25'5 ??? WVDY WDF DTGR 772,35,1807162842,10,71,1,1394,66,210,217,1394,49952602
16:27:25'7 ??? WVDY WVDY ERQD 778,0,-2941286
16:27:25'7 ??? WVDY WVDY ERQD 788,9,728641690
16:27:25'7 ??? WVDY ERCDP 756,5,-1394849574
16:27:25'7 ??? WVDY ERMC 765,9,-2941286,460807603118557,-2941222
16:27:25'7 ??? WVDY ERMC 789,9,728641690,4608086134650,728641794
789,7
16:27:25'8 ??? WVDY ERQD 768,10,292518895
16:27:25'8 ??? WVDY ERMC 793,19
16:27:25'8 ??? WVDY ERMC 793,19
16:27:25'8 ??? WVDY WDF DTGR 773,35,1807162842,4608008401806167,66,210,217,1394,10,71,1,1394,-357197786,49352788
16:27:25'8 ??? WVDY ERQD 746,3,-747688886
16:27:25'9 ??? WVDY ERMC 767,9,-384828966,46080736708718,-384828966
Single message mode Protocol: Gb-Grl.sk Setup: Gb-Interface_280402_tajce.set Frame: 3720
[Icons] [Local Disk (C:)] [Call Analyzer] 6:36 PM

```

Gb only

Events are based on complete call traces



The screenshot shows the Call Analyzer 1.0 interface with a call trace. The trace is a list of events with timestamps and details. Three red arrows point to specific lines in the trace:

- An arrow labeled "TUP/ISUP" points to the line: "05:20:19'6 BSC CR CL3I PAGRES ,6217,6228,22015,33511"
- An arrow labeled "A interface" points to the line: "05:20:20'1 BSC DT1 CICMP ,6217,6228"
- An arrow labeled "MAP" points to the line: "05:20:17'0 ??? UDT BEG ,851717,851763,Invoke (161) ,ProvideRoamingNumber (4) ,3846009328,460003846009328,8613900968,8613603849328"

```
05:20:17'0 ??? UDT BEG ,851717,851763,Invoke (161) ,ProvideRoamingNumber (4) ,3846009328,460003846009328,8613900968,8613603849328
05:20:17'1 ??? UDT END ,851763,851717,ReturnResult_Last (162) ,ProvideRoamingNumber (4) ,8613900968346,13900968346
05:20:17'7 ??? IRI ,11,7,235,11,13900968346,10,3718591450
05:20:17'8 MSC UDT PAGIN ,6228,6217,3846009328,460003846009328,22015
05:20:19'6 BSC CR CL3I PAGRES ,6217,6228,22015,33511
05:20:19'7 MSC CC CICMD ,6228,6217
05:20:20'1 BSC DT1 CICMP ,6217,6228
05:20:20'2 MSC DT1 SETUP ,6228,6217,calling (0) ,03718591450
05:20:20'8 BSC DT1 CCONE ,6217,6228
05:20:20'9 MSC DT1 ASREQ ,6228,6217
05:20:21'7 BSC DT1 ASCMP ,6217,6228,normal_event (0)
05:20:22'2 BSC DT1 ALERT ,6217,6228
05:20:22'2 ??? RCM ,11,7,235,charge (1) ,Subscriber free (1) ,not forwarded (0)
05:20:25'4 BSC DT1 CONNECT ,6217,6228
05:20:25'4 MSC DT1 CONACK ,6228,6217
05:20:25'5 ??? RNC ,11,7,235
05:20:43'0 BSC DT1 HOPER ,6217,6228,Better cell (12) ,22015,33640
05:20:47'1 BSC DT1 HOPER ,6217,6228,Uplink strength (3) ,22015,33511
```

For analysis of:

- When a call is dropped
- Timing measurements across a switch
- Searching for specific sequences
- Counting specific sequences
- Generation of user defined CDRs where the records are generated at a certain call state

Decode examples - GPRS

Call Analyzer 1.2 - C:\CA record files\g29_gb_sgsn2_gr_2_small.tif

File Protocol Mode Select Decode Message Flow Results Define Options View Tools Help

16:26:39:8 BSC VBT BSC 786281,786180,Invoke (161) ,Update GPRS Location (23) ,460007213100976,198613900160405,403B08F9301

16:26:39:8 BSC VBT BSC 786281,786181,Invoke (161) ,Update GPRS Location (23) ,460007213101074,198613900160405,403B08F9301

16:26:39:8 BSC VBT BSC 786180,786281,Invoke (161) ,Cancel Location (3)

16:26:39:9 BSC VBT BSC 786281,786181,ReturnResultLast (162) ,Insert Subscriber Data (7)

Call Analyzer - Decoded message - 16:26:40:4 SGSN IDT UL IUT RARQ

File Edit Search

00001000 Message Type Routing area update request

----000 Update Type RA updating

-----0----- Spare 0

-111---- GPRS Ciphering Key Seq No. 7

0----- Spare 0

***** RAC HCC 460

1111---- Filler 15

***** RAC HHC 00

***** LAC 6245

01100101 RAC 101

00001000 Length of Parameter 8

0001----- Access Technology Type GSM E

***** Length of Access Techn.Type 25

---100---- RF Power Capability class 5

-----1---- Encryption Algorithm Flag 1

-----1---- Encryption Algorithms A5/1 Available

0----- Encryption Algorithms A5/2 Available

-----0----- Encryption Algorithms A5/3 Not Available

-----0----- Encryption Algorithms A5/4 Not Available

-----0----- Encryption Algorithms A5/5 Not Available

-----0----- Encryption Algorithms A5/6 Not Available

-----0----- Encryption Algorithms A5/7 Not Available

9801C0405,403B08F9301

Line: 00 Pos: 1

16:26:40:3 BSC VBT BSC 786281,786281,Invoke (161) ,Insert Subscriber Data (7) ,8613917213176

16:26:40:4 BSC VBT BSC 786281,786281,ReturnResultLast (162)

16:26:40:4 SGSN VBT UL VBT RARQ 772,11,1965613350

16:26:40:4 BSC VBT UL VBT BSC 775,11,-1965613350,460001639037812

16:26:40:4 ??? VBT UL VBT VBT BSC 771,35,1007162042,10,71,1,194,66,210,71,86,20120200

16:26:40:5 ??? IISU

Single Message Mode Protocol: Gb-Gri.tk Setup: Gb-Gri.set Frame: 37

Start Call Analyzer Microsoft PowerPoint [CA] Protocol Stack Editor 6:07 PM

Full decode of Gb messages

Call Analyzer 1.2 - C:\CA record files\g29_gb_sgsn2_gr_2_small.tif

File Protocol Mode Select Decode Message Flow Results Define Options View Tools Help

16:26:39:8 BSC VBT BSC 786281,786180,Invoke (161) ,Update GPRS Location (23) ,460007213100976,198613900160405,403B08F9301

16:26:40:9 BSC VBT CON 786282,786201,Invoke (161) ,Update GPRS Location (23) ,460007213100976,198613900160405,403B08F9301

16:26:40:9 BSC VBT CON 786281,786281,ReturnResultLast (162) ,Insert Subscriber Data (7) ,8613917213176

16:26:40:9 BSC VBT CON 786281,786281,ReturnResultLast (162) ,Insert Subscriber Data (7) ,8613917213176

16:26:40:1 BSC VBT BSC 786312,786201,ReturnResultLast (162) ,Update GPRS Location (23) ,861391790800

3.1.1 Invoke Id (Univ F Integer) 1

00000010 Tag 1

00000001 Length 1

00000001 Invoke Id value 1

3.1.2 Local Operation (Univ F Integer) 1

00000010 Tag 1

00000001 Length 1

00010111 Operation Code Update GPRS Location

3.1.3 Update GPRS Location Parameters (Univ C Sequence) 1

00011001 Length 25

3.1.3.1 IMSI (Univ F Octet String) 1

00000100 Tag 1

00001000 Length 0

***** MAP IMSI 460007213100976

1111---- Filler 15

3.1.3.2 IMSI (Univ F Octet String) 1

00000100 Tag 1

00000110 Length 6

***** MAP IMSI 198613900160405

----0100 Filler 4

3.1.3.3 IMSI (Univ F Octet String) 5

00000100 Tag 1

00000101 Length 5

***** MAP IMSI 403B08F9308F301

----0001 Filler 1

Message flow mode Protocol: Gb-Gri.tk Setup: Gb-Gri.set Frame: 1

Start Call Analyzer 5:46 PM

Gr call trace and decode in the same Window

User defined counters

Call Analyzer - User Definitions

Message Events | Message Flows | Filters | Links | References | Ocean | Display | Others

Name of message-event : **RadioLinkSetup_Response_FDD** Description :

Message :

User : ??? Add

Name : **AAL2 BLC** Remove

Origin : ???

Dest : ???

Parameters :

Nbap_ElementaryProcedureCode = radioLinkSetupResponseFDD

Add Remove

New parameter : Nbap_AvailabilityStatus Decoded Value : failed (2) Value : not available

Update Remove Rename Save Export Quit ?

Counters can be defined as any combination of a message and any number of information elements

User-defined statistics based on message flows

Call Analyzer - Flow Event Counters

Incoming_from_PSTN | Location_Update | MOC_Setup | MTC_Setup | Outgoing_from_MSC | paging_analysis

Flow-Event	Frequency	Rate	Delay
Call_Attempt	422	100.00 %	0.000
ACM	344	81.52 %	2.830
ANC	179	42.42 %	9.407
ANN	3	0.71 %	0.861
SAM_after_IAM_or_IAI	13	3.08 %	0.005
SAO_after_IAM_or_IAI	5	1.18 %	0.004
SAO_after_ACM	0	0.00 %	0.000
Clear_forward_after_answer	34	8.06 %	20.597
Clear_backward_after_answer	25	5.92 %	23.187
Other_Release_after_answer	6	1.42 %	8.852
Timeout_after_answer	0	0.00 %	0.000
CFL_after_IAM_or_IAI	19	4.50 %	1.081
CLF_after_IAM_or_IAI	16	3.79 %	4.602
STB_after_IAM_or_IAI	6	1.42 %	1.543
ADI_after_IAM_or_IAI	0	0.00 %	0.000
LOS_after_IAM_or_IAI	0	0.00 %	0.000
UNN_after_IAM_or_IAI	0	0.00 %	0.000
CGC_after_IAM_or_IAI	0	0.00 %	0.000
SLB_after_IAM_or_IAI	0	0.00 %	0.000

Export Ok

Any information about network performance can be shown

Statistics for specific flow of messages can be defined

Search Flow-Event

-ANN
-Call_Attempt
-Catch_Undefined
-CFL_after_ACM
-CFL_after_IAM_or_IAI
-CGC_after_IAM_or_IAI
-Clear_backward_after_answer
-Clear_forward_after_answer
-CLF_after_ACM
-CLF_after_IAM_or_IAI
-LOS_after_IAM_or_IAI
-Other_Release_after_answer
-RSC_after_ACM
-SAM_after_IAM_or_IAI
-SAO_after_ACM
-SAO_after_IAM_or_IAI
-SLB_after_IAM_or_IAI
-STB_after_ACM
-STB_after_IAM_or_IAI
-Timeout_after_answer
-UNN_after_ACM
-UNN_after_IAM_or_IAI

Cancel Search

All counters are available for search or filters

User-defined message flow

The screenshot shows the 'Call Analyzer - User Definitions' window with the 'Message Flows' tab selected. The configuration for a message flow named 'RAB Assignment establish' is shown. The 'Message Event' is 'ATAC_with_TMSI' and the 'Other Items' are 'choice block'. The flow consists of 11 steps, with a 'choice' block starting at step 1 and ending at step 11. The steps are:

Step	Message	Count	Export	Action
1	GMM ATRQ	[20] 3,12,15,114	E	atrq
2	GMM SVCREQ	[20] 3,12,15,114	E	svreq
3	RANAP_initmsg_RAB_assignment	4!11	E	attempo
4	Ranap_outcome_RAB_assignment_success		E	success
5	Ranap_outcome_rab_ass_fail_cause_misc		E	failure
6	Ranap_outcome_rab_ass_fail_cause_nas		E	failure
7	Ranap_outcome_rab_ass_fail_cause_non_sta		E	failure
8	Ranap_outcome_rab_ass_fail_cause_prot		E	failure
9	ranap_outcome_rab_ass_fail_cause_radio		E	failure
10	Ranap_outcome_rab_ass_fail_transmission		E	failure
11	???	???		undefined

The flow is controlled by a 'choice' block, which allows for different paths based on the outcome of the previous steps. The 'Export' column indicates that the flow can be exported to CDR or timing measurement.

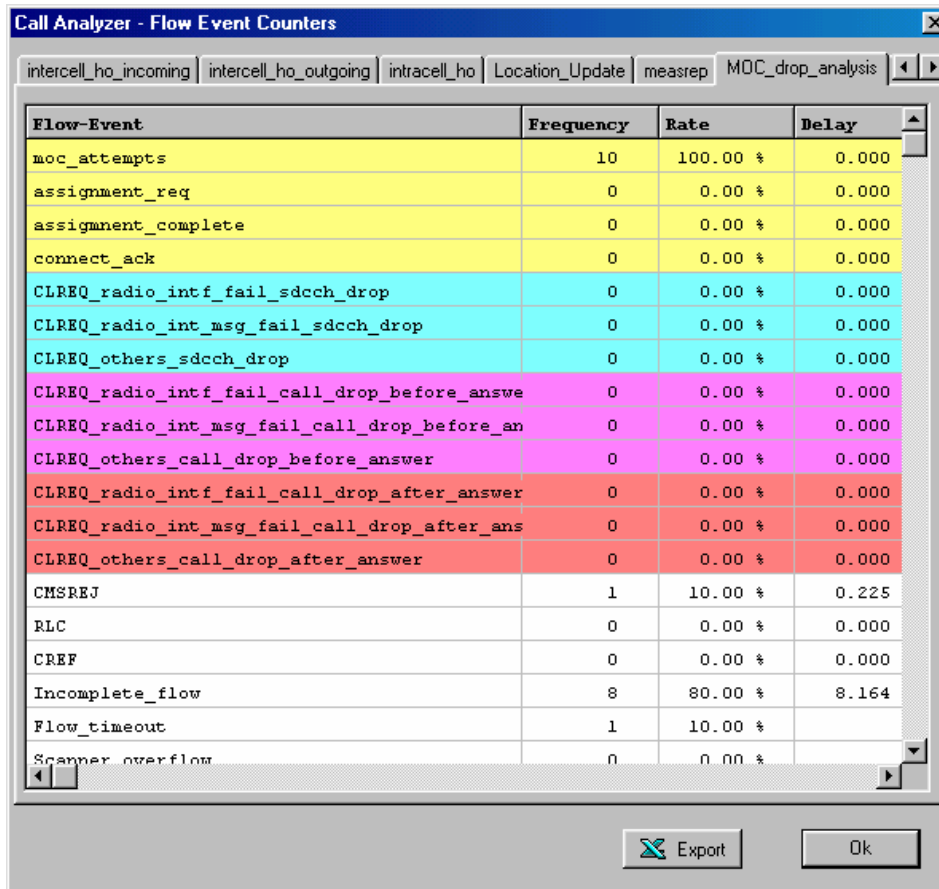
Any message or message event can be inserted in the sequence

If more choices are available after the message jumps to the different messages (choice) can be inserted

A counter can be assigned at any point in the flow

Indication of export to CDR or timing measurement

Analysis of when a call is dropped



Call Analyzer - Flow Event Counters

intercell_ho_incoming | intercell_ho_outgoing | intracell_ho | Location_Update | measrep | MOC_drop_analysis

Flow-Event	Frequency	Rate	Delay
moc_attempts	10	100.00 %	0.000
assignment_req	0	0.00 %	0.000
assignment_complete	0	0.00 %	0.000
connect_ack	0	0.00 %	0.000
CLREQ_radio_intf_fail_sdcch_drop	0	0.00 %	0.000
CLREQ_radio_int_msg_fail_sdcch_drop	0	0.00 %	0.000
CLREQ_others_sdcch_drop	0	0.00 %	0.000
CLREQ_radio_intf_fail_call_drop_before_answe	0	0.00 %	0.000
CLREQ_radio_int_msg_fail_call_drop_before_an	0	0.00 %	0.000
CLREQ_others_call_drop_before_answer	0	0.00 %	0.000
CLREQ_radio_intf_fail_call_drop_after_answer	0	0.00 %	0.000
CLREQ_radio_int_msg_fail_call_drop_after_ans	0	0.00 %	0.000
CLREQ_others_call_drop_after_answer	0	0.00 %	0.000
CMSREJ	1	10.00 %	0.225
RLC	0	0.00 %	0.000
CREF	0	0.00 %	0.000
Incomplete_flow	8	80.00 %	8.164
Flow_timeout	1	10.00 %	
Scanner_overflow	0	0.00 %	

Export Ok

Any flow of messages
can be defined for
statistics, search and filter

User defined statistics

The user can specify any sequence of messages to be used for statistics

Example - analysis of GPRS network behaviour

Call Analyzer - Flow Event Counters

Flow-Event	Frequency	Rate	Delay
GPRS_PDP_activate_request_MS_initiated			
GPRS_PDP_deactivation			
GPRS_Routing_area_update			
RA_upd			
RA_update_req	718	100.00 %	0.000
RA_update_succ	678	94.43 %	1.339
RARJ_impl_detach	5	0.70 %	1.613
RARJ_others	1	0.14 %	3.564
RARJ_cong_force_to_stby_ind	0	0.00 %	0.000
RARJ_cong_force_to_stby_not_ind	0	0.00 %	0.000
RARJ_gprs_serv_not_allow_force_to_stby_ind	0	0.00 %	0.000
RARJ_gprs_serv_not_allow_force_to_stby_not_ind	0	0.00 %	0.000
RARJ_net_fail_force_to_stby_ind	0	0.00 %	0.000
RARJ_net_fail_force_to_stby_not_ind	0	0.00 %	0.000
STA_radio_contact_lost_MS	3	0.42 %	1.060
Suspend	0	0.00 %	0.000
Suspend_ack	0	0.00 %	0.000
UA_update_accept_follow_RACMP	363	50.56 %	0.343
diuid	53	7.38 %	
uidst	30	5.23 %	
FLUSH	0	0.00 %	
FLUSH_ACK	0	0.00 %	
RAUpdate message abnormal	39	5.43 %	

Export Export

777, 11, -1969613350

Call Analyzer - Flow Event Counters

Flow-Event	Frequency	Rate	Delay
GPRS_attach			
GPRS_Detach			
GPRS_PDP_activate_request_MS_initiated			
GPRS_PDP_deacti			
PDP_act_request	4	100.00 %	
PDP_act_accepted	4	100.00 %	
APRJ_inisuf_resource	0	0.00 %	
APRJ_miss_or_unk_APN	0	0.00 %	
APRJ_QoS_not_accepted	0	0.00 %	
APRJ_unspecified	0	0.00 %	
APRJ_rejected_by_GGSN	0	0.00 %	
APRJ_NSAPI_already_used	0	0.00 %	
APRJ_network_fail	0	0.00 %	
APRJ_unk_PDP_act_or_type	0	0.00 %	
APRJ_act_failed	0	0.00 %	
APRJ_others	0	0.00 %	
Unspecified	0	0.00 %	
Flow_timeout	0	0.00 %	
Incomplete_flow	0	0.00 %	
Scanner_overflow	0	0.00 %	
Removed_after_overflow	0	0.00 %	
Reference_overflow	0	0.00 %	

Export Export Ok

777, 11, -1969613350

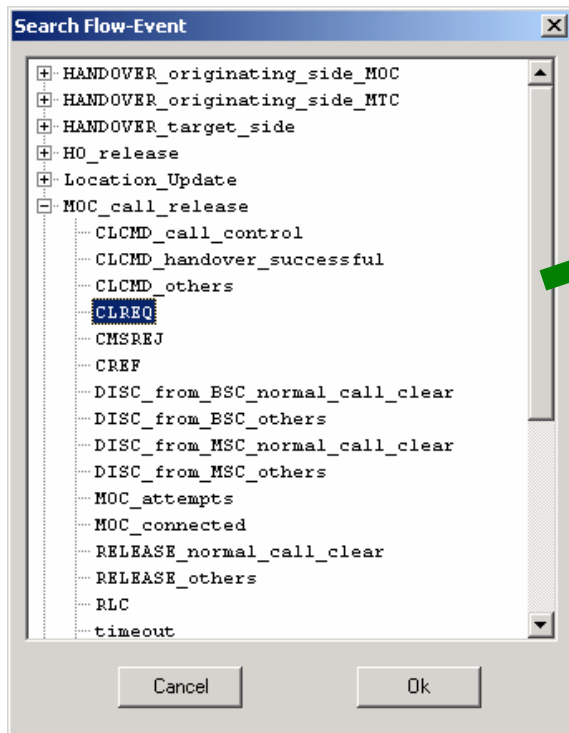
Call Analyzer - Flow Event Counters

GPRS_Routing_area_update

Flow-Event	Frequency	Rate	Delay
RARQ	704	100.00 %	0.000
RAAC_with_PTMSI	352	50.00 %	0.820
RACMP	320	45.45 %	3.293
RAAC_without_PTMSI	212	30.11 %	0.384
RAAC_repetitions	53	7.53 %	10.407
RARQ_repetitions	29	4.12 %	27.307
RARQ_reinitiated_after_RAAC	23	3.27 %	7.279
RAupdate_ended_by_Attach_Detach_proc	4	0.57 %	14.180
RAAC_with_RecPDUnum	0	0.00 %	0.000
RARJ_impl_detach	3	0.43 %	11.950
RARJ_cong_force_to_stby_ind	0	0.00 %	0.000
RARJ_cong_force_to_stby_not_ind	0	0.00 %	0.000
RARJ_gprs_serv_not_allow_force_to_stby_ind	0	0.00 %	0.000
RARJ_gprs_serv_not_allow_force_to_stby_not_ind	0	0.00 %	0.000
RARJ_net_fail_force_to_stby_ind	0	0.00 %	0.000
RARJ_net_fail_force_to_stby_not_ind	0	0.00 %	0.000
RARJ_others	0	0.00 %	0.000
IDREQ	0	0.00 %	0.000
IDRFS	0	0.00 %	0.000

Export Export Ok

Search for specific event in a sequence



Call Analyzer 1.0 - D:\RecordFiles\Demo A-Interface.REC

File Protocol Mode Select Decode Message Flow Results Define Options Help

20%

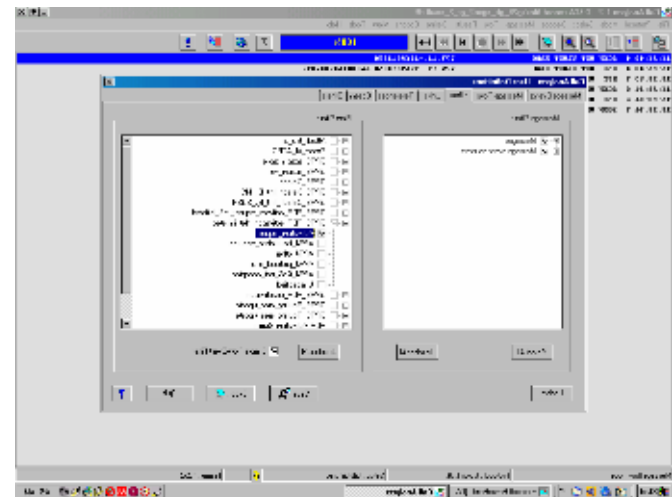
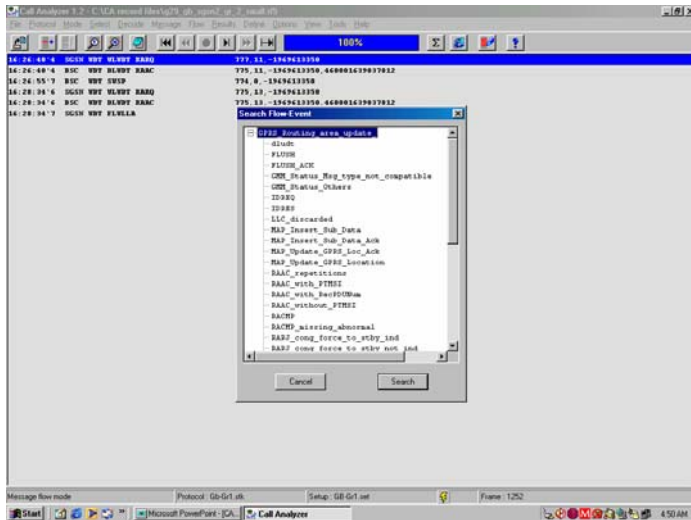
18:33:06.8	BSC	CR CL3I CMSREQ	, 21772,12530,mobile originating call	499871
18:33:06.8	MSC	CC AUTREQ		499878
18:33:07.5	BSC	DT1 AUTRES		499908
18:33:07.5	MSC	DT1 CICMD		499911
18:33:08.2	BSC	DT1 CICMP		499928
18:33:08.4	BSC	DT1 SETUP	, called, 05518753691	499933
18:33:08.5	MSC	DT1 CPROC		499936
18:33:08.5	MSC	DT1 ASREQ		499937
18:33:09.3	BSC	DT1 ASCMP	, normal_event	501789
18:33:10.7	MSC	DT1 ALERT		501833
18:33:15.2	MSC	DT1 CONNECT		503835
18:33:15.5	BSC	DT1 CONACK		503838
18:33:58.0	BSC	DT1 CLREQ	, Radio interface message failure	518167
18:33:58.0	MSC	DT1 CLCMD	, Radio interface message failure	518175
18:33:58.1	BSC	DT1 CLCMP		518182
18:33:58.1	MSC	RLSD	, end user originated	518184
18:33:58.2	BSC	RLC		518187

Example :

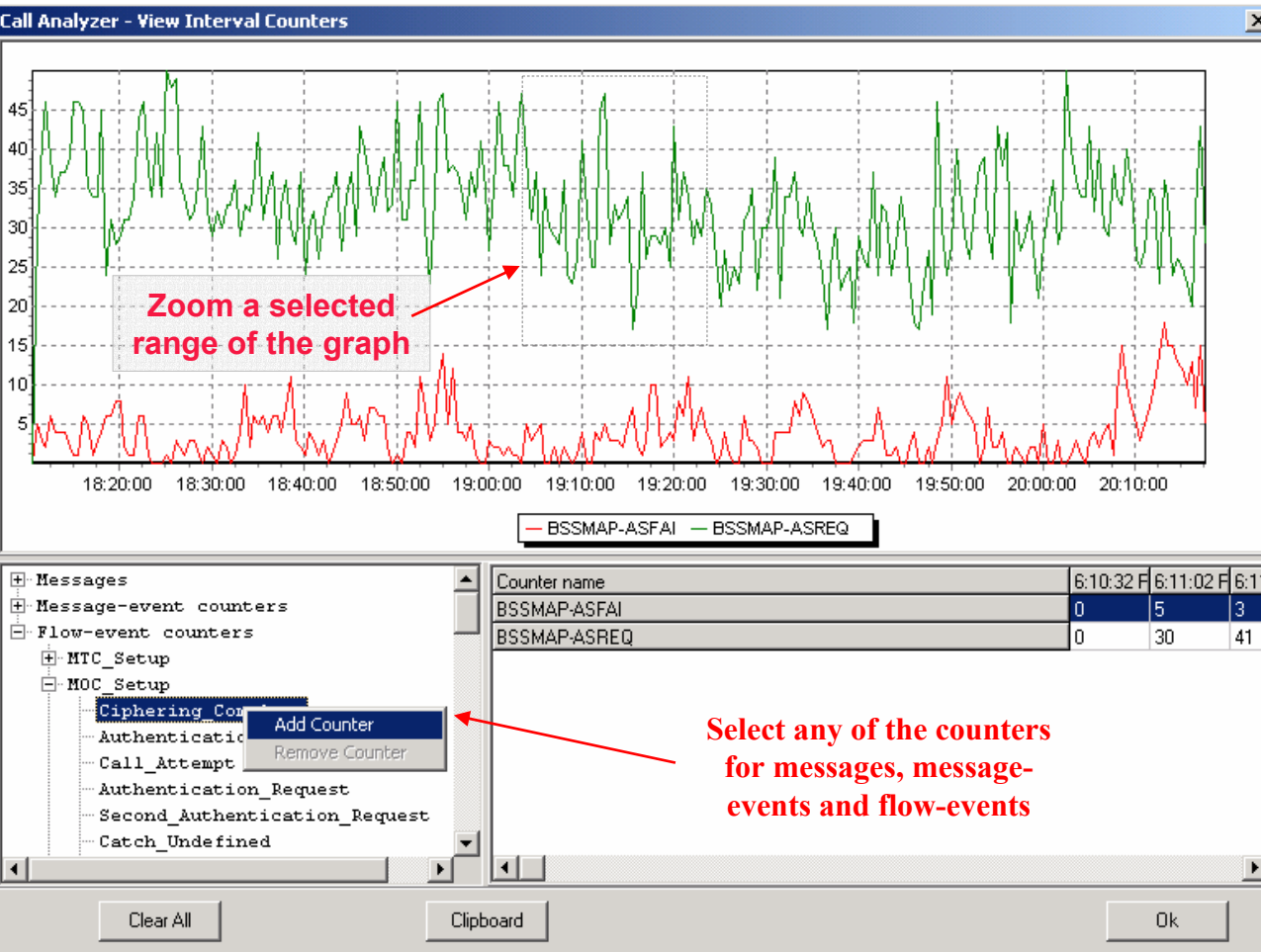
A dropped MOC can be found by searching for a CLREQ message after the CONACK message within a MOC

User defined search and filter

Any sequence of messages can be used for search or filter



Line chart of counters



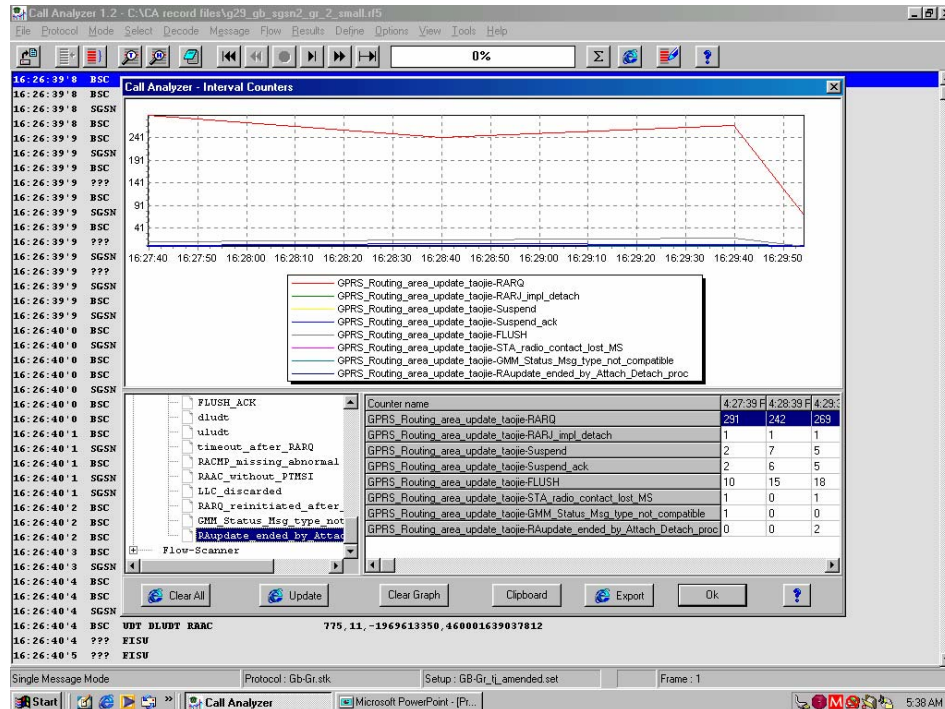
Investigate the behavior of a given counter over time

Interval counters as a table

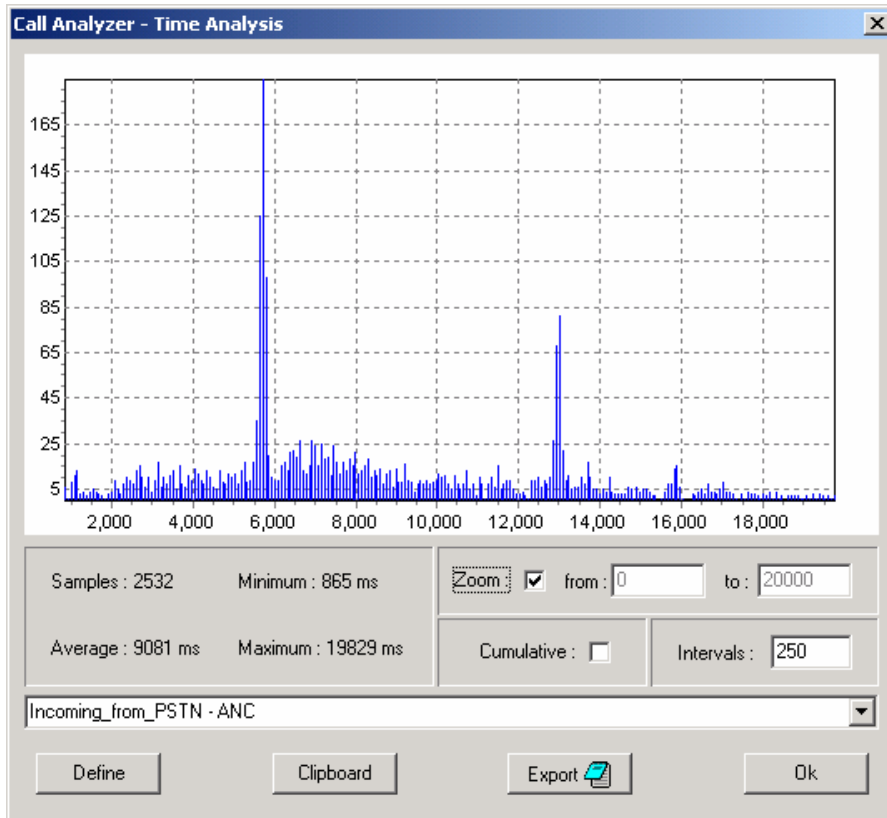
Select any of the counters for messages, message-events and flow-events

Interval counters

Any combination of messages, events or selected sequences can be shown



Timing measurements

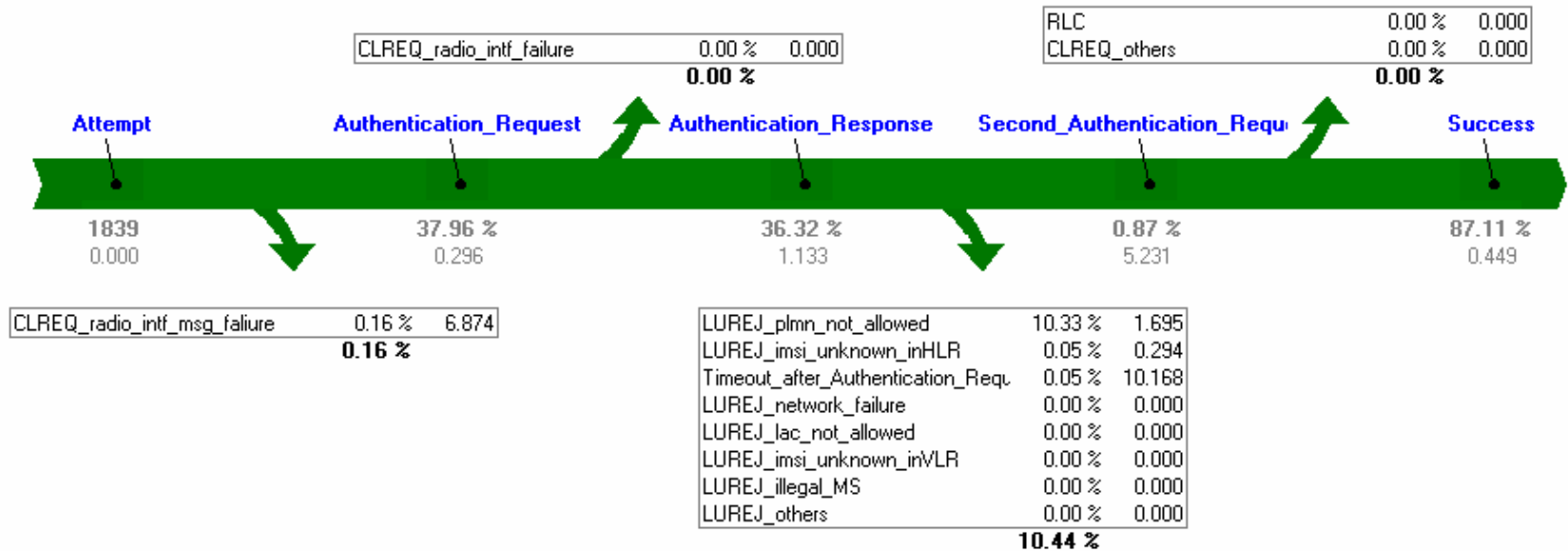


The delay between any 2 events on any interface can be measured

E.g. delay from IAI to paging

Graphical analysis of call behaviour

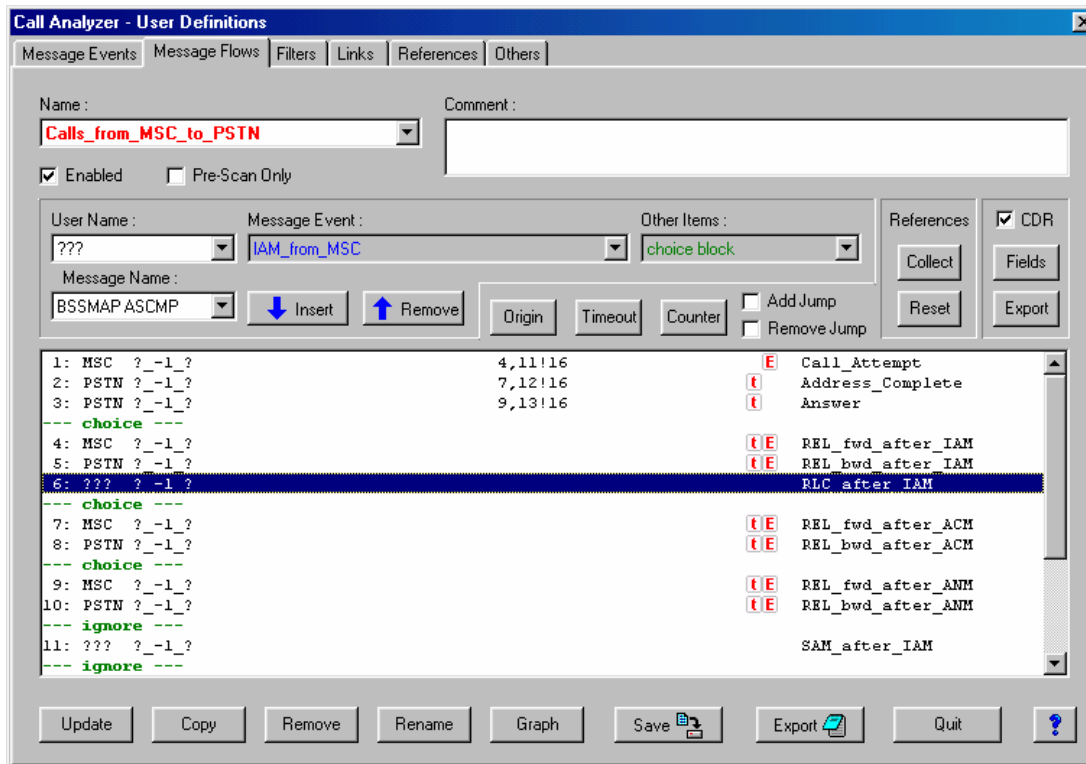
LU



Location_Update

C:\Rec\A-T-M.rf5 ; from 11.04.2000 - 13:20 to 11.04.2000 - 13:21

User defined CDRs



Any information element in any message at any point in the call can be used for CDR record

User defined CDRs

Call Analyzer - CDR Database


Call Records Summaries

HANDOVER_target_side | Location_Update | MOC_Setup | MTC_Setup | SDCCCH_Assignment | TCH_Assignment | TS_Traffic

Frame	TEI	TS_Number	Release_Time	Count
217	3	1	2016	1
290	0	1	3142	1
429	4	7	49428	1
1047	3	1	4629	1
1253	3	1	3903	1
1857	3	1	3155	1
2076	0	1	3342	1
2143	3	1	2991	1
4046	3	1	3542	1
4405	3	2	53940	1
7186	3	1	5505	1
7282	5	1	18192	1
7767	3	1	2866	1
8606	3	1	7541	1
9058	0	1	4540	1
9315	3	1	2604	1
9860	3	1	2104	1
10081	3	5	14741	1

Query :

146 Records

Export  Ok

Advanced filter functions

