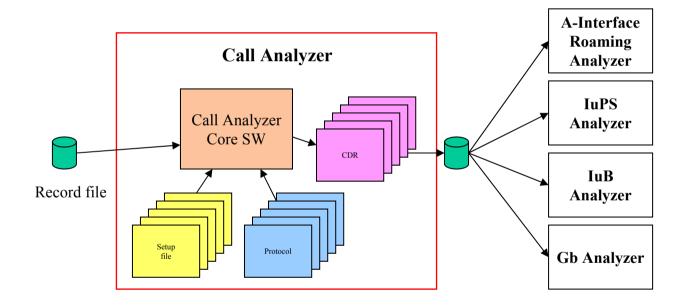
Call Analyser

Independent tool for advanced analysis of protocol data





Call Analyser product family



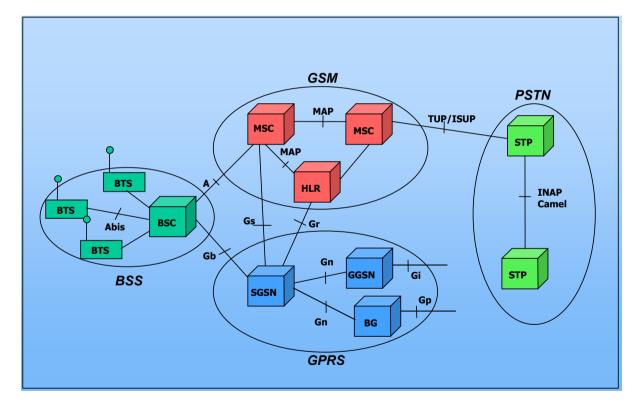
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Call Analyser is much more than protocol decode

- 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

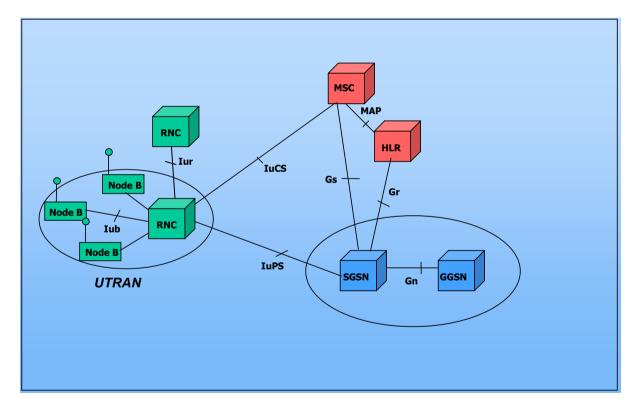


Supported interfaces - GSM/GPRS





Supported interfaces - UMTS





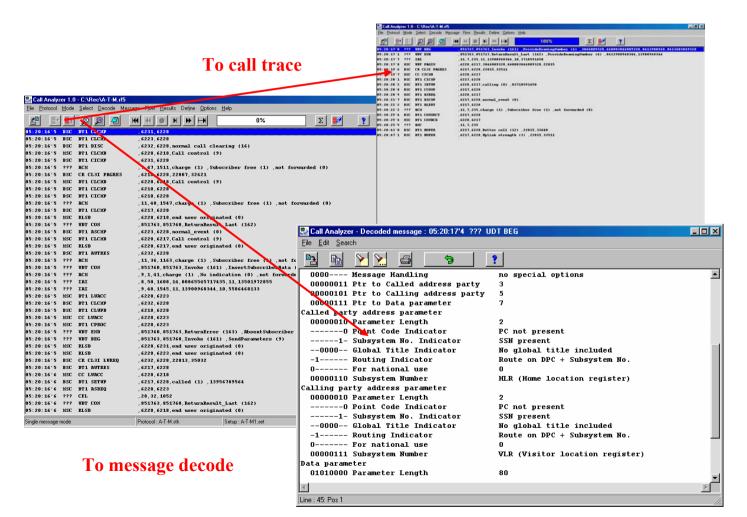
Currently supported instruments

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





Zoom functions



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~ 1

Decode example - CDMA

器 Call Analyzer 1.1 - C:\CDMA\csmsmt.rf				
<u>File Protocol Mode Select Decode Mess</u>	age Flow <u>R</u> esults Define <u>O</u> ptions <u>H</u> elp			
		Σ		
15:05:35'9 ??? SMSREQ	,131647,132924,226,199,232,55			
15:05:36'0 ??? SMSREQ 15:05:36'0 ??? SMDPP	, 132924 , 131647 , 228 , 199 , 232 , 55 , 131647 , 132926 , 226 , 199 , 232 , 53			
11 Call Analyzer - Decoded message : 15: File Edit Search	05:35'9 ??? SMSREQ			
00011011 Length 11101001 Component Tag 00011001 Length 11001111 Tag 00000001 Length ******** Component ID 11010001 Tag 00000010 Length 00010010 Group Code 00110111 Operation Code 11110010 Tag 00010000 Parameter name 00001010 Length 10001000 Parameter name 00000101 Length 0100 Digit 0011 Digit 0110 Digit 0001 Digit 0111 Digit 0000 Digit	27 Invoke(Last) 25 Component ID 1 37 National Operation Code Tag 2 IS41 MSRequest Parameter Set Tag 16 MobileIdentificationNumber 5 8 5 2 3 2 1 7 0			
Line : 82: Pos 1				
			×	
i Single message mode	Protocol : IS41D.stk Setup : TDC-Abis-A-ISUP-M	MAP-Interface 🥳 🛛 Frame : 4	<u>M</u>	Netcare

International

Examples of GPRS data

Call Analyzer 1.2 - C:\CA record files\gi File Protocol Mode Select Decode Messa							
				and the second	-	-	
8 🗉 💵 🛛 🖉 😬	4 0 H H H	0%		Σ		1	
6:26:89'S BSC VOT BEG	786201,78	6180 Invoke (161)	Update GPRS	Location (23) 468	007213100976	198613980160405 40388889
4:26:39'8 BSC WDT BEG	786201,78	6181, Invoke (161)	. Wpdate GPRS	Location (23) .460	007363101074	198613988168485, 48388879
6:26:39'B SGSN WET BEG	786180,78	6201, Invoke (161)	Cancel Local	Lion (3)			
4:26:35'8 BSC WDT END	786201.78	6181, BeturnResult	Last (162)				
6:26:39'9 BSC IDNGHSG							
LE:26:39'9 SCSN MACHSC							
L6:26:39'9 BSC HNGHSG							
16:26:39'9 PPP MNGMSG							
LE:26:39'9 BSC MMGHSG							
LE:26:39'9 SGSN HNGHSG							
16:26:39'9 BSC MNGMSG							
16:26:39'9 777 IDNING							
LET 26:39'9 SEEN HNEHSE							
L6:26:35'9 PPP WDT WLWDT	707, 31, 30	9533146					
LE:26:39'9 SGSN WPT CON		6201, Invoke (161)		criber Bata	(7) .86	13817361393	
L6:26:39'9 BSC WDT CON		6101, BeturnBesult					
L6:26:39'9 SGSN WDT END		6201, EcturnResult					280000
16:26:40'0 BSC WDT CON		6201, Invoke (161)					
6:26:40'0 SGSN WDT END		6201, ReturnResult					1730000
L6:26:40'0 BSC WDT CON		6181, ReturnResult			riber Ba	ta (7)	
LE:26:40'0 BSC WDY BEG		6100, Invoke (161)	,Purge MS (6	"			
LE:26:40'0 SEEN WOT SWEP	778, 8, -13	03437606					
LE:26:40'0 BSC EXSU							
L6:26:40'0 BSC VDT REG		6181, Invoke (161)					
16:26:40'1 BSC WDT END		6201, Beturnhesult	Last (162) . Up	pdate GPRS	Location	(23) .86139	1790000
L6:26:40'1 SGSN WDT ABT	786296,78						
6:26:40'1 BSC WDT WLWDT RACHP	795,9,-80	0055590					
6:26:40'1 SGSN FISU		10000					
LE 26:40 1 SGEN WDT ABT	786272,78						
6:26:40'2 BSC WDT SWSP 6:26:40'2 BSC FISU	268,0,297	270930					
				1. N. S. S.	SI 172		
	786201,78	6181, Invoke (161)	.update GPES	location (233 ,460	001770171942	198613988168485,48388879
6:26:40'3 BSC FISU							
L6:26:40'3 SCSN WDT FLWLLA L6:26:40'4 BSC WDT CON	769,0,-18						
6:26:40'4 BSC UDT CON 6:26:40'4 BSC UDT CON		6201, Invoke (161) 6181, ReturnResult		Criber Data	(1) .00	T100T115010	
LE:26:40'4 SGSN WDT ULWDT RARD	777.111						
16:26:40'4 BSC VDT BLVDT RAM		969613350,4600014	29427017				
6:26:40'4 PPP WET WEAT WET DIG		07162842.18.71.1.					
6:26:40'4 FFF BISU							
ingle message mode	Postocol Gb-Grl atk	Setup: GB-Grt			Funne		

Gb And Gr

Call Analyzer 1.2 - C:\CA record files\g29_gb_sgsn2_	gr_2_rmaltrf5	_ 6 ×
Elle Protocol Mode Select Decode Message Flow Bes	uits Define <u>O</u> ptions <u>View</u> <u>I</u> cols <u>H</u> elp	
e : : : : : : : : : : : : : : : : : : :	H → → 23% Σ 💰 📝 🍷	
16:27:25'9 777 STAK		-
16:27:25'0 FFF STAE		<u> </u>
16:27:25'1 PPP STAE		
16:27:25'1 PPP STAE		
14:27:25'1 PPP STA	1 · · · · · · · · · · · · · · · · · · ·	
16:27:25'1 FFF STR	+ · · · · · · · · · · · · · · · · · · ·	
16:27:25'1 PPP UDT ULUDT UDT DTCR	794, 22, -1059906006, 10, 71, 0, 246, 210, 22, 176, 100, 1222	
16:27:25'1 ??? VDT DLUDT VDT DTGR 16:27:25'1 ??? STAK	794, 22, -1059906006, 460006544101774, 210, 22, 176, 100, 10, 71, 0, 246, 2003406301, 1235	
16 27 25 1 PPP STA		
16:27:25'1 FFF VOT BLUDT VOT DTGR	773, 35, 1807162842, 460000040100167, 66, 230, 217, 196, 10, 71, 1, 194, -357197787, 49952602	
16:27:25'2 777 STRE	•	
16:27:25'2 PPP STA	1 · · · · · · · · · · · · · · · · · · ·	
16:27:25'2 ??? MLV	775	
16:27:25'2 FFF ALVA	775	
16:27:25'2 FFF UDT WLWDT KARQ 16:27:25'2 FFF BLV	796, 12, 1071062746	
16:27:25'2 PPP RLV 16:27:25'2 PPP WDT DLWDT RRAC	795 796,12,1071062746,460000733100191	
16:27:25'3 PPP UDT SUSP	756,0,-345628966	
16:27:25'4 TTT VET VLVDT RAED	792, 24, -586083366	
16:27:25'4 FFF UDT DLUDT RARC	793,24,-586083366,460007554107356	
16:27:25'4 ??? WDT SWSP	795, 0, 1945370522	
16:27:25'4 ??? WDT WLWDT	774,14,-266657030	
16:27:25'4 PPP WDT FLULL	788, 0, -266657830, 5888	
16:27:25'5 ??? VDT SUSP 16:27:25'5 ??? VDT FLULLR	757,0,-706782838	
16:27:25'5 777 OUT FLOLLA	780, 0, -266657030 767, 6, 1490755290	
16:27:25:5 PPP WDT WLWDT WDT DTCR	772, 35, 1807162842, 10, 71, 1, 194, 66, 230, 217, 196, 49952602	
16:27:25'7 PPP WDT WLWDT RARQ	778, 9, -2941286	
16:27:25'7 777 UDT ULUDT RAEQ	788, 9, 720641690	
16:27:25'7 777 WDT WLWDT RACHP	756, 5, -1754849574	
16:27:25'7 PPP WDT DLUDT RANC	769,9,-2941286,460007603118557,-2941222	
16:27:25'7 PPP UDT DLUDT RABC	789, 9, 720641690, 460006004114650, 720641754	
16:27:25'\$??? UDT FCBVC 16:27:25'\$??? UDT VLUDT FRED	783,7 768,10,252510875	
16:27:25'8 777 WDT FCBWC	793,19	
16:27:25'8 PPP UDT FCBWCR	793, 19	
16:27:25'S PPP WDT DLUDT UDT DTCR	773, 35, 1807162842, 460000040100167, 66, 230, 217, 196, 10, 71, 1, 194, -357197786, 49952788	
16:27:25'8 FFF VDT VLVDT RAEQ	746,3,-949608886	
16:27:25'S FFF UDT DLUDT RARC	747,3,-949608806,460001706704718,-949608742	-
Single message mode Protocol : Gb-G	i1.stk Setup : GB-Interface_260402_tagje.set 🦸 Frame : 3728	
📺 Start 🛛 🧭 🜔 😂 🎽 💷 Local Disk (C.)	🔝 Call Analyzer 🛛 😓 🖓 🌒 🕅 🖓 🕲 🖄 🖉	6:36 PM

Gb only





Examples of UMTS data

M Biolocol Mod		Mgraape Flow Bends Delive-				mail land	
e 📄	P 👂 🥥		M	1%	Σ	1	
12:07:08'5 NB	BATA BATA PA	ICH Bata (0) , Uplink (0)				
12:07:0015 30	RECCORReg						
LZ:07:08'5 XNC				(dd (1) ,comon (
12:07:00'6 NB	SD SuccOutes		nkSetup (27) ,1 nh request (5)	(dd (1) , common (0) ,0,1		
12:07:08 6 33	ECF		sh confirm (4)	, 65, 164			
2:07:08'7 ENC	DL Syncro		(1) .BL synchu	contration (3)			
12:07:08'7 108	UL Syncro		(1) .WL syncha				
L2:07:00'8 MNC	BATA BATA FA	ACH Data (0) . Doumlink (1)	Boumlink (1)			
LZ:07:08'8 830	BATA BATA FA	ACH Bata (0) , Doumlink (1)	, Boumlink (1)			
12:07:08'8 RNC	DATA DATA				_		
12:07:00'8 330		Coll Analyzer - Decoded messag	ge 12:07:08'5 N	8 HHLLOnHeq			
L2:07:09'1 NB		le Edit Search					
12:07:05'1 108	DATA DATA	🔁 🖻 🖌 🖉 🖨	3	2			
12:07:09'2 NB		there are all a line and		10 P 10 P 10			
L2:07:09'2 NB		UL_CCCH_Message			120.00		-
12:07:09'3 ESC		preamble			0×0		
12:07:09'3 ENC		.1 UL_CCCH_MessageType 01 UL_CCCM_Message1	Trans a		meesee		
12:07:09'3 RHC	02000000000000	.1.1 RRCConnectionReques			Recconne	ectionRequest	
12:07:09'3 NB	Contraction of the second s	00 preamble			0x0		
12:07:09'3 830		.1.1.1 InitialUE Identit	tv		0.40		
EX 6'40:50:50		001 InitialVE Ident:			tosi-an	I-LAI	
LZ:07:09'4 XMC	DATA DATA 1	.1.1.1.1 THSI and LAI 65					
L2:07:09'4 RMC	DATA DATA 1	.1.1.1.1.1 THSI_GSH_HAP	_				
12:07:09'4 BMC		0001110					
L2:07:09'4 RNC		1100000					
L2:07:09'5 NB		0001000					
12:07:09'6 NB		0100000 THSI_GSH_HAP			2495632	96	
12:07:09'6 NB	Contraction of the second second	.1.1.1.2.1 LAI	1000				
2:07:09'7 10		.1.1.1.2.1.1 PLNOL_Ident: .1.1.1.2.1.1.1 MCC	ity				
12:07:09'7 RMC		010 Digit			2		
L2:07:09'7 RMC	Contraction Products	0110 Digit			6		
LZ:07:09'8 BNC		010 Digit			2		
2:07:09'8 800		.1.1.1.2.1.2.1 MMC			<u> </u>		
12:07:09'8 330	MeasCtrl		nts		2		
L2:07:10'0 NB	BATA STAT	1					<u> </u>
L2:07:10'1 RMC		1					<u> </u>
12:07:10'1 RMC	DATA DATA LE	Ae : 25: Pos 1					

IuB and Uu

100 C			Call Analyzes 1.3
		Massaga Flow Bandis Delvis Opbani Yerir Idila Belo	
	Σ 🔊 💕 🏆		8 11.
	(19) ,PS-Bonain (1)		6:03:36'0 BNC :
			6103136'0 SGSN 1
			6:03:36'0 SCSN :
	al (6)		6:03:36'5 BSC :
			6:03:36'5 SGSN :
			6:03:44'8 SCSN
			6:03:45'2 BNC :
	auseNAS (2) , normal-release (83)		6:03:45'3 SGSN :
			6:03:45'8 BMC :
	(0)	12609, 12612, 3, end user originated	6:03:45'8 SGSN :
	SuccessfulOuto	Call Analyzer - Decoded message : 16:27:57'9 ANC SD AL DT1	6:03:45'8 RNC :
			6:27:57'4 BNC :
		Edit Search	6:27:57'4 SGSN :
			6:27:57'4 5GSN :
			6:27:57'9 BMC
		000000 Octet Alignment	1:27:57'9 SGSN :
		SecurityModeComplete	:20:06'0 SGSN :
	0	Type of length, Bit 1	6:28:06'5 BMC :
	8	01000 Length	6:20:06'5 SGSN :
		1.1 Protocol IE's	6:28:07'1 RNC :
	No extension present	Extensibility	6:28:07'1 SGSN :
	Not present	Protocol extension	6:28:07'1 BMC
	Contraction and Contraction	000000 Octet Alignment	7:26:27'0 565N :
		3.1.1 Protocol IE Container	1:26:27'8 BMC :
		00000	7:26:28'8 BMC :
	1	000001 Number of elements	7:26:20'0 BSRC :
		3.1.1.1 Protocol IE Field	7:26:28'6 SGSN :
	12	00000	1:26:29'0 BMC :
	6 P	000110 IE Id	7:26:47'1 5GSN :
		3.1.1.2.1 Criticality	1:27:02'2 RMC :
	Reject	Criticality	0:51:04'8 SGSN :
		100000 Octet Alignment	1:10:15'9 BNC :
	0	Type of length, Bit 1	1:21:43'9 565N :
	1	00001 Length	1:21:49'5 SESN
		1.1.1.3.1 Integrity Protect. Algorithm	1:56:36'8 BNC :
	standard-UMTS-integrity-algorit)	0 Integrity Protect. Algorithm	5:27:29'8 SGSN :
		0000 Octet Alignment	512712919 BMC 1
			5:27:30'8 RMC :
			5:27:30'9 SGSN :

IuPS





Events are based on complete call traces

🚰 Call Analy	zer 1.0	- C:\Rec\A-T-M.rf5		_ 8 ×
<u>File</u> Protocol	<u>M</u> ode	<u>Select D</u> ecode M <u>e</u> ssa	age Flow <u>R</u> esults Define <u>Options</u> <u>H</u> elp	
	•	<u>p</u> <u>p</u> <u>-</u>		
05:20:17'0	???	UDT BEG	. 851717, 851763, Invoke (161) , ProvideRoamingNumber (4) , 3846009328, 460003846009328, 8613900968, 861360384	9328
05:20:17'1	???	VDT END	,851763,851717,ReturnResult_Last (162) ,ProvideRoamingNumber (4) ,8613900968346,13900968346	
05:20:17'7	???	IAI	, 11, 7, 235, 11, 13900968346, 10, 3718591450 🚽 💦 💦	
05:20:17'8	MSC	UDT PAGIN	, 6228, 6217, 3846009328, 460003846009328, 22015 TUP/ISUP	
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 A interface MAP	
05:20:20'2	MSC	DT1 SETUP	,6228,6217,calling (0) ,03718591450	
05:20:20'8	BSC	DT1 CCONF	,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	???	ACM	,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	???	ANC	,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	

viessage flow mode	Protocol : A-T-M stk	Setup : A.T.M set	3	Frame : 362

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 generate at a certain call state

Netcare International



Decode examples - GPRS

And an and a second second			r Mgasaga Fjaw B	esulta Define Optional		noli Belp				<u>_ 6 ×</u>
sa 1-			H H H	H H H		0%	Σ	1 🖬 🔋		
:26:39'8	RSC	VDT REC		786201 786180	Invoke	(161) Undate CP	RS Location	(23) 469097	213100976 198613	900160405 403D88F9 -
- 26-39-8	ISC	URT BUG								200160405,40380889
5:26:39'8	SGSN	UDT BEG				(161) .Cancel Lo				
6:26:39*8	BSC	UDT END		286281 286181	Patural					
5:26:39'9	BSC	MINGH Call	Analyzer - Decoded	message : 16:26:40'4	SGSN L	DT ULUDT RARQ				
5:26:39.9	SGSN	MNGH Ele Ed	il Search							
26:39'9	BSC	MNGH	at at at	Ind I am	1	1			-	
1:26:39'9	\$44	MINEN PA		4 9	11000	8 k				
: 26:39'9	BSC	MINGH 000010	100 Message Ty	ne		Routing area	undate rem	nest		
:26:39'9	SGSN	30NG31	000 Update Typ			RA updating			_	
26:39'9	BSC	MNGH	Spare	2		0				
:26:39'9	555	JONGH -111		ring Key Seg No.		7				
:26:39*9	SGSN	2NG9 0	Spare			0				
:26:39'9	555	UDT	*** RAC HCC			460				
5:26:39'9 5:26:39'9	SGSN BSC	11111	Filler			15				
6:26:39 9	SGSN	UDT *****	*** RAC HIC			00				
26.40'0	BSC	UDT	AAA LAC			6245				
26:40 0	SGSN	011001	LO1 RAC			101				
. 26.40'0	BSC	UDT 000010	000 Length of 1	Parameter		8				
1:26:40 0	BSC	UNT 0001	Access T			GSM E				
5.26.40'0		1007		Access Techn.Typ	e	25				
5:26:40 0	BSC	FTSH 100	0 RF Power			class 5				
26.40.0	BSC	UDT		on Alogorithm Fl		1				
:26:40'1	BSC	VDT		on Algorithms A5		Available				
26:40'1	SGSN			on Algorithms A5		Available				
:26:40'1	BSC			on Algorithms A5		Not Available				
26:40'1	SGSN			on Algorithms A5		Not Available				
26:40'1	SGSN			on Algorithms A5		Not Available				
5:26:40*2	BSC			on Algorithms A5 on Algorithms A5		Not Available				
.26.40'2	BSC	FISU	Enerypti	on Algoritims Ab		Not Available			-	
26:40'2	DSC	UDT (900160405, 40300079
26:40'3	BSC	FISU Line: 88:	Pot 1							
126:40'3	SGSN	VDT			***				-20	
26:40'4	BSC	ADL CON				(161) .Insert Su	bscriber Dat	a (7) ,86138	01772838	
:26:40'4	BSC	VDT CON				esultLast (162)				
26:40.4		UDT BLUDT R		777, 11, -196961						
5:26:40'4	BSC	VDT BLUDT R		775, 11, -196961						
6:26:40'4	555	UDT ULUDT U	OT DTGR	771, 35, 1807162	842,10,	71, 1, 194, 66, 218,	71, 86, 281202			
1:26:40'5		FISU	Protocol : G	C.I.W.	le trans	ch c d .ut	()=tr	Frame : 37		
idie wettage		-	a parte a secondaria	D-G(1.50)	li>einb:	GB-Gr1.set		prome : 37		
B Start 5	1 15	N	Call Analyzer	Microsoft Pos	entPoint - I	CA Protocol Sta	k Editor		COMMINS	0.07 PM

Full decode of Gb messages

Eile Protocol Mode Select Decode Mg	ssage Flow <u>B</u> esults Define (jptions ⊻iew <u>I</u> ools <u>H</u> elp			
	H H D H H	60%	Σ	1	
6 26 39 8 BSC VIT BEG	كركر كر كر كره				0976,198613988168485,483888F91
L6:26:40'0 BSC WPT CON		6201, Invoke (161) , Inse			
L6:26:40'0 BSC WET CON		6181 ReturnResultLast			
6:26:40'1 BSC WDT END		6201, ReturnResultLast			61391790000
3.1.1 Invoke Id					
00000010 Tag	(Univ P	Integer)			
00000001 Length	1				
00000001 Invoke Id value	ĩ				
3.1.2 Local Operation	-				
00000010 Tag	(Insist D	Integer)			
00000001 Length	(oniv P	inceger)			
00010111 Operation Code		PRS Location			
3.1.3 Update GPRS Location Po					
00110000 Tag		Sequence)			
00011001 Length	25				
3.1.3.1 IMSI					
00000100 Tag	(Univ P	Octet String)			
00001000 Length	0				
******* MAP IMSI	4600072:	13100976			
1111 Filler	15				
3.1.3.2 IMSI					
00000100 Tag	(Inix P	Octet String)			
00000110 Length	6	cecce being,			
******* MAP IMSI	19861390	0160405			
0100 Filler	4	·····			
3.1.3.3 INSI	-				
00000100 Tag	(Being D	Octet String)			
	(Univ P	outet atring)			
00000101 Length					
	403D88F	DD8F381			
******* MAP IMSI	1				
O001 Filler					
	Protocol : Gb-Gr1.stk	Setup : G8-Gr1.set	1	Frame : 1	

Gr call trace and decode in the same Window





User defined counters

Call Analyzer - User Definitions	X
Message Events Message Flows Filters Links References Ocean Display Others	
Name of message-event : Description : RadioLinkSetup_Response_FDD Image: Content of the second	
Message : User : ??? Add Nbap SuccOutcome Origin : ??? Name : RAL2 BLC Y Remove Dest: ???	
Nbap_ElementaryProcedureCode = radioLinkSetupResponseFDD	
Add Remove	
New parameter : Decoded Value : Value :	
Nbap_AvailabilityStatus I failed (2)	
Update Remove Rename Save Export 2	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
SA0_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
SLR after TAM or TAT	0	0 00 %	0 000 0 •

Any information about network performance can be shown

× •

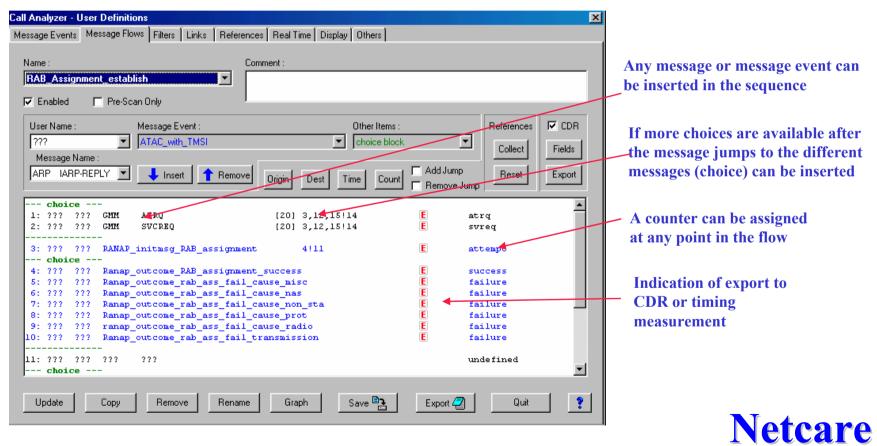
Statistics for specific flow of messages can be defined

S	earch Flow-Event
I	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
ļ	UNN after IAM or IAI
	Cancel Search

All counters are available for search or filters



User-defined message flow



International

Analysis of when a call is dropped

Flow-Event	Frequency	Rate	Delay .
moc_attempts	10	100.00 %	0.000
assignment_req	0	0.00 %	0.000
assigmnent_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	n	0 00 %	-

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

PALupdate_tocc 678 94.43.% 1.3. RARI_engLdetach 5 0.70.4 % 35 RARI_engLdetach 1 0.14 % 35 RARI_engLdetach 0 0.00.4 % 0.00 RARI_cong force to_thty_ind 0 0.00.3 % 0.00 RARI_ont_tern_int_silver force_to_thty_ind 0 0.00.3 % 0.00 RARI_ont_tell_force_to_thty_ind 0 0.00.3 % 0.00 Stapped 3 0.00.3 % 0.00 0.00 Stapped 0 0.00.3 % 0.00	Flow-Event	Frequency	Rate	Delay
BARD_encl_detach 5 0.70.% 1.8 RARD_cond_force_to_thby_ind 1 0.14.% 35 RARD_cond_force_to_thby_ind 0 0.00.% 0.00 RARD_onc_term_ind_abov_force_to_thby_ind 0 0.00.% 0.00 RARD_interfall_force_to_thby_ind 0 0.00.% 0.00 RARD_interfall_force_to_thby_ind 0 0.00.% 0.00 Stupend 0 0.00.% 0.00 0.00 Guide 53 7.30.% 0.00 0.00 0.00 0.00 ubd 30 5.29.% 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	RA_update_req	718	100.00 %	0.000
BARD_others 1 0.14 % 35 BARD_cons_frace_to_stby_ind 0 0.00 % 0.00 BARD_cons_frace_to_stby_ind 0 0.00 % 0.00 BARD_cons_trace_to_stby_ind 0 0.00 % 0.00 BARD_cons_trace_to_stby_ind 0 0.00 % 0.00 BARD_index_trace_to_stby_ind 0 0.00 % 0.00 BARD_index_trace_to_stby_ind 0 0.00 % 0.00 BARD_index_tore_to_stby_ind 0 0.00 % 0.00 Superd 0 0.00 % 0.00 0.00 Superd 0 0.00 % 0.00 0.00 Audit_secopt_blow_RACMP 30 52.9 % 0.00 0.00 Audit 30 52.9 % 0.00 0.00 0.00 Audit 30 52.9 % 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 </td <td>RA_update_succ</td> <td>678</td> <td>94.43 %</td> <td>1.339</td>	RA_update_succ	678	94.43 %	1.339
BAFU_cong_force_to_they_ind 0 000 % 000 BAFU_net/fail force_to_they_ind 0 000 % 000 Suppend 0 000 % 000 000 Suppend 50 7.30 % Cat 0 000 % 000 dudt 50 52.5 % 0.3 0.02 % 0 0.00 % 0.00 0.00 % 0.00 0.00 % 0.00 0.00 % 0.00 0.00 % 0.00 0.00 % 0.00 0.00 % 0.00 0.00 % 0.00 0.00 % 0.00 % 0.00 % 0.00 </td <td>RARJ_mpl_detach</td> <td>5</td> <td>0.70%</td> <td>1.613</td>	RARJ_mpl_detach	5	0.70%	1.613
RARD, conc. for the unit of an analysis 0 0.00 % 0.00 RARD, conc. for the unit of an analysis 0 0.00 % 0.00 RARD, conc. terr, not, allow, force, to, thou, not, ind 0 0.00 % 0.00 RARD, conc. terr, not, allow, force, to, thou, not, ind 0 0.00 % 0.00 RARD, and fail force, to, thou, not, ind 0 0.00 % 0.00 Statement 0 0.00 % 0.00 Statement, but, MS 3 0.42 % 1.00 Stupend, except, follow, RACMP 050 0.05 % 0.00 dualt 30 5.29 % 1.00 1.00 HUSH_ACK 0 0.00 % 0.00 1.00 1.00	RARJ_others	1	0.14 %	3.504
BAFD_gont_terv_ind 0 0.00 % 0.00 RAPL_gont_terv_ind 0 0.00 % 0.00 RAPL_gont_terv_ind 0 0.00 % 0.00 RAPL_inct laft_doce_to_tribut_ind 0 0.00 % 0.00 RAPL_inct laft_doce_to_tribut_ind 0 0.00 % 0.00 Superiod 0 0.00 % 0.00 0.00 Superiod 0 0.00 % 0.00 0.00 0.00 Superiod 0 0.00 % 0.00	RARJ_cong_force_to_stby_ind	0	0.00 %	0.000
RAFD, goot, serv, not, allow, force, to, nby, not, ind 0 0.00 % 0.00 RAFD, not, fail, force, to, nby, not, ind 0 0.00 % 0.00 RAFD, not, fail, force, to, nby, not, ind 0 0.00 % 0.00 RAFD, not, fail, force, to, nby, not, ind 0 0.00 % 0.00 Stuppend 0 0.00 % 0.00 0.00 Stuppend, context, lost, MS 0 0.00 % 0.00 0.00 Stuppend, acked, follow, RACMP 363 50.55 % 0.3 dudt 53 7.30 % Cat student 30 52.95 % 0.3 0.00 % 0.00<	RARJ_cong_force_to_stby_not_ind	0	0.00 %	0.000
BARD met fiel force, to, stby, ind 0 0.00 % 0.00 BARD met fiel force, to, stby, ind, ind 0 0.00 % 0.00 BARD met fiel force, to, stby, ind, ind 0 0.00 % 0.00 Stupend 0 0.00 % 0.00 Stupend, skc 0 0.00 % 0.00 RAL, sodate, sccrept, follow, RACMP 363 50 % % 0.00 dwd 53 7.30 % CET ukdt 30 5.29 % 0.00 % GET UUSH 0 0.00 % GET GET	RARJ gprs_serv_not_allow_force_to_stby_ind	0	0.00 %	0.000
FIARDunkt fail force, to: stop, not, ind 0 0.00 % 0.00 STA_rado_contact, bit, MS 3 0.42 % 1.60 Sugend 0 0.00 % 0.00 Sugend 0 0.00 % 0.00 Sugend ack 0 0.00 % 0.00 Galant, accept, lallow, FIACMP 363 5056 % 0.33 dualt 53 7.73 % C C ukat 30 5.22 % FLUSH_ACK 0 0.00 %	RARJ gprs_serv_not_allow_force_to_stby_not_ind	0	0.00 %	0.000
STA_radio_contact_bit_MS 3 0.42 k 1.9 Stupend 0 0.00 k 0.00 Suppend_ack 0 0.00 k 0.0 Ausdate_accept_talow_RACMP 363 555 k 0.3 duat 53 7.30 k Cat Ubit 30 5.22 k 1.9 Ubit 0 5.00 k 1.9 FLUSH 0 0.00 k 1.9	RARJ net fail force to stby ind	0	0.00 %	0.000
Superied 0 0.00 R 0.00 Superied 0 0.00 R 0.00	RARJ_net_fail_force_to_stby_not_ind	0	0.00 %	0.000
Surpend, ack 0 0.00% 0.00 RA_spdake, secopt, folow, RACMP 363 50.56% 0.3 dwd 53 7.36% Cat dwd 30 523% FUUSH 0 0.00% Cat RUSH 0 0.00% Cat Cat Cat Cat	STA_radio_contact_lost_MS	3	0.42 %	1.060
RA_sodate_secept_follow_RACMP 363 50.55 ½ 0.3 dwd 53 7.38 ½ Coll dwd 30 523 ½ RUSH 0 0.00 % RUSH_ACK 0 0.00 % Coll Coll Coll	Suspend	0	0.00 %	0.000
dwa 53 7.30 % Cat ukat 30 5.29 % 1 UUSH 0 0.00 % GI RUSH_ADX 0 0.00 % GI	Suspend_ack	0	0.00 %	0.000
ukat 30 5.29 % FLUSH 0 0.00 % Gi FLUSH_ADX 0 0.00 %	RA_update_accept_follow_RACMP	363	50.56 %	0.343
FLUSH 0 0.00% Gi FLUSH_ACK 0 0.00% I	dudt	53	7.38 %	Call
FLUSH_ACK 0 0.003	uludt	30	5.29 %	
	FLUSH	0	0.00 %	GPI
BACMP missing abnormal 23 320.3	FLUSH_ACK	0	0.00 %	E
	RACHP mission abnormal	23	320.3	PD

0000 0000 0000 0000 0000 0000 0000 0000 0000	equest_MS_initiated	iPRS_PDP_deactiv	HAupdate_er RAAC_with_1 RARJ_impl_c RARJ_cong_ RARJ_gprs_: RARJ_gprs_: RARJ_net_fz RARJ_net_fz RARJ_net_fz
Flow-Event	Frequency	Rate	IDREQ
PDP_act_request	4	100.00 %	IDBES
PDP_act_accepted	4	100.00 %	
APRJ_insuff_resource	0	0.00 %	
APRJ_miss_or_unk_APN	0	0.00 %	
APRJ_QoS_not_accepted	0	0.00 %	0.000
APRJ_unspecified	0	0.00 %	0.000
APRJ_rejected_by_GGSN	0	0.00 %	0.000
APRJ_NSAPI_already_used	0	0.00 %	0.000
APRJ_network_fail	0	0.00 %	0.000
APRJ_unk_PDP_adr_or_type	0	0.00 %	0.000
APRJ_aut_failed	0	0.00 %	0.000
APRJ_others	0	0.00 %	0.000
Unspecified	0	0.00 %	0.000
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 %	
<u> </u>	🚳 Export	🔀 Export	Ok
777, 11, -1969613350	Cxpoft		UK

Flow-Event	Frequency	Rate	Delay	1
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	
	n	0 00 %	0.000	È



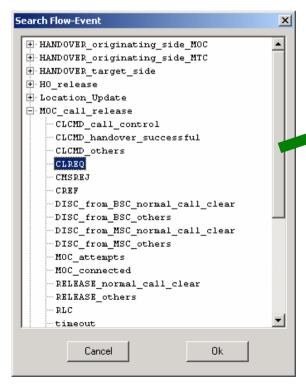
Search for specific event in a sequence

	器 Call Ana	lyzer 1.0	- D:\RecordFiles\D	emo A-Interface.REC			
	Eile Protoc	ol <u>M</u> ode	<u>S</u> elect <u>D</u> ecode M	<u>e</u> ssage F <u>l</u> ow <u>R</u> esults Del	fine <u>O</u> ptions	<u>H</u> elp	
	Ċ	•	<u>p</u> <u>p</u> <u>q</u>		▶ ►		20%
	18:33:06	8 BSC	CR CL31 CMSREQ	, 21772 , 12530 , mol	bile origin	nating ca	11 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,0551875	3691	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	
7	18:33:15	2 MSC	DT1 CONNECT			503835	
	18:33:15	5 BSC	DT1 CONACK			503838	
	18:33:58	0 BSC	DT1 CLREQ	,Radio interfa	e message f	failure	518167
	18:33:58	0 MSC	DT1 CLCMD	Radio interface	e me <i>ss</i> age f	failure	518175
	18:33:58	1 BSC	DT1 CLCMP			518182	
	18:33:58	1 MSC	RLSD	end user origi:	nated	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



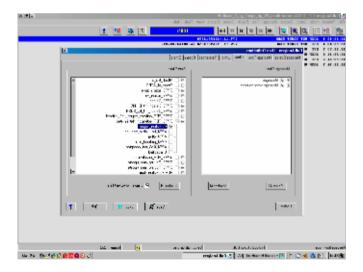
*7 7



User defined search and filter

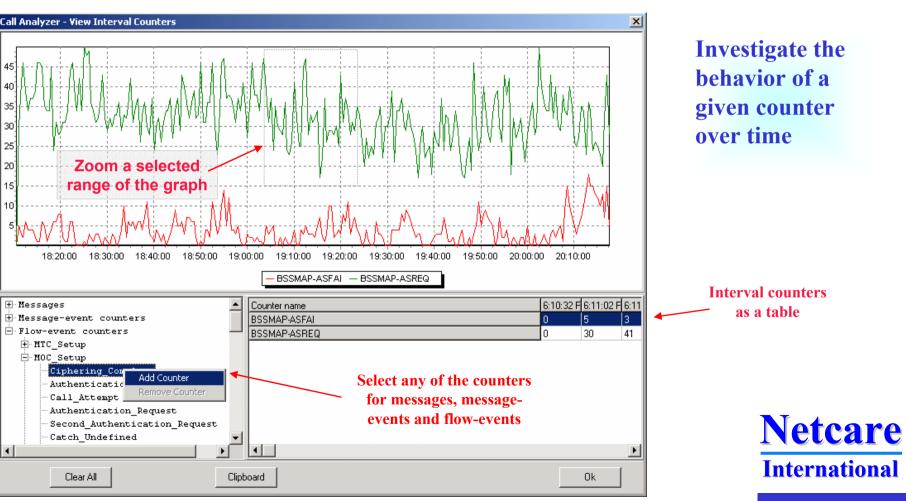
Any sequence of messages can be used for search or filter

ie Floraced Mode Select Deciste Myrinig	e files Beauty Debré (Littore Yors)	Jach Heb			
e =• =	R B N P P	100%	Σ 🛃 🔛	*	
26140'4 DOSN WIT VENUT RATO	777.111969613350				_
26:40'4 BSC UPT BLUDT RARC	775, 11, -1969613350, 40	68801615837812			_
24:55'7 BSC WHT SWSP	774,0,-1969613358				
28:34'6 DESN WHT WLWDT RARD	775, 13, -1969613358				
28:34'6 BSC VOT BLOOT BANC 28:34'7 BGSN WRT FLULLA	775, 13, -1969613350, 40 Search Flow Event	68801639837812			
28 34 7 DESN NUT FLULLA	Search Flow-Event				
	- 007, Japana, A. - 007, Japana, A. - 1935 - 1935 - 1945 - 1942, Japane, J. - 1944, Japane, Japane, J. - 1944, Japane, Japane, Japane, Japane, Japane, Japane,	eg type_not_compatible there d	4 		
suage flow mode	Protocol Gb-Gr1.stk Setup	GB-Gr1 set	💡 Frane	1252	
	PowerPoint - ICA.				





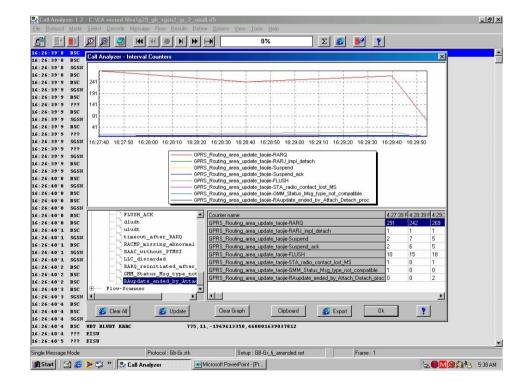
Line chart of counters



*7 1

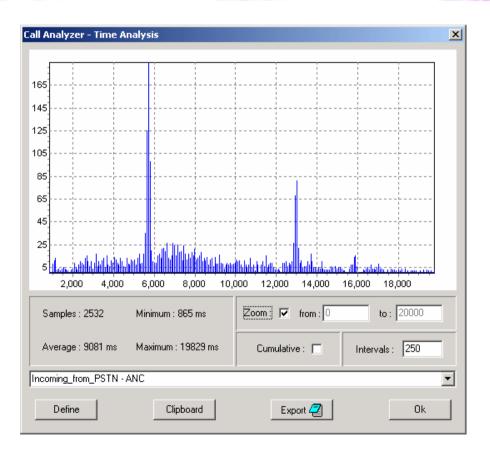
Interval counters

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		
	CLREQ_radio_intf_failure	0.00 % 0.000 0.00 %	RLC CLREQ_others	0.00 % 0.000 0.00 % 0.000 0.00 %
Attempt	Authentication_Request	Authentication_Response S	econd_Authentication_Requ	Success
<u> </u>				
1839 0.000	37.96 % 0.296	36.32 % 1.133	0.87 % 5.231	87.11 % 0.449
REQ_radio_intf_msg_faliure	0.16 % 6.874 0.16 %	LUREJ_plmn_not_allowed LUREJ_imsi_unknown_inHLR Timeout_after_Authentication_Red LUREJ_network_failure LUREJ_lac_not_allowed LUREJ_illegal_MS LUREJ_illegal_MS LUREJ_others	10.33 % 1.695 0.05 % 0.294 p 0.05 % 10.168 0.00 % 0.000 0.00 % 0.000 0.00 % 0.000 0.00 % 0.000 0.00 % 0.000	

Location_Update

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





User defined CDRs

Call Analyzer - User Definitions	×
Message Events Message Flows Filters Links References Other	s
Name : Comment : Calls_from_MSC_to_PSTN Comment : F Enabled Pre-Scan Only	
User Name : Message Event : ??? IAM_from_MSC Message Name : Insert BSSMAP ASCMP Insert	Other Items : References ✓ CDR ✓ choice block ✓ Collect Fields n Timeout Counter Remove Jump Reset Export
1: MSC ?1_? 4,1: 2: PSTN ?1_? 7,1: 3: PSTN ?1_? 9,1: choice 4: MSC ?1_? 5: PSTN ?1_? 6: ??? ?1? 6: ??? ?1? choice 7: MSC ?1_? 8: PSTN ?1_? choice 9: MSC ?1_? 10: PSTN ?1_? ignore	216 t Address_Complete
11: ??? ?1_? ignore Update Copy Remove Rename	SAM_after_IAM

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



User defined CDRs

217 3 1 2016 290 0 1 3142 429 4 7 49428 1047 3 1 4629 1253 3 1 3903 1857 3 1 3155 2076 0 1 3342 2143 3 1 2991 4046 3 1 3542	1 1 1 1 1 1
429 4 7 49428 1047 3 1 4629 1253 3 1 3903 1857 3 1 3155 2076 0 1 3342 2143 3 1 2991	1 1 1
1047 3 1 4629 1253 3 1 3903 1857 3 1 3155 2076 0 1 3342 2143 3 1 2991	1 1 1
1253 3 1 3903 1857 3 1 3155 2076 0 1 3342 2143 3 1 2991	1 1 1
1857 3 1 3155 2076 0 1 3342 2143 3 1 2991	1 1
2076 0 1 3342 2143 3 1 2991	1
2143 3 1 2991	
4046 3 1 3542	1
	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
iery :	



Advanced filter functions

Call Analyzer - User Definitions	×
Message Events Message Flows Filters Links References Ot	hers
Message Events Message Flows Filters Links References Other Message Filter :	hers Flow Filter : Flow Filter : HANDOVER_originating_side_MOC HANDOVER_originating_side_MTC HANDOVER_target_side HD_release Location_Update HO_call_release HOC_drop_analysis HOC_Call_release HOC_CALL_relea
Select All Unselect All	Unselect All Enable Flow-Event Filter
Update	Save 📴 Export 🖉 Quit 🔋

Netcare International

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