

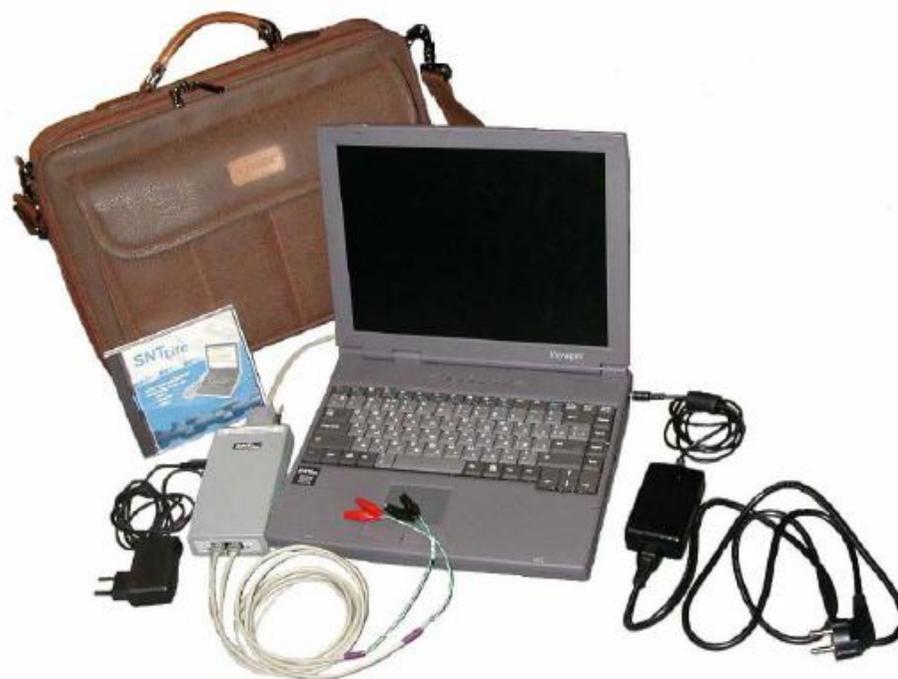
# Анализ сигнализации

ISDN, OKC7, 2BCK

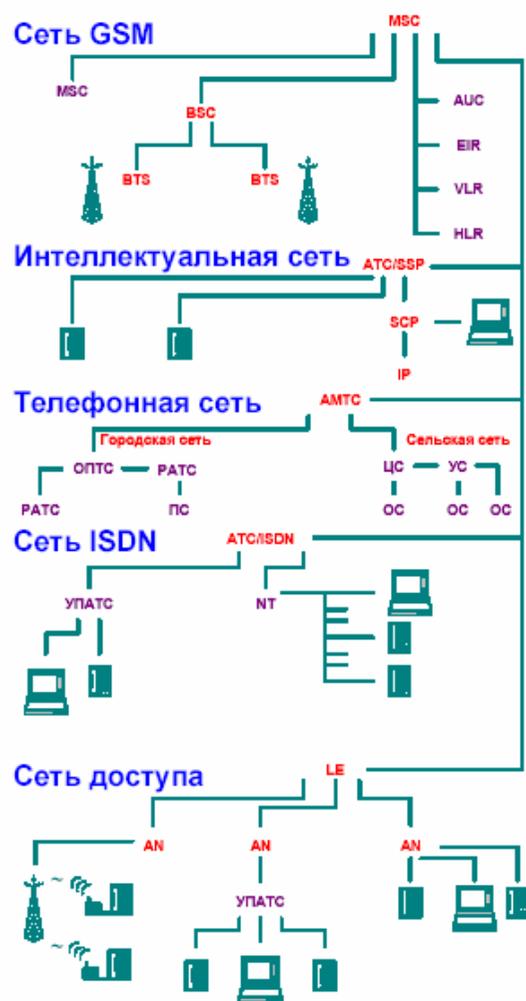


# Анализ системы сигнализации

- І Поиск протокол-конфликтов
- І Анализ параметров качества по обслуживанию вызовов
- І Сбор статистики



# Современные системы сигнализации



- ◆ Телефонные сети общего пользования
- ◆ Сети ОКС7 (С7, SS7)
- ◆ Сети ISDN PRI/BRI
- ◆ Интеллектуальные сети IN
- ◆ Сотовые сети GSM|GPRS 900/1800, CDMA2000 1x, IMT-MC-450, NMT-450, AMPS/DAMPS
- ◆ Интерфейсы сетей доступа V5
- ◆ Региональные и локальные сети передачи данных WAN/LAN
- ◆ Сети VoIP

# Декодирование протокола

The screenshot shows a network protocol analyzer interface. The main window displays a list of messages with columns for Time, Bundle Name, Protocol, Message, and Additional Information. A detailed view of a message is shown below, listing various ISUP parameters and their values.

Время	Пучок: Название	Протокол	Сообщение	Дополнительная информация
16:36:14.954	Пучок 1:---	ISUP	INITIAL ADDRESS	CgPN:939493
16:36:14.164	Пучок 1:---	ISUP	INITIAL ADDRESS	CgPN:930660
16:36:15.164	Пучок 1:---	ISUP	INITIAL ADDRESS	CgPN:939704
16:36:15.276	Пучок 1:---	ISUP	ADDRESS COMPLETE	BCI:No indication CV:Unknown value
16:36:15.642	Пучок 1:---	ISUP	ANSWER	
2000.10.05 16:36:15.376 Пучок 1:--> ISUP 2303 ISUP 11 42 ADDRESS COMPLETE		ISUP	INITIAL ADDRESS	CgPN:933223
		ISUP	INITIAL ADDRESS	CgPN:932184
		ISUP	INITIAL ADDRESS	CgPN:930192 CgPN:0852561655
		ISUP	ADDRESS COMPLETE	BCI:No indication
		ISUP	RELEASE COMPLETE	
		ISUP	CALL PROGRESS	Kind:Alerting BCI:Subscriber free
		ISUP	ANSWER	
		ISUP	ADDRESS COMPLETE	BCI:No indication
		ISUP	RELEASE COMPLETE	
		ISUP	RELEASE	CV:Normal call clearing
		ISUP	ADDRESS COMPLETE	BCI:No indication
		ISUP	RELEASE	CV:Normal call clearing
		ISUP	RELEASE COMPLETE	
		ISUP	RELEASE COMPLETE	
		ISUP	RELEASE COMPLETE	
		ISUP	SUSPEND	S/B Ind:Network initiated
		ISUP	RELEASE	CV:Normal call clearing
		ISUP	INITIAL ADDRESS	CgPN:933523
		ISUP	RELEASE COMPLETE	
		ISUP	RELEASE	CV:User busy
		ISUP	ADDRESS COMPLETE	BCI:Subscriber free
		ISUP	RELEASE COMPLETE	
		ISUP	RELEASE	CV:User busy
		ISUP	RELEASE	CV:Normal call clearing
		ISUP	INITIAL ADDRESS	CgPN:931300F CgPN:1950310F
		ISUP	RELEASE COMPLETE	
		ISUP	RELEASE COMPLETE	
		ISUP	INITIAL ADDRESS	CgPN:933656
		ISUP	RELEASE	CV:Normal call clearing
		ISUP	ADDRESS COMPLETE	BCI:No indication
		ISUP	INITIAL ADDRESS	CgPN:933397 CgPN:
		ISUP	ADDRESS COMPLETE	BCI:No indication
		ISUP	RELEASE COMPLETE	
		ISUP	RELEASE	CV:Normal call clearing
		ISUP	ADDRESS COMPLETE	BCI:Subscriber free
		ISUP	ADDRESS COMPLETE	BCI:No indication
		ISUP	RELEASE COMPLETE	

2000.10.05 16:36:15.376 Пучок 1:--> ISUP 2303 ISUP 11 42 ADDRESS COMPLETE

```
0 ***b12** Circuit identification code... 45 Dec
0000.... Spare..... 0 Dec
10 00000110 Message Type..... ADDRESS COMPLETE

-- Backward Call Indicators
11 .....10 Charge ind..... Charge
.....00.. Called party's status ind.... No indication
.....00.. Called party's category ind... No indication
00..... End-to-end method ind..... No method available
12 .....0 Interworking ind..... Not encountered
.....0.. End-to-end info ind..... Not available
.....1.. ISDN user part ind..... Used all the way
.....6.. Holding ind..... Not requested
.....1.. ISDN access ind..... Terminating access ISDN
.....0.. Echo control device..... Not included
00..... SCCP method ind..... No indication

13 00000001 Pointer..... 1 Dec
14 00010010 Optional parameter..... Cause Inds
15 00000010 length..... 2 Dec

-- Cause Indicators
16 .....0111 location..... Transit network
.....0.... Spare..... 0 Dec
.....00.... Coding standard..... CCITT standardized codin
1.....1.... Extension..... Last octet
17 .00000000 Cause value..... Unknown value
1.....1.... Extension..... Last octet

18 00101001 Optional parameter..... Optional Backward Call I
19 00000001 length..... 1 Dec

-- Optional Backward Call Indicators
20 .....1 In-band information ind..... In-band info now availab
.....0.. Call progress indicator..... No indication
.....0.. Signaling user part ind..... No additional info
.....0.. MFP user ind..... No indication
0000.... Reserved for national use..... 0 Hex
```

# Установки оборудования

The screenshot displays a software application window titled "SNI-7531 - E:\LAST\TRACES\SORTED TRACES\MTP2\_ISUP\_TCAP\MAP\FORMATI\_ISUP\_TCAP\_MAP\06102000\_1.out". The main window shows a configuration screen for "Пучок 1" (Bundle 1) with a tree view on the left and a "Настройка" (Configuration) dialog box on the right. The dialog box has tabs for "Настройка пучков", "Настройка сервисов", and "Настройка протоколов". The "Настройка протоколов" tab is active, showing a list of protocols and their specific configurations. The "Семейство протоколов" (Protocol family) is set to "CSS7", and the "Протоколы" (Protocols) list includes CSS7, DSS1, A-bis, V5, Ethernet, Frame Relay, GCS, H323, Russian specifications, GSM, V8, V7, ITU-T, and ETSI.

The main window also displays a log window at the bottom with the following entries:

Время	Пучок	Название	Протокол	Сообщение	Дополнительная информация
08:43.233	Пучок 1: <--	ISUP		ADDRESS COMPLETE	BCI:Subscriber free
08:45.606	Пучок 1: <--	ISUP		ADDRESS COMPLETE	BCI:Subscriber free
08:47.308	Пучок 1: <--	SCCP		ENIT DATA/TCAP: BEGIN/MAP: SEND PARAMETERS	SSN#VLR_CgPA#790237002000013 SSN#VLR_CgPA#20956099010 IMSI#250
08:55.085	Пучок 1: <--	ISUP		RELEASE	CV:Normal call clearing
09:01.191	Пучок 1: <--	ISUP		ANSWER	
09:01.233	Пучок 1: <--	ISUP		RELEASE	CV:Normal call clearing

# Анализ 2ВСК

SNT-7531 - CAS

Файл Вид Режим тестирования Мониторинг Настройки Помощь

Событие	Время	←→	Пучок/Назван	Канал	abcd →	abcd ←	M4-Сигнал	M4-Сигнал	Сообщение
10	11:53:47.121.080	←	RX1/TX1	20	0000	1101			Исходное
29	11:53:47.121.705	→	RX1/TX1	20	0101	1101			Контроль ис
1	11:53:47.120.504	←	RX1/TX1	1	0000	0101			Контроль ис
2	11:53:47.120.564	←	RX1/TX1	16	0000	1001			Занятие
3	11:53:47.120.633	←	RX1/TX1	2	0000	1001			?
4	11:53:47.120.693	←	RX1/TX1	17	0000	1101			Исходное
5	11:53:47.120.762	←	RX1/TX1	3	0000	0101			Контроль ис
6	11:53:47.120.822	←	RX1/TX1	18	0000	1101			Исходное
7	11:53:47.120.891	←	RX1/TX1	4	0000	0101			Контроль ис
8	11:53:47.120.951	←	RX1/TX1	19	0000	1101			Исходное
9	11:53:47.121.020	←	RX1/TX1	5	0000	0101			Контроль ис
10	11:53:47.121.080	←	RX1/TX1	20	0000	1101			Исходное
11	11:53:47.121.129	→	RX1/TX1	1	1101	0101			Исходное
12	11:53:47.121.149	←	RX1/TX1	6	0000	1001			?
13	11:53:47.121.189	→	RX1/TX1	16	1101	1001			Подтв. заня
14	11:53:47.121.209	←	RX1/TX1	21	0000	1001			?
15	11:53:47.121.258	→	RX1/TX1	2	1001	1001			?
16	11:53:47.121.278	←	RX1/TX1	7	0000	1001			?
17	11:53:47.121.318	→	RX1/TX1	17	0101	1101			Контроль ис
18	11:53:47.121.338	←	RX1/TX1	22	0000	1101			Исходное

Message #9, ChannelID = 1

For Help, press F1

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# Настройка мониторинга

Событие | Время

10	11:53:47.
29	11:53:47.

Событие | Время

1	11:53:47.120
2	11:53:47.120
3	11:53:47.120
4	11:53:47.120
5	11:53:47.120
6	11:53:47.120
7	11:53:47.120
8	11:53:47.120
9	11:53:47.120
10	11:53:47.120
11	11:53:47.120
12	11:53:47.120
13	11:53:47.120
14	11:53:47.120
15	11:53:47.120
16	11:53:47.120
17	11:53:47.120
18	11:53:47.120

Настройка мониторинга

Включить мониторинг поданном потоку

Работа через регенератор (на длинном шнуре)

Dk	X	X
1	2	3
X	Dk	X
4	5	6
X	X	X
7	8	9
X	X	X
10	11	12

Включить канал

Линейная сигнализация  
2ВСК

Регистровая сигнализация  
Декадный код

Тип СЛ:  
СПМ исходящая

Сохранять поток в файл

Чистанить

OK | Помощь | Отмена

For Help, press F1

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# Имитационные измерения

The screenshot displays a simulation software interface with a menu bar (Файл, Вид, Режим работы, Режим тестирования, Мониторинг, Симулятор, Генератор событий, Настройки, Доношь) and a toolbar. A central window titled "Открыть сценарий" (Open Scenario) is open, showing a list of scenarios and the details of the selected scenario "q784\_1\_1.scn".

**Список сценариев (Scenario List):**

Имя	Описание
GROUP-1	Circuit superv
1.1	Non-allocated
1.2	Reset of circ
1.2.1	RSC received
1.2.2	RSC sent on
1.2.3	RSC received
1.2.4	RSC received
1.2.5	Circuit group
1.2.6	Circuit group

**Сценарий (Scenario Details):**

q784\_1\_1.scn

#include "q784.mag"

INSTANCE SPB

OUT IAM TO SPA

COMMENT

SCENARIOS\_LIST "q784.scn"

TEST\_NUMBER "1.1"

TITLE "Circuit supervision"

SUBTITLE "Non-allocated circuits"

PURPOSE "To verify that on receipt of a CIC rel

REFERENCES "Q.757"

Buttons: Открыть, Редактировать, ОК, Помощь, Отмена

**Background Simulation Log:**

Дата	Время	Событие
2003.02.07	12:34:23.0	
2003.02.07	12:34:23.0	
2003.02.07	12:34:23.0	
2003.02.07	12:34:23.0	
2003.02.07	12:34:23.1	
2003.02.07	12:34:23.1	
2003.02.07	12:34:23.1	
2003.02.07	12:34:23.21	Пучок 1: --- NTPZ - - - FIGU
2003.02.07	12:34:23.237	Пучок 1: --- NTPZ - - - FIGU
2003.02.07	12:34:37.567	Пучок 1: --- NTPZ - - - FIGU
2003.02.07	12:34:51.908	Пучок 1: --- NTPZ - - - FIGU

Bottom status bar: Ожидание команды, 29, 1 2 3 4, NUM

# Совместная работа имитация/анализ

The screenshot displays the SNT-7531 software interface, which is used for call simulation and analysis. The main window shows a call log with the following details:

- Call ID: #1
- Date/Time: 2003/02/12 16:13:46.090000
- Duration: 4
- Source: Исход

The call log contains the following entries:

```
LAPD: RTS 300 125, 1991
D 000000.. SAPI..... Cal
.....0. C/R..... 0 I
.....0 SA..... Cor
1 0000000. TEL..... 0 I
.....1 SA..... la:
2 0
3 0
```

A dialog box titled "DSS1 parameters" is open, showing the following fields:

- Call\_reference\_value: 10
- Called\_Party\_Number: \*1019116\*
- Calling\_Party\_Number: \*1019116\*

The dialog box has "OK" and "Cancel" buttons.

On the right side, a protocol diagram shows a sequence of messages between a station (SP A) and a network element:

- MSSETUP (from SP A to network)
- MSETUP\_ACK, MCALL\_PRO, MALERTING (from network to SP A)
- MSTATUS\_ENQUIRY (from SP A to network)

At the bottom, a table displays the message log:

Time	Time	Пункт/Название	Протокол	DEC	OPC/TEI	SLS/SIC	STC/SEV	Сообщение	Дополнительно
01.12	16:13:46.112	Пункт: 10<-->	LAPD	- 0	-	-	-	RT	
02.12	16:14:03.102	Пункт: 10<-->	LAPD	- 0	-	-	-	SAPI3E	
03.12	16:14:03.107	Пункт: 10<-->	LAPD	- 0	-	-	-	SAPI3E	
04.12	16:14:03.137	Пункт: 10<-->	LAPD	- 0	-	-	-	SA	
05.12	16:14:08.152	Пункт: 10<-->	LAPD	- 0	-	-	-	SA	

At the bottom of the interface, there is a status bar with the text "Ожидание команды" (Waiting for command), a counter "6", and four indicator lights labeled 1, 2, 3, and 4, along with a "NUM" button.

# Генерация вызовов

The screenshot displays a software application for generating calls. The main window is titled "Генератор вызовов" (Call Generator) and contains several panels:

- Terminal Window:** Shows NTP (Network Time Protocol) data for two different calls. The first call is for "Q.701 White book, 1993" and the second is for "Russian specifications, 1994".
- Subscriber List Panel:** A panel on the right titled "Настройка абонентов" (Subscriber Settings) with fields for "Номер" (Number), "Тип" (Type), "Категория" (Category), and "Время разговора" (Call Duration). It also has radio buttons for "Общий" (General) and "Частный" (Private).
- Configuration Dialog:** A dialog box titled "Добавить группу абонентов" (Add subscriber group) is open, showing fields for "Начальный номер" (Start number), "Количество" (Quantity), "Настройки абонентов" (Subscriber settings), and "Список номеров" (Number list).
- Main Table:** A table at the bottom displays a log of generated calls with columns for "Дата" (Date), "Время" (Time), "Пучок" (Bundle), "Направление" (Direction), "Протокол" (Protocol), "DPC", "OPC/TIE", "SLI/SIC", "SIC/CRF", and "Состояние" (Status).

Дата	Время	Пучок	Направление	Протокол	DPC	OPC/TIE	SLI/SIC	SIC/CRF	Состояние
2001.05.30	18:22:06.569	Пучок 1:---	ISUP	111	113	0	2	2	IN
2001.05.30	18:22:08.323	Пучок 1:---	ISUP	113	111	2	2	2	AD
2001.05.30	18:22:08.371	Пучок 1:---	ISUP	113	111	2	2	2	AN
2001.05.30	18:22:10.140	Пучок 1:---	ISUP	113	111	2	2	2	SE
2001.05.30	18:22:10.444	Пучок 1:---	ISUP	111	113	0	2	2	SE
2001.05.30	18:22:25.165	Пучок 1:---	ISUP	111	113	0	2	2	IN
2001.05.30	18:22:26.124	Пучок 1:---	ISUP	111	113	0	3	3	IN
2001.05.30	18:22:26.622	Пучок 1:---	ISUP	113	111	2	2	2	ANSWER
2001.05.30	18:22:26.668	Пучок 1:---	ISUP	113	111	2	2	2	ANSWER
2001.05.30	18:22:27.110	Пучок 1:---	ISUP	111	113	0	4	4	INITIAL ADDRESS
2001.05.30	18:22:27.810	Пучок 1:---	ISUP	113	111	3	3	3	ADDRESS COMPLETE
2001.05.30	18:22:27.960	Пучок 1:---	ISUP	113	111	3	3	3	ANSWER
2001.05.30	18:22:27.984	Пучок 1:---	ISUP	113	111	2	2	2	RELEASE
2001.05.30	18:22:28.143	Пучок 1:---	ISUP	111	113	0	2	2	RELEASE COMPLETE
2001.05.30	18:22:28.169	Пучок 1:---	ISUP	111	113	0	2	2	INITIAL ADDRESS
2001.05.30	18:22:28.503	Пучок 1:---	ISUP	113	111	3	3	3	RELEASE
2001.05.30	18:22:28.730	Пучок 1:---	ISUP	113	111	4	4	4	ADDRESS COMPLETE
2001.05.30	18:22:28.828	Пучок 1:---	ISUP	113	111	4	4	4	ANSWER
2001.05.30	18:22:29.001	Пучок 1:---	ISUP	111	113	0	3	3	RELEASE COMPLETE
2001.05.30	18:22:29.131	Пучок 1:---	ISUP	111	113	0	3	3	INITIAL ADDRESS
2001.05.30	18:22:29.627	Пучок 1:---	ISUP	113	111	2	2	2	ADDRESS COMPLETE

Окнаемые команды: 5 415

# Трассировка вызовов

The screenshot displays a network protocol analyzer interface. A 'Настройка фильтров' (Filter Settings) dialog box is open, showing the 'Сообщения ISUP' (ISUP Messages) section with the following checked items:

- [1] Initial Address
- [2] Subsequent Address
- [3] Information Request
- [4] Information
- [5] Continuity
- [6] Address Complete
- [7] Connect
- [8] Forward Transfer

The main window shows a list of captured messages with the following columns: 'S/SIC', 'T/C/CFI', 'Сообщение', and 'Дополнительная информация'. The messages are as follows:

S/SIC	T/C/CFI	Сообщение	Дополнительная информация
2		INITIAL ADDRESS	CdPN:899000002F CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:899000003F CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:899000004F CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:899000005F CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:899000006F CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:899000007F CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:899000008F CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:899000009F CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:89900000AF CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:89900000BF CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:89900000CF CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:89900000DF CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:89900000EF CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	
2		INITIAL ADDRESS	CdPN:89900000FF CgSN:4990000
2		ADDRESS COMPLETE	BCI:Subscriber free
2		ANSWER	
2		RELEASE	CV:Normal call clearing
2		RELEASE COMPLETE	

# Разветвленная система фильтрации

The screenshot displays a network configuration environment. A terminal window on the left shows a configuration script for a filter rule, including fields for TAG, Length, Component portion, Invoke component, Invoke id, Local operation code, MAP, ProvideRoamingNumber, MSC-number, and Length. A dialog box titled "Настройка фильтров" (Filter Configuration) is overlaid on the terminal. It features a list of protocols to filter (MTP, ISUP, SCCP, DTAP, HUP, MUP, BSSMAP, INAP, CAMEL, TCAP, MAP) with checkboxes, and a section for "Режим фильтрации TCAP транзакции" (TCAP transaction filtering mode) with input fields for MS ISDN, IMSI (204000201475961), and TMSI. The dialog also includes fields for "Номер вызывающего" (Calling number) and "Номер вызываемого" (Called number). The background terminal shows a list of filter rules with columns for protocol, length, and action, such as "SCCP 4910 4601 UNII DATA/TCAP: BEGIN/MAP: FORWARD SM/SM-TP: SMS-DLIVER".

```
***b8*** TAG: class=1 code=12 type=1
***b8*** Length:..... 4294527298 Dec

Component portion
***b8*** TAG: class=2 code=1 type=1
***b8*** Length:..... 27 Dec

-- Invoke component
S1 ***b8*** TAG: class=0 code=2 type=0
S2 ***b8*** Length:..... 1 Dec

-- Invoke id
S3 00000001 invoke ID:..... 1 Max

S4 ***b8*** TAG: class=0 code=2 type=0
S5 ***b8*** Length:..... 1 Dec
S6 00000100 Local operation code:..... PROVIDE ROAMING

-- MAP: GSM 04.02
S7 ***b8*** TAG: class=0 code=16 type=1
S8 ***b8*** Length:..... 19 Dec

-- ProvideRoamingNumber
S9 ***b8*** TAG: class=2 code=3 type=0
S0 00001000 LENGTH:..... 8 Dec

-- IMSI
S1 ***b8*** MCC+MNC+MSIN:..... 204000201475961

S9 ***b8*** TAG: class=2 code=1 type=0
S0 00000111 LENGTH:..... 7 Dec

-- MSC-number
S01 ...0001 Numbering plan ind:..... ISDN/Telephony Number
S02 ...001... Nature of address ind:..... International number
S03 ...1... Extension:..... No extension
S04 ***b8*** Number:..... 781296000001

S08 ***b8*** TAG: class=0 code=0 type=0
***b8*** Length:..... 0 Dec

S11--> SCCP 4910 4601 - UNII DATA/TCAP: BEGIN/MAP: FORWARD SM/SM-TP: SMS-DLIVER
S12--> MTP2 - - - FISU
S13--> MTP2 - - - FISU
S14--> MTP2 - - - FISU
```



# Помощь по протоколам

сети для запроса разъединения или сетью в сторону пользователя для индикации разъединения.

**Таблица 2-20. Параметры сообщения DISCONNECT**

Параметр	Направление	Тип	Длина
<a href="#">Protocol discriminator</a>	u<->n	M	1
<a href="#">Call reference</a>	u<->n	M	2-3
<a href="#">Message type</a>	u<->n	M	1
<a href="#">Cause</a>	u<->n	M	4-32
<a href="#">Facility</a>	u<->n	O	2-*
<a href="#">Progress indicator</a>	n->u	O	2-4
<a href="#">Display</a>	n->u	O	2-34
<a href="#">User-user</a>	u<->n	O	2-131

0 0 0 1 0 0 0 1

криминатор протокола

криминатор протокола

8 7 6 5 4 3 2 1

0 0 0 0 0 0 0 0

до Не доступны для использования 1

0 0 0 0 0 1 1 1

0 0 0 0 1 0 0 0 Рекомендации Q.931/I.451 сообщ

0 0 0 1 0 0 0 0

до Зарезервированы для других уро

0 0 1 1 1 1 1 1

0 1 0 0 0 0 0 0

до Максимальное количество...

TKI	SIC/CRF	Сообщение	Дополнительная информация
-	-	RE	
-	-	RE	
24431	-	INFORMATION	CdPR: 92053881
24431	-	DISCONNECT	CV: No circuit/channel available
-	-	RE	
24431	-	RELEASE	
24431	-	RELEASE COMPLETE	
-	-	RE	
24687	-	SETUP	CdPR: 882226
24687	-	SETUP ACKNOWLEDGE	
-	-	RE	
24687	-	INFORMATION	CdPR: 94821942
-	-	RE	
24943	-	SETUP	CdPR: 562545
24943	-	SETUP ACKNOWLEDGE	
-	-	RE	
24943	-	INFORMATION	CdPR: 52704552
24943	-	DISCONNECT	CV: No circuit/channel available
-	-	RE	
24943	-	RELEASE	

Смещение кода: 4442

17:31