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Кафедра сетей и устройств телекоммуникаций

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***МЕЖСТАНЦИОННАЯ СИГНАЛИЗАЦИЯ ОКС № 7.
ОБСЛУЖИВАНИЕ БАЗОВОГО ВЫЗОВА ISDN***

Учебно-методическое пособие
для практических занятий по курсу
«Сетевые технологии и сигнализация в телекоммуникациях»
для студентов специальности «Сети телекоммуникаций»
всех форм обучения

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Х 76

Межстанционная сигнализация ОКС № 7. Обслуживание базового вызова ISDN: Учеб.-метод. пособие для практических занятий по курсу «Сетевые технологии и сигнализация в телекоммуникациях» для студ. спец. «Сети телекоммуникаций» всех форм обуч. / М.Ю. Хоменок, В.Ю. Цветков. – Мн.: БГУИР, 2005. – 104 с.: ил.

В учебно-методическом пособии рассмотрены примеры обслуживания вызовов ISDN на основе системы общеканальной сигнализации ОКС № 7. Пособие предназначено для изучения структуры, информационных параметров сигнальных сообщений и принципов межстанционного взаимодействия подсистемы пользователя ISDN при выполнении практических занятий студентами специальности «Сети телекоммуникаций» всех форм обучения.

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ВВЕДЕНИЕ

Анализ протоколов является основным видом измерений в ISDN, что обусловлено рядом причин, из которых можно выделить следующие:

- наличие большого числа разнородных цифровых устройств в сети требует постоянного анализа возможных логических конфликтов на уровне различных устройств, различных уровней протокола, а также логических уровней сопряжения различных подсетей и протоколов;
- наличие большого числа протоколов сетевого взаимодействия и вариантов их реализации на уровне технических спецификаций требует контроля полной или частичной совместимости по протоколам для сквозной поддержки услуг ISDN;
- технология ISDN является относительно новой и не до конца отработанной, поэтому требует особенно тщательного изучения, настройки и контроля с целью эффективности использования ресурсов сети, оптимизации ее работы, поиска участков перегрузки каналов по трафику и анализа планов маршрутизации.

Известен ряд подходов к анализу протоколов, использующих как методы активного тестирования по схеме «воздействие-отклик», так и методы пассивного мониторинга протокола. Целью анализа протокола является локализация точки или сетевого фрагмента ухудшения качества предоставляемой сетевой услуги, обычно связанной с логическими противоречиями в работе сетевого оборудования и, как следствие, уровня протокола, на котором имеет место противоречие.

Основным видом анализа протоколов ISDN являются трейсы протоколов, представляющих запись во времени логической последовательности сигнальных сообщений, проходящих через точку подключения.

Обычно поиск логического конфликта при обмене сообщениями протокола сводится к двум основным задачам:

- локализация точки логического конфликта в структуре протокола;
- установление причины конфликта.

Для поиска причин конфликта в условиях наличия большого объема информации используются различные фильтры обработки информации: по уровню, сообщениям и номеру соединения.



Рис. 1. Анализатор протоколов ОКС № 7: SNT-7

При организации эксплуатационных измерений используются различные сценарии проведения тестов. Такие сценарии (scripts) обычно предоставляются в виде программ, реализованных в системном измерительном оборудовании, которое предназначено для анализа протоколов.

Приборы, используемые для анализа протоколов, называются анализаторами или тестерами протоколов. Вариант такого прибора для тестирования протоколов ОКС № 7 представлен на рис.1.

Методики тестирования параметров ОКС № 7 приведены в рекомендациях МСЭ-Т Q.780-787.

Тестировать протокол ОКС № 7 на полное соответствие техническим требованиям следует в двух случаях:

- при пуске новой цифровой АТС или цифровой зоны в сети;
- при вводе нового канала (звена) сигнализации.

Различают три категории тестов: аттестационные тесты, АТ (VAT – Validation test); тесты совместимости, ТС (CPT – Compatibility test), тесты взаимодействия.

К сожалению, используемые в настоящее время цифровые АТС не оборудованы программными средствами для испытаний подобного рода, и поэтому для тестирования ОКС № 7 используется принцип программной имитации работы различных элементов сети сигнализации.

По масштабу решаемых задач анализаторы ОКС № 7 можно разделить на четыре класса:

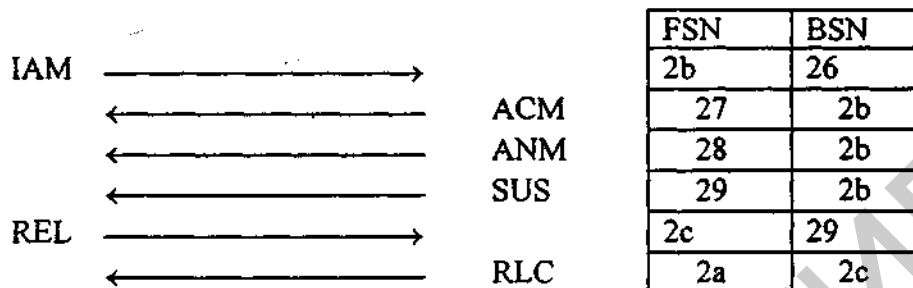
- анализаторы для транснационального и национального мониторинга;
- анализаторы для мониторинга и отладки протокола разработчиками ОКС № 7;
- анализаторы для эксплуатационных и комплексных измерений на сети ОКС № 7;
- анализаторы для простого тестирования с отдельными функциями анализа ОКС № 7.

В методическом пособии рассмотрены реальные примеры технологических ситуаций по обслуживанию вызовов на сети ISDN, представленные в виде трассировки сигнальных сообщений. Задачей изучения является анализ структуры сигнальных сообщений и их параметров, а также информационных сценариев обмена взаимодействующих подсистем ISUP при выполнении практических занятий, а также при самостоятельной подготовке по соответствующим разделам курса.

Назначение и форматы используемых сообщений при обслуживании вызова ISDN представлены в учебно-методических пособиях [1,2].

1. ПРИМЕРЫ УСТАНОВЛЕНИЯ БАЗОВОГО СОЕДИНЕНИЯ ОДНОУРОВНЕВОЙ СЕТИ СИГНАЛИЗАЦИИ

1.1. Вызов от абонента А к абоненту В: абоненты А и В – не - ISDN.
Абонент В отвечает. Первым отбивается абонент В.



FSN – прямой порядковый номер
BSN – обратный порядковый номер

Рис. 2. Диаграмма межстанционного взаимодействия сигнальными сообщениями ОКС № 7: IAM, ACM, ANM, SUS, REL, RLC

18:20:10.130 Port-1 D1-Usr L1->LO

L1: L0 Raw Message

L2: MTP (Whitebook)

```

0 1..... : Bwd indicator bit....01 Hex
  .0100110 : Bwd sequence num....26 Hex
1 1..... : Fwd indicator bit....01 Hex
  .0101011 : Fwd sequence num....2b Hex
2 00..... : Spare.....Ok
  ..011111 : Length Indicator....31 Dec
3 10..... : Network Indicator....National network
  ..00..... : Spare.....Ok
  ....0101 : Service Indicator....ISDN User Part
4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-6-00-1
7 0000.... : SLS.....0 Dec
  
```

L3: ISUP (Whitebook)

```

0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
  ....0000 : Circuit id (lower)...00 Hex
2 00000001 : Message type.....IAM-Initial address
-- Nature of connection ind
3 000..... : Spare.....00 Hex
  ...0.... : Echo control device..Not included
  ....00.. : Continuity check....Not required
  
```

```

.....00 : Satellite.....None in the
                                connection
-- Forward call inds
4 01..... : ISUP preference.....Not required all
                                the way
  ..1..... : ISUP part.....Used all the way
  ...0.... : ETE info.....None avail
  ....0... : Interworking.....None encountered
  .....00. : ETE method.....No ETE avail
  .....0 : Call type.....National
5 0000.... : Reserved (nat use)...00 Hex
  ....0... : Spare.....00 Hex
  .....00. : SCCP method.....No indication
  .....0 : ISDN access.....Originating access
                                non-ISDN
-- Calling party cat
6 00001010 : Category.....Ordinary calling
                                subscriber
-- Tx medium requirement
7 00000011 : Tx medium.....3.1 kHz audio
8 00000010 : Pointer.....2 Dec
9 00001001 : Pointer.....9 Dec
-- Called party nr
10 00000111 : Length.....7 Dec
11 0..... : Odd/Even ind.....Even
  .0000011 : Nature of addr ind...National
                                (significant) nr
12 1..... : INN ind.....Routing to INN not
                                allowed
  .001.... : Numbering plan.....ISDN (telephony)
  ....0000 : Spare.....Ok
13 ***** : Address signal.....0957491157
18 00001010 : Optional para.....Calling party number
-- Calling party number
19 00000101 : Length.....5 Dec
20 0..... : Odd/Even ind.....Even
  .0000011 : Nature of addr.....National
                                (significant) nr
21 0..... : NI indicator.....Nr complete
  .001.... : Numbering plan.....ISDN (telephony)
  ....00.. : Presentation.....Allowed
  .....11 : Screening.....Net provided
22 ***** : Address signal.....458002

```

25 00000000 : Optional para.....End

18:20:10.585 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

0 1..... : Bwd indicator bit....01 Hex
.0101011 : Bwd sequence num....2b Hex
1 1..... : Fwd indicator bit....01 Hex
.0100111 : Fwd sequence num....27 Hex
2 00..... : Spare.....Ok
..001011 : Length Indicator....11 Dec
3 10..... : Network Indicator...National network
..00.... : Spare.....Ok
....0101 : Service Indicator....ISDN User Part
4 ***** : DPC.....00-6-00-1
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS.....2 Dec

L3: ISUP (Whitebook)

0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00000110 : Message type.....ACM-
Address..complete

-- Backward call inds

3 00..... : ETE method.....No ETE avail
..01.... : Called party cat....Ordinary subscriber
....01.. : Called party status..Subscriber free
.....10 : Charge ind.....Charge
4 00..... : SCCP method avail...No indication
..0..... : Echo control device..Not included
...0.... : ISDN access.....Terminating access
non-ISDN
....0... : Holding.....Not requested
.....1.. : ISDN User Part.....ISUP all the way fee
.....0. : ETE info.....None avail
.....0 : Interworking.....None encounter
5 00000000 : Pointer.....0 Dec

18:20:12.968 Port-1 D1-Net L1>LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

0 1..... : Bwd indicator bit....01 Hex
.0101011 : Bwd sequence num....2b Hex
1 1..... : Fwd indicator bit....01 Hex

```
.0101000 : Fwd sequence num.....28 Hex
2 00..... : Spare.....Ok
..001001 : Length Indicator.....9 Dec
3 10..... : Network Indicator...National network
..00.... : Spare.....Ok
....0101 : Service Indicator....ISDN User Part
4 ***** : DPC.....00-6-00-1
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS.....2 Dec
```

L3: ISUP (Whitebook)

```
0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001001 : Message type.....ANM-Answer_
3 00000000 : Pointer.....0 Dec
```

18:20:28.286 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```
0 1..... : Bwd indicator bit....01 Hex
.0101011 : Bwd sequence num.....2b Hex
1 1..... : Fwd indicator bit....01 Hex
.0101001 : Fwd sequence num.....29 Hex
2 00..... : Spare.....Ok
..001010 : Length Indicator.....10 Dec
3 10..... : Network Indicator...National network
..00.... : Spare.....Ok
....0101 : Service Indicator....ISDN User Part
4 ***** : DPC.....00-6-00-1
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS.....2 Dec
```

L3: ISUP (Whitebook)

```
0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001101 : Message type.....SUS-Suspend
-- Suspend/Resume ind
3 00000000 : Spare.....00 Hex
.....1 : Suspend/Resume.....Net initiated
4 00000000 : Pointer.....0 Dec
```

18:20:28.902 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)


```

0  1..... : Bwd indicator bit....01 Hex
   .0101001 : Bwd sequence num.....29 Hex
1  1..... : Fwd indicator bit....01 Hex
   .0101100 : Fwd sequence num.....2c Hex
2  00..... : Spare.....Ok
   ..001101 : Length Indicator.....13 Dec
3  10..... : Network Indicator....National network
   ..00.... : Spare.....Ok
   ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-0-08-1
5  ***** : OPC.....00-6-00-1
7  0000.... : SLS.....0 Dec

```

L3: ISUP (Whitebook)

```

0  00000010 : Circuit id.....02 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00001100 : Message type.....REL-Release
3  00000010 : Pointer.....2 Dec
4  00000000 : Pointer.....0 Dec

```

-- Cause inds

```

5  00000010 : Length.....2 Dec
6  1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
                   coding
   ...0.... : Spare.....Spare
   ....0100 : Location.....Public net serving
                   remote usr
7  1..... : Extension.....Last octet
   .0010000 : Cause value.....Normal call
                   clearing

```

18:20:29.002 Port-1 D1-Net L1->L0

L1: L0_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
   .0101100 : Bwd sequence num.....2c Hex
1  1..... : Fwd indicator bit....01 Hex
   .0101010 : Fwd sequence num.....2a Hex
2  00..... : Spare.....Ok
   ..001001 : Length Indicator.....9 Dec
3  10..... : Network Indicator....National network
   ..00.... : Spare.....Ok
   ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-6-00-1

```

```

5  ***** : OPC.....00-0-08-1
7  0010.... : SLS.....2 Dec
L3: ISUP (Whitebook)
0  00000010 : Circuit id.....02 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00010000 : Message type.....RLC-Release
                               complete
3  00000000 : Pointer.....0 Dec

```

1.2. Вызов от абонента А к абоненту В: абоненты А – ISDN, В – не - ISDN. Абонент В отвечает. Первым отбивается абонент А.

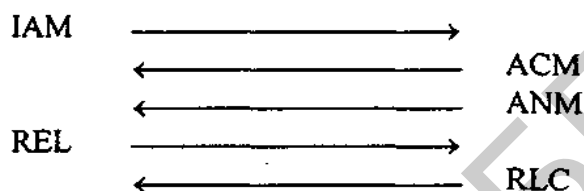


Рис. 3. Диаграмма межстанционного взаимодействия сигнальными сообщениями ОКС № 7: IAM, ACM, ANM, REL, RLC.

```

18:29:16.213 Port-1 D1-Net L1 LO
L1: LO_Raw_Message
L2: MTP (Whitebook)
0  1..... : Bwd indicator bit....01 Hex
   .0110101 : Bwd sequence num....35 Hex
1  1..... : Fwd indicator bit....01 Hex
   .0110100 : Fwd sequence num....34 Hex
2  00..... : Spare.....Ok
   ..110100 : Length Indicator....52 Dec
3  10..... : Network Indicator...National network
   ..00.... : Spare.....Ok
   ...0101 : Service Indicator...ISDN User Part
4  ***** : DPC.....00-6-00-1
5  ***** : OPC.....00-0-08-1
7  0001.... : SLS.....1 Dec
L3: ISUP (Whitebook)
0  00000001 : Circuit id.....01 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00000001 : Message type.....IAM-Initial
                               address

```

```

-- Nature of connection ind
 3  000..... : Spare.....00 Hex
    ...0.... : Echo control device..Not included
    ....00.. : Continuity check....Not required
    .....00 : Satellite.....None in the
                                connection

-- Forward call inds
 4  00..... : ISUP preference.....Preferred all
the
                                way
    ..1..... : ISUP part.....Used all the way
    ...0.... : ETE info.....None avail
    ....0... : Interworking.....None encountered
    .....00 : ETE method.....No ETE avail
    .....0 : Call type.....National
 5  0000.... : Reserved (nat use)...00 Hex
    ....0... : Spare.....00 Hex
    .....00. : SCCP method.....No indication
    .....1 : ISDN access.....Originating access
                                ISDN

-- Calling party cat
 6  00001010 : Category.....Ordinary calling
                                subscriber

-- Tx medium requirement
 7  00000000 : Tx medium.....Speech
 8  00000010 : Pointer.....2 Dec
 9  00001010 : Pointer.....10 Dec

-- Called party nr
10  00001000 : Length.....8 Dec
11  1..... : Odd/Even ind.....Odd
    .0000011 : Nature of addr ind...National
                                (significant) nr
12  0..... : INN ind.....Routing to INN
                                allowed
    .001.... : Numbering plan.....ISDN (telephony)
    ....0000 : Spare.....Ok
13  **** : Address signal.....0822458000f
19  00001010 : Optional para.....Calling party
                                number

-- Calling party number
20  00000111 : Length .....7 Dec
21  0..... : Odd/Even ind .....Even
    .0000011 : Nature of addr.....National
                                (significant) nr

```

```

22  0..... : NI indicator.....Nr complete
    .001.... : Numbering plan.....ISDN (telephony)
    ....00.. : Presentation .....Allowed
    .....01 : Screening.....User provided,
                                   verified, passed
23  ***** : Address signal.....0957491100
28  00000011 : Optional para.....Access transport
--  Access transport
29  00001011 : Length.....11 Dec
30  ***** : Info element.....7d 02 91 81 6d
05
                                   80 50 31 39 35
41  00011101 : Optional para.....Usr service info
--  User service info
42  00000011 : Length.....3 Dec
43  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                                   coding
    ...00000 : Info transfer cap....Speech__
44  1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
45  1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A Law
46  00000000 :Optional para.....End

```

18:29:16. 362 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
    .0110100 : Bwd sequence num....34 Hex
1  1..... : Fwd indicator bit....01 Hex
    .0110110 : Fwd sequence num....36 Hex
2  00..... : Spare.....Ok
    ..001011 : Length Indicator.....11 Dec
3  10..... : Network Indicator....National network
    ..00..... : Spare.....Ok
    ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-0-08-1
5  ***** : OPC.....00-6-00-1
7  0000.... : SLS.....0 Dec

```

L3: ISUP (Whitebook)

```

0  00000001 : Circuit id.....01 Hex

```

```

1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00000110 : Message type.....ACM-Address
                               complete
-- Backward call inds
3  00..... : ETE method.....No ETE avail
   ..00.... : Called party cat.....No indication
   ....01.. : Called party status..Subscriber free
   .....10 : Charge ind.....Charge
4  00..... : SCCP method avail...No indication
   ..0..... : Echo control device..Not included
   ...0.... : ISDN access.....Terminating
                               access non-ISDN
   ....0... : Holding.....Not requested
   .....1.. : ISDN User Part.....ISUP all the way
   .....0. : ETE info.....None avail
   .....0 : Interworking.....None encountered
5  00000000 : Pointer.....0 Dec

```

18:29:19.547 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
   .0110100 : Bwd sequence num.....34 Hex
1  1..... : Fwd indicator bit....01 Hex
   .0110111 : Fwd sequence num.....37 Hex
2  00..... : Spare.....Ok
   ..001001 : Length Indicator.....9 Dec
3  10..... : Network Indicator...National network
   ..00.... : Spare.....Ok
   ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC    ..00-0-08-1
5  ***** : OPC    ..00-6-00-1
7  0000.... : SLS    ..0 Dec

```

L3: ISUP (Whitebook)

```

0  00000001 : Circuit id.....01 Hex
1  0000.... : Spare ..Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00001001 : Message type  ..ANM-Answer
3  00000000 : Pointer.....0 Dec

```

18:29:29.922 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
   .0110111 : Bwd sequence num....37 Hex
1  1..... : Fwd indicator bit....01 Hex
   .0110101 : Fwd sequence num....35 Hex
2  00..... : Spare.....Ok
   ..001101 : Length Indicator    ..13 Dec
3  10..... : Network Indicator...National network
   ..00.... : Spare    ..Ok
   ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-6-00-1
5  ***** : OPC.....00-0-08-1
7  0001.... : SLS.....1 Dec

```

L3: ISUP (Whitebook)

```

0  00000001 : Circuit id.....01 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00001100 : Message type.....REL-Release
3  00000010 : Pointer.....2 Dec
4  00000000 : Pointer.....0 Dec
-- Cause inds
5  00000010 : Length.....2 Dec
6  1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
                        coding
   ....0.... : Spare.....Spare
   ....0000 : Location.....User
7  1..... : Extension.....Last octet
   .0010000 : Cause value.....Normal call
                        clearing

```

18:29:29.975 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
   .0110101 : Bwd sequence num....35 Hex
1  1..... : Fwd indicator bit....01 Hex
   .0111000 : Fwd sequence num....38 Hex
2  00..... : Spare.....Ok
   ..001001 : Length Indicator....9 Dec
3  10..... : Network Indicator...National
                        network
   ..00.... : Spare.....Ok
   ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-0-08-1

```

```

5      ***** : OPC.....00-6-00-1
7      0000.... : SLS.....0 Dec
L3: ISUP (Whitebook)
0      00000001 : Circuit id.....01 Hex
1      0000.... : Spare.....Ok
      ....0000 : Circuit id (lower)...00 Hex
2      00010000 : Message type.....RLC-Release
                                   complete
3      00000000 : Pointer.....0 Dec

```

1.3. Вызов от абонента А к абоненту В: абоненты А – ISDN, В – не - ISDN. Абонент В отвечает. Первым отбивается абонент В.

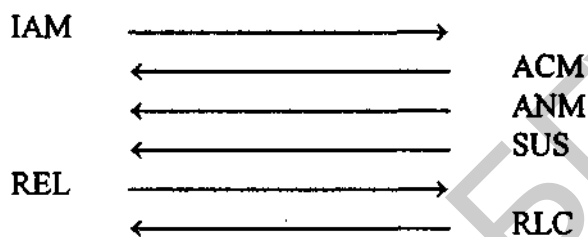


Рис. 4. Диаграмма межстанционного взаимодействия сигнальными сообщениями ОКС № 7: IAM, ACM, ANM, SUS, REL, RLC

18:32:40.249 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0      1..... : Bwd indicator bit....01 Hex
      .0111010 : Bwd sequence num....3a Hex
1      1..... : Fwd indicator bit....01 Hex
      .0111001 : Fwd sequence num....39 Hex
2      00..... : Spare.....Ok
      ..110011 : Length Indicator....51 Dec
3      10..... : Network Indicator...National network
      ..00.... : Spare.....Ok
      ...0101 : Service Indicator...ISDN User Part
4      ***** : DPC.....00-6-00-1
5      ***** : OPC.....00-0-08-1
7      0001.... : SLS.....1 Dec

```

L3: ISUP (Whitebook)

```

0      00000001 : Circuit id.....01 Hex
1      0000.... : Spare.....Ok
      ....0000 : Circuit id (lower)...00 Hex
2      00000001 : Message type.....IAM-Initial
                                   address

```

```

-- Nature of connection ind
 3  000..... : Spare.....00 Hex
    ...0.... : Echo control device..Not included
    ....00.. : Continuity check.....Not required
    .....00 : Satellite.....None in the
                                connection

-- Forward call inds
 4  00..... : ISUP preference.....Preferred all
the
                                way
    ..1..... : ISUP part.....Used all the way
    ...0.... : ETE info.....None avail
    ....0... : Interworking.....None encountered
    ...00... : ETE method.....No ETE avail
    ...0.... : Call type.....National
 5  0000.... : Reserved (nat use)...00 Hex
    ....0... : Spare.....00 Hex
    .....00. : SCCP method.....No indication
    .....1  : ISDN access.....Originating access
                                ISDN

-- Calling party cat
 6  00001010 : Category.....Ordinary calling
                                subscriber

-- Tx medium requirement
 7  00000000 : Tx medium.....Speech
 8  00000010 : Pointer.....2 Dec
 9  00001001 : Pointer.....9 Dec

-- Called party nr
10  00000111 : Length.....7 Dec
11  0..... : Odd/Even ind.....Even
    .0000011 : Nature of addr ind...National
                                (significant) nr
12  0..... : INN ind.....Routing to INN
                                allowed
    .001.... : Numbering plan.....ISDN (telephony)
    ....0000 : Spare.....Ok
13  *****: : Address signal.....0822458000
18  00001010 : Optional para.....Calling party
                                number

-- Calling party number
19  00000111 : Length.....7 Dec
20  0..... : Odd/Even ind.....Even
    .0000011 : Nature of addr.....National
                                (significant) nr

```



```

21  0..... : NI indicator.....Nr complete
    .001.... : Numbering plan.....ISDN (telephony)
    ....00.. : Presentation.....Allowed
    .....01 : Screening.....User provided,
                                verified, passed
22  ***** : Address signal.....0957491100
27  00000011 : Optional para.....Access transport
-- Access transport
28  00001011 : Length.....11 Dec
29  ***** : Info element.....7d 02 91 81 6d
05
                                80 50 31 39 35
40  00011101 : Optional para.....Usr service info
-- User service info
41  00000011 : Length.....3 Dec
42  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                                coding
    ...00000 : Info transfer cap....Speech
43  1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
44  1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A-Law
45  00000000 : Optional para.....End

```

18:32:40.371 Port-1 D1-Usr L1>L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
    .0111001 : Bwd sequence num      ....39 Hex
1  1..... : Fwd indicator bit....01 Hex
    .0111011 : Fwd sequence num      ....3b Hex
2  00..... : Spare.....Ok
    ..001011 : Length Indicator.....11 Dec
3  10..... : Network Indicator....National network
    ..00..... : Spare.....Ok
    ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-0-08-1
5  ***** : OPC.....00-6-00-1
7  0000.... : SLS.....0 Dec

```

L3: ISUP (Whitebook)

```

0  00000001 : Circuit id.....01 Hex

```

```

1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00000110 : Message type.....ACM-Address
                               complete
-- Backward call inds
3  00..... : ETE method.....No ETE avail
   ..00.... : Called party cat.....No indication
   ....01.. : Called party status..Subscriber free
   .....10 : Charge ind.....Charge
4  00..... : SCCP method avail...No indication
   ..0..... : Echo control device..Not included
   ...0.... : ISDN access.....Terminating
                               access non-ISDN
   ....0... : Holding.....Not requested
   .....1.. : ISDN User Part.....ISUP all the way
   .....0. : ETE info.....None avail
   .....0 : Interworking.....None encountered
5  00000000 : Pointer.....0 Dec

```

18:32:44.851 Port-1 D1-Usr L1-LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
   .0111001 : Bwd sequence num.....39 Hex
1  1..... : Fwd indicator bit....01 Hex
   .0111100 : Fwd sequence num.....3c Hex
2  00..... : Spare.....Ok
   ..001001 : Length Indicator.....9 Dec
3  10..... : Network Indicator...National network
   ..00.... : Spare.....Ok
   ....0101 : Service Indicator...ISDN User Part
4  ***** : DPC.....00-0-08-1
5  ***** : OPC.....00-6-00-1
7  0000.... : SLS.....0 Dec

```

L3: ISUP (Whitebook)

```

0  00000001 : Circuit id.....01 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00001001 : Message type.....ANM-Answer
3  00000000 : Pointer.....0 Dec

```

18:32:53.453 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
   .0111001 : Bwd sequence num....39 Hex
1  1..... : Fwd indicator bit....01 Hex
   .0111101 : Fwd sequence num....3d Hex
2  00..... : Spare.....Ok
   ..001010 : Length Indicator....10 Dec
3  10..... : Network Indicator....National network
   ..00.... : Spare.....Ok
   ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-0-08-1
5  ***** : OPC.....00-6-00-1
7  0000.... : SLS.....0 Dec

```

L3: ISUP (Whitebook)

```

0  00000001 : Circuit id.....01 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00001101 : Message type.....SUS-Suspend
-- Suspend/Resume ind
3  0000000. : Spare.....00 Hex
   .....1 : Suspend/Resume.....Net initiated
4  00000000 : Pointer.....0 Dec

```

18:32:54.579 Port-1 D1-Net L1->L0

L1: LO_Raw Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
   .0111101 : Bwd sequence num....3d Hex
1  1..... : Fwd indicator bit....01 Hex
   .0111010 : Fwd sequence num....3a Hex
2  00..... : Spare.....Ok
   ..001101 : Length Indicator....13 Dec
3  10..... : Network Indicator....National network
   ..00.... : Spare.....Ok
   ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-6-00-1
5  ***** : OPC.....00-0-08-1
7  0001.... : SLS.....1 Dec

```

L3: ISUP (Whitebook)

```

0  00000001 : Circuit id.....01 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00001100 : Message type.....REL-Release
3  00000010 : Pointer.....2 Dec
4  00000000 : Pointer.....0 Dec

```

```

-- Cause inds
5  00000010 : Length.....2 Dec
6  1..... : Extension.....Last octet

    .00..... : Coding std.....CCITT standardized
                    coding
    ...0..... : Spare.....Spare
    ....0100 : Location.....Public net serving
                    remote usr
7  1..... : Extension.....Last octet
    .1100110 : Cause value.....Unknown [0066 Hex]

```

18:32:54.634 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
    .0111010 : Bwd sequence num....3a Hex
1  1..... : Fwd indicator bit....01 Hex
    .0111110 : Fwd sequence num....3e Hex
2  00..... : Spare.....Ok
    ..001001 : Length Indicator.....9 Dec
3  10..... : Network Indicator...National network
    ..00..... : Spare.....Ok
    ....0101 : Service Indicator...ISDN User Part
4  **** : DPC.....00-0-08-1
5  **** : OPC.....00-6-00-1
7  0000.... : SLS.....0 Dec

```

L3: ISUP (Whitebook)

```

0  00000001 : Circuit id.....01 Hex
1  0000.... : Spare.....Ok
    ....0000 : Circuit id (lower)...00 Hex
2  00010000 : Message type.....RLC-Release
                    complete
3  00000000 : Pointer.....0 Dec

```

1.4. Блокировка и разблокировка каналов

18:42:35.984 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0  1..... : Bwd indicator bit....01 Hex
    .0101100 : Bwd sequence num....2c Hex
1  1..... : Fwd indicator bit....01 Hex

```

```
.0110101 : Fwd sequence num.....35 Hex
2 00..... : Spare.....Ok
..001000 : Length Indicator.....8 Dec
3 10..... : Network Indicator....National network
..00.... : Spare.....Ok
....0101 : Service Indicator....ISDN User Part
4 ***** : DPC.....00-2-00-3
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS.....2 Dec
```

L3: ISUP (Whitebook)

```
0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00010011 : Message type.....BLO-Blocking
```

18:42:36.026 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```
0 1..... : Bwd indicator bit....01 Hex
.0110101 : Bwd sequence num.....35 Hex
1 1..... : Fwd indicator bit....01 Hex
.0101101 : Fwd sequence num.....2d Hex
2 00..... : Spare.....Ok
..001000 : Length Indicator.....8 Dec
3 10..... : Network Indicator....National network
..00.... : Spare.....Ok
....0101 : Service Indicator....ISDN User Part
4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-2-00-3
7 0010.... : SLS.....2 Dec
```

L3: ISUP (Whitebook)

```
0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00010101 : Message type.....BLA-Blocking ack
```

18:44:52.275 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```
0 1..... : Bwd indicator bit....01 Hex
.0101110 : Bwd sequence num.....2e Hex
1 1..... : Fwd indicator bit....01 Hex
.0110111 : Fwd sequence num.....37 Hex
2 00..... : Spare ....Ok
```

```
..001000 : Length Indicator.....8 Dec
3 10..... : Network Indicator....National network
..00..... : Spare.....Ok
....0101 : Service Indicator....ISDN User Part
4 ***** : DPC.....00-2-00-3
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS .....2 Dec
```

L3: ISUP (Whitebook)

```
0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare ....Ok
....0000 : Circuit id (lower)...00 Hex
2 00010100 : Message type.....UBL-Unblocking
```

18:44:52.304 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```
0 1..... : Bwd indicator bit....01 Hex
.0110111 : Bwd sequence num.....37 Hex
1 1..... : Fwd indicator bit....01 Hex
.0101111 : Fwd sequence num.....2f Hex
2 00..... : Spare.....Ok
..001000 : Length Indicator.....8 Dec
3 10..... : Network Indicator....National network
..00..... : Spare.....Ok
....0101 : Service Indicator....ISDN User Part
4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-2-00-3
7 0010.... : SLS.....2 Dec
```

L3: ISUP (Whitebook)

```
0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00010110 : Message type.....UBA-Unblocking
```

ack

1.5. Сброс канала

18:20:21.891 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

```
0 1..... : Bwd indicator bit....01 Hex
.0011011 : Bwd sequence num.....1b Hex
1 1..... : Fwd indicator bit....01 Hex
```

```

    .0011110 : Fwd sequence num.....1e Hex
2   00..... : Spare.....Ok
    ..001000 : Length Indicator.....8 Dec
3   10..... : Network Indicator....National network
    ..00.... : Spare.....Ok
    ....0101 : Service Indicator....ISDN User Part
4   **** : DPC.....00-2-00-3
5   **** : OPC.....00-0-08-1
7   0010... : SLS.....2 Dec
L3: ISUP (Whitebook)
0   00000010 : Circuit id.....02 Hex
1   0000.... : Spare.....0k
    ....0000 : Circuit id (lower)...00 Hex
2   00010010 : Message type.....RSC-Reset
circuit

```

18:20:21.922 Port-1 D1-Usr L1-LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

```

0   1..... : Bwd indicator bit....01 Hex
    .0011110 : Bwd sequence num.....1e Hex
1   1..... : Fwd indicator bit....01 Hex
    .0011100 : Fwd sequence num.....1c Hex
2   00..... : Spare.....Ok
    ..001001 : Length Indicator.....9 Dec
3   10..... : Network Indicator....National network
    ..00.... : Spare.....Ok
    ....0101 : Service Indicator....ISDN User Part
4   **** : DPC.....00-0-08-1
5   **** : OPC.....00-2-00-3
7   0010... : SLS.....2 Dec

```

L3: ISUP (Whitebook)

```

0   00000010 : Circuit id.....02 Hex
1   0000.... : Spare.....Ok
    ....0000 : Circuit id (lower)...00 Hex
2   00010000 : Message type.....RLC-Release
                                complete
3   00000000 : Pointer.....0 Dec

```

1.6. Работа с перекрытием

20:18:41.846 Port-1 D1-Net L1-LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
2 00000001 : Message type.....IAM-Initial
                        address
-- Nature of connection ind
3 000..... : Spare.....00 Hex
  ...0.... : Echo control device..Not included
  ....00.. : Continuity check.....Not required
  .....00 : Satellite.....None in the
                        connection
-- Forward call inds
4 00..... : ISUP preference.....Preferred all
the
                        way
  ..1..... : ISUP part.....Used all the way
  ...0.... : ETE info.....None avail
  ....0... : Interworking.....None encountered
  .....00. : ETE method.....No ETE avail
  .....0 : Call type.....National
5 0000.... : Reserved (nat use)...00 Hex
  ....0... : Spare.....00 Hex
  .....00. : SCCP method.....No indication
  .....1 : ISDN access.....Originating access
                        ISDN
--Calling party cat
6 00001010 : Category.....Ordinary calling
                        subscriber
-- Tx medium requirement
7 00000000 : Tx medium.....Speech
8 00000010 : Pointer.....2 Dec
9 00000110 : Pointer.....6 Dec
-- Called party nr
10 00000100 : Length.....4 Dec
11 1..... : Odd/Even ind.....Odd
  .0000011 : Nature of addr ind...National
                        (significant) nr
12 0..... : INN ind.....Routing to INN -
                        allowed
  .001.... : Numbering plan.....ISDN (telephony)
  ....0000 : Spare.....Ok
13 ***** : Address signal.....082
15 00001010 : Optional para.....Calling party
                        number
-- Calling party number
16 00000111 : Length.....7 Dec
```



```

17  0..... : Odd/Even ind.....Even
    .0000011 : Nature of addr.....National
                                   (significant) nr
18  0..... : N1 indicator.....Nr complete
    .001.... : Numbering plan.....ISDN (telephony)
    ....00.. : Presentation.....Allowed
    .....01 : Screening.....User provided,
                                   verified, passed
19  ***** : Address signal.....0957491100
24  00000011 : Optional para.....Access transport
-- Access transport
25  00001011 : Length.....11 Dec
26  ***** : Info element.....7d 02 91 51 6d
05
                                   80 50 31 39 35
37  00011101 : Optional para.....Usr service info
-- User service info
38  00000011 : Length.....3 Dec
39  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                                   coding
    ...00000 : Info transfer cap....Speech
40  1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit ir.ode
    ...10000 : Transfer rate.....64 kbit/s
41  1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A-Law
42  00000000 : Optional para.....End

```

20:18:45.534 Port-1 D1-Net L1-LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```

2  00000010 : Message type.....SAM-Subsequent
                                   addr
3  00000010 : Pointer.....2 Dec
4  00000000 : Pointer.....0 Dec
-- Subsequent nr
5  00000010 : Length.....2 Dec
6  1..... : Odd/Even ind.....Odd
    .0000000 : Spare.....00 Hex

```

7 ***** : Address signal.....2

20:18:46.364 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000010 : Message type.....SAM-Subsequent
addr
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
-- Subsequent nr
5 00000010 : Length.....2 Dec
6 1..... : Odd/Even ind.....Odd
.00000000 : Spare.....00 Hex
7 ***** : Address signal.....4

20:18:47.501 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000010 : Message type.....SAM-Subsequent
addr
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
-- Subsequent nr
5 00000010 : Length.....2 Dec
6 1..... : Odd/Even ind.....Odd
.00000000 : Spare.....00 Hex
7 ***** : Address signal.....5

20:18:49.414 Port-1 D1-Net L1-LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000010 : Message type.....SAM-Subsequent
addr
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
-- Subsequent nr
5 00000010 : Length.....2 Dec
6 1..... : Odd/Even ind.....Odd
.00000000 : Spare.....00 Hex
7 ***** : Address signal.....8

20:18:50.280 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000010 : Message type.....SAM-Subsequent
addr
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
-- Subsequent nr
5 00000010 : Length.....2 Dec
6 1..... : Odd/Even ind.....Odd
.00000000 : Spare.....00 Hex
7 ***** : Address signal.....0

20:18:50.833 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000010 : Message type.....SAM-Subsequent
addr
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
-- Subsequent nr
5 00000010 : Length.....2 Dec
6 1..... : Odd/Even ind.....Odd
.00000000 : Spare.....00 Hex
7 ***** : Address signal.....0

20:18:51.199 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000010 : Message type.....SAM-Subsequent
addr
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
-- Subsequent nr
5 00000010 : Length.....2 Dec
6 1..... : Odd/Even ind.....Odd
.00000000 : Spare.....00 Hex
7 ***** : Address signal.....0

20:18:51.313 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000110 : Message type.....ACM-Address
complete

-- Backward call inds

3 00..... : ETE method.....No ETE avail

..00.... : Called party cat.....No indication

....01.. : Called party status..Subscriber free

.....10 : Charge ind.....Charge

4 00..... : SCCP method avail....No indication

..0..... : Echo control device..Not included

...0.... : ISDN access.....Terminating access
non-ISDN

....0... : Holding.....Not requested

.....1.. : ISDN User Part.....ISUP all the way

.....0. : ETE info.....None avail

.....0 : Interworking.....None encountered

5 00000000 : Pointer.....0 Dec

20:18:53.040 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00001001 : Message type.....ANM-Answer

3 00000000 : Pointer.....0 Dec

20:33:54.949 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00001101 : Message type.....SUS-Suspend

-- Suspend/Resume ind

3 00000000. : Spare.....00 Hex

.....1 : Suspend/Resume.....Net initiated

4 00000000 : Pointer.....0 Dec

20:33:55.630 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00001100 : Message type.....REL-Release

3 00000010 : Pointer.....2 Dec

4 00000000 : Pointer.....0 Dec

-- Cause inds

```

5  00000010 : Length.....2 Dec
6  1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
                                   coding
   ...0.... : Spare.....Spare
   ....0000 : Location.....User
7  1..... : Extension.....Last octet
   .0010000 : Cause value.....Normal call
                                   clearing

```

20:33:55.697 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```

2  00010000 : Message type.....RLC-Release
                                   complete
3  00000000 : Pointer.....0 Dec

```

**1.7. Использование сигнального сообщения «вызов обслуживается»
[CPG: Call progress]**

12:59:56.491 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```

2  00000001 : Message type.....IAM-Initial
                                   address

```

-- Nature of connection ind

```

3  000..... : Spare.....00 Hex
   ...0.... : Echo control device..Not included
   ....00.. : Continuity check....Not required
   ....00.. : Satellite.....None in the
                                   connection

```

-- Forward call inds

```

4  01..... : ISUP preference.....Not required all
                                   the way
   ..1..... : ISUP part.....Used all the way
   ...0.... : ETE info.....None avail
   ....0... : Interworking.....None encountered
   .....00. : ETE method.....No ETE avail
   .....0   : Call type.....National
5  0000.... : Reserved (nat use)...00 Hex
   ....0... : Spare.....00 Hex
   .....00. : SCCP method.....No indication
   .....0   : ISDN access.....Originating access

```

non-ISDN

```
-- Calling party cat
  6  00001010 : Category.....Ordinary calling
                                subscriber
-- Tx medium requirement
  7  00000011 : Tx medium.....3.1 kHz audio
  8  00000010 : Pointer.....2 Dec
  9  00000111 : Pointer.....7 Dec
-- Called party nr
 10  00000101 : Length.....5 Dec
 11  0..... : Odd/Even ind.....Even
     .0000001 : Nature of addr ind...Subscriber nr
 12  0..... : INN ind.....Routing to INN
                                allowed
     .001.... : Numbering plan.....ISDN (telephony)
     ....0000 : Spare.....Ok
 13  ***** : Address signal.....23429f
 16  00001010 : Optional para.....Calling party
                                number
-- Calling party number
 17  00000111 : Length.....7 Dec
 18  0..... : Odd/Even ind.....Even
     .0000011 : Nature of addr.....National
                                (significant) nr
 19  0..... : N1 indicator.....Nr complete
     .001.... : Numbering plan.....ISDN (telephony)
     ....00.. : Presentation.....Allowed
     .....11 : Screening.....Net provided
 20  ***** : Address signal.....0959601155
 25  00000000 : Optional para.....End
```

13:00:00.080 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
  2  00000110 : Message type.....ACM-Address
                                complete
-- Backward call inds
```

```
  3  00..... : ETE method.....No ETE avail
     ..00.... : Called party cat.....No_indication
     ....00.. : Called party status..No_indication
     .....10 : Charge ind.....Charge
  4  00..... : SCCP method avail....No indication
     ..0..... : Echo control device..Not included
```

```
...0.... : ISDN access.....Terminating access
              non-ISDN
....0... : Holding.....Not requested
.....0.. : ISDN User Part.....ISUP not all the
              way
.....0. : ETE info.....None avail
.....1 : Interworking.....Encountered
5 00000000 : Pointer.....0 Dec
```

13:00:00.441 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
2 00101100 : Message type.....CPG-Call
progress
-- Event info
3 0..... : Event presentation...No indication
.00000001 : Event ind.....Alerting
4 00000001 : Pointer.....1 Dec
5 00010001 : Optional para.....Backward call
ind
-- Backward call inds
6 00000010 : Length.....2 Dec
7 00..... : ETE method.....No ETE avail
..00.... : Called party cat....No indication
....01.. : Called party status..Subscriber_free__
.....10 : Charge ind.....Charge
8 00..... : SCCP method avail....No indication
..0..... : Echo control device..Not included
...0.... : ISDN access.....Terminating access
              non-ISDN
....0... : Holding.....Not requested
.....0.. : ISDN User Part.....ISUP not all the
              way
.....0. : ETE info.....None avail
.....1 : Interworking.....Encountered
9 00000000 : Optional para.....End
```

13:00:04.213 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
2 00001001 : Message type.....ANM-Answer
3 00000001 : Pointer.....1 Dec
```

```

4 00010001 : Optional para.....Bkwd call ind
-- Backward call inds
5 00000010 : Length.....2 Dec
6 00..... : ETE method.....No ETE avail
  .00.... : Called party cat.....No indication
  ....01.. : Called party status..Subscriber free
  .....10 : Charge ind.....Charge
7 00..... : SCCP method avail....No indication
  ..0..... : Echo control device..Not included
  ...0.... : ISDN access.....Terminating access
                                   non-ISDN
  ....0... : Holding.....Not requested
  .....0.. : ISDN User Part.....ISUP not all the
                                   way
  .....0. : ETE info.....None avail
  .....1 : Interworking.....Encountered
8 00000000 : Optional para.....End

```

13:00:57.311 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```

2 00001100 : Message type.....REL-Release
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
--Cause inds
5 00000010 : Length.....2 Dec
6 1..... : Extension.....Last octet
  .00..... : Coding std.....CCITT standardized
                                   coding
  ...0.... : Spare.....Spare
  ....0011 : Location.....Transit network
7 1..... : Extension.....Last octet
  .0010000 : Cause value.....Normal call
                                   clearing

```

13:00:57.409 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```

2 00010000 : Message type.....RLC-Release
                                   complete
3 00000000 : Pointer.....0 Dec

```


1.8. Запрос дополнительной информации

17:17:40.049 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
  2  00000001 : Message type.....IAM-Initial
                                address
-- Nature of connection ind
  3  000..... : Spare.....00 Hex
    ...0.... : Echo control device..Not included
    ....00.. : Continuity check....Not required
    .....00 : Satellite.....None in the
                                connection
-- Forward call inds
  4  01..... : ISUP preference.....Not required all
                                the way
    ..1..... : ISUP part.....Used all the way
    ...0.... : ETE info.....None avail
    ....0... : Interworking.....None encountered
    .....00. : ETE method.....No ETE avail
    .....0 : Call type.....National
  5  0000.... : Reserved (nat use)...00 Hex
    ....0... : Spare.....00 Hex
    .....00. : SCCP method.....No indication
    .....0 : ISDN access.....Originating access
                                non-ISDN
-- Calling party cat
  6  00001010 : Category.....Ordinary calling
                                subscriber
-- Tx medium requirement
  7  00000000 : Tx medium.....Speech
  8  00000010 : Pointer.....2 Dec
  9  00000000 : Pointer.....0 Dec
-- Called party nr
 10  00000111 : Length.....7 Dec
 11  0..... : Odd/Even ind.....Even
    .0000011 : Nature of addr ind...National
                                (significant) nr
 12  1..... : INN ind.....Routing to INN
not
                                allowed
    .001.... : Numbering plan.....ISDN (telephony)
```

....0000 : Spare.....Ok
13 ***** : Address signal.....0959601157

17:17:40.158 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000011 : Message type.....INR-Information
req

-- Info request ind

3 0..... : Malicious call Id....Not req

.00..... : Spare.....Spare

...0.... : Charge info.....Not

requested

....0... : Calling party.....Not requested

.....0.. : Spare.....Spare

.....0. : Holding.....Not requested

.....1 : Calling party addr...Requested

4 0000.... : Reserved.....Ok

....0000 : Spare.....Ok

5 00000000 : Pointer.....0 Dec

17:17:40.182 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000100 : Message type.....INF-Information

-- Info inds

3 0..... : info type.....Solicited

.0..... : Charge info.....Not included

..0..... : Calling party's cat..Not included

...00... : Spare.....Spare

.....0.. : Hold.....Not provided

.....11 : Calling party addr...Included

4 00000000 : Spare.....Spare

5 00000001 : Pointer.....1 Dec

6 00001010 : Optional para.....Calling party
number

--Calling party number

7 00000101 : Length.....5 Dec

8 1..... : Odd/Even ind.....Odd

.0000000 : Nature of addr.....Spare

9 0..... : N1 indicator.....Nr complete

.001.... : Numbering plan.....ISDN (telephony)

```
....00.. : Presentation.....Allowed
.....11 : Screening.....Net provided
10 ***** : Address signal.....01502
13 00000000 : Optional para.....End
```

17:17:40.954 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
2 00000110 : Message type.....ACM-Address
                                complete
-- Backward call inds
3 00..... : ETE method.....No ETE avail
  ..01.... : Called party cat.....Ordinary
                                subscriber
  ....01.. : Called party status..Subscriber free
  .....10 : Charge ind.....Char
4 00..... : SCCP method avail...No indication
  ..0..... : Echo control device..Not included
  ...0.... : ISDN access.....Terminating access
                                non-ISDN
  ....0... : Holding.....Not requested
  .....1.. : ISDN User Part.....ISUP all the way
  .....0. : ETE info.....None avail
  .....0 : Interworking.....None encountered
5 00000000 : Pointer.....0 Dec
```

17:17:46.028 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
2 00001001 : Message type.....ANM-Answer
3 00000000 : Pointer.....0 Dec
```

17:20:08.227 Port-1 D1-Net L1-L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
2 00001100 : Message type.....REL-Release
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
-- Cause inds
5 00000010 : Length.....2 Dec
6 1..... : Extension.....Last octet
```

```

.00..... : Coding std.....CCITT standardized
                                coding
....0.... : Spare.....Spare
....0011  : Location.....Transit network
7   1..... : Extension.....Last octet
.0010000 : Cause value.....Normal call
                                clearing

```

17:20:08.327 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```

2 00010000 : Message type.....RLC-Release
                                complete
3  00000000 : Pointer.....0 Dec

```

1.9. Использование эхоградителя

13:02:42.990 Port-1 D1-Net L->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```

2  00000001 : Message type.....IAM-Initial
                                address
-- Nature of connection ind
3  000..... : Spare.....00 Hex
   ...1.... : Echo control device..Included
   ....00.. : Continuity check....Not required
   .....01 : Satellite.....One in the
                                connection
-- Forward call inds
4  01..... : ISUP preference.....Not required all
                                the way
   ..1..... : ISUP part.....Used all the way
   ....0.... : ETE info.....None avail
   ....0... : Interworking.....None encountered
   .....00. : ETE method.....No ETE avail
   .....0  : Call type.....National
5  0000.... : Reserved (nat use)...00 Hex
   ....0... : Spare.....00 Hex
   .....00. : SCCP method.....No indication
   .....1  : ISDN access.....Originating access ISDN
-- Calling party cat

```

```

6 00001010 : Category.....Ordinary calling
                        subscriber
-- Tx medium requirement
7 00000000 : Tx medium.....Speech
8 00000010 : Pointer.....2 Dec
9 00001010 : Pointer.....10 Dec
-- Called party nr
10 00001000 : Length.....8 Dec
11 1..... : Odd/Even ind.....Odd
   .0000011 : Nature of addr ind...National
                        (significant) nr
12 0..... : INN ind.....Routing to INN
                        allowed
   .001.... : Numbering plan.....ISDN (telephony)
   ....0000 : Spare.....Ok
13 ***** : Address signal.....0959601120f
19 00001010 : Optional para.....Calling party
                        number
-- Calling party number
20 00000111 : Length.....7 Dec
21 0..... : Odd/Even ind.....Even
   .0000011 : Nature of addr.....National
                        (significant) nr
22 0..... : N1 indicator.....Nr complete
   .001.... : Numbering plan.....ISDN (telephony)
   ....00.. : Presentation.....Allowed
   .....01 : Screening.....User provided,
                        verified, passed
23 ***** : Address signal.....3412516284
28 00001000 : Optional para.....Optional fwd
call
                        ind
-- Optional forward call inds
29 00000001 : Length.....1 Dec
30 1..... : Connected line id...Requested
   .0000... : Spare.....00 Hex
   .....0.. : Simple segmentation..Will send no
                        additional info
   .....00 : CUG call.....Non-CUG call
31 00000011 : Optional para.....Access transport
-- Access transport
32 00000100 : Length.....4 Dec
33 ***** : info element.....7d 02 91 81
37 00011101 : Optional para.....Usr service info

```

```

-- User service info
 38 00000011 : Length.....3 Dec
 39 1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                    coding
    ...00000 : Info transfer cap....Speech
 40 1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
 41 1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A-Law
 42 00000000 : Optional para.....End

```

13:02:43.694 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```

 2 00000110 : Message type.....ACM-Address
                    complete

```

-- Backward call inds

```

 3 00..... : ETE method.....No ETE avail
    ..01.... : Called party cat.....Ordinary
                    subscriber
    ....01.. : Called party status..Subscriber free
    .....10 : Charge ind.....Charge
 4 00..... : SCCP method avail....No indication
    ..1..... : Echo control device..Included
    ...1.... : ISDN access.....Terminating access
                    ISDN
    ....0... : Holding.....Not requested
    ....1.. : ISDN User Part.....ISUP all the way
    .....0. : ETE info.....None avail
    .....0 : Interworking.....None encountered
 5 00000001 : Pointer.....1 Dec
 6 00101001 : Optional para.....Optional bkwd

```

call

ind

```

 7 00000001 : Length.....1 Dec

```

-- Optional backward call inds

```

 8 0000.... : Spare.....00 Hex
    ....0... : MLPP user.....No indication
    .....0.. : Simple segmentation..Will send no
                    additional info

```

```
.....0. : Call diversion.....No indication
.....1 : In band info.....Now avail
9 00000000 : Optional para.....End
```

13:02:45.840 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
2 00001001 : Message type.....ANM-Answer
3 00000001 : Pointer.....1 Dec
4 00100001 : Optional para.....Connected nr
-- Connected nr
5 00000111 : Length.....7 Dec
6 0..... : Odd/Even ind.....Even
.0000011 : Nature of addr.....National
              (significant) nr
7 0..... : Spare.....00 Hex
.001.... : Numbering plan.....ISDN (telephony)
....00.. : Presentation.....Allowed
.....01 : Screening.....User provided,
              verified, passed
8 ***** : Address signal.....0959601120
13 00000000 : Optional para.....End
```

13:03:43.483 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

```
2 00001100 : Message type.....REL-Release
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
-- Cause inds
5 00000010 : Length.....2 Dec
6 1..... : Extension.....Last octet
.00..... : Coding std.....CCITT standardized
              coding
...0.... : Spare.....Spare
...0000 : Location.....User
7 1..... : Extension.....Last octet
.0010000 : Cause value.....Normal call
              clearing
```

13:03:44.124 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00010000 : Message type.....RLC-Release
complete
3 00000000 : Pointer.....0 Dec

1.10. Вызов с услугой "64 Кбит/с"

16:58:16.162 Port-1 D1-Usr L1-LO

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000001 : Message type.....IAM-Initial
address
-- Nature of connection ind
3 000..... : Spare.....00 Hex
...0.... : Echo control device..Not included
....00.. : Continuity check....Not required
.....00 : Satellite.....None in the
connection
-- Forward call inds
4 00..... : ISUP preference.....Preferred all
the way
..1..... : ISUP part.....Used all the_way _
...0.... : ETE info.....None avail
....0... : Interworking.....None encountered
.....00. : ETE method.....No ETE avail
.....1 : Call type.....International
5 0000..... : Reserved (nat use)...00 Hex
....0... : Spare.....00 Hex
....00. : SCCP method.....No indication
.....1 : ISDN access.....Originating access
ISDN
-- Calling party cat
6 00001010 : Category.....Ordinary calling
subscriber
-- Tx medium requirement
7 00000010 : Tx medium.....64 kbit/s
unrestricted
8 00000010 : Pointer.....2 Dec
9 00001010 : Pointer.....10 Dec
-- Called party nr


```

10  00001000 : Length.....8 Dec
11  1..... : Odd/Even ind.....Odd
    .0000011 : Nature of addr ind...National
                                   (significant) nr
12  0..... : INN ind.....Routing to INN
                                   allowed
    .001.... : Numbering plan.....ISDN (telephony)
    ....0000 : Spare.....Ok
13  *****: Address signal.....0957491100f
19  00001010 : Optional para.....Calling party
                                   number
-- Calling party number
20  00001000 : Length.....8 Dec
21  1..... : Odd/Even ind.....Odd
    .0000100 : Nature of addr.....International nr
22  0..... : N1 indicator.....Nr complete
    .001.... : Numbering plan.....ISDN (telephony)
    ....00.. : Presentation.....Allowed
    .....11 : Screening.....Net provided
23  *****: Address signal.....78123212348
29  00001000 : Optional para.....Optional fwd
call
                                   ind
-- Optional forward call inds
30  00000001 : Length.....1 Dec
31  1..... : Connected line id...Requested
    .0000... : Spare.....00 Hex
    .....0.. : Simple segmentation..Will send no
                                   additional info
    .....00 : CUG call.....Non-CUG call
32  00011101 : Optional para.....Usr service info
-- User service info
33  00000010 : Length.....2 Dec
34  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                                   coding
    ...01000 : Info transfer cap...Unrestr digital
                                   info
35  1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
36  00000011 : Optional para.....Access transport
-- Access transport
37  00001000 : Length.....8 Dec

```

38 ***** : Info element.....7c 06 88 90 21
48

42 bb 46

00000000 : Optional para.....End

16:58:16.889 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00000110 : Message type.....ACM-Address
complete

-- Backward call inds

3 00..... : ETE method.....No ETE avail

..01.... : Called party cat.....Ordinary
subscriber

....01.. : Called party status..Subscriber free

.....10 : Charge ind.....Charge

4 00..... : SCCP method avail...No indication

..0..... : Echo-control device..Not included

...1.... : ISDN access.....Terminating
access ISDN

....0... : Holding.....Not requested

.....1.. : ISDN User Part.....ISUP all the_way

.....0. : ETE info.....None avail

.....0 : Interworking.....None encountered

5 00000000 : Pointer.....0 Dec

16:58:16.930 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00001001 : Message type.....ANM-Answer

3 00000001 : Pointer.....1 Dec

4 00100001 : Optional para.....Connected nr

-- Connected nr

5 00001000 : Length.....8 Dec

6 1..... : Odd/Even ind.....Odd

.0000100 : Nature of addr.....International nr

7 0..... : Spare.....00 Hex

.001.... : Numbering plan.....ISDN (telephony)

....00.. : Presentation.....Allowed

.....01 : Screening.....User provided,
verified, passed

8 ***** : Address signal.....70957491100

14 00000000 : Optional para.....End

16:59:57.642 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00001100 : Message type.....REL-Release

3 00000010 : Pointer.....2 Dec

4 00000000 : Pointer.....0 Dec

-- Cause inds

5 00000010 : Length.....2 Dec

6 1..... : Extension.....Last octet

.00..... : Coding std.....CCITT standardized
coding

...0.... : Spare.....Spare

....0000 : Location.....User

7 1..... : Extension.....Last octet

.0101001 : Cause value.....Temporary failure

16:59:57.661 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP (Whitebook)

L3: ISUP (Whitebook)

2 00010000 : Message type.....RLC-Release
complete

3 00000000 : Pointer.....0 Dec

2. ПРИМЕРЫ ТЕСТОВ ДОПОЛНИТЕЛЬНЫХ УСЛУГ

2.1. Определение номера вызывающего абонента [CLIP: Calling Identification/Identity Presentation]

04-12-96:10:47:54.210 Port-1 D1-Net L1->L0

L2: MTP (Whitebook)

4 ***** : DPC.....00-6-00-1
5 ***** : OPC.....00-0-08-1
7 0001.... : SLS.....1 Dec

L3: ISUP (Whitebook)

0 00000001 : Circuit id.....01 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00000001 : Message type.....IAM-Initial
address

-- Nature of connection ind

3 000..... : Spare.....00 Hex
...0.... : Echo control device..Not included
....00.. : Continuity check....Not required
.....00 : Satellite.....None in the
connection

-- Forward call inds

4 00..... : ISUP preference.....Preferred all
the way
...1..... : ISUP part.....Used all the way
...0.... : ETE info.....None avail
....0... : Interworking.....None encountered
....00.. : ETE method.....No ETE avail
.....0 : Call type.....National
5 0000.... : Reserved (nat use)...00 Hex
....0... : Spare.....00 Hex
....00.. : SCCP method.....No indication
.....1 : ISDN access.....Originating access
ISDN

-- Calling party cat

6 00001010 : Category.....Ordinary calling
subscriber

-- Tx medium requirement

7 00000000 : Tx medium.....Speech
8 00000010 : Pointer.....2 Dec
9 00001010 : Pointer.....10 Dec

```

-- Called party nr
10 00001000 : Length.....8 Dec
11 1..... : Odd/Even ind.....Odd
   .0000011 : Nature of addr ind...National
                                     (significant) nr
12 0..... : INN ind.....Routing to INN
                                     allowed
   .001.... : Numbering plan.....ISDN (telephony)
   ....0000 : Spare.....Ok
13 ***** : Address signal.....0822458000f
19 00001010 : Optional para.....Calling party
                                     number

-- Calling party number
20 00000111 : Length.....7 Dec
21 0..... : Odd/Even ind.....Even
   .0000011 : Nature of addr.....National
                                     (significant) nr
22 0..... : N1 indicator.....Nr complete
   .001.... : Numbering plan.....ISDN (telephony)
   ....00.. : Presentation.....Allowed
   .....01 : Screening.....User provided,
                                     verified, passed
23 ***** : Address signal.....0957491103
28 00001000 : Optional para.....Optional fwd
call
                                     ind

-- Optional forward call inds
29 00000001 : Length.....1 Dec
30 1..... : Connected line id...Requested
   .0000... : Spare.....00 Hex
   .....0.. : Simple segmentation..Will
sendno
                                     additional info
   .....00 : CUG call.....Non-CUG call
31 00000011 : Optional para.....Access transport

-- Access transport
32 0000100  : Length.....4 Dec
33 ***** : Info element.....7d 02 91 81
37 00011101 : Optional para.....Usr service info

-- User service info
38 00000011 : Length.....3 Dec
39 1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
                                     coding

```

```
...00000 : Info transfer cap....Speech
40 1..... : Extension.....Last octet
   .00..... : Transfer mode.....Circuit mode
...10000 : Transfer rate.....64 kbit/s
41 1..... : Extension bit.....Last octet
   .01..... : Layer ID.....Layer 1
...00011 : Layer protocol.....A-Law
42 00000000 : Optional para.....End
```

04-12-96:10:47:54.352 Port-1 D1-Usr L1-LO

L2: MTP (Whitebook)

```
4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-6-00-1
7 0000.... : SLS.....0 Dec
```

L3: ISUP (Whitebook)

```
0 00000001 : Circuit id.....01 Hex
1 0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2 00000110 : Message type.....ACM-Address
                                     complete
```

-- Backward call inds

```
3 00..... : ETE method.....No ETE avail
   ..00.... : Called party cat....No indication
   ....01.. : Called party status..Subscriber free
   .....10 : Charge ind.....Charge
4 00..... : SCCP method avail...No indication
   ..0..... : Echo control device..Not included
   ...0.... : ISDN access.....Terminating access
                                     non-ISDN
   ....0... : Holding.....Not requested
   .....1.. : ISDN User Part.....ISUP all the way
   .....0. : ETE info.....None avail
   .....0 : Interworking.....None encountered
5 00000000 : Pointer.....0 Dec
```

04-12-96:10:48:00.069 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

```
4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-6-00-1
7 0000.... : SLS.....0 Dec
```

L3: ISUP (Whitebook)

```
0 00000001 : Circuit id.....01 Hex
1 0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
```

```

2 00001001 : Message type.....ANM-Answer
3 00000001 : Pointer.....1 Dec
4 00100001 : Optional para.....Connected nr
-- Connected nr
5 00000010 : Length.....2 Dec
6 0..... : Odd/Even ind.....Even
.00000000 : Nature of addr.....Spare
7 0..... : Spare.....00 Hex
.000.... : Numbering plan.....Spare
....10.. : Presentation.....Addr not avail
.....11 : Screening.....Net provided
8 00000000 : Optional para.....End

```

2.2. Запрет определения номера вызывающего абонента [CLIR: Calling Line Identification/Identity Restriction]

29-10-96:16:00:44.245 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

```

4 ***** : DPC.....00-7-08-1
5 ***** : OPC.....00-0-08-1
7 0011.... : SLS.....3 Dec

```

L3: ISUP (Whitebook)

```

0 00000011 : Circuit id.....03 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00000001 : Message type.....IAM-Initial
                                address
-- Nature of connection ind
3 000..... : Spare.....00 Hex
...1.... : Echo control device..Included
....00.. : Continuity check....Not required
.....01 : Satellite.....One in the
                                connection
-- Forward call inds
4 00..... : ISUP preference.....Preferred all
the
                                way
...1.... : ISUP part.....Used all the way
...0.... : ETE info.....None avail
....0... : Interworking.....None encountered
.....00. : ETE method.....No ETE avail
.....0 : Call type.....National
5 0000.... : Reserved (nat use)...00 Hex
....0... : Spare.....00 Hex
.....00. : SCCP method.....No indication

```

```

.....1 : ISDN access.....Originating access
                                         ISDN
-- Calling party cat
  6  00001010 : Category.....Ordinary calling
                                         subscriber
-- Tx medium requirement
  7  00000000 : Tx medium.....Speech
  8  00000010 : Pointer.....2 Dec
  9  00001010 : Pointer.....10 Dec
-- Called party nr
 10  00001000 : Length.....8 Dec
 11  1..... : Odd/Even ind.....Odd
     .0000011 : Nature of addr ind...National
                                         (significant) nr
 12  0..... : INN ind.....Routing to INN
                                         allowed
     .001.... : Numbering plan.....ISDN (telephony)
     ....0000 : Spare.....Ok
 13  ***** : Address signal.....3412516283f
 19  00001010 : Optional para.....Calling party
                                         number
-- Calling party number
 20  00000111 : Length.....7 Dec
 21  0..... : Odd/Even ind.....Even
     .0000011 : Nature of addr.....National
                                         (significant) nr
 22  0..... : N1 indicator.....Nr complete
     .001.... : Numbering plan.....ISDN (telephony)
     ....01.. : Presentation.....Restricted
     .....11 : Screening.....Net provided
 23  ***** : Address signal.....0959601121
 28  00000011 : Optional para.....Access transport
-- Access transport
 29  00000100 : Length.....4 Dec
 30  ***** : Info element.....7d 02 91 81
 34  00011101 : Optional para.....Usr service info
-- User service info
 35  00000011 : Length.....3 Dec
 36  1..... : Extension.....Last octet
     .00..... : Coding std.....CCITT standardized
                                         coding
     ...00000 : Info transfer cap....Speech
 37  1..... : Extension.....Last octet
     .00..... : Transfer mode.....Circuit mode

```



```

...10000 : Transfer rate.....64 kbit/s
38  1..... : Extension bit.....Last octet
   .01..... : Layer ID.....Layer 1
...00011 : Layer protocol.....A-Law
39  00000000 : Optional para.....End

```

29-10-96:16:00:45.534 Port-1 D1-Net L1->L0

L2: MTP (Whitebook)

```

4  ***** : DPC.....00-0-08-1
5  ***** : OPC.....00-7-08-1
7  0011.... : SLS.....3 Dec

```

L3: ISUP (Whitebook)

```

0  00000011 : Circuit id.....03 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00000110 : Message type.....ACM-Address
                                   complete

```

-- Backward call inds

```

3  00..... : ETE method.....No ETE avail
   ..01.... : Called party cat.....Ordinary
                                   subscriber
   ....01.. : Called party status..Subscriber free
   .....10 : Charge ind.....Charge
4  00..... : SCCP method avail....No indication
   ..1..... : Echo control device..Included
   ...1.... : ISDN access.....Terminating access
                                   ISDN
   ....0... : Holding .....Not requested
   .....1.. : ISDN User Part.....ISUP all the way
   .....0. : ETE info.....None avail
   .....0 : Interworking.....None encountered
5  00000001 : Pointer.....1 Dec
6  00101001 : Optional para.....Optional bkwd
call
                                   ind
7  00000001: Length.....1 Dec

```

-- Optional backward call inds

```

8  0000.... : Spare.....00 Hex
   ....0... : MLPP user.....No indication
   .....0.. : Simple segmentation..Will send no
                                   additional info
   .....0. : Call diversion.....No indication
   .....1 : In band info.....Now avail
9  00000000 : Optional para.....End

```

29-10-96:16:00:52.642 Port-1 D1-Net L1-LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-0-8-1
5 ***** : OPC.....00-7-08-1
7 0011.... : SLS.....3 Dec

L3: ISUP (Whitebook)

0 00000011 : Circuit id.....03 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001001 : Message type.....ANM-Answer
3 00000000 : Pointer.....0 Dec

2.3. Определение номера вызываемого абонента [COLP: Connection Line Identification/Identity Presentation]

27-11-96:16:46:33.323 Port-1 D1-Net L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-2-00-2
5 ***** : OPC.....00-0-08-1
7 0101.... : SLS.....5 Dec

L3: ISUP (Whitebook)

0 00000101 : Circuit id.....05 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00000001 : Message type.....IAM-Initial
address

-- Nature of connection ind

3 000.... : Spare.....00 Hex
...0.... : Echo control device..Not included
....00.. : Continuity check.....Not required
.....00 : Satellite.....None in the
connection

-- Forward call inds

4 00..... : ISUP preference.....Preferred all
the

way

..1..... : ISUP part.....Used all the way
...0.... : ETE info.....None avail
....0... : Interworking.....None encountered
.....00. : ETE method.....No ETE avail
.....0 : Call type.....National
5 0000.... : Reserved (nat use)...00 Hex
....0... : Spare.....00 Hex

```

.....00. : SCCP method.....No indication
.....1 : ISDN access.....Originating access
        ISDN
-- Calling party cat
  6  00001010 : Category.....Ordinary calling
        subscriber
-- Tx medium requirement
  7  00000000 : Tx medium.....Speech
  8  00000010 : Pointer.....2 Dec
  9  00001010 : Pointer.....10 Dec
-- Called party nr
 10  00001000 : Length.....8 Dec
 11  1..... : Odd/Even ind.....Odd
     .0000011 : Nature of addr ind...National
        (significant) nr
 12  0..... : INN ind.....Routing to INN
        allowed
     .001.... : Numbering plan.....ISDN (telephony)
     ....0000 : Spare.....Ok
 13  ***** : Address signal.....8123212348f
 19  00001010 : Optional para.....Calling party
        number
-- Calling party number
 20  00000111 : Length.....7 Dec
 21  0..... : Odd/Even ind.....Even
     .0000011 : Nature of addr.....National
        (significant) nr
 22  0..... : N1 indicator.....Nr complete
     .001.... : Numbering plan.....ISDN (telephony)
     ....00.. : Presentation.....Allowed
     .....01 : Screening.....User provided,
        verified, passed
 23  ***** : Address signal.....0959601100
 28  00001000 : Optional para.....Optional fwd
call
        ind
-- Optional forward call inds
 29  00000001 : Length.....1 Dec
 30  1..... : Connected line id....Requested
     .0000... : Spare.....00 Hex

     .....0.. : Simple segmentation..Will send no
        additional info
     .....00 : CUG call.....Non-CUG call

```

```

31 00000011 : Optional para.....Access transport
-- Access transport
32 00000100 : Length.....4 Dec
33 ***** : Info element.....7d 02 91 81
37 00011101 : Optional para.....Usr service info
-- User service info
38 00000011 : Length.....3 Dec
39 1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
               coding
   ...00000 : Info transfer cap....Speech
40 1..... : Extension.....Last octet
   .00..... : Transfer mode.....Circuit mode
   ...10000 : Transfer rate.....64 kbit/s
41 1..... : Extension bit.....Last octet
   .01..... : Layer ID.....Layer 1
   ...00011 : Layer protocol.....A-Law
42 00000000 : Optional para.....End

```

27-11-96:16:46:33.448 Port-1 D1-Usr L1->L0

L2: MTP (Whitebook)

```

4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-2-00-2
7 0101.... : SLS.....5 Dec

```

L3: ISUP (Whitebook)

```

0 00000101 : Circuit id.....05 Hex
1 0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2 00000110 : Message type.....ACM-Address
               complete

```

-- Backward call inds

```

3 00..... : ETE method.....No ETE avail
   ..00.... : Called party cat....No indication
   ....00.. : Called party status..No indication
   .....10 : Charge ind.....Charge
4 00..... : SCCP method avail....No indication
   ..0..... : Echo control device..Not included
   ...1.... : ISDN access.....Terminating access
               ISDN
   ....0... : Holding.....Not requested
   .....1.. : ISDN User Part.....ISUP all the way
   .....0. : ETE info.....None avail
   .....0 : Interworking.....None encountered
5 00000000 : Pointer.....0 Dec

```

27-11-96:16:46:36.081 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-2-00-2
7 0101.... : SLS.....5 Dec

L3: ISUP (Whitebook)

0 00000101 : Circuit id.....05 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00101100 : Message type.....CPG-Call

progress

-- Event info

3 0..... : Event presentation...No indication
.0000001 : Event ind.....Alerting
4 00000001 : Pointer.....1 Dec
5 00000011 : Optional para.....Access transport

-- Access transport

6 00000100 : Length.....4 Dec
7 ***** : Info element.....1e 02 82 88
11 00000000 : Optional para.....End

27-11-96:16:46:43.705 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-2-00-2
7 0101.... : SLS.....5 Dec

L3: ISUP (Whitebook)

0 00000101 : Circuit id.....05 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001001 : Message type.....ANM-Answer
3 00000001 : Pointer.....1 Dec
4 00100001 : Optional para.....Connected nr

-- Connected nr

5 00000111 : Length.....7 Dec
6 0..... : Odd/Even ind.....Even
.0000011 : Nature of addr.....National
(significant) nr
7 0..... : Spare.....00 Hex
.001.... : Numbering plan.....ISDN (telephony)
....00.. : Presentation.....Allowed
.....11 : Screening.....Net provided
8 ***** : Address signal.....8123212348

13 00000000 : Optional para.....End

2.4. Запрет определения номера вызываемого абонента [COLR: Connection Line Identification/Identity Restriction]

29-10-96:17:19:00.247 Port-1 D1-Net L1->L0

L2: MTP (Whitebook)

4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-7-08-1
7 0110.... : SLS.....6 Dec

L3: ISUP (Whitebook)

0 00000110 : Circuit id.....06 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00000001 : Message type.....IAM-Initial
address

-- Nature of connection ind

3 000.... : Spare.....00 Hex
...1.... : Echo control device..Included
....00.. : Continuity check....Not required
.....01 : Satellite.....One in the
connection

-- Forward call inds

4 01..... : ISUP preference.....Not required all
the way
..1..... : ISUP part.....Used all the way
...0.... : ETE info.....None avail
....0... : Interworking.....None encountered
.....00. : ETE method.....No ETE avail
.....0 : Call type.....National
5 0000.... : Reserved (nat use)...00 Hex
....0... : Spare.....00 Hex
....00. : SCCP method.....No indication
.....1 : ISDN access.....Originating
access ISDN

-- Calling party cat

6 00001010 : Category.....Ordinary calling
subscriber

-- Tx medium requirement

7 00000000 : Tx medium.....Speech
8 00000010 : Pointer.....2 Dec
9 00001010 : Pointer.....10 Dec

-- Called party nr

10 00001000 : Length.....8 Dec
11 1..... : Odd/Even ind.....Odd

```

    .0000011 : Nature of addr ind...National
                                     (significant)nr
12  0..... : INN ind.....Routing to INN
                                     allowed
    .001.... : Numbering plan.....ISDN (telephony)
    ....0000 : Spare.....Ok
13  ***** : Address signal.....0959601120f
19  00001010 : Optional para.....Calling party
                                     number
-- Calling party number
20  00000111 : Length.....7 Dec
21  0..... : Odd/Even ind.....Even
    .0000011 : Nature of addr.....National
                                     (significant) nr
22  0..... : N1 indicator.....Nr complete
    .001.... : Numbering plan.....ISDN (telephony)
    ....01.. : Presentation.....Restricted
    .....01 : Screening.....User provided,
                                     verified, passed
23  ***** : Address signal.....3412516283
28  00001000 : Optional para.....Optional fwd
call
                                     ind
-- Optional forward call inds
29  00000001 : Length.....1 Dec
30  1..... : Connected line id...Requested
    .0000... : Spare.....00 Hex
    .....0.. : Simple segmentation..Will send no
                                     additional info
    .....00 : CUG call.....Non-CUG call
31  00000011 : Optional para.....Access transport
-- Access transport
32  00010001 : Length.....17 Dec
33  ***** : Info element.....7d 02 91 81 71
04
                                     80 50 31 33 6d 05
                                     80 50 30 30 34
50  00011101 : Optional para.....Usr service info
-- User service info
51  00000011 : Length.....3 Dec
52  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                                     coding
    ...00000 : Info transfer cap....Speech

```

```

53  1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
54  1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A-Law
55  00000000 : Optional para.....End

```

29-10-96:17:19:01.051 Port-1 D1-Usr L1->L0

L2: MTP (Whitebook)

```

4  ***** : DPC.....00-7-08-1
5  ***** : OPC.....00-0-08-1
7  0110.... : SLS.....6 Dec

```

L3: ISUP (Whitebook)

```

0  00000110 : Circuit id.....06 Hex
1  0000.... : Spare.....Ok
    ....0000 : Circuit id (lower)...00 Hex
2  00000110 : Message type.....ACM-Address
                               complete

```

-- Backward call inds

```

3  00..... : ETE method.....No ETE avail
    ..01.... : Called party cat.....Ordinary
                               subscriber
    ....01.. : Called party status..Subscriber free
    .....10 : Charge ind.....Charge
4  00..... : SCCP method avail...No indication
    ..1..... : Echo control device..Included
    ...1.... : ISDN access.....Terminating access
                               ISDN
    ....0... : Holding.....Not requested
    .....1.. : ISDN User Part.....ISUP all the way
    .....0. : ETE info.....None avail
    .....0 : Interworking.....None encountered
5  00000001 : Pointer.....1 Dec
6  00101001 : Optional para.....Optional bkwd
call

```

ind

```

7  00000001 : Length.....1 Dec

```

-- Optional backward call inds

```

8  0000.... : Spare.....00 Hex
    ....0... : MLPP user.....No indication
    .....0.. : Simple segmentation..Will send no
                               additional info
    .....0. : Call diversion.....No indication

```



```
.....1 : In band info.....Now avail
9 00000000 : Optional para.....End
```

29-10-96:17:19:03.167 Port-1 D1-Usr L1->LO

L2: MTP {Whitebook}

```
4 ***** : DPC.....00-7-08-1
5 ***** : OPC.....00-0-08-1
7 0110.... : SLS.....6 Dec
```

L3: ISUP (Whitebook)

```
0 00000110 : Circuit id.....06 Hex
1 0000.... : Spare.....Ok
  ....0000 : Circuit id (lower)...00 Hex
2 00001001 : Message type.....ANM-Answer
3 00000001 : Pointer.....1 Dec
4 00100001 : Optional para.....Connected nr
-- Connected nr
5 00000111 : Length.....7 Dec
6 0..... : Odd/Even ind.....Even
  .0000011 : Nature of addr.....National
                                     (significant) nr
7 0..... : Spare.....00 Hex
  .001.... : Numbering plan.....ISDN (telephony)
  ....01.. : Presentation.....Restricted
  .....01 : Screening.....User provided,
                                     verified, passed
8 ***** : Address signal.....0959601120
13 00000000 : Optional para.....End
```

2.5. Поадресация

29-10-96:16:32:24.072 Port-1 D1-Net L1->LO

L2: MTP (Whitebook)

```
4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-7-08-1
7 0110.... : SLS.....6 Dec
```

L3: ISUP (Whitebook)

```
0 00000110 : Circuit id.....06 Hex
1 0000.... : Spare.....Ok
  ....0000 : Circuit id (lower)...00 Hex
2 00000001 : Message type.....IAM-Initial
                                     address
-- Nature of connection ind
3 000..... : Spare.....00 Hex
```

```

...1.... : Echo control device..Included
...00.. : Continuity check.....Not required
.....01 : Satellite.....One in the
           connection
-- Forward call inds
  4  01..... : ISUP preference.....Not required all
           the way
    ..1.... : ISUP part.....Used all the way
    ...0.... : ETE info.....None avail
    ....0... : Interworking.....None encountered
    .....00. : ETE method.....No ETE avail
    .....0 : Call type.....National
  5  0000.... : Reserved (nat use)...00 Hex
    ....0... : Spare.....00 Hex
    .....00. : SCCP method.....No indication
    .....1 : ISDN access.....Originating access
           ISDN
-- Calling party cat
  6 00001010 : Category.....Ordinary calling
           subscriber
-- Tx medium requirement
  7  00000000 : Tx medium.....Speech
  8  00000010 : Pointer.....2 Dec
  9  00001010 : Pointer.....10 Dec
-- Called party nr
 10  00001000 : Length.....8 Dec
 11  1..... : Odd/Even ind.....Odd
    .0000011 : Nature of addr ind...National
           (significant) nr
 12  0..... : INN ind.....Routing to INN
           allowed
    .001.... : Numbering plan.....ISDN (telephony)
    ....0000 : Spare.....Ok
 13  ***** : Address signal.....0959601120f
 19  00001010 : Optional para.....Calling party
           number
-- Calling party number
 20  00000111 : Length.....7 Dec
 21  0..... : Odd/Even ind.....Even
    .0000011 : Nature of addr.....National
           (significant) nr
 22  0..... : N1 indicator.....Nr complete
    .001.... : Numbering plan.....ISDN (telephony)
    ....01.. : Presentation.....Restricted

```

```

.....01 : Screening.....User provided,
                                verified, passed
23  ***** : Address signal.....3412516284
28  00001000 : Optional para.....Optional fwd
call
                                ind
-- Optional forward call inds
29  00000001 : Length.....1 Dec
30  1..... : Connected line id....Requested
    .0000... : Spare.....00 Hex
    .....0.. : Simple segmentation..Will send no
                                additional info
    .....00 : CUG call.....Non-CUG call
31  00000011 : Optional para.....Access transport
-- Access transport
32  00010001 : Length.....17 Dec
33  ***** : Info element.....7d 02 91 81/71
04
                                80 50 31 33/6d 05
                                80 50 30 30 33
                                71-called party SA
                                6d-calling party SA
50  00011101 : Optional para.....Usr service
                                info
-- User service info
51  00000011 : Length.....3 Dec
52  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                                coding
    ...00000 : Info transfer cap....Speech
53  1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
54  1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A-Law
55  00000000 : Optional para.....End

```

29-10-96:16:32:24.863 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

```

4  ***** : DPC.....00-7-08-1
5  ***** : OPC.....00-0-08-1
7  0110.... : SLS.....6 Dec

```

L3: ISUP (Whitebook)

```

0  00000110 : Circuit id.....06 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00000110 : Message type.....ACM-Address
                               complete
-- Backward call inds
3  00..... : ETE method.....No ETE avail
   ..01.... : Called party cat.....Ordinary
                               subscriber
   ....01.. : Called party status..Subscriber free
   .....10 : Charge ind.....Charge
4  00..... : SCCP method avail....No indication
   ..1..... : Echo control device..Included

   ...1.... : ISDN access.....Terminating access
                               ISDN
   ....0... : Holding.....Not requested
   .....1.. : ISDN User Part.....ISUP all the way
   .....0. : ETE info.....None avail
   .....0 : Interworking.....None encountered
5  00000001 : Pointer.....1 Dec
6  00101001 : Optional para.....Optional bkwd
call
                               ind
7  00000001 : Length.....1 Dec
-- Optional backward call inds
8  0000.... : Spare.....00 Hex
   ....0... : MLPP user.....No indication
   .....0.. : Simple segmentation..Will send no
                               additional info
   .....0. : Call diversion.....No indication
   .....1 : In band info.....Now avail
9  00000000 : Optional para.....End

```

29-10-96:16:32:35.146 Port-1 D1-Usr L1->L0

L2: MTP (Whitebook)

```

4  ***** : DPC.....00-7-08-1
5  ***** : OPC.....00-0-08-1
7  0110.... : SLS.....6 Dec

```

L3: ISUP (Whitebook)

```

0  00000110 : Circuit id.....06 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex

```

```

2 00001001 : Message type.....ANM-Answer
3 00000001 : Pointer.....1 Dec
4 00100001 : Optional para.....Connected nr
-- Connected nr
5 00000111 : Length.....7 Dec
6 0..... : Odd/Even ind.....Even
  .0000011 : Nature of addr.....National
                                     (significant) nr
7 0..... : Spare.....00 Hex
  .001.... : Numbering plan.....ISDN (telephony)
  ....00.. : Presentation.....Allowed
  .....01 : Screening.....User provided,
                                     verified, passed
8 ***** : Address signal.....0959601120
13 00000000 : Optional para.....End

```

2.6. Переносимость терминала

01-11-96:15:38:51.109 Port-1 Dl-Usr L1->L0

L2: MTP {Whitebook}

```

4 ***** : DPC.....00-7-08-1
5 ***** : OPC.....00-0-08-1
7 0111.... : SLS.....7 Dec

```

L3: ISUP (Whitebook)

```

0 00000111 : Circuit id.....07 Hex
1 0000.... : Spare.....Ok
  ....0000 : Circuit id (lower)...00 Hex
2 00000001 : Message type.....IAM-Initial
                                     address

```

-- Nature of connection ind

```

3 000..... : Spare.....00 Hex
  ...1.... : Echo control device..Included
  ....00.. : Continuity check.....Not required
  .....01 : Satellite.....One in the
                                     connection

```

-- Forward call inds

```

4 00..... : ISUP preference.....Preferred all
the
                                     way
  ..1..... : ISUP part.....Used all the way
  ...0.... : ETE info.....None avail
  ....0... : Interworking.....None encountered
  .....00. : ETE method.....No ETE avail
  .....0   : Call type.....National
5 0000.... : Reserved (nat use)...00 Hex

```

```

.....0... : Spare.....00 Hex
.....00. : SCCP method.....No indication
.....1 : ISDN access.....Originating access
                                ISDN
-- Calling party cat
  6  00001010 : Category.....Ordinary calling
                                subscriber
-- Tx medium requirement
  7  00000000 : Tx medium.....Speech
  8  00000010 : Pointer.....2 Dec
  9  00001010 : Pointer.....10 Dec
-- Called party nr
 10  00001000 : Length.....8 Dec
 11  1..... : Odd/Even ind.....Odd
     .0000011 : Nature of addr ind...National
                                (significant) nr
 12  0..... : INN ind.....Routing to INN
                                allowed
     .001.... : Numbering plan.....ISDN (telephony)
     ....0000 : Spare.....Ok
 13  *..... : Address signal.....3412516284f
 19  00001010 : Optional para.....Calling party
                                number
-- Calling party number
 20  00000111 : Length.....7 Dec
 21  0..... : Odd/Even ind.....Even
     .0000011 : Nature of addr.....National
                                (significant) nr
 22  0..... : NI indicator.....Nr complete
     .001.... : Numbering plan.....ISDN (telephony)
     ....00.. : Presentation.....Allowed
     .....11 : Screening.....Net provided
 23  *..... : Address signal.....0959601121
 28  00000011 : Optional para.....Access transport
-- Access transport
 29  00000100 : Length.....4 Dec
 30  *..... : Info element.....7d 02 91 81
 34  00011101 : Optional para.....Usr service info
-- User service info
 35  00000011 : Length.....3 Dec
 36  1..... : Extension.....Last octet
     .00..... : Coding std.....CCITT standardized
                                coding
     ...00000 : Info transfer cap....Speech

```

```

37  1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
38  1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A-Law
39  00000000 : Optional para.....End

```

01-11-96:15:38:52.170 Port-1 D1-Net L1->L0

L2: MTP (Whitebook)

```

4   **** : DPC.....00-0-08-1
5   **** : OPC.....00-7-08-1
7   0111... : SLS.....7 Dec

```

L3: ISUP (Whitebook)

```

0   00000111 : Circuit id.....07 Hex
1   0000.... : Spare.....Ok
    ....0000 : Circuit id (lower)...00 Hex
2   00000110 : Message type.....ACM-Address
                                complete

```

-- Backward call inds

```

3   00..... : ETE method.....No ETE avail
    ..01.... : Called party cat.....Ordinary
                                subscriber
    ....01.. : Called party status..Subscriber free
    .....10 : Charge ind.....Charge
4   00..... : SCCP method avail....No indication
    ..1..... : Echo control device..Included
    ...1.... : ISDN access.....Terminating access
                                ISDN
    ....0... : Holding.....Not requested
    .....1.. : ISDN User Part.....ISUP all the way
    .....0. : ETE info.....None avail
    .....0 : Interworking.....None encountered
5   00000001 : Pointer.....1 Dec
6   00101001 : Optional para.....Optional bkwd
call

```

ind

```

7   00000001 : Length.....1 Dec

```

-- Optional backward call inds

```

8   0000.... : Spare.....00 Hex
    ....0... : MLPP user.....No indication
    .....0.. : Simple segmentation..Will send no
                                additional info
    .....0. : Call diversion.....No indication

```

.....1 : In band info.....Now avail
9 00000000 : Optional para.....End

01-11-96:15:38:54.099 Port-1 D1-Net L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-7-08-1
7 0111.... : SLS.....7 Dec

L3: ISUP (Whitebook)

0 00000111 : Circuit id.....07 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001001 : Message type.....ANM-Answer
3 00000000 : Pointer.....0 Dec

01-11-96:15:39:37.143 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-7-08-1
5 ***** : OPC.....00-0-08-1
7 0111.... : SLS.....7 Dec

L3: ISUP (Whitebook)

0 00000111 : Circuit id.....07 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001101 : Message type.....SUS-Suspend
-- Suspend/Resume ind
3 00000000. : Spare.....00 Hex
.....0 : Suspend/Resume.....ISDN subscriber
intiated
4 00000000 : Pointer.....0 Dec

01-11-96:15:39:52.860 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-7-08-1
5 ***** : OPC.....00-0-08-1
7 0111.... : SLS.....7 Dec

L3: ISUP (Whitebook)

0 00000111 : Circuit id.....07 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001110 : Message type.....RES-Resume
-- Suspend/Resume ind
3 00000000. : Spare.....00 Hex


```
.....0 : Suspend/Resume.....ISDN subscriber
intiated
4 00000000 : Pointer.....0 Dec
```

01-11-96:15:40:10.784 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

```
4 ***** : DPC.....00-7-08-1
5 ***** : OPC.....00-0-08-1
7 0111.... : SLS.....7 Dec
```

L3: ISUP (Whitebook)

```
0 00000111 : Circuit id.....07 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001100 : Message type.....REL-Release
3 00000010 : Pointer.....2 Dec
4 00000000 : Pointer.....0 Dec
```

-- Cause inds

```
5 00000010 : Length.....2 Dec
6 1..... : Extension.....Last octet
.00..... : Coding std.....CCITT standardized
coding
...0.... : Spare.....Spare
....0000 : Location.....User
7 1..... : Extension.....Last octet
.0010000 : Cause value.....Normal call
clearing
```

01-11-96:15:40:11.431 Port-1 D1-Net L1->LO

L2: MTP (Whitebook)

```
4 ***** : DPC.....00-0-08-1
5 ***** : OPC.....00-7-08-1
7 0111.... : SLS.....7 Dec
```

L3: ISUP (Whitebook)

```
0 00000111 : Circuit id.....07 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00010000 : Message type.....RLC-Release
complete
3 00000000 : Pointer.....0 Dec
```

2.7. Удержание вызова

24-10-96:11:33:50.822 Port-1 D1-Net L1->L0

L2: MTP (Whitebook)

4 **** : DPC.....00-0-08-1
5 **** : OPC.....00-2-00-2
7 0010.... : SLS.....2 Dec

L3: ISUP (Whitebook)

0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
. . . . 0000 : Circuit id (lower)...00 Hex
2 00000001 : Message type.....IAM-Initial
 address

-- Nature of connection ind

3 000.... : Spare.....00 Hex
. . . . 0.... : Echo control device..Not included
.00.. : Continuity check....Not required
.00 : Satellite.....None in the
 connection

-- Forward call inds

4 01.... : ISUP preference.....Not required all
 the way
. . 1.... : ISUP part.....Used all the way
. . . 0.... : ETE info.....None avail
. . . . 0... : Interworking.....None encountered
.00. : ETE method.....No ETE avail
.0 : Call type.....National
5 0000.... : Reserved(nat use)...00 Hex
. . . . 0... : Spare.....00 Hex
.00. : SCCP method.....No indication
.0 : ISDN access.....Originating access
 non-ISDN

-- Calling party cat

6 00001010 : Category.....Ordinary calling
 subscriber

-- Tx medium requirement

7 00000000 : Tx medium.....Speech
8 00000010 : Pointer.....2 Dec
9 00000000 : Pointer.....0 Dec

-- Called party nr

10 00000111 : Length.....7 Dec
11 0.... : Odd/Even ind.....Even
. . 0000011 : Nature of addr ind...National
 (significant) nr
12 1.... : INN ind.....Routing to INN
not

allowed
.001.... : Numbering plan.....ISDN (telephony)
....0000 : Spare.....Ok
13 ***** : Address signal.....0959601100

24-10-96:11:33:51.483 Port-1 D1-Usr L1->L0

L2: MTP (Whitebook)

4 ***** : DPC.....00-2-00-2
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS.....2 Dec

L3: ISUP (Whitebook)

0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00000110 : Message type.....ACM-Address
complete

-- Backward call inds

3 00..... : ETE method.....No ETE avail
..01.... : Called party cat.....Ordinary
subscriber
....01.. : Called party status..Subscriber free
.....10 : Charge ind.....Charge
4 00..... : SCCP method avail....No indication
..0..... : Echo control device..Not included
...1.... : ISDN access.....Terminating access
ISDN
....0... : Holding.....Not requested
.....1.. : ISDN User Part.....ISUP all the way
.....0. : ETE info.....None avail
.....0 : Interworking.....None encountered
5 00000001 : Pointer.....1 Dec
6 00101001 : Optional para.....Optional bkwd
call
ind
7 00000001 : Length.....1 Dec

-- Optional backward call inds

8 0000.... : Spare.....00 Hex
....0... : MLPP user.....No indication
.....0.. : Simple segmentation..Will send no
additional in.
.....0. : Call diversion.....No indication
.....1 : In band info.....Now avail
9 00000000 : Optional para.....End

24-10-96:11:33:57.528 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-2-00-2
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS.....2 Dec

L3: ISUP (Whitebook)

0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00001001 : Message type.....ANM-Answer
3 00000000 : Pointer.....0 Dec

24-10-96:11:34:25.895 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-2-00-2
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS.....2 Dec

L3: ISUP (Whitebook)

0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok
....0000 : Circuit id (lower)...00 Hex
2 00101100 : Message type.....CPG-Call
progress

-- Event info

3 0..... : Event presentation...No indication
.00000010 : Event ind.....Progress
4 00000001 : Pointer.....1 Dec
5 00101100 : Optional para.....Generic
notification ind

-- Generic notification

6 00000001 : Length.....1 Dec
7 1..... : Extension.....Last octet
.1111001 : Notification.....Remote hold
8 00000000 : Optional para.....End

124-10-96:11:34:40.779 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

4 ***** : DPC.....00-2-00-2
5 ***** : OPC.....00-0-08-1
7 0010.... : SLS.....2 Dec

L3: ISUP (Whitebook)

0 00000010 : Circuit id.....02 Hex
1 0000.... : Spare.....Ok

```

    ....0000 : Circuit id (lower)...00 Hex
  2  00101100 : Message typ.....CPG-Call progress
-- Event info
  3  0..... : Event presentation...No indication
    .0000010 : Event ind.....Progress
  4  00000001 : Pointer.....1 Dec
  5  00101100 : Optional para.....Generic
                                           notification ind
-- Generic notification
  6  00000001 : Length.....1 Dec
  7  1..... : Extension.....Last octet
    .1111010 : Notification.....Remote retrieval
  8  00000000 : Optional para.....End

```

24-10-96:11:35:34.305 Port-1-D1-Net L1->LO

L2: MTP (Whitebook)

```

  4  ***** : DPC.....00-0-08-1
  5  ***** : OPC.....00-2-00-2
  7  0010.... : SLS.....2 Dec

```

L3: ISUP (Whitebook)

```

  0  00000010 : Circuit id.....02 Hex
  1  0000.... : Spare.....Ok
    ....0000 : Circuit id (lower)...00 Hex
  2  00001100 : Message type.....REL-Release
  3  00000010 : Pointer.....2 Dec
  4  00000000 : Pointer.....0 Dec

```

-- Cause inds

```

  5  00000010 : Length.....2 Dec
  6  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                                           coding
    ...0.... : Spare.....Spare
    ...0011 : Location.....Transit network
  7  1..... : Extension.....Last octet
    .0010000 : Cause value.....Normal call
                                           clearing

```

24-10-96:11:35:34.416 Port-1 D1-Usr L1->LO

L2: MTP (Whitebook)

```

  4  ***** : DPC.....00-2-00-2
  5  ***** : OPC.....00-0-08-1
  7  0010.... : SLS.....2 Dec

```

L3: ISUP (Whitebook)

```

  0  00000010 : Circuit id.....02 Hex

```

```

1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00010000 : Message type.....RLC-Release
                               complete
3  00000000 : Pointer.....0 Dec

```

2.8. Информация "пользователь-пользователь"

27-11-96:19:35:46.541 Port-1 D1-Usr L1->L0

L2: MTP (Whitebook)

```

3  10..... : Network Indicator....National network
   ..00.... : Spare.....Ok
   ....0101 : Service Indicator....ISDN User Part
4  ***** : DPC.....00-0-08-1
5  ***** : OPC.....00-2-00-2
7  0100.... : SLS.....4 Dec

```

L3: ISUP (Whitebook)

```

0  00000100 : Circuit id.....04 Hex
1  0000.... : Spare.....Ok
   ....0000 : Circuit id (lower)...00 Hex
2  00000001 : Message type.....IAM-Initial
                               address
-- Nature of connection ind
3  000..... : Spare.....00 Hex
   ...0.... : Echo control device..Not included
   ....00.. : Continuity check.....Not required
   .....00 : Satellite.....None in the
                               connection
-- Forward call inds
4  00..... : ISUP preference.....Preferred all
the
                               way
   ..1..... : ISUP part.....Used all the way
   ....0.... : ETE info.....None avail
   ....0... : Interworking.....None encountered
   .....00. : ETE method.....No ETE avail
   .....0   : Call type.....National
5  0000.... : Reserved (nat use)...00 Hex
   ....0... : Spare.....00 Hex
   .....00. : SCCP method.....No indication
   .....1   : ISDN access.....Originating access
                               ISDN

```

```

-- Calling party cat
  6  00001010 : Category.....Ordinary calling
                                subscriber
-- Tx medium requirement
  7  00000000 : Tx medium.....Speech
  8  00000010 : Pointer.....2 Dec
  9  00001010 : Pointer.....10 Dec
-- Called party nr
 10  00001000 : Length.....8 Dec
 11  1..... : Odd/Even ind.....Odd
     .00000011 : Nature of addr ind...National
                                (significant) nr
 12  0..... : INN ind.....Routing to INN
                                allowed
     001..... : Numbering plan.....ISDN (telephony)
     ....0000 : Spare.....Ok
 13  ***** : Address signal.....0959601100f
 19  00001010 : Optional para.....Calling party
                                number
-- Calling party number
 20  00000111 : Length.....7 Dec
 21  0..... : Odd/Even ind.....Even
     .00000011 : Nature of addr.....National
                                (significant) nr
 22  0..... : N1 indicator.....Nr complete
     .001..... : Numbering plan.....ISDN (telephony)
     ....00.. : Presentation.....Allowed
     .....11 : Screening.....Net provided
 23  ***** : Address signal.....8123212348
 28  00000011 : Optional para.....Access transport
-- Access transport
 29  00001111 : Length.....15 Dec
 30  ***** : Info element.....6d 09 80 50 37
36
                                35 34 33 32 31 7d
                                02 91 81
 45  00011101 : Optional para.....Usr service info
-- User service info
 46  00000011 : Length.....3 Dec
 47  1..... : Extension.....Last octet
     .00..... : Coding std.....CCITT standardized
                                coding
     ...00000 : Info transfer cap....Speech
 48  1..... : Extension.....Last octet

```

```

    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
49   1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A-Law
50   00100000 : Optional para.....Usr to usr info
-- Usr to usr info
51   00110011 : Length.....51 Dec
52   00000100 : Protocol.....IA5 characters
53   *****) : Usr to usr info.....48 45 4c 4c 4f
20
                                     54 48 49 53 20 49 53
                                     20 41 20 54 45 53 54
                                     20 4d 45 53 53 41 47
                                     45 20 46 52 4f 4d 20
                                     41 54 43 33 32 35 19
                                     50 45 54 45 52 53 54
                                     41 52 HELLO THIS IS
                                     A TEST MESSAGE...
103          00000000 : Optional para.....End

```

2.9. Ожидающий вызов

26-01-98:13:53:04.356 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP_VO

L3: ISUP_W1

```

0   00000001 : Message type.....IAM-Initial
                                     address
-- Nature of connection indicators
1   000..... : Spare.....00 Hex
    ...0..... : Echo control device..Not included
    ...00.. : Continuity check.....Not required
    .....00 : Satellite.....None in the
                                     connection
-- Forward call indicators
2   00..... : ISUP preference.....Preferred all
the
                                     way
    ..1..... : ISUP part.....Used all the way
    ...0.... : ETE info.....None avail
    ....0... : Interworking.....None encountered
    .....00. : ETE method.....No ETE avail

```



```

.....0 : Call type.....National
3  0000.... : Reserved (nat use)...00 Hex
.....0... : Spare.....00 Hex
.....00. : SCCP method.....No indication
.....1 : ISDN access.....Originating
                        access ISDN

-- Calling party's category
4  11100010 : Category.....Unknown [00e2
Hex]
-- Transmission medium requirement
5  00000000 : Tx medium.....Speech
6  00000010 : Pointer.....2 Dec
7  00001000 : Pointer.....8 Dec
-- Called party number
8  00000110 : Length.....6 Dec
9  0..... : Odd/Even ind.....Even
.00000001 : Nature of addr ind...Subscriber nr
10 1..... : INN ind.....Routing to INN
not
                        allowed
.001.... : Numbering plan.....ISDN (telephony)
....0000 : Spare.....Ok
11 ***** : Address signal.....7491160f
15 00001010 : Optional para.....Calling party
                        number

-- Calling party number
16 00000111 : Length.....7 Dec
17 0..... : Odd/Even ind.....Even
.00000011 : Nature of addr.....National
                        (significant) nr
18 0..... : N1 indicator.....Nr complete
.001.... : Numbering plan.....ISDN (telephony)
....00.. : Presentation.....Allowed
.....01 : Screening.....User provided,
                        verified, passed
19 ***** : Address signal.....0965671100
24 00001000 : Optional para.....Optional fwd
call
                        ind

-- Optional forward call inds
25 00000001 : Length.....1 Dec
26 1..... : Connected line id...Requested
.0000... : Spare.....00 Hex
.....0.. : Simple segmentation..Will send no

```

```

                                additional info
.....00 : CUG call.....Non-CUG call
27 00000011 : Optional para.....Access transport
-- Access transport
28 00000100 : Length.....4 Dec
29 ***** : Info element.....7d 02 91 81
33 00011101 : Optional para.....Usr service info
-- User service info
34 00000011 : Length.....3 Dec
35 1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
                                coding
   ...00000 : Info transfer cap....Speech
36 1..... : Extension.....Last octet
   .00..... : Transfer mode.....Circuit mode
   ...10000 : Transfer rate.....64 kbit/s
37 1..... : Extension bit.....Last octet
   .01..... : Layer ID.....Layer 1
   ...00011 : Layer protocol.....A-Law
38 00000000 : Optional para.....End

```

26-01-98:13:53:04.873 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP_BO

L3: ISUP_W1

```

0 00000110 : Message type.....ACM-Address
                                complete
-- Backward call inds
1 00..... : ETE method.....No ETE avail
   ..01.... : Called party cat.....Ordinary
                                subscriber
   ....01.. : Called party status..Subscriber free
   .....10 : Charge ind.....Charge
2 00..... : SCCP method avail....No indication
   .0..... : Echo control device..Not included
   ...1.... : ISDN access.....Terminating
                                access ISDN
   ....0... : Holding.....Not requested
   .....1.. : ISDN User Part.....ISUP all the way
   .....0. : ETE info.....None avail
   .....0 : Interworking.....None encountered
3 00000001 : Pointer.....1 Dec
4 00101001 : Optional para.....Optional bkwd
                                call ind

```

```

5 00000001 : Length.....1 Dec
-- Optional backward call inds
6 0000.... : Spare.....00 Hex
   ....0... : MLPP user.....No indication
   .....0.. : Simple segmentation..Will send no
                                   additional info
   .....0. : Call diversion.....No indication
   .....1 : In band info.....Now avail
7 00101100 : Optional para.....Generic
                                   notification ind
-- Generic notification
8 00000001 : Length.....1 Dec
9 1..... : Extension.....Last octet
   .1100000 : Notification.....Call is a waiting
                                   call
10 00000000 : Optional para.....End

```

26-01-98:13:53:11.289 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP_BO

L3: ISUP_W1

```

0 00001001 : Message type.....ANM-Answer
1 00000001 : Pointer.....1 Dec
2 00100001 : Optional para.....Connected nr
-- Connected nr
3 00000111 : Length.....7 Dec
4 0..... : Odd/Even ind.....Even
   .0000011 : Nature of addr.....National
                                   (significant) nr
5 0..... : Spare.....00 Hex
   .001.... : Numbering plan.....ISDN (telephony)
   ....00.. : Presentation.....Allowed
   .....01 : Screening.....User provided,
                                   verified, passed
6 ***** : Address signal.....0957491160
11 00000000 : Optional para.....End

```

26-01-98:13:53:25.294 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP_BO

L3: ISUP_W1

```

0 00001100 : Message type.....REL-Release
1 00000010 : Pointer.....2 Dec
2 00000000 : Pointer.....0 Dec

```

```

-- Cause inds
3  00000010 : Length.....2 Dec
4  1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
                   coding
   ....0.... : Spare.....Spare
   ....0000 : Location.....User
5  1..... : Extension.....Last octet
   .0010000 : Cause value.....Normal call
                   clearing

```

26-01-98:13:53:25.364 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP_BO

L3: ISUP_W1

```

0  00010000 : Message type.....RLC-Release
                   complete
1  00000000 : Pointer.....0 Dec

```

2.10. Переадресация вызова

26-01-98:14:10:03.988 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP_BO

```

4  ***** : DPC.....129
5  ***** : OPC.....4
7  0001.... : SLS.....1 Dec
8  00000001 : CIC.....01 Hex
9  0000.... : Spare.....Ok
   ....0000 : CIC (upper).....00 Hex

```

L3: ISUP_W1

```

0  00000001 : Message type.....IAM-Initial
                   address

```

-- Nature of connection indicators

```

1  000..... : Spare.....00 Hex
   ...0.... : Echo control device..Not included
   ....00.. : Continuity check....Not required
   .....00 : Satellite.....None in the
                   connection

```

-- Forward call indicators

```

2  00..... : ISUP preference.....Preferred all
the

```

way


```

25  00000001 : Length.....1 Dec
26  1..... : Connected line id....Requested
    .0000... : Spare.....00 Hex
    .....0.. : Simple segmentation..Will send no
                additional info
    .....00 : CUG call.....Non-CUG call
27  00000011 : Optional para.....Access transport
-- Access transport
28  00000100 : Length.....4 Dec
29  ***** : Info element.....7d 02 91 81
33  00011101 : Optional para.....Usr service info
-- User service info
34  00000011 : Length.....3 Dec
35  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                coding
    ...00000 : Info transfer cap....Speech
36  1..... : Extension.....Last octet
    .00..... : Transfer mode.....Circuit mode
    ...10000 : Transfer rate.....64 kbit/s
37  1..... : Extension bit.....Last octet
    .01..... : Layer ID.....Layer 1
    ...00011 : Layer protocol.....A-Law
38  00000000 : Optional para.....End

```

26-01-98:14:10:04.435 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP_BO

```

4  ***** : DPC.....4
5  ***** : OPC.....129
7  0010.... : SLS.....2 Dec
8  00000010 : CIC.....02 Hex
9  0000.... : Spare.....Ok
    ....0000 : CIC (upper).....00 Hex

```

L3: ISUP_W1

```

0  00000001 : Message type.....IAM-Initial
                address

```

-- Nature of connection indicators

```

1  000..... : Spare.....00 Hex
    ...0.... : Echo control device..Not included
    ....00.. : Continuity check....Not required
    .....00 : Satellite.....None in the
                connection

```

-- Forward call indicators

```

2  00..... : ISUP preference.....Preferred all
                                the way
  ..1..... : ISUP part.....Used all the way
  ...0.... : ETE info.....None avail
  ....0... : Interworking.....None encountered
  .....00. : ETE method.....No ETE avail
  .....0 : Call type.....National
3  0000.... : Reserved (nat use)...00 Hex
  ....0... : Spare.....00 Hex
  .....00. : SCCP method.....No indication
  .....1 : ISDN access.....Originating access
                                ISDN

-- Calling party's category
4  11100010 : Category.....Unknown [00e2
Hex]

-- Transmission medium requirement
5  00000000 : Tx medium.....Speech
6  00000010 : Pointer.....2 Dec
7  00000111 : Pointer.....7 Dec

-- Called party number
8  00000101 : Length.....5 Dec
9  0..... : Odd/Even ind.....Even
  .0000001 : Nature of addr ind...Subscriber nr
10 1..... : INN ind.....Routing to INN
not
                                allowed
  .001.... : Numbering plan.....ISDN (telephony)
  ....0000 : Spare.....Ok
11  ***** : Address signal.....73333_f
14  00001010 : Optional para.....Calling party
                                number

-- Calling party number
15  00000111 : Length.....7 Dec
16  0..... : Odd/Even ind.....Even
  .0000011 : Nature of addr.....National
                                (significant) nr
17  0..... : N1 indicator.....Nr complete
  .001.... : Numbering plan.....ISDN (telephony)
  ....00.. : Presentation.....Allowed
  .....01 : Screening.....User provided,
                                verified, passed
18  ***** : Address signal.....0965671100
23  00101000 : Optional para.....Original
called nr

```

```

-- Original called number
24 00000111 : Length.....7 Dec
25 0..... : Odd/Even ind.....Even
   .0000011 : Nature of addr.....National
                                     (significant) nr
26 0..... : Spare.....00 Hex
   .001.... : Numbering plan.....ISDN (telephony)
   ....00.. : Presentation.....Allowed
   .....00 : Spare.....00 Hex
27 ***** : Address signal.....0957491160
32 00010011 : Optional para.....Redirection info
-- Redirection info
33 00000010 : Length.....2 Dec
34 0000.... : Redirection reasons..Unknown/Not
avail
   ....0... : Spare.....00 Hex
   .....011 : Redirecting ind.....Call diversion
35 0001.... : Redirecting reason...User busy
   ....0... : Spare.....00 Hex
   .....001 : Redirection counter..01 Hex
36 00001011 : Optional para.....Redirecting
number
-- Redirecting number
37 00000111 : Length.....7 Dec
38 0..... : Odd/Even ind.....Even
   .0000011 : Nature of addr.....National
                                     (significant) nr
39 0..... : Spare.....00 Hex
   .001.... : Numbering plan.....ISDN (telephony)
   ....00.. : Presentation.....Allowed
   .....00 : Spare.....00 Hex
40 ***** : Address signal.....0957491160
45 00001000 : Optional para.....Optional fwd
call
                                     ind
-- Optional forward call inds
46 00000001 : Length.....1 Dec
47 1..... : Connected line id...Requested
   .0000... : Spare.....00 Hex
   .....0.. : Simple segmentation..Will send no
                                     additional info
   .....00 : CUG call.....Non-CUG call
48 00000011 : Optional para.....Access transport
-- Access transport

```



```

49 00000100 : Length.....4 Dec
50 ***** : Info element.....7d 02 91 81
54 00011101 : Optional para.....Usr service info
-- User service info
55 00000011 : Length.....3 Dec
56 1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
                    coding
   ...00000 : Info transfer cap....Speech
57 1..... : Extension.....Last octet
   .00..... : Transfer mode.....Circuit mode
   ...10000 : Transfer rate.....64 kbit/s
58 1..... : Extension bit.....Last octet
   .01..... : Layer ID.....Layer 1
   ...00011 : Layer protocol.....A-Law
59 00000000 : Optional para.....End

```

26-01-98:14:10:04.440 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP_BO

```

4 ***** : DPC.....4
5 ***** : OPC.....129
7 0001.... : SLS.....1 Dec
8 00000001 : CIC.....01 Hex
9 0000.... : Spare.....Ok
   ....0000 : CIC (upper).....00 Hex

```

L3: ISUP_W1

```

0 00000110 : Message type.....ACM-Address
                    complete

```

-- Backward call inds

```

1 00..... : ETE method.....No ETE avail
   ..00.... : Called party cat....No indication
   ....00.. : Called party status..No indication
   .....10 : Charge ind.....Charge
2 00..... : SCCP method avail...No indication
   ..0..... : Echo control device..Not included
   ...1.... : ISDN access.....Terminating access
                    ISDN
   ....0... : Holding.....Not requested
   .....1.. : ISDN User Part.....ISUP all the way
   .....0. : ETE info.....None avail
   .....0 : Interworking.....None encountered
3 00000001 : Pointer.....1 Dec
4 00110110 : Optional para.....Call diversion

```

```

info
-- Call diversion info
5 00000001 : Length.....1 Dec
6 0..... : Spare.....00 Hex
  .0001... : Redirection reason...User busy
  .....010 : Subscription option..Allowed with
              redirection nr
7 00001100 : Optional para.....Redirection nr
-- Redirection nr
8 00001000 : Length.....8 Dec
9 0..... : Odd/Even ind.....Even
  .0000011 : Nature of addr.....National
              (significant) nr
10 1..... : INN ind.....Routing to INN
not
              allowed
  .001.... : Numbering plan.....ISDN (telephony)
  ....0000 : Spare.....00 Hex
11 ***** : Address signal.....095006673333
17 00101100 : Optional para.....Generic
              notification ind
-- Generic notification
18 00000001 : Length.....1 Dec
19 1..... : Extension.....Last octet
  .1111011 : Notification.....Call is diverting
20 00000000 : Optional para.....End

```

26-01-98:14:10:04.676 Port-1 D1-Net L1->L0

L1: LO_Raw_Message

L2: MTP_BO

```

4 ***** : DPC.....129
5 ***** : OPC.....4
7 0010.... : SLS.....2 Dec
8 00000010 : CIC.....02 Hex
9 0000.... : Spare.....Ok
  ....0000 : CIC (upper).....00 Hex

```

L3: ISUP_W1

```

0 00000110 : Message type.....ACM-Address
              complete

```

-- Backward call inds

```

1 00..... : ETE method.....No ETE avail
  ..01.... : Called party cat.....Ordinary
              subscriber
  ....00.. : Called party status..No indication

```

```

.....10 : Charge ind.....Charge
2  00..... : SCCP method avail....No indication
..0..... : Echo control device..Not included
...0.... : ISDN access.....Terminating access
                    non-ISDN
.....0... : Holding.....Not requested
.....1.. : ISDN User Part.....ISUP all the way
.....0. : ETE info.....None avail
.....0 : Interworking.....None encountered
3  00000000 : Pointer.....0 Dec

```

26-01-98:14:10:04.758 Port-1 D1-Usr L1->L0

L1: LO_Raw_Message

L2: MTP_BO

```

4  ***** : DPC.....4
5  ***** : OPC.....129
7  0001.... : SLS.....1 Dec
8  00000001 : CIC.....01 Hex
9  0000.... : Spare.....Ok
....0000 : CIC (upper).....00 Hex

```

L3: ISUP_W1

```

0  00101100 : Message type.....CPG-Call
progress

```

-- Event info

```

1  0..... : Event presentation...No indication
..0000010 : Event ind.....Progress
2  00000001 : Pointer.....1 Dec
3  00010001 : Optional para.....Backward call
ind

```

-- Backward call inds

```

4  00000010 : Length.....2 Dec
5  00..... : ETE method.....No ETE avail
..01.... : Called party cat....Ordinary
                    subscriber
.....00.. : Called party status..No indication
.....10 : Charge ind.....Charge
6  00..... : SCCP method avail....No indication
..0..... : Echo control device..Not included
...0.... : ISDN access.....Terminating access
                    non-ISDN
.....0... : Holding.....Not requested
.....1.. : ISDN User Part.....ISUP all the way
.....0. : ETE info.....None avail

```

.....0 : Interworking.....None encountered
7 00000000 : Optional para.....End

26-01-98:14:10:07.064 Port-1 D1-Net L1->LO

L1: LO_Raw_Message

L2: MTP_BO

4 ***** : DPC.....129
5 ***** : OPC.....4
7 0010.... : SLS.....2 Dec
8 00000010 : CIC.....02 Hex
9 0000.... : Spare.....Ok
....0000 : CIC (upper).....00 Hex

L3: ISUP_W1

0 00001100 : Message type.....REL-Release
1 00000010 : Pointer.....2 Dec
2 00000000 : Pointer.....0 Dec
-- Cause inds
3 00000010 : Length.....2 Dec
4 1..... : Extension.....Last octet
.00..... : Coding std.....CCITT standardized
coding
...0..... : Spare.....Spare
....0010 : Location.....Public net serving
local usr
5 1..... : Extension.....Last octet
.0010001 : Cause value.....User busy

26-01-98:14:10:07.135 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP_BO

4 ***** : DPC.....4
5 ***** : OPC.....129
7 0010.... : SLS.....2 Dec
8 00000010 : CIC.....02 Hex
9 0000.... : Spare.....Ok
....0000 : CIC (upper).....00 Hex

L3: ISUP_W1

0 00010000 : Message type.....RLC-Release
complete
1 00000000 : Pointer.....0 Dec

26-01-98:14:10:07.177 Port-1 D1-Usr L1->LO

L1: LO_Raw_Message

L2: MTP_BO

```

4  **** : DPC.....4
5  **** : OPC.....129
7  0001 : SLS.....1 Dec
8  00000001 : CIC.....01 Hex
9  0000 : Spare.....Ok
    ....0000 : CIC (upper).....00 Hex

```

L3: ISUP_W1

```

0  00001100 : Message type.....REL-Release
1  00000010 : Pointer.....2 Dec
2  00000000 : Pointer.....0 Dec
-- Cause inds
3  00000010 : Length.....2 Dec
4  1..... : Extension.....Last octet
    .00..... : Coding std.....CCITT standardized
                    coding
    ...0..... : Spare.....Spare
    ....0010 : Location.....Public net serving
                    local usr
5  1..... : Extension.....Last octet
    .0010001 : Cause value.....User busy

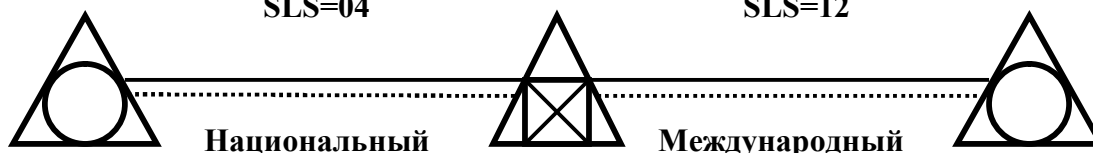
```

3. ПРОЦЕДУРА ОБСЛУЖИВАНИЯ ТРАНЗИТНОГО СОЕДИНЕНИЯ ДВУХУРОВНЕВОЙ СЕТИ СИГНАЛИЗАЦИИ

Транзитная АТС

**OPC=2177 DPC=2176
CIC: 20 ВК, 9 ИКМ тракт
SLS=04**

**OPC=5728 DPC=4832
CIC: 12 ВК, 0 ИКМ тракт
SLS=12**



АМТС - 2 г. Минск ←————→ МнТС г. Минск

1: 29/10/2002 15:13:12.142 Avista [4.3] Usr

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

0 1..... : BIB.....1
.1001100 : BSN.....4C Hex
1 1..... : FIB.....1
.1011010 : FSN.....5A Hex
2 00..... : Spare.....00 Hex
..110100 : Length indicator.....52 Dec
3 10..... : Network indicator.....National
network
..00..... : Spare.....00 Hex
....0101 : Service indicator.....ISUP-ISDN user
part
4 ***** : DPC.....0880 Hex 2176
5 ***** : OPC.....0881 Hex 2176
7 0100.... : SLS.....04 Dec
-- CIC decoding according to Q.763, 1.2 a
8 ***** : CIC channel number.....14 Hex
***** : CIC PCM link number.....09 Hex
0000.... : Spare.....0000 Hex

L3: [ISUP (Whitebook)]:

```
0 00000001 : Message type.....IAM-Initial
                        address
-- Nature of: connection indicators
1 000..... : Spare.....00 Hex
  ...0.... : Echo control device.....Not included
  ....00.. : Continuity check.....Not required
  .....00 : Satellite.....None in the
                        connection
-- Forward call indicators
2 00..... : ISUP preference.....Preferred all
                        the way
  ..1..... : ISUP part.....Used all the
                        way
  ...0.... : ETE info.....None avail
  ....0... : Interworking.....None
                        encountered
  .....00. : ETE method.....No ETE avail
  .....0 : Call type.....National
3 0000.... : Reserved (nat use).....00 Hex
  ....0... : Spare.....00 Hex
  .....00. : SCCP method.....No indication
  .....1 : ISDN access.....Originating
                        access ISDN
-- Calling party's category
4 11110110 : Category.....Unknown
[F6Hex]
-- Transmission medium requirement
5 00000000 : Tx medium.....Speech
6 00000010 : Pointer.....02 Dec
7 00001001 : Pointer.....09 Dec
- Called party number
8 00000111 : Length.....07 Dec
9 0..... : Odd/Even ind.....Even
.0000100 : Nature of addr ind.....International No.
10 0..... : INN ind.....Routing to
INN
                        allowed
.001.... : Numbering plan.....ISDN
                        (telephony)
....0000 : Spare.....Ok
11 ***** : Address signal.....3726402599
16 00001010 : Optional para.....Calling party
                        number
```

```

-- Calling party number
17 00000111 : Length.....07 Dec
18 0..... : Odd/Even ind.....Even
   .0000011 : Nature of addr.....National
                                   (significant) No.
19 0..... : NI indicator.....Nr complete
   .001.... : Numbering plan.....ISDN (telephony)
   ....00.. : Presentation.....Allowed
   .....11 : Screening.....Net provided
20 ***** : Address signal.....0172100044
25 00001000 : Optional para.....Optional fwd
                                   call ind

-- Optional forward call inds
26 00000001 : Length.....01 Dec
27 1..... : Connected line id.....Requested
   .0000... : Spare.....00 Hex
   .....0.. : Simple segmentation.....Will send no
                                   additional inf
   .....00 : CUG call.....Non-CUG call
28 00000011 : Optional para.....Access
                                   transport

-- Access transport
29 00001001 : Length.....09 Dec
30 ***** : Info element.....7D 02 91 81
7C
                                   03 80 90 A3
39 00011101 : Optional para.....Usr service
                                   info

-- User service info
40 00000011 : Length.....03 Dec
41 1..... : Extension bit.....Last octet
   .00..... : Coding standard.....CCITT standardized
                                   coding
   ...00000 : Info transfer cap.....Speech
42 1..... : Extension bit.....Last octet
   .00..... : Transfer mode.....Circuit mode
   ...10000 : Transfer rate.....64 kBit/s
43 1..... : Extension bit.....Last
octet
   .01..... : Layer ID.....Layer 1
   ...00011 : Layer protocol.....A-Law
44 00000000 : Optional para.....End

```


2: 29/10/2002 15:13:32.758 Avista [4.3] Net

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

0 1..... : BIB.....1
.0110001 : BSN.....31 Hex
1 1..... : FIB.....1
.1001001 : FSN.....49 Hex
2 00..... : Spare.....00 Hex
..001011 : Length indicator.....11 Dec
3 10..... : Network indicator.....National
network
..00.... : Spare.....00 Hex
....0101 : Service indicator.....ISUP-ISDN user
part
4 ***** : DPC.....0881 Hex
5 ***** : OPC.....0880 Hex
7 0100.... : SLS.....04 Dec
-- CIC decoding according to Q.763, 1.2 a
8 ***** : CIC channel number.....14 Hex
***** : CIC PCM link number.....09 Hex
0000.... : Spare.....0000 Hex

L3: [ISUP (Whitebook)]:

0 00000110 : Message type.....ACM-Address
complete
-- Backward call inds
1 00..... : ETE method.....No ETE avail
..01.... : Called party
cat.....Ordinary
subscriber
....00.. : Called party status.....No indication
.....10 : Charge ind.....Charge
2 00..... : SCCP method avail.....No indication
..0..... : Echo control device.....Not included
..1.... : ISDN access.....Terminating
access ISDN
.....0... : Holding.....Not requested
.....1.. : ISDN User Part.....ISUP all the
way
.....0. : ETE info.....None avail
.....0 : Interworking.....None
encountered
3 00000000 : Pointer.....00 Dec

3: 29/10/2002 15:13:32.910 Avista [4.3] Net

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

0 1..... : BIB.....1
.0110011 : BSN.....33 Hex
1 1..... : FIB.....1
.1001100 : FSN.....4C Hex
2 00..... : Spare.....00 Hex
..011000 : Length indicator.....24 Dec
3 10..... : Network indicator.....National
network
..00.... : Spare.....00 Hex
....0101 : Service indicator.....ISUP-ISDN user
part
4 ***** : DPC.....0881 Hex
5 ***** : OPC.....0880 Hex
7 0100.... : SLS.....04 Dec
-- CIC decoding according to Q.763, 1.2 a
8 ***** : CIC channel number.....14 Hex
***** : CIC PCM link number.....09 Hex
0000.... : Spare.....0000 Hex

L3: [ISUP (Whitebook)]:

0 00101100 : Message type.....CPG-Call
progress
-- Event info
1 0..... : Event presentation.....No indication
.0000001 : Event ind.....Alerting
2 00000001 : Pointer.....01 Dec
3 00010001 : Optional para.....Backward call
ind
-- Backward call inds
4 00000010 : Length.....02 Dec
5 00..... : ETE method.....No ETE avail
..01.... : Called party cat.....Ordinary
subscriber
....01.. : Called party status.....Subscriber free
.....10 : Charge ind.....Charge
6 00..... : SCCP method avail.....No indication
..0..... : Echo control device.....Not included
...1.... : ISDN access.....Terminating
access ISDN
....0... : Holding.....Not requested
.....1.. : ISDN User Part.....ISUP all the
way

```

.....0. : ETE info.....None avail
.....0 : Interworking.....None
                                encountered
7  00101001 : Optional para.....Optional bkwd
                                call ind
8  00000001 : Length.....01 Dec
-- Optional backward call inds
9  0000.... : Spare.....00 Hex
    ....0... : MLPP user.....No indication
    .....0.. : Simple segmentation.....Will send no
                                additional info
    .....0. : Call diversion.....No indication
    .....1 : In band info.....Now available
10 00000011 : Optional para.....Access
                                transport
-- Access transport
11 00000100 : Length.....04 Dec
12 ***** : Info element.....1E 02 80 88
16 00000000 : Optional para.....End

```

4: 29/10/2002 15:13:39.841 Avista [4.3] Net

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

```

0  1..... : BIB.....1
    .0001100 : BSN.....OC Hex
1  1..... : FIB.....1
    .1110000 : FSN.....70 Hex
2  00..... : Spare.....00 Hex
    ..011101 : Length indicator.....29 Dec
3  10..... : Network indicator.....National
                                network
    ..00.... : Spare.....00 Hex
    ....0101 : Service indicator.....ISUP-ISDN user
                                part
4  ***** : DPC.....0881 Hex
5  ***** : OPC.....0880 Hex
7  0100.... : SLS.....04 Dec
-- CIC decoding according to Q.763, 1.2 a
8  ***** : CIC channel number.....14 Hex
    ***** : CIC PCM link number.....09 Hex
    0000.... : Spare.....0000 Hex

```

L3: [ISUP (Whitebook)]:

```

0  00001001 : Message type.....ANM-Answer
1  00000001 : Pointer.....01 Dec

```

```

2 00010001 : Optional para.....Bkwd call ind
-- Backward call inds
3 00000010 : Length.....02 Dec
4 00..... : ETE method.....No ETE avail
  ..00.... : Called party cat.....No indication
  ....01.. : Called party status.....Subscriber free
  .....10. : Charge ind.....Charge
5 00..... : SCCP method avail.....No indication
  ..0..... : Echo control device.....Not included
  ...1.... : ISDN access.....Terminating
                    access ISDN
  ....0... : Holding.....Not requested
  .....1.. : ISDN User Part.....ISUP all the
                    way
  .....0. : ETE info.....None avail
  .....0 : Interworking.....None
                    encountered
6 00100001 : Optional para.....Connected nr
-- Connected nr
7 00000111 : Length.....07 Dec
8 0..... : Odd/Even ind.....Even
  .0000100 : Nature of addr.....International No.
9 0..... : Spare.....00 Hex
  .001.... : Numbering plan.....ISDN (telephony)
  ....00.. : Presentation.....Allowed
  .....01 : Screening.....User provided,
                    verified, passed
10 ***** : Address signal.....3726402599
15 00000011 : Optional para.....Access
                    transport
-- Access transport
16 00000100 : Length.....04 Dec
17 ***** : info element.....1E 02 80 82
21 00000000 : Optional para.....End

```

5: 29/10/2002 15:13:46.687 Avista [4.3] Usr

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

```

0 1..... : BIB.....1
  .1110100 : BSN.....74 Hex
1 1..... : FIB.....1
  .1011111 : FSN.....5F Hex
2 00..... : Spare.....00 Hex
  ..001101 : Length indicator.....13 Dec

```

```

3  10..... : Network indicator.....National
                                network
   ..00.... : Spare.....00 Hex
   ....0101 : Service indicator.....ISUP-ISDN user
                                part
4  ***** : DPC.....0880 Hex
5  ***** : OPC.....0881 Hex
7  0100.... : SLS.....04 Dec
-- CIC decoding according to Q.763, 1.2 a
8  ***** : CIC channel number.....14 Hex
   ***** : CIC PCM link number.....09 Hex
   0000.... : Spare.....0000 Hex

```

L3: [ISUP (Whitebook)]:

```

0  00001100 : Message type.....REL-Release
1  00000010 : Pointer.....02 Dec
2  00000000 : Pointer.....00 Dec
-- Cause inds
3  00000010 : Length.....02 Dec
4  1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized
                                coding
   ...0.... : Spare.....Spare
   ....0000 : Location.....User
5  1..... : Extension.....Last octet
   .0010000 : Cause value.....Normal call
                                clearing

```

6: 29/10/2002 15:13:46.724 Avista [4.3] Net

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

```

0  1..... : BIB.....1
   .10111111 : BSN.....5F Hex
1  1..... : FIB.....1
   .11101111 : FSN.....77 Hex
2  00..... : Spare.....00 Hex
   .001001 : Length indicator.....09 Dec
3  10..... : Network indicator.....National
                                network
   ..00.... : Spare.....00 Hex
   ....0101 : Service indicator.....ISUP-ISDN user
                                part
4  ***** : DPC.....0881 Hex
5  ***** : OPC.....0880 Hex
7  0100.... : SLS.....04 Dec

```

```
-- CIC decoding according to Q.763, 1.2 a
8  ***** : CIC channel number.....14 Hex
   ***** : CIC PCM link number.....09 Hex
   0000.... : Spare.....0000 Hex
```

L3: [ISUP (Whitebook)]:

```
0  00010000 : Message type.....RLC-Release
                               complete
1  00000000 : Pointer.....00 Dec
```

1: 29/10/2002 15:13:32.249 Avista [1.1] Net

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

```
0  1..... : BIB.....1
   .0011110 : BSN.....1E Hex
1  1..... : FIB.....1
   .0101101 : FSN.....2D Hex
2  00..... : Spare.....00 Hex
   ..110100 : Length indicator.....52 Dec
3  00..... : Network indicator.....International
                               network
   ..00.... : Spare.....00 Hex
   ....0101 : Service indicator.....ISUP-ISDN user
                               part
4  ***** : DPC.....12E0 Hex 4832
5  ***** : OPC.....1660 Hex 5728
7  1100.... : SLS.....12 Dec
```

```
-- CIC decoding according to Q.763, 1.2 a
8  ***** : CIC channel number.....0C Hex
   ***** : CIC PCM link number.....00 Hex
   0000.... : Spare.....0000 Hex
```

L3: [ISUP (Whitebook)]:

```
0  00000001 : Message type.....IAM-Initial
                               address
```

-- Nature of connection indicators

```
1  000..... : Spare.....00 Hex
   ...0.... : Echo control device.....Not included
   ....00.. : Continuity check.....Not required
   .....00 : Satellite.....None in the
                               connection
```

-- Forward call indicators

```
2  00..... : ISUP preference.....Preferred all
                               the way
   ..1..... : ISUP part.....Used all the
                               way
```

```

    ...0.... : ETE info.....None avail
    ....0... : Interworking.....None encountered
    .....00. : ETE method.....No ETE avail
    .....0 : Call type.....National
3   0000.... : Reserved (nat use).....00 Hex
    ....0... : Spare.....00 Hex
    .....00. : SCCP method.....No indication
    .....1 : ISDN access.....Originating
                                access ISDN
-- Calling party's category
4   00001010 : Category.....Ordinary calling
                                subscriber
- Transmission medium requirement
5   00000000 : Tx medium.....Speech
6   00000010 : Pointer.....02 Dec
7   00001000 : Pointer.....08 Dec
-- Called party number
8   00000110 : Length.....06 Dec
9   0..... : Odd/Even ind.....Even
    .0000011 : Nature of addr ind.....National
                                (significant) No.
10  0..... : INN ind.....Routing to
INN
                                allowed
    .001.... : Numbering plan.....ISDN (telephony)
    ....0000 : Spare.....Ok
11  ***** : Address signal.....6402599F
15  00001010 : Optional para.....Calling party
                                number
-- Calling party number
16  00001000 : Length.....08 Dec
17  0..... : Odd/Even ind.....Even
    .0000100 : Nature of addr.....International No.
18  0..... : NI indicator.....Nr complete
    .001.... : Numbering plan.....ISDN (telephony)
    ....00.. : Presentation.....Allowed
    .....11 : Screening.....Net provided
19  ***** : Address signal.....375172100044
25  00001000 : Optional para.....Optional fwd
                                call ind
-- Optional forward call inds
26  00000001 : Length.....01 Dec
27  1..... : Connected line id.....Requested
    .0000... : Spare.....00 Hex

```

```

.....0.. : Simple segmentation.....Will send no
additional info
.....00 : CUG call.....Non-CUG call
28 00000011 : Optional para.....Access
transport
-- Access transport
29 00001001 : Length.....09 Dec
30 ***** : Info element.....7D 02 91 81
7C
03 80 90 A3
39 00011101 : Optional para.....Usr service
info
-- User service info
40 00000011 : Length.....03 Dec
41 1..... : Extension bit.....Last octet
.00..... : Coding standard.....CCITT standardized
coding
...00000 : Info transfer cap.....Speech
42 1..... : Extension bit.....Last octet
.00..... : Transfer mode.....Circuit mode
...10000 : Transfer rate.....64 kBit/s
43 1..... : Extension bit.....Last octet
.01..... : Layer ID.....Layer 1
...00011 : Layer protocol.....A-Law
44 00000000 : Optional para.....End

```

2: 29/10/2002 15:13:32.692 Avista [1.1] Usr

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

```

0 1..... : BIB.....1
.0110001 : BSN.....31 Hex
1 1..... : FIB.....1
.0100010 : FSN.....22 Hex
2 00..... : Spare.....00 Hex
.001011 : Length indicator.....11 Dec
3 00..... : Network indicator.....International
network
..00..... : Spare.....00 Hex
....0101 : Service indicator.....ISUP-ISDN user
part
4 ***** : DPC.....1660 Hex
5 ***** : OPC.....12EO Hex
7 1100.... : SLS.....12 Dec

```

-- CIC decoding according to Q.763, 1.2 a

8 ***** : CIC channel number.....OC Hex
***** : CIC PCM link number.....00 Hex
0000.... : Spare.....0000 Hex

L3: [ISUP (Whitebook)]:

0 00000110 : Message type.....ACM-Address
complete

-- Backward call inds

1 00..... : ETE method.....No ETE avail
..01.... : Called party cat.....Ordinary
subscriber
....00.. : Called party status.....No indication
.....00 : Charge ind.....No indication
2 00..... : SCCP method avail.....No indication
..0..... : Echo control device.....Not included
...1.... : ISDN access.....Terminating
access ISDN
....0... : Holding.....Not requested
.....1.. : ISDN User Part.....ISUP all the
way
.....0. : ETE info.....None avail
.....0 : Interworking.....None
encountered
3 00000000 : Pointer.....00 Dec

3: 29/10/2002 15:13:32.780 Avista [1.1] Usr

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

0 1..... : BIB.....1
..0110001 : BSN.....31 Hex
1 1..... : FIB.....1
..0100100 : FSN.....24 Hex
2 00..... : Spare.....00 Hex
..011000 : Length indicator.....24 Dec
3 00..... : Network indicator.....International
network
..00.... : Spare.....00 Hex
....0101 : Service indicator.....ISUP-ISDN user
part
4 ***** : DPC.....1660 Hex
5 ***** : OPC.....12EO Hex
7 1100.... : SLS.....12 Dec

-- CIC decoding according to Q.763, 1.2 a

8 ***** : CIC channel number.....OC Hex
***** : CIC PCM link number.....00 Hex

```

0000.... : Spare.....0000 Hex
L3: [ISUP (Whitebook)]:
0 00101100 : Message type.....CPG-Call
                                     progress
-- Event info
1 0..... : Event presentation.....No indication
  .0000001 : Event ind.....Alerting
2 00000001 : Pointer.....01 Dec
3 00000011 : Optional para.....Access
                                     transport
-- Access transport
4 00000100 : Length.....04 Dec
5 ***** : Info element.....1E 02 80 88
9 00010001 : Optional para.....Backward call
                                     ind
-- Backward call inds
10 00000010 : Length.....02 Dec
11 00..... : ETE method.....No ETE avail
  ..01.... : Called party cat.....Ordinary
                                     subscriber
  ....01.. : Called party status.....Subscriber free
  .....00 : Charge ind.....No indication
12 00..... : SCCP method avail.....No indication
  ..0..... : Echo control device.....Not included
  ...1.... : ISDN access.....Terminating
                                     access ISDN
  ....0... : Holding.....Not requested
  .....1.. : ISDN User Part.....ISUP all the
                                     way
  .....0. : ETE info.....None avail
  .....0 : Interworking.....None
                                     encountered
13 00101001 : Optional para.....Optional bkwd
                                     call ind
14 00000001 : Length.....01 Dec
-- Optional backward call inds
15 0000.... : Spare.....00 Hex
  ....0... : MLPP user.....No indication
  .....0.. : Simple segmentation.....Will send no
                                     additional info
  .....0. : Call diversion.....No indication
  .....1 : In band info.....Now available
16 00000000 : Optional para.....End

```

4: 29/10/2002 15:13:39.692 Avista [1.1] Usr

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

0 1..... : BIB.....1
.0111110 : BSN.....3E Hex
1 1..... : FIB.....1
.0111101 : FSN.....3D Hex
2 00..... : Spare.....00 Hex
..011101 : Length indicator.....29 Dec
3 00..... : Network indicator.....International
network
..00.... : Spare.....00 Hex
....0101 : Service indicator.....ISUP-ISDN user
part
4 ***** : DPC.....1660 Hex
5 ***** : OPC.....12EO Hex
7 1100.... : SLS.....12 Dec
-- CIC decoding according to Q.763, 1.2 a
8 ***** : CIC channel number.....OC Hex
***** : CIC PCM link number.....00 Hex
0000.... : Spare.....0000 Hex

L3: [ISUP (Whitebook)]:

0 00001001 : Message type.....ANM-Answer
1 00000001 : Pointer.....01 Dec
2 00000011 : Optional para.....Access
transport
-- Access transport
3 00000100 : Length.....04 Dec
4 ***** : Info element.....1E 02 80 82
8 00100001 : Optional para.....Connected nr
-- Connected nr
9 00000111 : Length.....07 Dec
10 0..... : Odd/Even ind.....Even
.0000100 : Nature of addr.....International No.
11 0..... : Spare.....00 Hex
.001.... : Numbering plan.....ISDN (telephony)
....00.. : Presentation.....Allowed
.....01 : Screening.....User provided,
verified, passed
12 ***** : Address signal.....3726402599
17 00010001 : Optional para.....Bkwd call ind
-- Backward call inds
18 00000010 : Length.....02 Dec
19 00..... : ETE method.....No ETE avail

```

..00.... : Called party cat.....No indication
....01.. : Called party status.....Subscriber free
.....10 : Charge ind.....Charge
20  00..... : SCCP method avail.....No indication
..0..... : Echo control device.....Not included
...1.... : ISDN access.....Terminating
                    access ISDN
....0... : Holding.....Not requested
.....1.. : ISDN User Part.....ISUP all the
                    way
.....0.  : ETE info.....None avail
.....0   : Interworking.....None
                    encountered
21  00000000 : Optional para.....End

```

5: 29/10/2002 15:13:46.660 Avista [1.1] Net

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

```

0  1..... : BIB.....1
   .1010010 : BSN.....52 Hex
1  1..... : FIB.....1
   .1010000 : FSN.....50 Hex
2  00..... : Spare.....00 Hex
   ..001101 : Length indicator.....13 Dec
3  00..... : Network indicator.....International
                    network
   ..00.... : Spare.....00 Hex
   ....0101 : Service indicator.....ISUP-ISDN user
                    part
4  ***** : DPC.....12EO Hex
5  ***** : OPC.....1660 Hex
7  1100.... : SLS.....12 Dec
-- CIC decoding according to Q.763, 1.2 a
8  ***** : CIC channel number.....0C Hex
   ***** : CIC PCM link number.....00 Hex
   0000.... : Spare.....0000 Hex

```

L3: [ISUP (Whitebook)]:

```

0  00001100 : Message type.....REL-Release
1  00000010 : Pointer.....02 Dec
2  00000000 : Pointer.....00 Dec
-- Cause inds
3  00000010 : Length.....02 Dec
4  1..... : Extension.....Last octet
   .00..... : Coding std.....CCITT standardized

```

```

coding
....0.... : Spare.....Spare
....0000 : Location.....User
5 1..... : Extension.....Last octet
.0010000 : Cause value.....Normal call
clearing

```

6: 29/10/2002 15:13:46.703 Avista [1.1] Usr

L1: [Primitive] LO Raw Message

L2: [MTP (Whitebook)]:

```

0 1..... : BIB.....1
.1010000 : BSN.....50 Hex
1 1..... : FIB.....1
.1010011 : FSN.....53 Hex
2 00..... : Spare.....00 Hex
..001001 : Length indicator.....09 Dec
3 00..... : Network indicator.....International
network
..00.....: Spare.....00 Hex
....0101: Service indicator.....ISUP-ISDN user
part
4 *****: DPC.....1660 Hex
5 *****: OPC.....12EO Hex
7 1100....: SLS.....12 Dec
--CIC decoding according to Q.763,1.2 a
8 ***** : CIC channel number.....0C Hex
***** : CIC PCM link number.....00 Hex
0000.... : Spare.....0000 Hex

```

L3: [ISUP (Whitebook)]:

```

0 00010000 : Message type.....RLC-Release
complete
1 00000000 : Pointer.....00 Dec

```

4. КОНТРОЛЬНЫЕ ВОПРОСЫ

1. Системы общеканальной сигнализации № 7 и назначение подсистем MTP, SCCP и ISUP с позиций модели взаимодействия открытых систем ISO.

2. Типы и назначение сигнальных единиц при межстанционном взаимодействии пунктов сигнализации.

3. Типы и назначение основных сигнальных сообщений при обслуживании базового вызова ISDN.

4. Типы и назначение информационных параметров основных сигнальных сообщений при обслуживании базового вызова ISDN.

5. Особенности организации межстанционной сигнализации "от звена к звену" (link-to-link) и "из конца в конец" (end-to-end).

6. Пояснить методы реализации межстанционной сигнализации "из конца в конец": метод сквозной передачи и метод SCCP.

7. Пояснить номера кодов пунктов сигнализации в структурном формате, десятичном и шестнадцатеричном.

8. На примере трасс сигнальных сообщений пояснить структуру полей формата значащих сигнальных единиц. Указать принцип разделения сигнальных единиц на заполняющие, состояния звена и значащие.

9. Определить постоянную длину сигнальных единиц подсистем передачи сообщений MTP и подсистемы пользователя ISDN.

10. На примере трасс сигнальных сообщений пояснить реализацию основного метода защиты от ошибок сигнальных единиц системы ОКС № 7.

11. Пояснить принцип разделения сигнальной нагрузки и назначение информационного элемента «поля селекции звена сигнализации» SLC.

12. На примере трасс сигнальных сообщений пояснить особенности взаимодействия пунктов сигнализации при предоставлении дополнительных услуг и структуру информационных параметров, их обеспечивающих.

13. Пояснить структуру и назначение информационных параметров сообщений подсистемы пользователя ISDN по управлению конфигурацией информационной сети.

14. Формат и назначение кода идентификатора канала CIC.

15. На примере трасс сигнальных сообщений пояснить особенности обслуживания вызова абонентов сети ISDN и не ISDN.

16. Адресация сигнальных сообщений в одноуровневой и двухуровневой сети сигнализации и назначение байта служебной информации SIO.

17. Пояснить структуру номера ISDN и информации маршрутизации сигнальных сообщений в оконечных, транзитных и шлюзовых пунктах сигнализации.

18. Используя трассы сигнальных сообщений для фрагмента двухуровневой сети общеканальной сигнализации, построить блок-схему

алгоритма процедуры взаимодействия оконечных и транзитной станций при обслуживании базового вызова ISDN.

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