

实验系列--- RAN 开通

实验目标

- 掌握 TD-SCDMA RAN 接入网联调设备间协商基本参数
 - ✚ 网元硬件结构（含主设备、单板、各种接口，如 IUB 传输接口、IU 接口、电源线接口、GPS/北斗/IEEE1588 接口等）
 - ✚ 硬件选型配置方案
 - ✚ 设备电气机械指标
- 掌握 RNC 的基本软件调测操作
- 掌握 RNC 侧无线参数配置方法
- 掌握基站调测基本方法
- 掌握典型故障定位和处理方法
- 了解 TD-SCDMA 系统典型业务的基本流程

适用对象

无线通信相关专业在校学生、社会人员

具备 TD-SCDMA RAN 网元设备主流厂家无线接入网设备基本理论

LAB 1.1 IuB 接口联调

目标:在完成了 TD-SCDMA RAN 无线接入网 IUB 接口所涉及的设备本地安装调测后,完成 IUB 接口联调。

步骤:

步骤一, 核对网络规划 IUB 接口需要协商的参数。

IUB 接口协议栈模型如图,

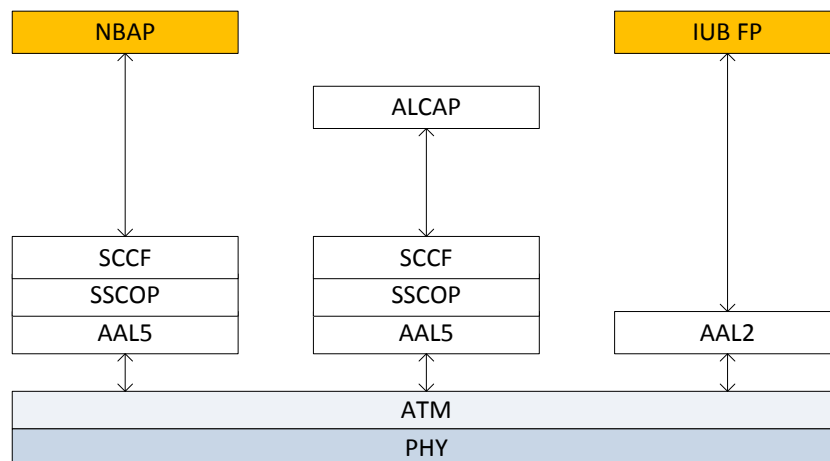


图 1.1-1: IUB 接口协议栈模型

上图反映如果 TD-SCDMA RAN 完成正常 IUB 信令以及业务传送所必须打通的接口。

在实际中各个网元设备可维护的, 所以我们还需要操作维护接口, 因此我们需要至少调试以下几条 IUB 接口局间链路:

1. NBAP 信令控制链路;
2. ALCAP 传输网络层控制链路;
3. IUB 数据链路;
4. 基站专用 OML 操作维护链路;

5. 基站默认 OML 操作维护链路；

由于 TD-SCDMA 系统引入一种新技术 IPOA，极大的简化基站侧软件调测，基站侧仅需配置较少的参数，而主要的 IUB 接口参数集中在 RNC 侧配置。而 NB、RNC 正常启动时，NB 检测到底层传输已经连通，会自动上报 IPOA 建立请求，RNC 核查 NB 发送的消息所携带的参数是否合法，触发 IPOA 建立过程，将 NBAP 信令控制链路、ALCAP 传输网络层控制链路、IUB 数据链路、基站专用 OML 操作维护链路参数下发给基站，完成 IUB 接口参数的配置。

基于 IUB 接口原理，基站侧需要配置的参数：

- 1. EID；
- 2. 底层传输参数；

如图所示，

属性	值
E1数目	1
E1起始标识	1
最小激活链路数	1
默认参数是否更改	否
IMA模式	IMA组
IMA版本	1.1
IMA组时钟模式	ITC模式
IMA组发送帧长度(单位：Byte)	128
IMA组接收帧长度(单位：Byte)	128
链路最大时延(单位：cell)	20
链路最小DCB深度(单位：Cell)	5
链路最大DCB深度(单位：Cell)	43
对称性	对称配置
加扰类型	对信元净荷加扰
设备参数标示	AF-B3-FF-8A-77-25
<div>保存重置</div>	

图 1.1-1: 基站 SI 参数-传输参数

RNC 侧需要配置的参数：

1. Node B ID；
2. EID；
3. 底层传输参数；
4. NBAP 信令控制链路参数；
5. ALCAP 传输网络层控制链路参数；
6. IUB 数据链路参数；
7. 基站专用 OML 操作维护链路参数；

步骤二，通过 OMC 人机监控软件查看 IUB 接口相关告警，并排除相关告警。告警显示如图所示，

告警标号	告警源	可能原因	告警级别	上报时间
10001	参数核查	基站6 (基站标识:183)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:35:12
10002	参数核查	基站4 (标识:181)的IP地址192.168.0.5 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:35:13
10003	背景告警	超出服务范围	严重告警	2010-11-20 19:35:15
10004	参数核查	基站1 (标识:178)的IP地址192.168.0.2 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:35:15
10005	背景告警	超出服务范围	严重告警	2010-11-20 19:37:08
10006	背景告警	传输错误	主要告警	2010-11-20 19:37:35
10007	参数核查	基站2 (标识:179)的IP地址192.168.0.3 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:38:08
10008	背景告警	超出服务范围	严重告警	2010-11-20 19:38:28
10009	参数核查	基站3 (基站标识:180)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:38:58
10010	参数核查	基站5 (基站标识:182)下的各链路速率总和为0, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:39:22
10011	背景告警	处理器问题	严重告警	2010-11-20 19:39:55
10012	参数核查	基站5 (基站标识:182)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:40:47
10013	背景告警	设备失灵	主要告警	2010-11-20 19:40:52
10014	参数核查	BPV0 (标识:243未处于正常运行状态!	主要告警	2010-11-20 19:41:02
10015	背景告警	不可用	主要告警	2010-11-20 19:41:05
10016	参数核查	基站1 (基站标识:178)下的各链路速率总和为0, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:41:06
10017	参数核查	基站6 (标识:183)的IP地址192.168.0.7 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:41:46
10018	背景告警	设备失灵	主要告警	2010-11-20 19:42:27

图 1.1-2: OMC 告警

步骤三，右键点击 OMC 节点，选择“查看 RNS 网络拓扑”，如图

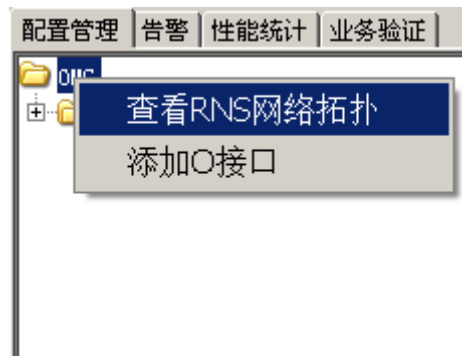


图 1.1-3：查看 RNS 网络拓扑

查看结果如图，

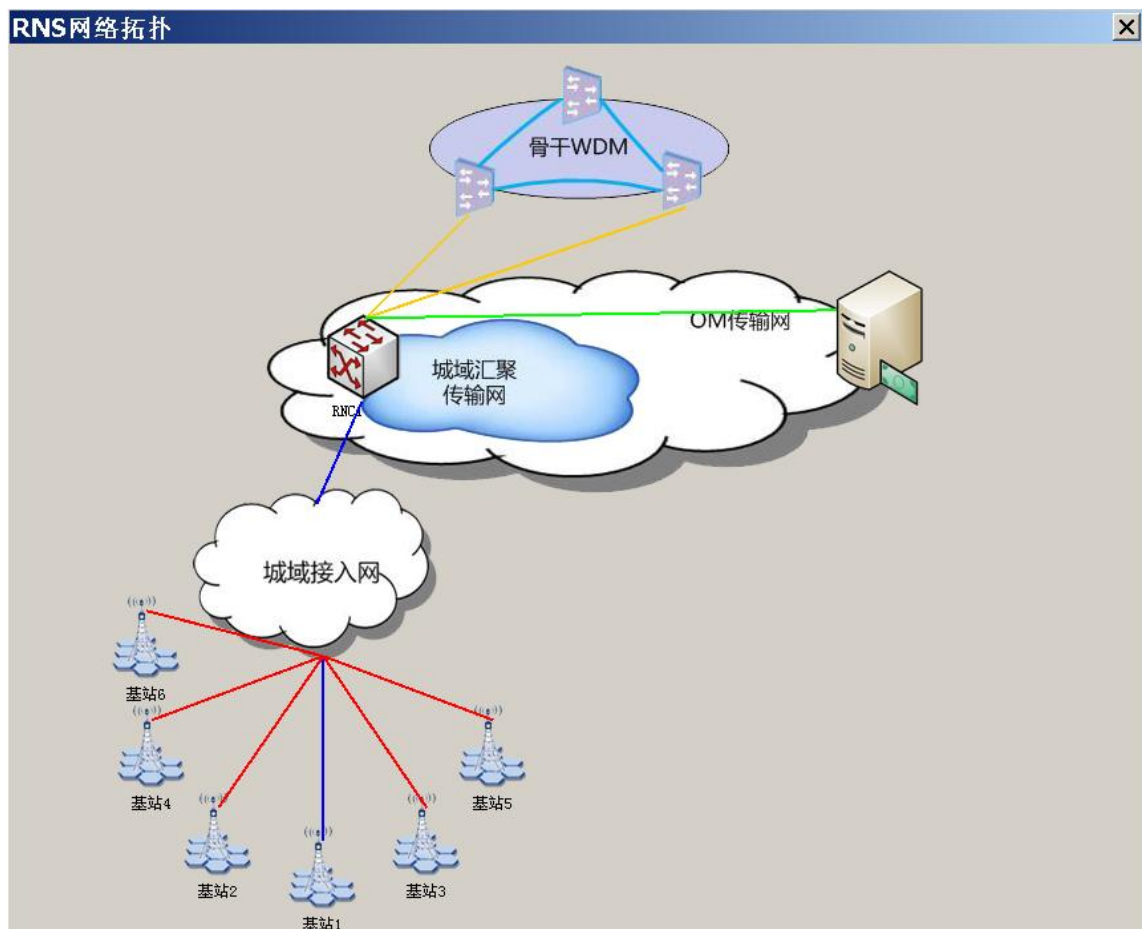


图 1.1-4：RNS 网络拓扑

上图基站 1 的 IUB 接口显示为蓝色，表示接口正常，而其余基站 IUB 接口显示为红色表示接口异常，需要故障定位并做相应处理。

LAB 1.2 IuCS 接口联调

目标: 在完成了 TD-SCDMA RAN 无线接入网 IU 接口所涉及的设备本地安装调测后, 完成 IU 接口联调。

步骤:

步骤一, 核对网络规划 IU-CS 接口需要协商的参数。

IU-CS 接口协议栈模型如图,

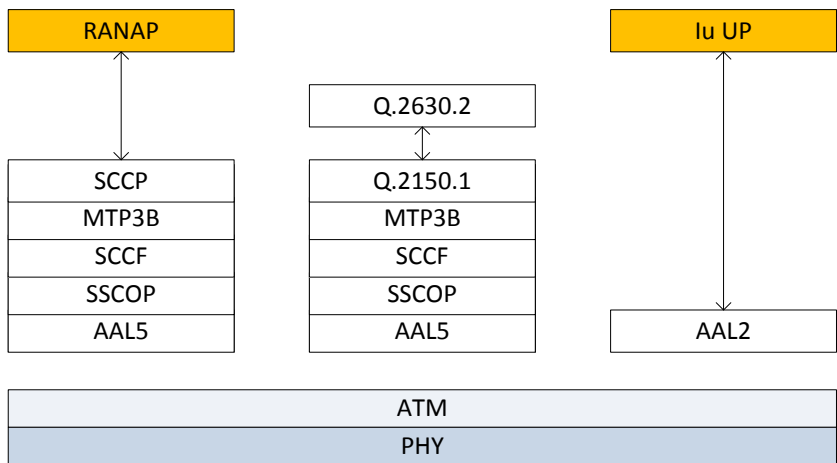


图 1.2-1: IU-CS 接口协议模型

上图反映如果 TD-SCDMA RAN 完成正常 IU-CS 信令以及业务传送所必须的打通的接口。

上图反映如果 TD-SCDMA RAN 完成正常 IU 信令以及业务传送所必须的打通的接口, 因此我们需要调试以下两条 IU 口局间链路:

1. RANAP 信令控制链路;
2. IUB 数据链路;

步骤二, 通过 OMC 人机监控软件查看 IU-CS 接口相关告警, 并排除相关告警。告警显示如图所示,

配置管理 告警 性能统计 业务验证					
告警标号	告警源	可能原因	告警级别	上报时间	
10001	参数核查	基站6 (基站标识:183)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:35:12	
10002	参数核查	基站4 (标识:181)的IP地址192.168.0.5 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:35:13	
10003	背景告警	超出服务范围	严重告警	2010-11-20 19:35:15	
10004	参数核查	基站1 (标识:178)的IP地址192.168.0.2 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:35:15	
10005	背景告警	超出服务范围	严重告警	2010-11-20 19:37:08	
10006	背景告警	传输错误	主要告警	2010-11-20 19:37:35	
10007	参数核查	基站2 (标识:179)的IP地址192.168.0.3 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:38:08	
10008	背景告警	超出服务范围	严重告警	2010-11-20 19:38:28	
10009	参数核查	基站3 (基站标识:180)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:38:58	
10010	参数核查	基站5 (基站标识:182)下的各链路速率总和为0, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:39:22	
10011	背景告警	处理器问题	严重告警	2010-11-20 19:39:55	
10012	参数核查	基站5 (基站标识:182)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:40:47	
10013	背景告警	设备失灵	主要告警	2010-11-20 19:40:52	
10014	参数核查	BPVO (标识:243)未处于正常运行状态!	主要告警	2010-11-20 19:41:02	
10015	背景告警	不可用	主要告警	2010-11-20 19:41:05	
10016	参数核查	基站1 (基站标识:178)下的各链路速率总和为0, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:41:06	
10017	参数核查	基站6 (标识:183)的IP地址192.168.0.7 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:41:46	
10018	背景告警	设备失灵	主要告警	2010-11-20 19:42:27	

图 1.2-2： OMC 告警

步骤三，右键点击 OMC 节点，选择“查看 RNS 网络拓扑”，如图

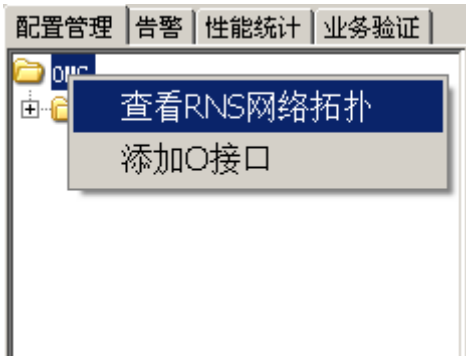


图 1.1-3： 查看 RNS 网络拓扑

查看结果如图，

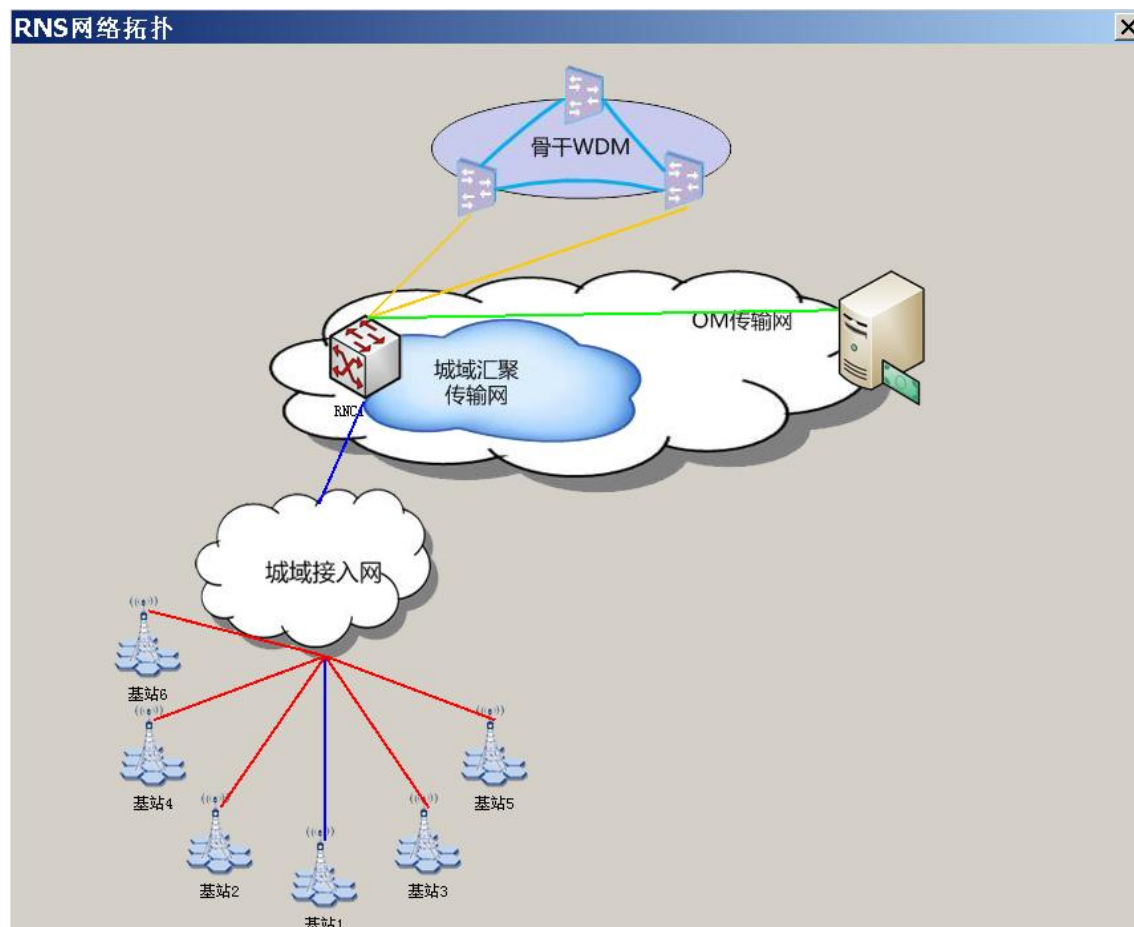


图 1.1-4：RNS 网络拓扑

上图 RNC1 的 IU 接口显示为黄色，表示接口正常，如接口显示为红色表示接口异常，需要故障定位并做相应处理。

LAB 1.3 IuPS 接口联调

目标:在完成了 TD-SCDMA RAN 无线接入网 IU 接口所涉及的设备本地安装调测后，完成 IU 接口联调。

步骤：

步骤一，核对网络规划 IU-PS 接口需要协商的参数。

IU-PS 接口协议栈模型如图，

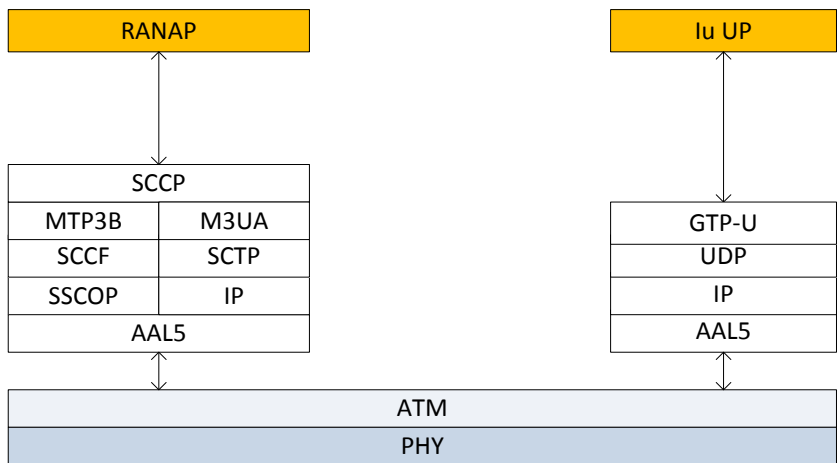


图 1.2-1：IU-PS 接口协议模型

上图反映如果 TD-SCDMA RAN 完成正常 IU-PS 信令以及业务传送所必须的打通的接口。

上图反映如果 TD-SCDMA RAN 完成正常 IU 信令以及业务传送所必须的打通的接口，因此我们需要调通以下两条 IU 口局间链路：

3. RANAP 信令控制链路；
4. IUB 数据链路；

步骤二，通过 OMC 人机监控软件查看 IU-PS 接口相关告警，并排除相关告警。告警显示如图所示，

配置管理 告警 性能统计 业务验证					
告警标号	告警源	可能原因	告警级别	上报时间	
10001	参数核查	基站6 (基站标识:183)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:35:12	
10002	参数核查	基站4 (标识:181)的IP地址192.168.0.5 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:35:13	
10003	背景告警	超出服务范围	严重告警	2010-11-20 19:35:15	
10004	参数核查	基站1 (标识:178)的IP地址192.168.0.2 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:35:15	
10005	背景告警	超出服务范围	严重告警	2010-11-20 19:37:08	
10006	背景告警	传输错误	主要告警	2010-11-20 19:37:35	
10007	参数核查	基站2 (标识:179)的IP地址192.168.0.3 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:38:08	
10008	背景告警	超出服务范围	严重告警	2010-11-20 19:38:28	
10009	参数核查	基站3 (基站标识:180)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:38:58	
10010	参数核查	基站5 (基站标识:182)下的各链路速率总和为0, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:39:22	
10011	背景告警	处理器问题	严重告警	2010-11-20 19:39:55	
10012	参数核查	基站5 (基站标识:182)下的链路数类型不足5种, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:40:47	
10013	背景告警	设备失灵	主要告警	2010-11-20 19:40:52	
10014	参数核查	BPVO (标识:243)未处于正常运行状态!	主要告警	2010-11-20 19:41:02	
10015	背景告警	不可用	主要告警	2010-11-20 19:41:05	
10016	参数核查	基站1 (基站标识:178)下的各链路速率总和为0, 该Logi cNB无法正常通信	次要告警	2010-11-20 19:41:06	
10017	参数核查	基站6 (标识:183)的IP地址192.168.0.7 (子网掩码:255.255.255.0)与其...	主要告警	2010-11-20 19:41:46	
10018	背景告警	设备失灵	主要告警	2010-11-20 19:42:27	

图 1.2-2： OMC 告警

步骤三，右键点击 OMC 节点，选择“查看 RNS 网络拓扑”，如图

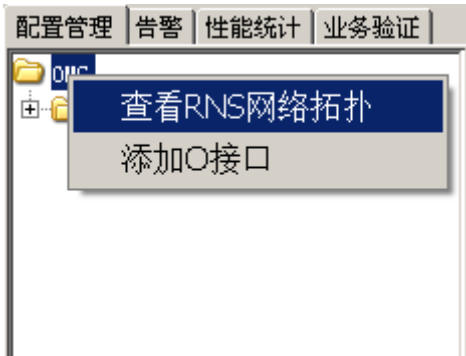


图 1.1-3： 查看 RNS 网络拓扑

查看结果如图，

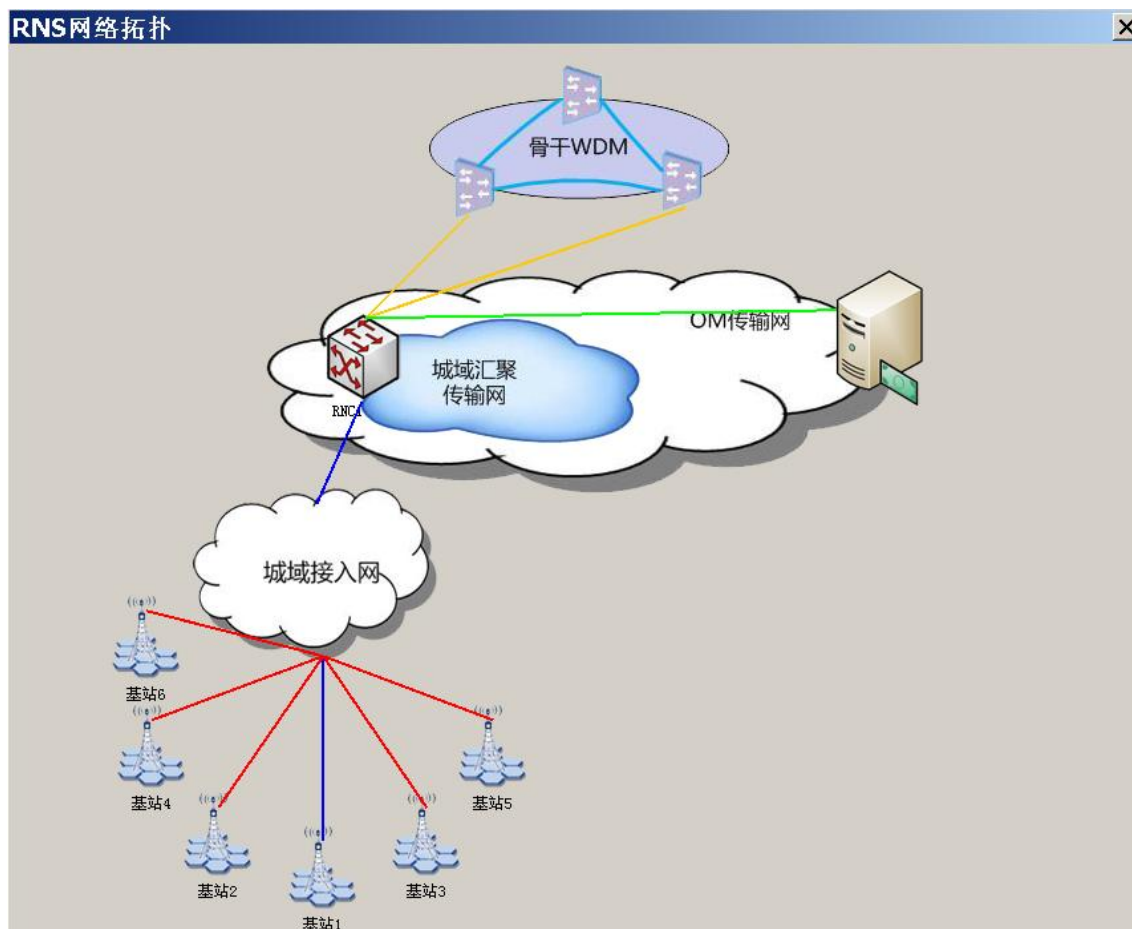


图 1.1-4：RNS 网络拓扑

上图 RNC1 的 IU 接口显示为黄色，表示接口正常，如接口显示为红色表示接口异常，需要故障定位并做相应处理。

LAB 1.4 业务验证-移动起始呼叫 MOC

目标：在完成了 TD-SCDMA RAN 无线接入网所有接口所涉及的设备本地安装调测后，完成移动起始呼叫 MOC 业务验证。

步骤：

步骤一，点击“OMC” — “业务验证”，选择待测试的小区，如图，

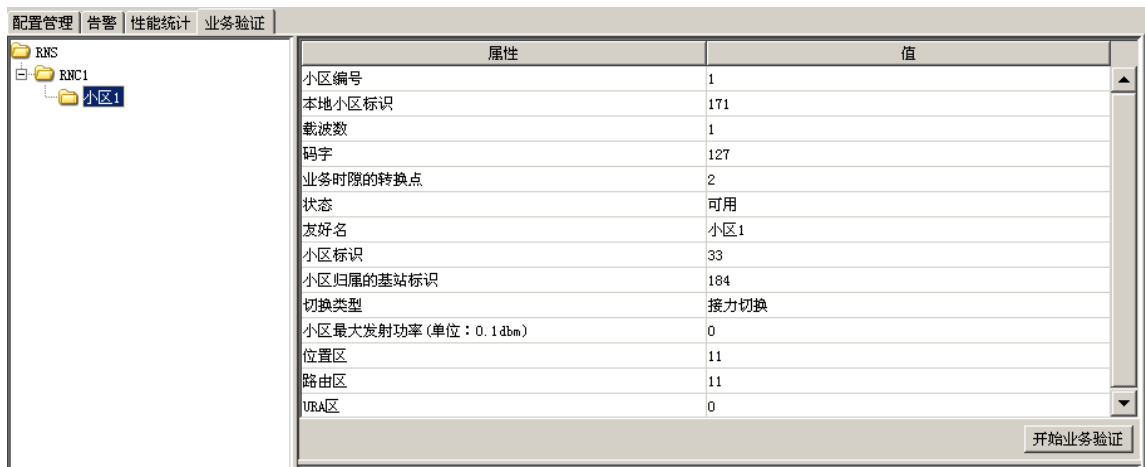


图 1.4-1：业务验证-选择小区

检查小区状态为“可用”。

步骤二，右键点击“待测试小区”节点，点击“开始业务验证”

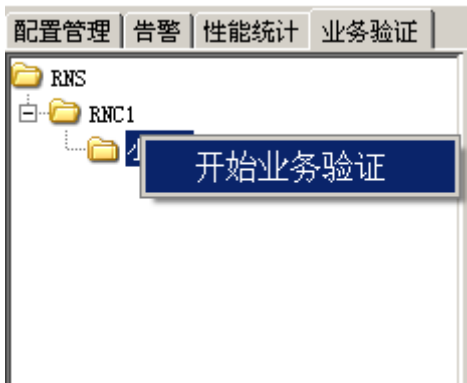


图 1.4-2：开始业务验证

如小区及其相关网元全部正常，则开始完成业务接入的信令和呼叫流程，如图，

序号	消息名称	消息类型
1	RRC Connection Request	Uu
2	Radio Link Setup Request	Iub
3	Radio Link Setup Response	Iub
4	RRC Connection Setup	Uu
5	Radio Link Restore Indication	Iub
6	RRC Connection Setup Complete	Uu
7	INITIAL DIRECT TRANSFER (CM Service Request)	Uu
8	INITIAL UE MESSAGE	Iu
9	SECURITY MODE COMMAND	Iu
10	SECURITY MODE COMMAND	Uu
11	SECURITY MODE COMPLETE	Uu
12	SECURITY MODE COMPLETE	Iu
13	COMMON ID	Iu
14	UPLINK DIRECT TRANSFER (Call Setup)	Uu
15	DIRECT TRANSFER	Iu
16	DIRECT TRANSFER (Call Proceeding)	Iu
17	DOWNLINK DIRECT TRANSFER	Uu
18	RAB ASSIGNMENT REQUEST	Iu

```
value UL-CCCH-Message ::=
{
  message rrcConnectionRequest :
  {
    initialUE-Identity tmsi-and-LAI :
    {
      tmsi '00100000 01100000 10010100 01101110'B,
      lai
    }
  }
}
```

图 1.4-3：信令流程

附 1：示例 MOC 的信令流程：**RRC Connection Request (Uu)**

```

value UL-CCCH-Message ::=
{
  message rrcConnectionRequest :
  {
    initialUE-Identity tmsi-and-LAI :
    {
      tmsi '00100000 01100000 10010100 01101110'B,
      lai
      {
        plmn-Identity
        {
          mcc
          {
            4,
            6,
            0
          },
          mnc
          {
            0,
            2
          }
        },
        lac '01111001 00011100'B
      }
    },
    establishmentCause originatingConversationalCall,
    protocolErrorIndicator noError,
    v3d0NonCriticalExtensions
    {
      rRCConnectionRequest-v3d0ext
      {
        uESpecificBehaviourInformation1idle '0000'B
      },

```

```
v4b0NonCriticalExtensions
{
    rrcConnectionRequest-v4b0ext
    {
        accessStratumReleaseIndicator rel-4
    }
}
}
```


Radio Link Setup Request(Iub)

```

value NBAP-PDU ::= initiatingMessage :
{
  procedureID
  {
    procedureCode 27,
    ddMode tdd
  },
  criticality reject,
  messageDiscriminator common,
  transactionID longTransActionId : 854,
  value RadioLinkSetupRequestTDD :
  {
    protocolIEs
    {
      {
        id 44,
        criticality reject,
        value CRNC-CommunicationContextID : 854
      },
      {
        id 288,
        criticality notify,
        value UL-CCTrCH-InformationList-RL-SetupRqstTDD :
        {
          {
            id 284,
            criticality notify,
            value UL-CCTrCH-InformationItem-RL-SetupRqstTDD :
            {
              cCTrCH-ID 1,
              tFCS
              {
                tFCSvalues no-Split-in-TFCI :
                {
                  {
                    cTFC ctfc2bit : 0,
                    tFC-Beta computedGainFactors : 0
                  },

```

```

        {
            cTFC ctfc2bit : 1,
            tFC-Beta signalledGainFactors :
            {
                gainFactor tdd : 15,
                refTFCNumber 0
            }
        }
    },
    tFCI-Coding v8,
    punctureLimit 15,
    iE-Extensions
    {
        {
            id 470,
            criticality notify,
            extensionValue UL-DPCH-LCR-Information-RL-SetupRqstTDD :
            {
                repetitionPeriod v1,
                repetitionLength 1,
                tdd-DPCHOffset noinitialOffset : 0,
                uL-TimeslotLCR-Information
                {
                    {
                        timeSlotLCR 1,
                        midambleShiftLCR
                        {
                            midambleAllocationMode defaultMidamble,
                            midambleConfigurationLCR v8
                        },
                        tFCI-Presence present,
                        uL-Code-InformationList
                        {
                            {
                                dPCH-ID 29,
                                tdd-ChannelisationCodeLCR
                                {
                                    tDD-ChannelisationCode chCode16div15,
                                    modulation qPSK
                                },
                                tdd-UL-DPCH-TimeSlotFormat-LCR qPSK : 7
                            }
                        }
                    }
                }
            }
        }
    }

```

```

    }
    }
    }
    },
    {
        id 510,
        criticality reject,
        extensionValue UL-SIR : 120
    },
    {
        id 560,
        criticality reject,
        extensionValue TDD-TPC-UplinkStepSize-LCR : step-size1
    }
    }
    }
    },
    {
        id 76,
        criticality notify,
        value DL-CCTrCH-InformationList-RL-SetupRqstTDD :
        {
            {
                id 72,
                criticality notify,
                value DL-CCTrCH-InformationItem-RL-SetupRqstTDD :
                {
                    cCTrCH-ID 1,
                    tFCS
                    {
                        tFCSvalues no-Split-in-TFCI :
                        {
                            {
                                cTFC ctfc2bit : 0
                            },
                            {
                                cTFC ctfc2bit : 1
                            }
                        }
                    }
                },
            },
        },
    },

```

```

tFCI-Coding v8,
punctureLimit 15,
tdd-TPC-DownlinkStepSize step-size1,
cCTrCH-TPCList
{
    {
        cCTrCH-ID 1
    }
},
iE-Extensions
{
    {
        id 74,
        criticality notify,
        extensionValue DL-DPCH-LCR-Information-RL-SetupRqstTDD :
        {
            repetitionPeriod v1,
            repetitionLength 1,
            tdd-DPCHOffset noinitialOffset : 0,
            dL-TimeslotLCR-Information
            {
                {
                    timeSlotLCR 3,
                    midambleShiftLCR
                    {
                        midambleAllocationMode defaultMidamble,
                        midambleConfigurationLCR v8
                    },
                    tFCI-Presence present,
                    dL-Code-LCR-Information
                    {
                        {
                            dPCH-ID 103,
                            tdd-ChannelisationCodeLCR
                            {
                                tDD-ChannelisationCode chCode16div9,
                                modulation qPSK
                            },
                            tdd-DL-DPCH-TimeSlotFormat-LCR qPSK : 7
                        }
                    }
                }
            }
        },
    }
},

```

```

tstdIndicator inactive
    }
    }
    }
    }
    }
    },
    {
    id 57,
    criticality reject,
    value DCH-TDD-Information :
    {
    {
    payloadCRC-PresenceIndicator cRC-Included,
    ul-FP-Mode normal,
    toAWS 40,
    toAWE 7,
    dCH-SpecificInformationList
    {
    {
    dCH-ID 1,
    ul-CCTrCH-ID 1,
    dl-CCTrCH-ID 1,
    ul-TransportFormatSet
    {
    dynamicParts
    {
    {
    nrOfTransportBlocks 0,
    mode notApplicable : NULL
    },
    {
    nrOfTransportBlocks 1,
    transportBlockSize 148,
    mode notApplicable : NULL
    }
    },
    semi-staticPart
    {
    transmissionTimeInterval msec-40,
    channelCoding convolutional-coding,
    codingRate third,

```

```

        rateMatchingAttribute 160,
        cRC-Size v16,
        mode tdd : frame-related
    }
},
dl-TransportFormatSet
{
    dynamicParts
    {
        {
            nrOfTransportBlocks 0,
            mode notApplicable : NULL
        },
        {
            nrOfTransportBlocks 1,
            transportBlockSize 148,
            mode notApplicable : NULL
        }
    },
    semi-staticPart
    {
        transmissionTimeInterval msec-40,
        channelCoding convolutional-coding,
        codingRate third,
        rateMatchingAttribute 160,
        cRC-Size v16,
        mode tdd : frame-related
    }
},
allocationRetentionPriority
{
    priorityLevel 15,
    pre-emptionCapability shall-not-trigger-pre-emption,
    pre-emptionVulnerability not-pre-emptable
},
frameHandlingPriority 0
}
}
}
},
{
    id 230,

```

```

criticality reject,
value RL-Information-RL-SetupRqstTDD :
{
  rL-ID 0,
  c-ID 14011,
  frameOffset 0,
  specialBurstScheduling 1,
  initialDL-transmissionPower -60,
  maximumDL-power 59,
  minimumDL-power -350,
  iE-Extensions
  {
    {
      id 554,
      criticality reject,
      extensionValue UL-Synchronisation-Parameters-LCR :
      {
        uL-Synchronisation-StepSize 1,
        uL-Synchronisation-Frequency 1
      }
    },
    {
      id 280,
      criticality reject,
      extensionValue UARFCN : 10055
    }
  }
}
}
}
}
}
}
}
}

```

Radio Link Setup Response(Iub)

```
value NBAP-PDU ::= succesfulOutcome :
{
  procedureID
  {
    procedureCode 27,
    ddMode tdd
  },
  criticality reject,
  messageDiscriminator common,
  transactionID longTransActionId : 854,
  value RadioLinkSetupResponseTDD :
  {
    protocolIEs
    {
      {
        id 44,
        criticality ignore,
        value CRNC-CommunicationContextID : 854
      },
      {
        id 143,
        criticality ignore,
        value NodeB-CommunicationContextID : 0
      },
      {
        id 40,
        criticality ignore,
        value CommunicationControlPortID : 1
      }
    },
    protocolExtensions
    {
      {
        id 463,
        criticality ignore,
        extensionValue RL-InformationResponse-LCR-RL-SetupRspTDD :
        {
          rL-ID 0,
```



```

uL-TimeSlot-ISCP-LCR-Info
{
    {
        timeSlotLCR 1,
        iSCP 25
    }
},
ul-PhysCH-SF-Variation sf-variation-not-supported,
dCH-InformationResponseList
{
    id 59,
    criticality ignore,
    value DCH-InformationResponse :
    {
        {
            dCH-ID 1,
            bindingID '0000007C'H,
            transportLayerAddress '00001010 000000001 00000010 00000011
00000100 00000101 00000110 00000111 00001000 00001001 00001010 00001011
00001100 00001101 00001110 00001111 000000001 00000010 00000011 000000001'B
        }
    }
}
}
}
}
}
}
}
}
}
}

```

RRC Connection Setup(Uu)

```

value DL-CCCH-Message ::=
{
  message rrcConnectionSetup : later-than-r3 :
  {
    initialUE-Identity tmsi-and-LAI :
    {
      tmsi '00100000 01100000 10010100 01101110'B,
      lai
      {
        plmn-Identity
        {
          mcc
          {
            4,
            6,
            0
          },
          mnc
          {
            0,
            2
          }
        },
        lac '01111001 00011100'B
      }
    },
    rrc-TransactionIdentifier 0,
    criticalExtensions r4 :
    {
      rrcConnectionSetup-r4
      {
        new-U-RNTI
        {
          srnc-Identity '00000000 1110'B,
          s-RNTI '00001000 00110110 1010'B
        },
        rrc-StateIndicator cell-DCH,
        utran-DRX-CycleLengthCoeff 6,

```

```

capabilityUpdateRequirement
{
    ue-RadioCapabilityFDDUpdateRequirement-FDD FALSE,
    ue-RadioCapabilityTDDUpdateRequirement-TDD384 FALSE,
    ue-RadioCapabilityTDDUpdateRequirement-TDD128 TRUE
},
srb-InformationSetupList
{
    {
        rb-Identity 1,
        rlc-InfoChoice rlc-Info :
        {
            ul-RLC-Mode ul-UM-RLC-Mode :
            {
            },
            dl-RLC-Mode dl-UM-RLC-Mode : NULL
        },
        rb-MappingInfo
        {
            {
                ul-LogicalChannelMappings oneLogicalChannel :
                {
                    ul-TransportChannelType dch : 1,
                    logicalChannelIdentity 1,
                    rlc-SizeList configured : NULL,
                    mac-LogicalChannelPriority 4
                },
                dl-LogicalChannelMappingList
                {
                    {
                        dl-TransportChannelType dch : 1,
                        logicalChannelIdentity 1
                    }
                }
            },
            {
                ul-LogicalChannelMappings oneLogicalChannel :
                {
                    ul-TransportChannelType rach : NULL,
                    logicalChannelIdentity 1,
                    rlc-SizeList explicitList :
                    {

```

```

        rlc-SizeIndex 1
    }
},
    mac-LogicalChannelPriority 4
},
    dl-LogicalChannelMappingList
{
    {
        dl-TransportChannelType fach : NULL,
        logicalChannelIdentity 1
    }
}
},
{
    rb-Identity 2,
    rlc-InfoChoice rlc-Info :
    {
        ul-RLC-Mode ul-AM-RLC-Mode :
        {
            transmissionRLC-Discard noDiscard : dat15,
            transmissionWindowSize tw64,
            timerRST tr500,
            max-RST rst16,
            pollingInfo
            {
                timerPoll tp200,
                poll-SDU sdu1,
                lastTransmissionPDU-Poll TRUE,
                lastRetransmissionPDU-Poll TRUE,
                pollWindow pw70
            }
        },
        dl-RLC-Mode dl-AM-RLC-Mode :
        {
            inSequenceDelivery TRUE,
            receivingWindowSize rw64,
            dl-RLC-StatusInfo
            {
                missingPDU-Indicator TRUE
            }
        }
    }
}

```

```

    },
    rb-MappingInfo
    {
        {
            ul-LogicalChannelMappings oneLogicalChannel :
            {
                ul-TransportChannelType dch : 1,
                logicalChannelIdentity 2,
                rlc-SizeList configured : NULL,
                mac-LogicalChannelPriority 1
            },
            dl-LogicalChannelMappingList
            {
                {
                    dl-TransportChannelType dch : 1,
                    logicalChannelIdentity 2
                }
            }
        },
        {
            ul-LogicalChannelMappings oneLogicalChannel :
            {
                ul-TransportChannelType rach : NULL,
                logicalChannelIdentity 2,
                rlc-SizeList explicitList :
                {
                    {
                        rlc-SizeIndex 1
                    }
                },
                mac-LogicalChannelPriority 1
            },
            dl-LogicalChannelMappingList
            {
                {
                    dl-TransportChannelType fach : NULL,
                    logicalChannelIdentity 2
                }
            }
        }
    },
    {

```

```

rb-Identity 3,
rlc-InfoChoice rlc-Info :
{
    ul-RLC-Mode ul-AM-RLC-Mode :
    {
        transmissionRLC-Discard noDiscard : dat15,
        transmissionWindowSize tw64,
        timerRST tr500,
        max-RST rst16,
        pollingInfo
        {
            timerPoll tp200,
            poll-SDU sdu1,
            lastTransmissionPDU-Poll TRUE,
            lastRetransmissionPDU-Poll TRUE,
            pollWindow pw70
        }
    },
    dl-RLC-Mode dl-AM-RLC-Mode :
    {
        inSequenceDelivery TRUE,
        receivingWindowSize rw64,
        dl-RLC-StatusInfo
        {
            missingPDU-Indicator TRUE
        }
    }
},
rb-MappingInfo
{
    {
        ul-LogicalChannelMappings oneLogicalChannel :
        {
            ul-TransportChannelType dch : 1,
            logicalChannelIdentity 3,
            rlc-SizeList configured : NULL,
            mac-LogicalChannelPriority 2
        },
        dl-LogicalChannelMappingList
        {
            {
                dl-TransportChannelType dch : 1,
                logicalChannelIdentity 3
            }
        }
    }
}

```

```

    }
  }
},
{
  ul-LogicalChannelMappings oneLogicalChannel :
  {
    ul-TransportChannelType rach : NULL,
    logicalChannelIdentity 3,
    rlc-SizeList explicitList :
    {
      {
        rlc-SizeIndex 1
      }
    },
    mac-LogicalChannelPriority 2
  },
  dl-LogicalChannelMappingList
  {
    {
      dl-TransportChannelType fach : NULL,
      logicalChannelIdentity 3
    }
  }
}
},
{
  rb-Identity 4,
  rlc-InfoChoice rlc-Info :
  {
    ul-RLC-Mode ul-AM-RLC-Mode :
    {
      transmissionRLC-Discard noDiscard : dat15,
      transmissionWindowSize tw64,
      timerRST tr500,
      max-RST rst16,
      pollingInfo
      {
        timerPoll tp200,
        poll-SDU sdu1,
        lastTransmissionPDU-Poll TRUE,
        lastRetransmissionPDU-Poll TRUE,
        pollWindow pw70
      }
    }
  }
}
}

```

```

    }
  },
  dl-RLC-Mode dl-AM-RLC-Mode :
  {
    inSequenceDelivery TRUE,
    receivingWindowSize rw64,
    dl-RLC-StatusInfo
    {
      missingPDU-Indicator TRUE
    }
  }
},
rb-MappingInfo
{
  {
    ul-LogicalChannelMappings oneLogicalChannel :
    {
      ul-TransportChannelType dch : 1,
      logicalChannelIdentity 4,
      rlc-SizeList configured : NULL,
      mac-LogicalChannelPriority 3
    },
    dl-LogicalChannelMappingList
    {
      {
        dl-TransportChannelType dch : 1,
        logicalChannelIdentity 4
      }
    }
  },
  {
    ul-LogicalChannelMappings oneLogicalChannel :
    {
      ul-TransportChannelType rach : NULL,
      logicalChannelIdentity 4,
      rlc-SizeList explicitList :
      {
        {
          rlc-SizeIndex 1
        }
      },
      mac-LogicalChannelPriority 3
    },
  },

```



```

dl-LogicalChannelMappingList
{
    {
        dl-TransportChannelType fach : NULL,
        logicalChannelIdentity 4
    }
}
},
ul-CommonTransChInfo
{
    modeSpecificInfo tdd :
    {
        individualUL-CCTrCH-InfoList
        {
            {
                ul-TFCS-Identity
                {
                    tfcs-ID 1,
                    sharedChannelIndicator FALSE
                },
                ul-TFCS normalTFCI-Signalling : complete :
                {
                    ctfcSize ctfc2Bit :
                    {
                        {
                            ctfc2 0,
                            powerOffsetInformation
                            {
                                gainFactorInformation
computedGainFactors : 0
                            }
                        },
                        {
                            ctfc2 1,
                            powerOffsetInformation
                            {
                                gainFactorInformation
signalledGainFactors :
                                {
                                    modeSpecificInfo tdd : NULL,

```

```

gainFactorBetaD 15,
referenceTFC-ID 0
    }
    }
    }
    },
    tfc-Subset fullTFCS : NULL
    }
    }
    },
ul-AddReconfTransChInfoList
{
    {
        ul-TransportChannelType dch,
        transportChannelIdentity 1,
        transportFormatSet dedicatedTransChTFS :
        {
            tti tti40 :
            {
                {
                    rlc-Size octetModeType1 : sizeType1 : 16,
                    numberOfTbSizeList
                    {
                        zero : NULL,
                        one : NULL
                    },
                    logicalChannelList allSizes : NULL
                }
            },
            semistaticTF-Information
            {
                channelCodingType convolutional : third,
                rateMatchingAttribute 160,
                crc-Size crc16
            }
        }
    }
    },
dl-CommonTransChInfo
{
    modeSpecificInfo tdd :

```

```

{
    individualDL-CCTrCH-InfoList
    {
        {
            dl-TFCS-Identity
            {
                tfcs-ID 1,
                sharedChannelIndicator FALSE
            },
            tfcs-SignallingMode explicit-config : normalTFCI-Signalling :
complete :
                {
                    ctfcSize ctfc2Bit :
                    {
                        {
                            ctfc2 0
                        },
                        {
                            ctfc2 1
                        }
                    }
                }
            }
        }
    },
    dl-AddReconfTransChInfoList
    {
        {
            dl-TransportChannelType dch,
            dl-transportChannelIdentity 1,
            tfs-SignallingMode explicit-config : dedicatedTransChTFS :
            {
                tti tti40 :
                {
                    {
                        rlc-Size octetModeType1 : sizeType1 : 16,
                        numberOfTbSizeList
                        {
                            zero : NULL,
                            one : NULL
                        },
                    },
                    logicalChannelList allSizes : NULL
                }
            }
        }
    }
}

```

```

    }
    },
    semistaticTF-Information
    {
        channelCodingType convolutional : third,
        rateMatchingAttribute 160,
        crc-Size crc16
    }
}
},
frequencyInfo
{
    modeSpecificInfo tdd :
    {
        uarfcn-Nt 10071
    }
},
maxAllowedUL-TX-Power 24,
ul-ChannelRequirement ul-DPCH-Info :
{
    ul-DPCH-PowerControlInfo tdd :
    {
        ul-TargetSIR 25,
        ul-OL-PC-Signalling individuallySignalled :
        {
            tddOption tdd128 :
            {
                tpc-StepSize 1
            },
            primaryCCPCH-TX-Power 27
        }
    },
    modeSpecificInfo tdd :
    {
        ul-TimingAdvance enabled :
        {
            tddOption tdd128 :
            {
                ul-SynchronisationParameters
                {
                    stepSize 1,
                    frequency 1
                }
            }
        }
    }
}

```

```

    }
  }
},
ul-CCTrCHList
{
  {
    tfcs-ID 1,
    ul-TargetSIR 25,
    timeInfo
    {
    },
    commonTimeslotInfo
    {
      secondInterleavingMode frameRelated,
      tfci-Coding tfci-bits-8,
      puncturingLimit pl1,
      repetitionPeriodAndLength repetitionPeriod1 : NULL
    },
    tddOption tdd128 :
    {
      ul-CCTrCH-TimeslotsCodes
      {
        dynamicSFusage FALSE,
        firstIndividualTimeslotInfo
        {
          timeslotNumber 1,
          tfci-Existence TRUE,
          midambleShiftAndBurstType
          {
            midambleAllocationMode

            midambleConfiguration 4
          },
          modulation mod-QPSK,
          ss-TPC-Symbols one
        },
        ul-TS-ChannelisationCodeList
        {
          cc16-15
        },
        moreTimeslots noMore : NULL
      }
    }
  }
}
defaultMidamble : NULL,

```

```

    }
  }
},
dl-CommonInformation
{
  dl-DPCH-InfoCommon
  {
    cfnHandling initialise :
    {
    },
    modeSpecificInfo tdd :
    {
      dl-DPCH-PowerControlInfo
      {
        modeSpecificInfo tdd :
        {
          tpc-StepSizeTDD 1
        }
      }
    }
  },
  modeSpecificInfo tdd :
  {
    tddOption tdd128 :
    {
      tstd-Indicator FALSE
    },
    defaultDPCH-OffsetValue 0
  }
},
dl-InformationPerRL-List
{
  {
    modeSpecificInfo tdd : tdd :
    {
      tddOption tdd128 :
      {
        tstd-Indicator FALSE
      },
      sctd-Indicator FALSE
    },
    dl-DPCH-InfoPerRL tdd :

```

```

{
    dl-CCTrChListToEstablish
    {
        {
            tfcs-ID 1,
            timeInfo
            {
            },
            commonTimeslotInfo
            {
                secondInterleavingMode frameRelated,
                tfci-Coding tfci-bits-8,
                puncturingLimit pl1,
                repetitionPeriodAndLength repetitionPeriod1 : NULL
            },
            tddOption tdd128 :
            {
                dl-CCTrCH-TimeslotsCodes
                {
                    firstIndividualTimeslotInfo
                    {
                        timeslotNumber 3,
                        tfci-Existence TRUE,
                        midambleShiftAndBurstType
                        {
                            midambleAllocationMode
                                defaultMidamble : NULL,

                                midambleConfiguration 4
                        },
                        modulation mod-QPSK,
                        ss-TPC-Symbols one
                    },
                    dl-TS-ChannelisationCodesShort
                    {
                        codesRepresentation          bitmap          :
                        { chCode9-SF16 }

                    },
                    moreTimeslots noMore : NULL
                }
            }
        }
    }
}

```

TD-SCDMA RAN 仿真软件使用指导手册

Radio Link Restore Indication(Iub)

```

value NBAP-PDU ::= initiatingMessage :
{
  procedureID
  {
    procedureCode 26,
    ddMode common
  },
  criticality ignore,
  messageDiscriminator dedicated,
  transactionID longTransActionId : 0,
  value RadioLinkRestoreIndication :
  {
    protocolIEs
    {
      {
        id 44,
        criticality ignore,
        value CRNC-CommunicationContextID : 854
      },
      {
        id 200,
        criticality ignore,
        value Reporting-Object-RL-RestoreInd : rL :
        {
          rL-InformationList-RL-RestoreInd
          {
            {
              id 210,
              criticality ignore,
              value RL-InformationItem-RL-RestoreInd :
              {
                rL-ID 0
              }
            }
          }
        }
      }
    }
  }
}

```

 }

RRC Connection Setup Complete(Uu)

```

value UL-DCCH-Message ::=
{
  message rrcConnectionSetupComplete :
  {
    rrc-TransactionIdentifier 0,
    startList
    {
      {
        cn-DomainIdentity cs-domain,
        start-Value '00000000 00000000 0110'B
      },
      {
        cn-DomainIdentity ps-domain,
        start-Value '00000000 00000000 0010'B
      }
    },
    ue-RadioAccessCapability
    {
      pdcp-Capability
      {
        losslessSRNS-RelocationSupport FALSE,
        supportForRfc2507 notSupported : NULL
      },
      rlc-Capability
      {
        totalRLC-AM-BufferSize kb50,
        maximumRLC-WindowSize mws4095,
        maximumAM-EntityNumber am6
      },
      transportChannelCapability
      {
        dl-TransChCapability
        {
          maxNoBitsReceived b8960,
          maxConvCodeBitsReceived b640,
          turboDecodingSupport supported : b8960,
          maxSimultaneousTransChs e8,
          maxSimultaneousCCTrCH-Count 1,

```

```

        maxReceivedTransportBlocks tb32,
        maxNumberOfTFC tfc128,
        maxNumberOfTF tf64
    },
    ul-TransChCapability
    {
        maxNoBitsTransmitted b3840,
        maxConvCodeBitsTransmitted b640,
        turboEncodingSupport supported : b3840,
        maxSimultaneousTransChs e8,
        modeSpecificInfo tdd :
        {
            maxSimultaneousCCTrCH-Count 1
        },
        maxTransmittedBlocks tb8,
        maxNumberOfTFC tfc48,
        maxNumberOfTF tf32
    }
},
rf-Capability
{
},
physicalChannelCapability
{
},
ue-MultiModeRAT-Capability
{
    multiRAT-CapabilityList
    {
        supportOfGSM FALSE,
        supportOfMulticarrier FALSE
    },
    multiModeCapability tdd
},
securityCapability
{
    cipheringAlgorithmCap { uea0 },
    integrityProtectionAlgorithmCap { uia1 }
},
ue-positioning-Capability
{
    standaloneLocMethodsSupported FALSE,
    ue-BasedOTDOA-Supported FALSE,

```

```

        networkAssistedGPS-Supported noNetworkAssistedGPS,
        supportForUE-GPS-TimingOfCellFrames FALSE,
        supportForIPDL FALSE
    }
},
v370NonCriticalExtensions
{
    rrcConnectionSetupComplete-v370ext
    {
    },
    v380NonCriticalExtensions
    {
        rrcConnectionSetupComplete-v380ext
        {
            dl-PhysChCapabilityFDD-v380ext
            {
            }
        },
        v3a0NonCriticalExtensions
        {
            rrcConnectionSetupComplete-v3a0ext
            {
            },
            laterNonCriticalExtensions
            {
                v3g0NonCriticalExtensions
                {
                    rrcConnectionSetupComplete-v3g0ext
                    {
                    },
                    v4b0NonCriticalExtensions
                    {
                        rrcConnectionSetupComplete-v4b0ext
                        {
                            ue-RadioAccessCapability-v4b0ext
                            {
                                pdcp-Capability-r4-ext
                                {
                                    supportForRfc3095 notSupported : NULL
                                },
                                tdd-CapabilityExt
                                {
                                    rf-Capability

```

```

{
    tddRF-Capability
    {
        ue-PowerClass 2,
        radioFrequencyBandTDDList a,
        chipRateCapability mcps1-28
    }
},
physicalChannelCapability-LCR
{
    tdd128-PhysChCapability
    {
        downlinkPhysChCapability
        {
            maxTS-PerSubFrame 4,
            maxPhysChPerFrame 48,
            minimumSF sf1,
            supportOfPDSCH FALSE,
            maxPhysChPerTS 16,
            supportOf8PSK FALSE
        },
        uplinkPhysChCapability
        {
            maxTS-PerSubFrame 3,
            maxPhysChPerTimeslot ts2,
            minimumSF sf1,
            supportOfPUSCH FALSE,
            supportOf8PSK FALSE
        }
    }
},
measurementCapability-r4-ext
{
    downlinkCompressedMode-LCR
    {
    },
    uplinkCompressedMode-LCR
    {
    }
}
}
}

```



```

{
  pLMNIdentity '64F020'H,
  lAC '791C'H,
  sAC '36B1'H
},
{
  id 16,
  criticality ignore,
  value NAS-PDU : '052441034F189005F42060946E'H
},
{
  id 79,
  criticality ignore,
  value luSignallingConnectionIdentifier : '00000000 10000011 01101010'B
},
{
  id 86,
  criticality ignore,
  value GlobalRNC-ID :
  {
    pLMNIdentity '64F020'H,
    rNC-ID 14
  }
}
}
}

```

SECURITY MODE COMMAND(Iu)

value RANAP-PDU ::= initiatingMessage :

```
{
  procedureCode 6,
  criticality reject,
  value SecurityModeCommand :
  {
    protocolIEs
    {
      {
        id 12,
        criticality reject,
        value IntegrityProtectionInformation :
        {
          permittedAlgorithms
          {
            standard-UMTS-integrity-algorithm-UIA1
          },
          key '10110100 01001111 11111101 00001001 10111000 10010111
00111011 10101011 00011001 00010001 00010100 00111110 10000011 01000100
10101001 01110000'B
        }
      },
      {
        id 11,
        criticality ignore,
        value EncryptionInformation :
        {
          permittedAlgorithms
          {
            standard-UMTS-encryption-algorithm-UEA1,
            no-encryption
          },
          key '00111100 11100001 10101100 01110101 01001001 01010001
01101110 00101101 11110110 11001010 01111001 01101110 10101111 11011100
10010000 00011000'B
        }
      },
      {
        id 75,
```

```
        criticality ignore,  
        value KeyStatus : old  
    }  
}  
}  
}
```

SECURITY MODE COMMAND(Uu)

```

value DL-DCCH-Message ::=
{
    integrityCheckInfo
    {
        messageAuthenticationCode '11000010 11000110 00001011 00010000'B,
        rrc-MessageSequenceNumber 3
    },
    message securityModeCommand : r3 :
    {
        securityModeCommand-r3
        {
            rrc-TransactionIdentifier 0,
            securityCapability
            {
                cipheringAlgorithmCap { uea0 },
                integrityProtectionAlgorithmCap { uia1 }
            },
            integrityProtectionModeInfo
            {
                integrityProtectionModeCommand startIntegrityProtection :
                {
                    integrityProtInitNumber    '00000000    00000000    00101111
00011100'B
                },
                integrityProtectionAlgorithm uia1
            },
            cn-DomainIdentity cs-domain
        }
    }
}

```

SECURITY MODE COMPLETE(Uu)

SECURITY MODE COMPLETE(Iu)

COMMON ID(Iu)

value RANAP-PDU ::= initiatingMessage :

```
{
  procedureCode 15,
  criticality ignore,
  value CommonID :
  {
    protocolIEs
    {
      {
        id 23,
        criticality ignore,
        value PermanentNAS-UE-ID : iMSI : '640012001400FFFF'H
      }
    }
  }
}
```

UPLINK DIRECT TRANSFER(Call Setup)(Uu)

DIRECT TRANSFER(Iu)

DIRECT TRANSFER(Call Proceeding)(Iu)

DOWNLINK DIRECT TRANSFER(Uu)

RAB ASSIGNMENT REQUEST(Iu)

```
value RANAP-PDU ::= initiatingMessage :
{
    procedureCode 0,
    criticality reject,
    value RAB-AssignmentRequest :
    {
        protocolIEs
        {
            {
                id 54,
                criticality ignore,
                value RAB-SetupOrModifyList :
                {
                    {
                        {
                            id 53,
                            firstCriticality reject,
                            firstValue RAB-SetupOrModifyItemFirst :
                            {
```

```
rAB-ID '00000001'B,  
nAS-SynchronisationIndicator '0101'B,  
rAB-Parameters  
{  
  trafficClass conversational,  
  rAB-AsymmetryIndicator symmetric-bidirectional,  
  maxBitrate  
  {  
    12200  
  },  
  guaranteedBitRate  
  {  
    12200  
  },  
  deliveryOrder delivery-order-requested,  
  maxSDU-Size 244,  
  sDU-Parameters  
  {  
    {  
      sDU-ErrorRatio  
      {  
        mantissa 7,  
        exponent 3  
      },  
      residualBitErrorRatio  
      {  
        mantissa 1,  
        exponent 6  
      },  
      deliveryOfErroneousSDU no,  
      sDU-FormatInformationParameters  
      {  
        {  
          subflowSDU-Size 81  
        },  
        {  
          subflowSDU-Size 39  
        },  
        {  
          subflowSDU-Size 0  
        }  
      }  
    }  
  },  
}
```

```

{
    sDU-ErrorRatio
    {
        mantissa 7,
        exponent 3
    },
    residualBitErrorRatio
    {
        mantissa 1,
        exponent 3
    },
    deliveryOfErroneousSDU yes,
    sDU-FormatInformationParameters
    {
        {
            subflowSDU-Size 103
        },
        {
            subflowSDU-Size 0
        },
        {
            subflowSDU-Size 0
        }
    }
},
{
    sDU-ErrorRatio
    {
        mantissa 7,
        exponent 3
    },
    residualBitErrorRatio
    {
        mantissa 5,
        exponent 3
    },
    deliveryOfErroneousSDU yes,
    sDU-FormatInformationParameters
    {
        {
            subflowSDU-Size 60
        },
        {

```

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RADIO LINK RECONFIGURATION PREPARE(Iub)

```

value NBAP-PDU ::= initiatingMessage :
{
  procedureID
  {
    procedureCode 31,
    ddMode tdd
  },
  criticality reject,
  messageDiscriminator dedicated,
  transactionID longTransActionId : 0,
  value RadioLinkReconfigurationPrepareTDD :
  {
    protocolIEs
    {
      {
        id 143,
        criticality reject,
        value NodeB-CommunicationContextID : 0
      },
      {
        id 401,
        criticality reject,
        value UL-CCTrCH-InformationModifyList-RL-ReconfPrepTDD :
        {
          {
            cCTrCH-ID 1,
            tFCS
            {
              tFCSvalues no-Split-in-TFCI :
              {
                {
                  cTFC ctfc6bit : 0,
                  tFC-Beta computedGainFactors : 0
                },
                {
                  cTFC ctfc6bit : 1,
                  tFC-Beta computedGainFactors : 0
                },
                {

```



```

        cTFC ctfc6bit : 2,
        tFC-Beta computedGainFactors : 0
    },
    {
        cTFC ctfc6bit : 3,
        tFC-Beta computedGainFactors : 0
    },
    {
        cTFC ctfc6bit : 22,
        tFC-Beta computedGainFactors : 0
    },
    {
        cTFC ctfc6bit : 23,
        tFC-Beta signalledGainFactors :
        {
            gainFactor tdd : 15,
            refTFCNumber 0
        }
    }
},
tFCI-Coding v16,
punctureLimit 2,
ul-DPCH-InformationDeleteList
{
    id 406,
    criticality reject,
    value UL-DPCH-InformationModify-DeleteListIE-RL-ReconfPrepTDD :
    {
        {
            dPCH-ID 29
        }
    }
},
iE-Extensions
{
    {
        id 483,
        criticality reject,
        extensionValue
        UL-DPCH-LCR-InformationModify-AddList-RL-ReconfPrepTDD :
        {
            repetitionPeriod v1,

```

```

        repetitionLength 1,
        tdd-DPCHOffset noinitialOffset : 0,
        uL-Timeslot-InformationLCR
        {
            {
                timeSlotLCR 1,
                midambleShiftLCR
                {
                    midambleAllocationMode defaultMidamble,
                    midambleConfigurationLCR v8
                },
                tFCI-Presence present,
                uL-Code-InformationList
                {
                    {
                        dPCH-ID 14,
                        tdd-ChannelisationCodeLCR
                        {
                            tDD-ChannelisationCode chCode8div8,
                            modulation qPSK
                        },
                        tdd-UL-DPCH-TimeSlotFormat-LCR qPSK : 18
                    }
                }
            }
        }
    },
    {
        id 510,
        criticality reject,
        extensionValue UL-SIR : 120
    },
    {
        id 564,
        criticality reject,
        extensionValue TDD-TPC-UplinkStepSize-LCR : step-size1
    }
}
},
{

```

```

id 351,
criticality reject,
value DL-CCTrCH-InformationModifyList-RL-ReconfPrepTDD :
{
  {
    cCTrCH-ID 1,
    tFCS
    {
      tFCSvalues no-Split-in-TFCI :
      {
        {
          cTFC ctfc6bit : 0
        },
        {
          cTFC ctfc6bit : 1
        },
        {
          cTFC ctfc6bit : 2
        },
        {
          cTFC ctfc6bit : 3
        },
        {
          cTFC ctfc6bit : 22
        },
        {
          cTFC ctfc6bit : 23
        }
      }
    },
    tFCI-Coding v16,
    punctureLimit 2,
    cCTrCH-TPCList
    {
      {
        cCTrCH-ID 1
      }
    },
    dl-DPCH-InformationModifyList
    {
      id 357,
      criticality reject,
      value DL-DPCH-InformationModify-ModifyItem-RL-ReconfPrepTDD :

```

```

{
    repetitionPeriod v1,
    repetitionLength 1,
    tdd-DPCHOffset noinitialOffset : 0,
    iE-Extensions
    {
        {
            id 479,
            criticality reject,
            extensionValue
DL-Timeslot-LCR-InformationModify-ModifyList-RL-ReconfPrepTDD :
        {
            {
                timeSlotLCR 3,
                midambleShiftLCR
                {
                    midambleAllocationMode defaultMidamble,
                    midambleConfigurationLCR v8
                },
                tFCI-Presence present,

dL-Code-LCR-InformationModify-ModifyList-RL-ReconfPrepTDD
            {
                {
                    dPCH-ID 103,
                    tdd-ChannelisationCodeLCR
                    {
                        tDD-ChannelisationCode chCode16div9,
                        modulation qPSK
                    },
                    iE-Extensions
                    {
                        {
                            id 558,
                            criticality reject,
                            extensionValue
TDD-DL-DPCH-TimeSlotFormat-LCR : qPSK : 8
                        }
                    }
                }
            }
        }
    }
}

```

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```

    }
  },
  {
    id 50,
    criticality reject,
    value DCH-TDD-Information :
    {
      {
        payloadCRC-PresenceIndicator cRC-Included,
        ul-FP-Mode normal,
        toAWS 40,
        toAWE 7,
        dCH-SpecificInformationList
        {
          {
            dCH-ID 4,
            ul-CCTrCH-ID 1,
            dl-CCTrCH-ID 1,
            ul-TransportFormatSet
            {
              dynamicParts
              {
                {
                  nrOfTransportBlocks 0,
                  mode notApplicable : NULL
                },
                {
                  nrOfTransportBlocks 1,
                  transportBlockSize 39,
                  mode notApplicable : NULL
                },
                {
                  nrOfTransportBlocks 1,
                  transportBlockSize 81,
                  mode notApplicable : NULL
                }
              },
              semi-staticPart
              {
                transmissionTimeInterval msec-20,
                channelCoding convolutional-coding,
                codingRate third,
                rateMatchingAttribute 200,

```

```

        cRC-Size v12,
        mode tdd : frame-related
    }
},
dl-TransportFormatSet
{
    dynamicParts
    {
        {
            nrOfTransportBlocks 0,
            mode notApplicable : NULL
        },
        {
            nrOfTransportBlocks 1,
            transportBlockSize 39,
            mode notApplicable : NULL
        },
        {
            nrOfTransportBlocks 1,
            transportBlockSize 81,
            mode notApplicable : NULL
        }
    },
    semi-staticPart
    {
        transmissionTimeInterval msec-20,
        channelCoding convolutional-coding,
        codingRate third,
        rateMatchingAttribute 200,
        cRC-Size v12,
        mode tdd : frame-related
    }
},
allocationRetentionPriority
{
    priorityLevel 15,
    pre-emptionCapability shall-not-trigger-pre-emption,
    pre-emptionVulnerability not-pre-emptable
},
frameHandlingPriority 0,
qE-Selector selected
},
{

```

```
dCH-ID 5,  
ul-CCTrCH-ID 1,  
dl-CCTrCH-ID 1,  
ul-TransportFormatSet  
{  
    dynamicParts  
    {  
        {  
            nrOfTransportBlocks 0,  
            mode notApplicable : NULL  
        },  
        {  
            nrOfTransportBlocks 1,  
            transportBlockSize 103,  
            mode notApplicable : NULL  
        }  
    },  
    semi-staticPart  
    {  
        transmissionTimeInterval msec-20,  
        channelCoding convolutional-coding,  
        codingRate third,  
        rateMatchingAttribute 190,  
        crc-Size v0,  
        mode tdd : frame-related  
    }  
},  
dl-TransportFormatSet  
{  
    dynamicParts  
    {  
        {  
            nrOfTransportBlocks 0,  
            mode notApplicable : NULL  
        },  
        {  
            nrOfTransportBlocks 1,  
            transportBlockSize 103,  
            mode notApplicable : NULL  
        }  
    },  
    semi-staticPart  
    {
```



```

        transmissionTimeInterval msec-20,
        channelCoding convolutional-coding,
        codingRate third,
        rateMatchingAttribute 190,
        cRC-Size v0,
        mode tdd : frame-related
    }
},
allocationRetentionPriority
{
    priorityLevel 15,
    pre-emptionCapability shall-not-trigger-pre-emption,
    pre-emptionVulnerability not-pre-emptable
},
frameHandlingPriority 0,
qE-Selector non-selected
},
{
    dCH-ID 6,
    ul-CCTrCH-ID 1,
    dl-CCTrCH-ID 1,
    ul-TransportFormatSet
    {
        dynamicParts
        {
            {
                nrOfTransportBlocks 0,
                mode notApplicable : NULL
            },
            {
                nrOfTransportBlocks 1,
                transportBlockSize 60,
                mode notApplicable : NULL
            }
        },
        semi-staticPart
        {
            transmissionTimeInterval msec-20,
            channelCoding convolutional-coding,
            codingRate half,
            rateMatchingAttribute 235,
            cRC-Size v0,
            mode tdd : frame-related
        }
    }
}

```

```

    }
  },
  dl-TransportFormatSet
  {
    dynamicParts
    {
      {
        nrOfTransportBlocks 0,
        mode notApplicable : NULL
      },
      {
        nrOfTransportBlocks 1,
        transportBlockSize 60,
        mode notApplicable : NULL
      }
    },
    semi-staticPart
    {
      transmissionTimeInterval msec-20,
      channelCoding convolutional-coding,
      codingRate half,
      rateMatchingAttribute 235,
      crc-Size v0,
      mode tdd : frame-related
    }
  },
  allocationRetentionPriority
  {
    priorityLevel 15,
    pre-emptionCapability shall-not-trigger-pre-emption,
    pre-emptionVulnerability not-pre-emptable
  },
  frameHandlingPriority 0,
  qE-Selector non-selected
}
}
}
},
{
  id 229,
  criticality reject,
  value RL-Information-RL-ReconfPrepTDD :

```

```

    {
        rL-ID 0,
        maxDL-Power 59,
        minDL-Power -350,
        iE-Extensions
        {
            {
                id 554,
                criticality ignore,
                extensionValue UL-Synchronisation-Parameters-LCR :
                {
                    uL-Synchronisation-StepSize 1,
                    uL-Synchronisation-Frequency 1
                }
            }
        }
    }
}

```

RADIO LINK RECONFIGURATION READY(Iub)

```

value NBAP-PDU ::= succesfulOutcome :
{
    procedureID
    {
        procedureCode 31,
        ddMode tdd
    },
    criticality reject,
    messageDiscriminator dedicated,
    transactionID longTransActionId : 0,
    value RadioLinkReconfigurationReady :
    {
        protocolIEs
        {
            {
                id 44,

```

```

        criticality ignore,
        value CRNC-CommunicationContextID : 854
    },
    {
        id 222,
        criticality ignore,
        value RL-InformationResponseList-RL-ReconfReady :
        {
            {
                id 218,
                criticality ignore,
                value RL-InformationResponseItem-RL-ReconfReady :
                {
                    rL-ID 0,
                    dCH-InformationResponseList-RL-ReconfReady
                    {
                        id 59,
                        criticality ignore,
                        value DCH-InformationResponse :
                        {
                            {
                                dCH-ID 4,
                                bindingID '0000007E'H,
                                transportLayerAddress '00001010 00000001 00000010
                                00000011 00000100 00000101 00000110 00000111 00001000 00001001 00001010
                                00001011 00001100 00001101 00001110 00001111 00000001 00000010 00000011
                                00000001'B
                            }
                        }
                    }
                }
            }
        }
    }
}

```

RADIO BEARER SETUP(Uu)

```

value DL-DCCH-Message ::=
{
  integrityCheckInfo
  {
    messageAuthenticationCode '00010000 01011101 11001001 00000110'B,
    rrc-MessageSequenceNumber 4
  },
  message radioBearerSetup : later-than-r3 :
  {
    rrc-TransactionIdentifier 0,
    criticalExtensions r4 :
    {
      radioBearerSetup-r4
      {
        activationTime 24,
        rrc-StateIndicator cell-DCH,
        rab-InformationSetupList
        {
          {
            rab-Info
            {
              rab-Identity gsm-MAP-RAB-Identity : '00000001'B,
              cn-DomainIdentity cs-domain,
              nas-Synchronisation-Indicator '0101'B,
              re-EstablishmentTimer useT314
            },
            rb-InformationSetupList
            {
              {
                rb-Identity 5,
                rlc-InfoChoice rlc-Info :
                {
                  ul-RLC-Mode ul-TM-RLC-Mode :
                  {
                    segmentationIndication FALSE
                  },
                  dl-RLC-Mode dl-TM-RLC-Mode :
                  {
                    segmentationIndication FALSE

```

```

    }
  },
  rb-MappingInfo
  {
    {
      ul-LogicalChannelMappings oneLogicalChannel :
      {
        ul-TransportChannelType dch : 4,
        rlc-SizeList configured : NULL,
        mac-LogicalChannelPriority 5
      },
      dl-LogicalChannelMappingList
      {
        {
          dl-TransportChannelType dch : 4
        }
      }
    }
  },
  {
    rb-Identity 6,
    rlc-InfoChoice rlc-Info :
    {
      ul-RLC-Mode ul-TM-RLC-Mode :
      {
        segmentationIndication FALSE
      },
      dl-RLC-Mode dl-TM-RLC-Mode :
      {
        segmentationIndication FALSE
      }
    },
    rb-MappingInfo
    {
      {
        ul-LogicalChannelMappings oneLogicalChannel :
        {
          ul-TransportChannelType dch : 5,
          rlc-SizeList configured : NULL,
          mac-LogicalChannelPriority 5
        },
        dl-LogicalChannelMappingList

```

```

        {
            {
                dl-TransportChannelType dch : 5
            }
        }
    },
    {
        rb-Identity 7,
        rlc-InfoChoice rlc-Info :
        {
            ul-RLC-Mode ul-TM-RLC-Mode :
            {
                segmentationIndication FALSE
            },
            dl-RLC-Mode dl-TM-RLC-Mode :
            {
                segmentationIndication FALSE
            }
        },
        rb-MappingInfo
        {
            {
                ul-LogicalChannelMappings oneLogicalChannel :
                {
                    ul-TransportChannelType dch : 6,
                    rlc-SizeList configured : NULL,
                    mac-LogicalChannelPriority 5
                },
                dl-LogicalChannelMappingList
                {
                    {
                        dl-TransportChannelType dch : 6
                    }
                }
            }
        }
    },
    ul-CommonTransChInfo

```

```

{
    modeSpecificInfo tdd :
    {
        individualUL-CCTrCH-InfoList
        {
            {
                ul-TFCS-Identity
                {
                    tfcs-ID 1,
                    sharedChannelIndicator FALSE
                },
                ul-TFCS normalTFCI-Signalling : complete :
                {
                    ctfcSize ctfc6Bit :
                    {
                        {
                            ctfc6 0,
                            powerOffsetInformation
                            {
                                gainFactorInformation
computedGainFactors : 0
                            }
                        },
                        {
                            ctfc6 1,
                            powerOffsetInformation
                            {
                                gainFactorInformation
computedGainFactors : 0
                            }
                        },
                        {
                            ctfc6 2,
                            powerOffsetInformation
                            {
                                gainFactorInformation
computedGainFactors : 0
                            }
                        },
                        {
                            ctfc6 3,
                            powerOffsetInformation
                            {

```



```

gainFactorInformation
computedGainFactors : 0
    }
    },
    {
        ctfc6 22,
        powerOffsetInformation
        {
            gainFactorInformation
            computedGainFactors : 0
            }
        },
        {
            ctfc6 23,
            powerOffsetInformation
            {
                gainFactorInformation
                signalledGainFactors :
                    {
                        modeSpecificInfo tdd : NULL,
                        gainFactorBetaD 15,
                        referenceTFC-ID 0
                    }
                }
            }
        },
        },
        tfc-Subset fullTFCS : NULL
    }
}
},
ul-AddReconfTransChInfoList
{
    {
        ul-TransportChannelType dch,
        transportChannelIdentity 4,
        transportFormatSet dedicatedTransChTFS :
        {
            tti tti20 :
            {
                {
                    rlc-Size bitMode : sizeType1 : 39,

```

```

        numberOfTbSizeList
        {
            zero : NULL,
            one : NULL
        },
        logicalChannelList allSizes : NULL
    },
    {
        rlc-Size bitMode : sizeType1 : 81,
        numberOfTbSizeList
        {
            one : NULL
        },
        logicalChannelList allSizes : NULL
    }
},
semistaticTF-Information
{
    channelCodingType convolutional : third,
    rateMatchingAttribute 200,
    crc-Size crc12
}
},
{
    ul-TransportChannelType dch,
    transportChannelIdentity 5,
    transportFormatSet dedicatedTransChTFS :
    {
        tti tti20 :
        {
            {
                rlc-Size bitMode : sizeType1 : 103,
                numberOfTbSizeList
                {
                    zero : NULL,
                    one : NULL
                },
                logicalChannelList allSizes : NULL
            }
        },
        semistaticTF-Information
        {

```

```

        channelCodingType convolutional : third,
        rateMatchingAttribute 190,
        crc-Size crc0
    }
}
},
{
    ul-TransportChannelType dch,
    transportChannelIdentity 6,
    transportFormatSet dedicatedTransChTFS :
    {
        tti tti20 :
        {
            {
                rlc-Size bitMode : sizeType1 : 60,
                numberOfTbSizeList
            {
                zero : NULL,
                one : NULL
            },
            logicalChannelList allSizes : NULL
        }
    },
    semistaticTF-Information
    {
        channelCodingType convolutional : half,
        rateMatchingAttribute 235,
        crc-Size crc0
    }
}
},
dl-CommonTransChInfo
{
    modeSpecificInfo tdd :
    {
        individualDL-CCTrCH-InfoList
        {
            {
                dl-TFCS-Identity
            {
                tfcs-ID 1,
                sharedChannelIndicator FALSE
            }
        }
    }
}
}

```

```

    },
    tfcs-SignallingMode explicit-config : normalTFCl-Signalling :
complete :
    {
        ctfcSize ctfc6Bit :
        {
            {
                ctfc6 0
            },
            {
                ctfc6 1
            },
            {
                ctfc6 2
            },
            {
                ctfc6 3
            },
            {
                ctfc6 22
            },
            {
                ctfc6 23
            }
        }
    }
}
},
dl-AddReconfTransChInfoList
{
    {
        dl-TransportChannelType dch,
        dl-transportChannelIdentity 4,
        tfs-SignallingMode explicit-config : dedicatedTransChTFS :
        {
            tti tti20 :
            {
                {
                    rlc-Size bitMode : sizeType1 : 39,
                    numberOfTbSizeList
                }
            }
        }
    }
}

```

```

        zero : NULL,
        one : NULL
    },
    logicalChannelList allSizes : NULL
},
{
    rlc-Size bitMode : sizeType1 : 81,
    numberOfTbSizeList
    {
        one : NULL
    },
    logicalChannelList allSizes : NULL
}
},
semistaticTF-Information
{
    channelCodingType convolutional : third,
    rateMatchingAttribute 200,
    crc-Size crc12
}
},
dch-QualityTarget
{
    bler-QualityValue -20
}
},
{
    dl-TransportChannelType dch,
    dl-transportChannelIdentity 5,
    tfs-SignallingMode explicit-config : dedicatedTransChTFS :
    {
        tti tti20 :
        {
            {
                rlc-Size bitMode : sizeType1 : 103,
                numberOfTbSizeList
                {
                    zero : NULL,
                    one : NULL
                },
                logicalChannelList allSizes : NULL
            }
        }
    },

```

```

        semistaticTF-Information
        {
            channelCodingType convolutional : third,
            rateMatchingAttribute 190,
            crc-Size crc0
        }
    },
    dch-QualityTarget
    {
        bler-QualityValue 0
    }
},
{
    dl-TransportChannelType dch,
    dl-transportChannelIdentity 6,
    tfs-SignallingMode explicit-config : dedicatedTransChTFS :
    {
        tti tti20 :
        {
            {
                rlc-Size bitMode : sizeType1 : 60,
                numberOfTbSizeList
                {
                    zero : NULL,
                    one : NULL
                },
                logicalChannelList allSizes : NULL
            }
        },
        semistaticTF-Information
        {
            channelCodingType convolutional : half,
            rateMatchingAttribute 235,
            crc-Size crc0
        }
    },
    dch-QualityTarget
    {
        bler-QualityValue 0
    }
}
},
frequencyInfo

```

```

{
    modeSpecificInfo tdd :
    {
        uarfcn-Nt 10071
    }
},
maxAllowedUL-TX-Power 24,
ul-ChannelRequirement ul-DPCH-Info :
{
    ul-DPCH-PowerControlInfo tdd :
    {
        ul-TargetSIR 25,
        ul-OL-PC-Signalling individuallySignalled :
        {
            tddOption tdd128 :
            {
                tpc-StepSize 1
            },
            primaryCCPCH-TX-Power 27
        }
    },
    modeSpecificInfo tdd :
    {
        ul-TimingAdvance enabled :
        {
            tddOption tdd128 :
            {
                ul-SynchronisationParameters
                {
                    stepSize 1,
                    frequency 1
                }
            }
        },
        ul-CCTrCHList
        {
            {
                tfcs-ID 1,
                ul-TargetSIR 25,
                timeInfo
                {
                    activationTime 24
                }
            },

```

```

commonTimeslotInfo
{
    secondInterleavingMode frameRelated,
    tfci-Coding tfci-bits-16,
    puncturingLimit pl0-48,
    repetitionPeriodAndLength repetitionPeriod1 : NULL
},
tddOption tdd128 :
{
    ul-CCTrCH-TimeslotsCodes
    {
        dynamicSFusage FALSE,
        firstIndividualTimeslotInfo
        {
            timeslotNumber 1,
            tfci-Existence TRUE,
            midambleShiftAndBurstType
            {
                midambleAllocationMode

                midambleConfiguration 4
            },
            modulation mod-QPSK,
            ss-TPC-Symbols one
        },
        ul-TS-ChannelisationCodeList
        {
            cc8-8
        },
        moreTimeslots noMore : NULL
    }
}
}
},
modeSpecificPhysChInfo tdd : NULL,
dl-CommonInformation
{
    dl-DPCH-InfoCommon
    {
        cfnHandling maintain : NULL,
        modeSpecificInfo tdd :

```



```

        {
        }
    },
    modeSpecificInfo tdd :
    {
        tddOption tdd128 :
        {
            tstd-Indicator FALSE
        }
    }
},
dl-InformationPerRL-List
{
    {
        modeSpecificInfo tdd : tdd :
        {
            tddOption tdd128 :
            {
                tstd-Indicator FALSE
            },
            sctd-Indicator FALSE
        },
        dl-DPCH-InfoPerRL tdd :
        {
            dl-CCTrChListToEstablish
            {
                {
                    tfcs-ID 1,
                    timeInfo
                    {
                        activationTime 24
                    },
                    commonTimeslotInfo
                    {
                        secondInterleavingMode frameRelated,
                        tfci-Coding tfci-bits-16,
                        puncturingLimit pl0-48,
                        repetitionPeriodAndLength repetitionPeriod1 : NULL
                    },
                    tddOption tdd128 :
                    {
                        dl-CCTrCH-TimeslotsCodes
                        {

```

```

firstIndividualTimeslotInfo
{
    timeslotNumber 3,
    tfci-Existence TRUE,
    midambleShiftAndBurstType
    {
        midambleAllocationMode

        midambleConfiguration 4
    },
    modulation mod-QPSK,
    ss-TPC-Symbols one
},
dl-TS-ChannelisationCodesShort
{
    codesRepresentation      bitmap      :
{ chCode10-SF16, chCode9-SF16 }
},
moreTimeslots noMore : NULL
}
}
}
}
}
}
},
v4d0NonCriticalExtensions
{
    radioBearerSetup-r4-add-ext
    CONTAINING
    {
        radioBearerSetup-r4-TDD128-add-ext
        {
            frequencyInfo
            {
                modeSpecificInfo tdd :
                {
                    uarfcn-Nt 10055
                }
            },
            upPCHpositionInfo 0
        }
    }
}

```

```
}  
  }  
    }  
      }  
        }
```

RADIO LINK RECONFIGURATION COMMIT(lub)

```
value NBAP-PDU ::= initiatingMessage :
{
  procedureID
  {
    procedureCode 30,
    ddMode common
  },
  criticality ignore,
  messageDiscriminator dedicated,
  transactionID longTransActionId : 0,
  value RadioLinkReconfigurationCommit :
  {
    protocolIEs
    {
      {
        id 143,
        criticality ignore,
        value NodeB-CommunicationContextID : 0
      },
      {
        id 24,
        criticality ignore,
        value CFN : 24
      }
    }
  }
}
```

RADIO BEARER SETUP COMPLETE(Uu)

```

value UL-DCCH-Message ::=
{
  integrityCheckInfo
  {
    messageAuthenticationCode '10000100 00110100 10000000 01110101'B,
    rrc-MessageSequenceNumber 3
  },
  message radioBearerSetupComplete :
  {
    rrc-TransactionIdentifier 0,
    start-Value '00000000 00000000 1000'B
  }
}

```

RAB ASSIGNMENT RESPONSE(Iu)

```

value RANAP-PDU ::= outcome :
{
  procedureCode 0,
  criticality reject,
  value RAB-AssignmentResponse :
  {
    protocolIEs
    {
      {
        id 52,
        criticality ignore,
        value RAB-SetupOrModifiedList :
        {
          {
            {
              id 51,
              criticality ignore,
              value RAB-SetupOrModifiedItem :
              {
                rAB-ID '00000001'B
              }
            }
          }
        }
      }
    }
  }
}

```

```
}  
  }  
    }  
      }  
        }  
          }  
            }  
              }
```

DIRECT TRANSFER(Progress)(Iu)

DOWNLINK DIRECT TRANSFER(Uu)

DIRECT TRANSFER(Alerting)(Iu)

DOWNLINK DIRECT TRANSFER(Uu)

DIRECT TRANSFER(Connect)(Iu)

DOWNLINK DIRECT TRANSFER(Uu)

UPLINK DIRECT TRANSFER(ConACK)(Uu)

DIRECT TRANSFER(Iu)

