

20 апреля 2024

Протоколы и интерфейсы БС LTE. Лекция 9.

Интерфейс W1. TS 37.473

ВЛАД РЫЖОВ

Fast Track в Телеком, 2024



Что сегодня будет происходить? Адженда

**Список
процедур W1**

5 минут

**Разбор типов
процедур**

25 минут

**Примеры
сообщений**

5 минут

Пример ASN1

10 минут

**Какие компоненты сети соединяет
интерфейс W1? Каковы его функции?**

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5 минут

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25 минут

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10 минут

Пример ASN1

10 минут

Список процедур. Класс-1.

Table 8.1-1: Class 1 procedures

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Reset	RESET	RESET ACKNOWLEDGE	
W1 Setup	W1 SETUP REQUEST	W1 SETUP RESPONSE	W1 SETUP FAILURE
ng-eNB-DU Configuration Update	NG-ENB-DU CONFIGURATION UPDATE	NG-ENB-DU CONFIGURATION UPDATE ACKNOWLEDGE	NG-ENB-DU CONFIGURATION UPDATE FAILURE
ng-eNB-CU Configuration Update	NG-ENB-CU CONFIGURATION UPDATE	NG-ENB-CU CONFIGURATION UPDATE ACKNOWLEDGE	NG-ENB-CU CONFIGURATION UPDATE FAILURE
UE Context Setup	UE CONTEXT SETUP REQUEST	UE CONTEXT SETUP RESPONSE	UE CONTEXT SETUP FAILURE
UE Context Release (ng-eNB-CU initiated)	UE CONTEXT RELEASE COMMAND	UE CONTEXT RELEASE COMPLETE	
UE Context Modification (ng-eNB-CU initiated)	UE CONTEXT MODIFICATION REQUEST	UE CONTEXT MODIFICATION RESPONSE	UE CONTEXT MODIFICATION FAILURE
UE Context Modification Required (ng-eNB-DU initiated)	UE CONTEXT MODIFICATION REQUIRED	UE CONTEXT MODIFICATION CONFIRM	UE CONTEXT MODIFICATION REFUSE
Write-Replace Warning	WRITE-REPLACE WARNING REQUEST	WRITE-REPLACE WARNING RESPONSE	
PWS Cancel	PWS CANCEL REQUEST	PWS CANCEL RESPONSE	
NG-ENB-DU RESOURCE COORDINATION	NG-ENB-DU RESOURCE COORDINATION REQUEST	NG-ENB-DU RESOURCE COORDINATION RESPONSE	



Список процедур. Класс-2.

Table 8.2-2: Class 2 procedures

Elementary Procedure	Message
Error Indication	ERROR INDICATION
UE Context Release Request (ng-eNB-DU initiated)	UE CONTEXT RELEASE REQUEST
Initial UL RRC Message Transfer	INITIAL UL RRC MESSAGE TRANSFER
DL RRC Message Transfer	DL RRC MESSAGE TRANSFER
UL RRC Message Transfer	UL RRC MESSAGE TRANSFER
UE Inactivity Notification	UE INACTIVITY NOTIFICATION
System Information Delivery	SYSTEM INFORMATION DELIVERY COMMAND
Paging	PAGING
Notify	NOTIFY
PWS Restart Indication	PWS RESTART INDICATION
PWS Failure Indication	PWS FAILURE INDICATION
ng-eNB-DU Status Indication	NG-ENB-DU STATUS INDICATION
RRC Delivery Report	RRC DELIVERY REPORT



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5 минут

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25 минут

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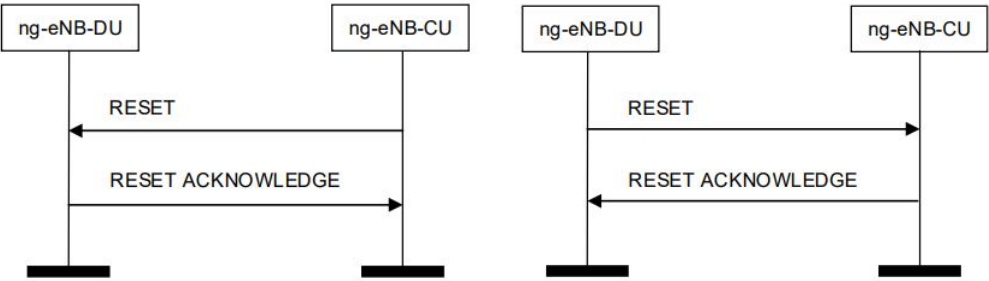
10 минут

Пример ASN1

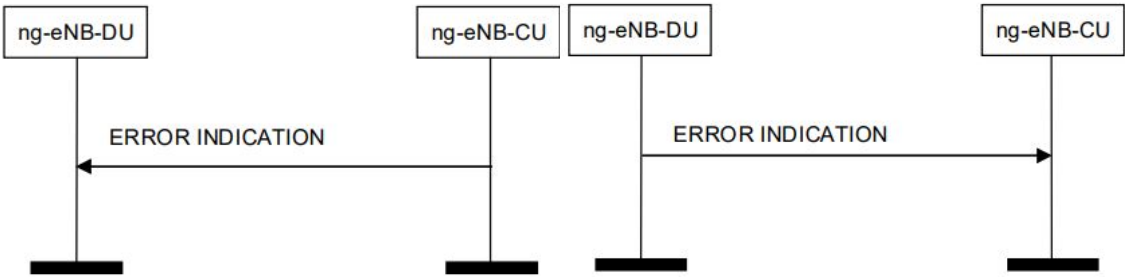
10 минут

Interface Management procedures

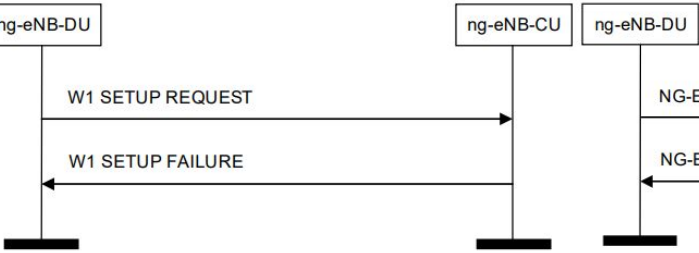
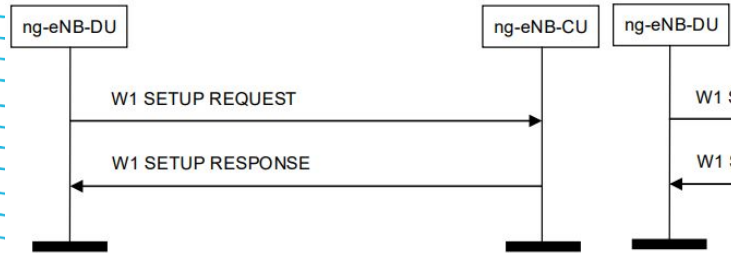
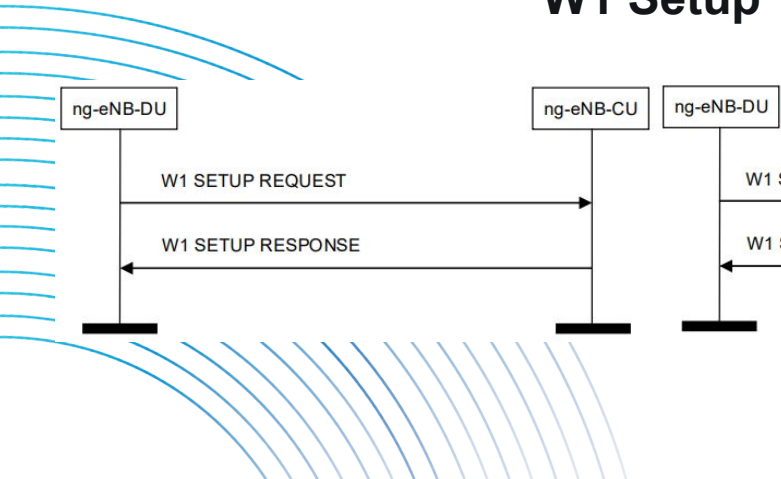
Reset



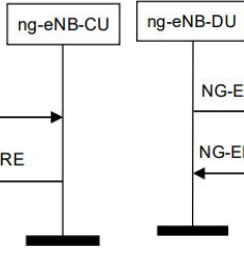
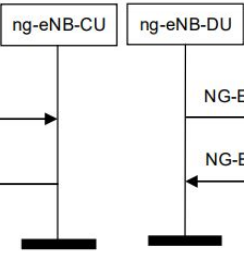
Error Indication



W1 Setup

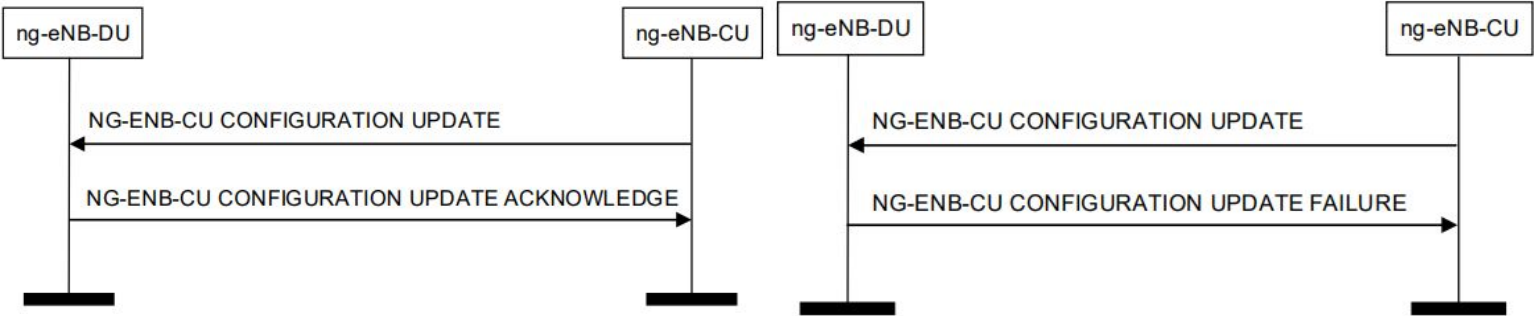


ng-eNB-DU Configuration Update

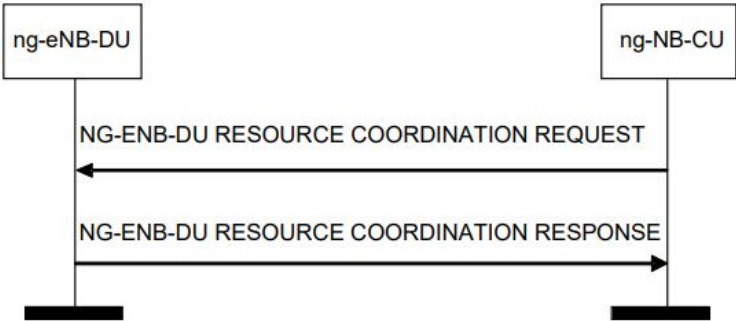


Interface Management procedures

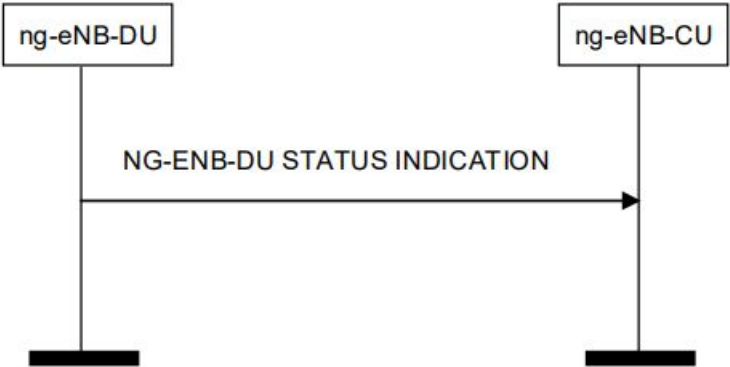
ng-eNB-CU Configuration Update



ng-eNB-DU Resource Coordination

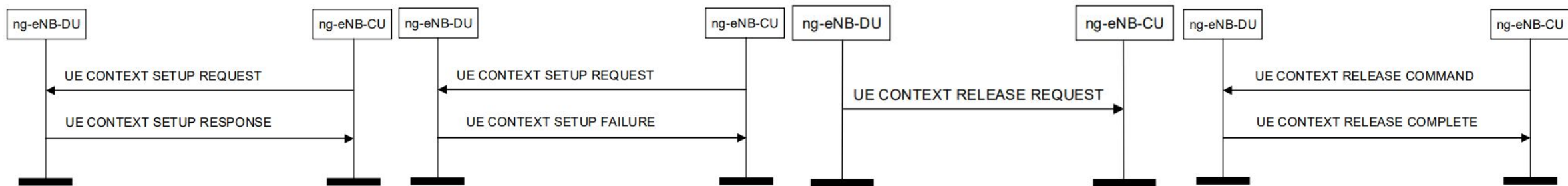


ng-eNB-DU Status Indication



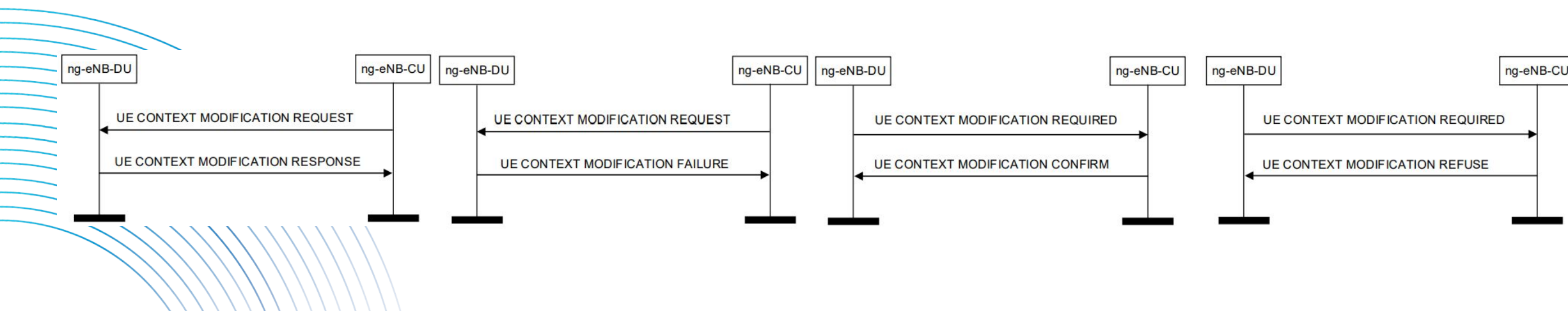
UE Context Management procedures

UE Context Setup



UE Context Release Request

UE Context Modification

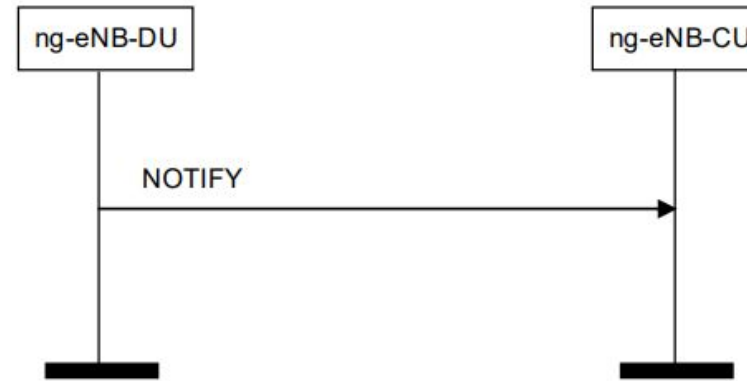


UE Context Management procedures

UE Inactivity Notification



Notify



RRC Message Transfer procedures

Initial UL RRC Message Transfer



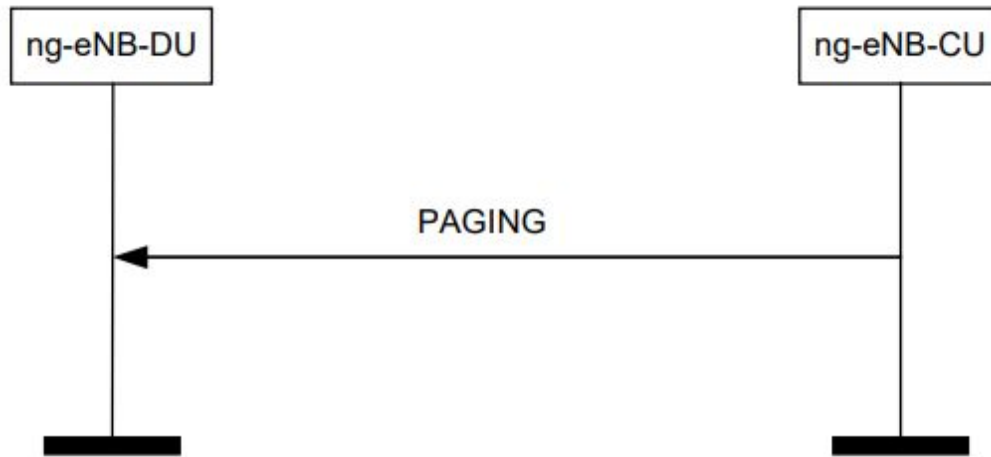
DL RRC Message Transfer



UL RRC Message Transfer



Paging procedures



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5 минут

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25 минут

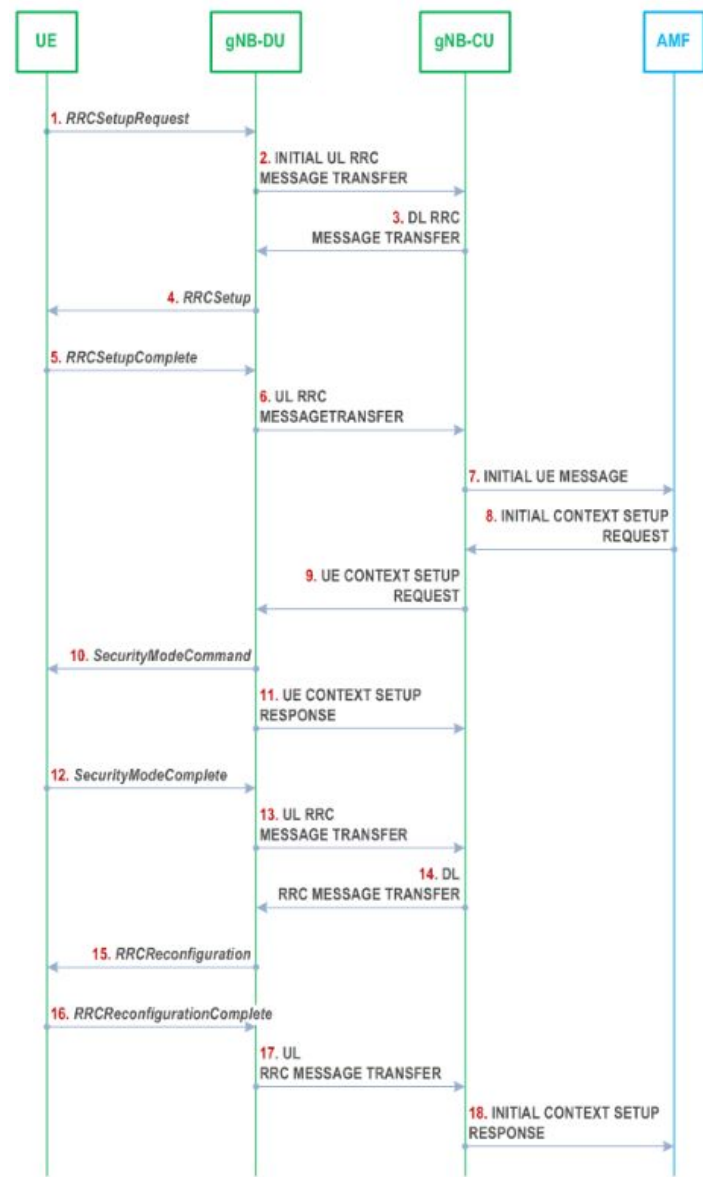
**Примеры
сообщений**

10 минут

Пример ASN1

10 минут

MESSAGE TRANSFER call flow



INITIAL UL RRC MESSAGE TRANSFER

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
Transaction ID	M		9.3.1.23		YES	Ignore
ng-eNB-DU UE W1AP ID	M		9.3.1.5		YES	reject
E-UTRAN CGI	M		9.3.1.12	NG-RAN Cell Global Identifier	YES	reject
C-RNTI	M		9.3.1.29	C-RNTI allocated at the ng-eNB-DU	YES	reject
RRC-Container	M		9.3.1.6	Includes the <i>UL-CCCH-Message</i> IE as defined in clause 6.2 of TS 36.331 [2].	YES	reject
DU to CU RRC Container	O		OCTET STRING	<i>RadioResourceConfigDedicated</i> IE as defined in clause 6.3.2 in TS 36.331 [2]. Required at least to carry SRB1 configuration.	YES	reject

```

InitialULRRCTransfer ::= SEQUENCE {
    protocolIES          ProtocolIE-Container    {{ InitialULRRCTransferIEs}},
    ...
}

InitialULRRCTransferIEs W1AP-PROTOCOL-IES ::= {
    { ID id-ng-eNB-DU-UE-W1AP-ID      CRITICALITY reject  TYPE NGENB-DU-UE-W1AP-ID    PRESENCE
mandatory  }}
    { ID id-EUTRANCGI                CRITICALITY reject  TYPE EUTRANCGI        PRESENCE mandatory }}
    { ID id-C-RNTI                    CRITICALITY reject  TYPE C-RNTI           PRESENCE mandatory }}
    { ID id-RRCContainer               CRITICALITY reject  TYPE RRCContainer     PRESENCE mandatory }}
    { ID id-DUtoCURRCCContainer        CRITICALITY reject  TYPE DUtoCURRCCContainer PRESENCE
optional  }}
    { ID id-TransactionID              CRITICALITY ignore TYPE TransactionID    PRESENCE mandatory },
    ...
}

```



DL RRC MESSAGE TRANSFER

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
ng-eNB-CU UE W1AP ID	M		9.3.1.4		YES	reject
ng-eNB-DU UE W1AP ID	M		9.3.1.5		YES	reject
old ng-eNB-DU UE W1AP ID	O		9.3.1.5	Include it if RRCConnectionReestablishment is included in RRC-Container	YES	reject
SRB ID	M		9.3.1.7		YES	reject
RRC-Container	M		9.3.1.6	Includes the <i>DL-DCCH-Message</i> IE as defined in clause 6.2 of TS 36.331 [2] encapsulated in a PDCP PDU, or the <i>DL-CCCH-Message</i> IE as defined in clause 6.2 of TS 36.331 [2].	YES	reject

```

id-InitialULRRCTestMessageTransfer      ProcedureCode ::= 11
id-DLRRCTestMessageTransfer              ProcedureCode ::= 12
id-ULRRCTestMessageTransfer              ProcedureCode ::= 13

```

```

DLRRCTestMessageTransfer ::= SEQUENCE {
    protocolIEs          ProtocolIE-Container    {{ DLRRCTestMessageTransferIEs}},
    ...
}

```

```

DLRRCTestMessageTransferIEs W1AP-PROTOCOL-IES ::= {
    { ID id-ng-eNB-CU-UE-W1AP-ID CRITICALITY reject TYPE NGENB-CU-UE-W1AP-ID PRESENCE mandatory }|
    { ID id-ng-eNB-DU-UE-W1AP-ID CRITICALITY reject TYPE NGENB-DU-UE-W1AP-ID PRESENCE mandatory }|
    { ID id-oldng-eNB-DU-UE-W1AP-ID PRESENCE optional CRITICALITY reject TYPE NGENB-DU-UE-W1AP-ID }|
    { ID id-SRBID PRESENCE mandatory CRITICALITY reject TYPE SRBID }|
    { ID id-RRCContainer PRESENCE mandatory CRITICALITY reject TYPE RRCContainer }|
    ...
}

```



UL RRC MESSAGE TRANSFER

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M		9.3.1.1		YES	ignore
ng-eNB-CU UE W1AP ID	M		9.3.1.4		YES	reject
ng-eNB-DU UE W1AP ID	M		9.3.1.5		YES	reject
SRB ID	M		9.3.1.7		YES	reject
RRC-Container	M		9.3.1.6	Includes the <i>UL-DCCH-Message</i> IE as defined in clause 6.2 of TS 36.331 [2], encapsulated in a PDCP PDU.	YES	reject

```
id-InitialULRRCTransfer ::= ProcedureCode ::= 11
id-DLRRCTransfer ::= ProcedureCode ::= 12
id-ULRRCTransfer ::= ProcedureCode ::= 13

ULRRCTransfer ::= SEQUENCE {
    protocolIEs ProtocolIE-Container {{ ULRRCTransferIEs}},
    ...
}

ULRRCTransferIEs W1AP-PROTOCOL-IES ::= {
    { ID id-ng-eNB-CU-UE-W1AP-ID CRITICALITY reject TYPE NGENB-CU-UE-W1AP-ID
    PRESENCE mandatory }|
    { ID id-ng-eNB-DU-UE-W1AP-ID CRITICALITY reject TYPE NGENB-DU-UE-W1AP-ID
    PRESENCE mandatory }|
    { ID id-SRBID CRITICALITY reject TYPE SRBID
    PRESENCE mandatory }|
    { ID id-RRCContainer CRITICALITY reject TYPE RRCContainer
    PRESENCE mandatory },
    ...
}
```



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Разбор примера

СПАСИБО