

Ban đầu cái to nhất tạo TVALUE

```
E2setupRequest ::= SEQUENCE {
    protocolIEs  ProtocolIE-Container { {E2setupRequestIEs} },
    ...
}
```



```
typedef enum {
    T_E2AP_PDU_Contents_e2ap_E2SetupRequestIEs_UNDEF,
    T_E2AP_PDU_Contents_e2ap_E2SetupRequestIEs_id_TransactionID,
    T_E2AP_PDU_Contents_e2ap_E2SetupRequestIEs_id_GlobalE2node_ID,
    T_E2AP_PDU_Contents_e2ap_E2SetupRequestIEs_id_RANfunctionsAdded_List,
    T_E2AP_PDU_Contents_e2ap_E2SetupRequestIEs_id_E2nodeComponentConfigAddition_List,
    T_E2AP_PDU_Contents_e2ap_E2SetupRequestIEs_id_Extended_RANnodeName_
} e2ap_E2SetupRequestIEs_TVALUE;
```

Tạo struct gồm Tvalue và union của nó

```
E2setupRequestIEs E2AP-PROTOCOL-IES ::= {
    { ID id-TransactionID      CRITICALITY reject TYPE TransactionID      PRESENCE mandatory },
    { ID id-GlobalE2node-ID    CRITICALITY reject TYPE GlobalE2node-ID    PRESENCE mandatory },
    { ID id-RANfunctionsAdded  CRITICALITY reject TYPE RANfunctions-List   PRESENCE mandatory },
    { ID id-E2nodeComponentConfigAddition CRITICALITY reject TYPE E2nodeComponentConfigAddition-List   PRESENCE mandatory },
    ...
}
```

```
typedef struct e2ap_E2SetupRequest_protocolIEs_element {
    e2ap_ProtocolIE_ID id;
    e2ap_Criticality criticality;
    struct {
        /**
         * Information object selector
         */
        e2ap_E2SetupRequestIEs_TVALUE t;
    }/*;
    /**
     * E2SetupRequest-IEs information objects
     */
    union {
        /**
         * id: id-TransactionID
         * criticality: e2ap_reject
         * presence: e2ap_mandatory
         */
        e2ap_TransactionID *_e2ap_E2SetupRequestIEs_id_TransactionID;

        /**
         * id: id-GlobalE2node-ID
         * criticality: e2ap_reject
         * presence: e2ap_mandatory
         */
        e2ap_GlobalE2node_ID *_e2ap_E2SetupRequestIEs_id_GlobalE2node_ID;

        /**
         * id: id-RANfunctionsAdded
         * criticality: e2ap_reject
         * presence: e2ap_mandatory
         */
        e2ap_RANfunctionsAdded_List *_e2ap_E2SetupRequestIEs_id_RANfunctionsAdded_List;

        /**
         * id: id-E2nodeComponentConfigAddition
         * List
         * criticality: e2ap_reject
         * presence: e2ap_mandatory
         */
        e2ap_E2nodeComponentConfigAddition_List *_e2ap_E2SetupRequestIEs_id_E2nodeComponentConfigAddition_List;

        // Add more cases here if necessary
        ASN1OpenType* extElem1;
    } u;
} value;
} e2ap_E2SetupRequest_protocolIEs_element;
```

```

EXTERN int asn1PE_e2ap_E2SetupRequest_protocolIEs_element (OSCTXT* pctxt, e2ap_E2SetupRequest_protocolIEs_element* pvalue);
EXTERN int e2apPD_E2SetupRequest_protocolIEs_element(OSCTXT* pctxt, e2ap_E2SetupRequest_protocolIEs_element* pvalue);
EXTERN int asn1Init_e2ap_E2SetupRequest_protocolIEs_element (e2ap_E2SetupRequest_protocolIEs_element* pvalue);
EXTERN void free_e2ap_E2SetupRequest_protocolIEs_element (OSCTXT *pctxt,e2ap_E2SetupRequest_protocolIEs_element *pvalue);

```

Sau khi tạo từng element (dùng 4 cái trong 1 struct-union)-> gộp chúng lại thành 1 bản tin

1 list gồm 4 cái kia

```

*****
/*
*   E2SetupRequest_protocolIEs
*
*****
Type was extracted from 'E2SetupRequest'
*/
/* List of e2ap_E2SetupRequest_protocolIEs_element */
typedef OSRTDList e2ap_E2SetupRequest_protocolIEs;

EXTERN int asn1PE_e2ap_E2SetupRequest_protocolIEs (OSCTXT* pctxt, e2ap_E2SetupRequest_protocolIEs* pvalue);

EXTERN int asn1PD_e2ap_E2SetupRequest_protocolIEs (OSCTXT* pctxt, e2ap_E2SetupRequest_protocolIEs* pvalue);

EXTERN void asn1Print_e2ap_E2SetupRequest_protocolIEs
    (const char* name, const e2ap_E2SetupRequest_protocolIEs* pvalue);

EXTERN int asn1PrtToStr_e2ap_E2SetupRequest_protocolIEs (const char* name,
    e2ap_E2SetupRequest_protocolIEs* pvalue, char* buffer, OSSIZE bufSize);

EXTERN int asn1PrtToStrm_e2ap_E2SetupRequest_protocolIEs (OSCTXT *pctxt,
    const char* name, const e2ap_E2SetupRequest_protocolIEs* pvalue);

```

Bản tin E2SETUP REQUEST

```

*****
/*
*   E2SetupRequest
*
*****
E2 SETUP REQUEST

*****  

E2SetupRequest ::= SEQUENCE {
    protocolIEs [0] SEQUENCE <SIZE (0..maxProtocolIEs)> OF SEQUENCE {
        id [0] E2AP-PROTOCOL-IES.&id {{E2SetupRequest-IEs}},
        criticality [1] E2AP-PROTOCOL-IES.&criticality {{E2SetupRequest-IEs}:@id}},
        value [2] EXPLICIT E2AP-PROTOCOL-IES.&Value {{E2SetupRequest-IEs}:@id}}
    },
    ...
}
typedef struct EXTERN e2ap_E2SetupRequest {
    e2ap_E2SetupRequest_protocolIEs protocolIEs;
    OSRTDList extElmt;
} e2ap_E2SetupRequest;

EXTERN int asn1PE_e2ap_E2SetupRequest (OSCTXT* pctxt, e2ap_E2SetupRequest* pvalue); // endcode
EXTERN int asn1PD_e2ap_E2SetupRequest (OSCTXT* pctxt, e2ap_E2SetupRequest* pvalue); // decode
EXTERN int asn1PrtToStr_e2ap_E2SetupRequest (const char* name,
    e2ap_E2SetupRequest* pvalue, char* buffer, OSSIZE bufSize); // print E2AP after encoding/decoding
EXTERN int asn1Init_e2ap_E2SetupRequest (e2ap_E2SetupRequest* pvalue); // init value before encoding
EXTERN void asn1Free_e2ap_E2SetupRequest (OSCTXT *pctxt, e2ap_E2SetupRequest* pvalue); // release memory after decoding
EXTERN void asn1Print_e2ap_E2SetupRequest (const char* name, const e2ap_E2SetupRequest* pvalue);
EXTERN int asn1Copy_e2ap_E2SetupRequest (OSCTXT* pctxt, const e2ap_E2SetupRequest* pSrcValue, e2ap_E2SetupRequest* pDstValue);
EXTERN int asn1PrtToStrm_e2ap_E2SetupRequest (OSCTXT *pctxt,
    const char* name, const e2ap_E2SetupRequest* pvalue);

```

```

GlobalE2node-ID ::= CHOICE{
  gNB      GlobalE2node-gNB-ID,
  en-gNB   GlobalE2node-en-gNB-ID,
  ng-eNB    GlobalE2node-ng-eNB-ID,
  eNB      GlobalE2node-eNB-ID,
  ...
}

```

```

GlobalE2node-ID ::= CHOICE {
  gNB [0] GlobalE2node-gNB-ID,
  en-gNB [1] GlobalE2node-en-gNB-ID,
  ng-eNB [2] GlobalE2node-ng-eNB-ID,
  eNB [3] GlobalE2node-eNB-ID
}
*/
/* Choice tag constants */

#define T_e2ap_GlobalE2node_ID_gNB 1
#define T_e2ap_GlobalE2node_ID_en_gNB 2
#define T_e2ap_GlobalE2node_ID_ng_eNB 3
#define T_e2ap_GlobalE2node_ID_eNB 4

typedef struct EXTERN e2ap_GlobalE2node_ID {
  OSINT32 t;
  union {
    /* t = 0 */
    e2ap_GlobalE2node_gNB_ID *gNB;
    /* t = 1 */
    e2ap_GlobalE2node_en_gNB_ID *en_gNB;
    /* t = 2 */
    e2ap_GlobalE2node_ng_eNB_ID *ng_eNB;
    /* t = 3 */
    e2ap_GlobalE2node_eNB_ID *eNB;
  } u;
} e2ap_GlobalE2node_ID;

EXTERN int asn1PE_e2ap_GlobalE2node_ID (OSCTXT* pctxt, e2ap_GlobalE2node_ID* pvalue);

EXTERN int asn1PD_e2ap_GlobalE2node_ID (OSCTXT* pctxt, e2ap_GlobalE2node_ID* pvalue);

EXTERN void asn1Print_e2ap_GlobalE2node_ID
  (const char* name, const e2ap_GlobalE2node_ID* pvalue);

EXTERN int asn1PrtToStr_e2ap_GlobalE2node_ID (const char* name,
  e2ap_GlobalE2node_ID* pvalue, char* buffer, OSSIZE bufSize);

EXTERN int asn1PrtToStrm_e2ap_GlobalE2node_ID (OSCTXT *pctxt,
  const char* name, const e2ap_GlobalE2node_ID* pvalue);

EXTERN int asn1Copy_e2ap_GlobalE2node_ID (OSCTXT* pctxt,
  const e2ap_GlobalE2node_ID* pSrcValue, e2ap_GlobalE2node_ID*
  | pDstValue);

EXTERN int asn1Init_e2ap_GlobalE2node_ID (e2ap_GlobalE2node_ID* pvalue);

EXTERN void asn1Free_e2ap_GlobalE2node_ID (OSCTXT *pctxt,
  e2ap_GlobalE2node_ID* pvalue);

typedef enum {
  T_E2AP_PDU_Contents_e2ap_RANfunction_ItemIEs_UNDEF_,
  T_E2AP_PDU_Contents_e2ap_RANfunction_ItemIEs_id_RANfunction_Item
} e2ap_RANfunction_ItemIEs_TVALUE;

```

```

GlobalE2node-gNB-ID ::= SEQUENCE{
    global-gNB-ID GlobalgNB-ID,
    global-en-gNB-ID GlobalenGNB-ID OPTIONAL,
    gNB-CU-UP-ID GNB-CU-UP-ID OPTIONAL,
    gNB-DU-ID GNB-DU-ID OPTIONAL,
    ...
}

```

```

/*
 *  GlobalE2node-gNB-ID
 */
/***********************/

/*
GlobalE2node-gNB-ID ::= SEQUENCE{
    global-gNB-ID GlobalgNB-ID,
    global-en-gNB-ID GlobalenGNB-ID OPTIONAL,
    gNB-CU-UP-ID GNB-CU-UP-ID OPTIONAL,
    gNB-DU-ID GNB-DU-ID OPTIONAL
}
*/

typedef struct EXTERN e2ap_GlobalE2node_gNB_ID {
    struct {
        unsigned GlobalenGNB_ID_Present : 1;
        unsigned GNB_CU_UP_ID_Present : 1;
        unsigned GNB_DU_ID_Present : 1;
    } m;
    e2ap_GlobalgNB_ID *globalgNB_ID;
    e2ap_GlobalenGNB_ID *globalenGNB_ID;
    e2ap_GNB_CU_UP_ID *gNB_CU_UP_ID;
    e2ap_GNB_DU_ID *gNB_DU_ID;
    OSRTDList extElem1;
} e2ap_GlobalE2node_gNB_ID;

EXTERN int asn1PE_e2ap_GlobalE2node_gNB_ID (OSCTXT* pctxt, e2ap_GlobalE2node_gNB_ID *pvalue);

EXTERN int asn1PD_e2ap_GlobalE2node_gNB_ID (OSCTXT* pctxt, e2ap_GlobalE2node_gNB_ID *pvalue);

EXTERN int asn1Init_e2ap_GlobalE2node_gNB_ID (e2ap_GlobalE2node_gNB_ID* pvalue);

/*
GlobalE2node-en-gNB-ID ::= SEQUENCE{
    global-en-gNB-ID GlobalenGNB-ID,
    en-gNB-CU-UP-ID GNB-CU-UP-ID OPTIONAL,
    en-gNB-DU-ID GNB-DU-ID OPTIONAL,
    ...
}
*/

typedef struct EXTERN e2ap_GlobalE2node_en_gNB_ID {
    struct {
        unsigned GlobalenGNB_ID_Present : 1;
        unsigned en_GNB_CU_UP_ID_Present : 1;
        unsigned en_GNB_DU_ID_Present : 1;
    } m;
    e2ap_GlobalenGNB_ID *globalenGNB_ID;
    e2ap_GNB_CU_UP_ID *en_GNB_CU_UP_ID;
    e2ap_GNB_DU_ID *en_GNB_DU_ID;
    OSRTDList extElem1;
} e2ap_GlobalE2node_en_gNB_ID;

EXTERN int asn1PE_e2ap_GlobalE2node_en_gNB_ID (OSCTXT* pctxt, e2ap_GlobalE2node_en_gNB_ID *pvalue);

EXTERN int asn1PD_e2ap_GlobalE2node_en_gNB_ID (OSCTXT* pctxt, e2ap_GlobalE2node_en_gNB_ID *pvalue);

EXTERN int asn1Init_e2ap_GlobalE2node_en_gNB_ID (e2ap_GlobalE2node_en_gNB_ID* pvalue);

```

```

GlobalgNB-ID ::= SEQUENCE {
    plmn-id    PLMN-Identity,
    gnb-id     GNB-ID-Choice,
    ...
}

```

```

/*
 * GlobalgNB_ID
 */
/*
***** Add to chat (Ctrl+L) | Edit highlighted code (Ctrl+I).
GlobalgNB-ID ::= SEQUENCE {
    plmn-id [0] PLMN-Identity,
    gnb-id [1] EXPLICIT GNB-ID-Choice,
    ...
}
*/
typedef struct e2ap_GlobalgNB_ID {
    e2ap_PLMN_Identity plmn_id;
    e2ap_GNB_ID_Choice gnb_id;
    OSRTDList extElem1;
} e2ap_GlobalgNB_ID;

EXTERN int asn1PE_e2ap_GlobalgNB_ID (OSCTXT* pctxt, e2ap_GlobalgNB_ID* pvalue);

EXTERN int asn1PD_e2ap_GlobalgNB_ID (OSCTXT* pctxt, e2ap_GlobalgNB_ID* pvalue);

EXTERN void asn1Print_e2ap_GlobalgNB_ID
    (const char* name, const e2ap_GlobalgNB_ID* pvalue);

EXTERN int asn1PrtToStr_e2ap_GlobalgNB_ID (const char* name,
    e2ap_GlobalgNB_ID* pvalue, char* buffer, OSSIZE bufSize);

EXTERN int asn1PrtToStrm_e2ap_GlobalgNB_ID (OSCTXT *pctxt,
    const char* name, const e2ap_GlobalgNB_ID* pvalue);

EXTERN int asn1Copy_e2ap_GlobalgNB_ID (OSCTXT* pctxt,
    const e2ap_GlobalgNB_ID* pSrcValue, e2ap_GlobalgNB_ID* pDstValue);

EXTERN int asn1Init_e2ap_GlobalgNB_ID (e2ap_GlobalgNB_ID* pvalue);

EXTERN void asn1Free_e2ap_GlobalgNB_ID (OSCTXT *pctxt, e2ap_GlobalgNB_ID* pvalue);

```

```

/*
 * PLMN_Identity
 */
/*
***** Add to chat (Ctrl+L) | Edit highlighted code (Ctrl+I).
typedef struct EXTERN e2ap_PLMN_Identity {
    OSUINT32 numocts;
    OSOCTET data[3];
} e2ap_PLMN_Identity;

EXTERN int asn1PE_e2ap_PLMN_Identity (OSCTXT* pctxt, e2ap_PLMN_Identity* pvalue);

EXTERN int asn1PD_e2ap_PLMN_Identity (OSCTXT* pctxt, e2ap_PLMN_Identity* pvalue);

EXTERN void asn1Print_e2ap_PLMN_Identity
    (const char* name, const e2ap_PLMN_Identity* pvalue);

EXTERN int asn1PrtToStr_e2ap_PLMN_Identity (const char* name,
    e2ap_PLMN_Identity* pvalue, char* buffer, OSSIZE bufSize);

EXTERN int asn1PrtToStrm_e2ap_PLMN_Identity (OSCTXT *pctxt,
    const char* name, const e2ap_PLMN_Identity* pvalue);

EXTERN int asn1Copy_e2ap_PLMN_Identity (OSCTXT* pctxt,
    const e2ap_PLMN_Identity* pSrcValue, e2ap_PLMN_Identity* pDstValue);

EXTERN int asn1Init_e2ap_PLMN_Identity (e2ap_PLMN_Identity* pvalue);

```

```

/****************************************************************************
 * GNB_ID_Choice
 */
/*E2AP-GNB-ID-Choice ::= CHOICE {
|   gnb-ID [0] BIT STRING  (SIZE (22..32))
}
*/
/* Choice tag constants */

#define T_e2ap_GNB_ID_Choice_gnb_ID      1

typedef struct EXTERN e2ap_GNB_ID_Choice {
    OSINT32 t;
    union {
        /* t = 1 */
        ASN1BitStr32 *gnb_ID;
    } u;
} e2ap_GNB_ID_Choice;

EXTERN int asn1PE_e2ap_GNB_ID_Choice (OSCTXT* pctxt, e2ap_GNB_ID_Choice* pvalue);

EXTERN int asn1PD_e2ap_GNB_ID_Choice (OSCTXT* pctxt, e2ap_GNB_ID_Choice* pvalue);

EXTERN void asn1Print_e2ap_GNB_ID_Choice
(const char* name, const e2ap_GNB_ID_Choice* pvalue);

EXTERN int asn1PrtToStr_e2ap_GNB_ID_Choice (const char* name,
                                             e2ap_GNB_ID_Choice* pvalue, char* buffer, OSSIZE bufSize);

EXTERN int asn1PrtToStrm_e2ap_GNB_ID_Choice (OSCTXT *pctxt,
                                              const char* name, const e2ap_GNB_ID_Choice* pvalue);

EXTERN int asn1Copy_e2ap_GNB_ID_Choice (OSCTXT* pctxt,
                                         const e2ap_GNB_ID_Choice* pSrcValue, e2ap_GNB_ID_Choice* pDstValue);

EXTERN int asn1Init_e2ap_GNB_ID_Choice (e2ap_GNB_ID_Choice* pvalue);

EXTERN void asn1Free_e2ap_GNB_ID_Choice (OSCTXT *pctxt, e2ap_GNB_ID_Choice* pvalue);

```