

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 extElem1;
} e2ap_E2SetupRequest;

EXTERN int asn1PE_e2ap_E2SetupRequest (OSCTXT* pctxt, e2ap_E2SetupRequest* pvalue); // encode

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,
    ...
}

```

```

/*****
/*
/* GlobalNB_ID
/*
/*
/*****
/* Add to chat (Ctrl+L) | Edit highlighted code (Ctrl+I).
GlobalNB-ID ::= SEQUENCE {
    plmn-id [0] PLMN-Identity,
    gnb-id [1] EXPLICIT GNB-ID-Choice,
    ...
}
*/
typedef struct e2ap_GlobalNB_ID {
    e2ap_PLMN_Identity plmn_id;
    e2ap_GNB_ID_Choice gnb_id;
    OSRTDList extElem1;
} e2ap_GlobalNB_ID;

EXTERN int asn1PE_e2ap_GlobalNB_ID (OSCTXT* pctxt, e2ap_GlobalNB_ID* pvalue);

EXTERN int asn1PD_e2ap_GlobalNB_ID (OSCTXT* pctxt, e2ap_GlobalNB_ID* pvalue);

EXTERN void asn1Print_e2ap_GlobalNB_ID
    (const char* name, const e2ap_GlobalNB_ID* pvalue);

EXTERN int asn1PrtToStr_e2ap_GlobalNB_ID (const char* name,
    e2ap_GlobalNB_ID* pvalue, char* buffer, OSSIZE bufSize);

EXTERN int asn1PrtToStrm_e2ap_GlobalNB_ID (OSCTXT *pctxt,
    const char* name, const e2ap_GlobalNB_ID* pvalue);

EXTERN int asn1Copy_e2ap_GlobalNB_ID (OSCTXT* pctxt,
    const e2ap_GlobalNB_ID* pSrcValue, e2ap_GlobalNB_ID* pDstValue);

EXTERN int asn1Init_e2ap_GlobalNB_ID (e2ap_GlobalNB_ID* pvalue);

EXTERN void asn1Free_e2ap_GlobalNB_ID (OSCTXT *pctxt, e2ap_GlobalNB_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* ptxt, e2ap_GNB_ID_Choice* pvalue);

EXTERN int asn1PD_e2ap_GNB_ID_Choice (OSCTXT* ptxt, 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 *ptxt,
|      | const char* name, const e2ap_GNB_ID_Choice* pvalue);

EXTERN int asn1Copy_e2ap_GNB_ID_Choice (OSCTXT* ptxt,
|      | 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 *ptxt, e2ap_GNB_ID_Choice* pvalue);

```