

**Source:** Ericsson  
**Title:** Background information on current private messages in RANAP, SABP, RNSAP and NBAP  
**Agenda item:** 9.10  
**Document for:** Discussion

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### **Background**

When discussing vendor/operator specific protocol extensions for in December 1999, it was agreed that at that point in time it was too early to allow manufacturer specific message extensions. Such message extensions were claimed to endanger multi-vendor interoperability for basic functionality. Therefore R99 NBAP, RNSAP, RANAP and SABP specifications only allow vendor/operator specific messages, but no vendor/operator specific extensions to standardised protocol messages.

The current possibilities in NBAP, RNSAP, RANAP and SABP allows a vendor/operator to make use of a single standardised message ("privateMessage") where any standardised or not standardised IE's could be included. Non standardised IE's shall be identified by a globally unique Object Identifier, and standardised IE's by the 3GPP defined local value (integer).

With the current capabilities it is quite straight forward to add a vendor/operator specific request message, and by defining the first IE as a message type selector it would be also possible to use the "privateMessage" as both request and reply message.

If more than one vendor/operator specific procedure (message) needs to be implemented, the first new IE's in the "privateMessage" could be a procedure selector, and the second one could be a message type selector.

It is however expected that the most common non standardised extensions for research use would be to add a new vendor/operator specific IE to one or a few already defined procedures (messages). This is currently possible, by using the "privateMessage", but it requires some extra overhead since the standardised message(s) needs to be copied into the "privateMessage" and in addition to this the new additional private IE's needs to be added.

The main drawback is however that this type of private research messages would **not** be recognised by foreign nodes in a multi-vendor network, and thus be subject to criticality handling (ignore, notify or reject). A research implementation (multi-vendor case) would thus have to make use of criticality reject and be forced to handle the interworking by resending the normal unextended message.

Because of all the drawbacks when using the current allowed private extension possibilities it can be foreseen that if a vendor/operator for some reason need to add a new additional private IE to a standardised message, then the "privateMessage" approach described above may not be used by all implementations.

An attractive solution would be to make use of the current extension mechanism that is used when new IE's are added in a standardised way, and thus assign a new private IE-ID's within the allowed range according to the standard. This will work perfectly until the secretly assigned IE-ID's clash between different vendor implementations, or until a standardised IE with the same IE-ID is added.

### **Proposal**

The preferred solution would be to allow vendor/operator specific extensions to standardised messages, since this would reduce the message and implementation overhead, and prevent that vendor/operators implement the attractive (secret) solutions.

With the proposed solution the current criticality handling for unrecognised IE's would also handle the multi-vendor interworking (for the criticality ignore or notify case) in the same way as for new standardised IE's added to a later release.

## ASN.1 Examples

### Example 1, current possibilities

Adding a new function triggered by a vendor/operator specific IE using the “privateMessage”

The “privateMessage” would be defined as: (Additions are marked with yellow)

```
privateMessage RANAP-ELEMENTARY-PROCEDURE ::= {
  INITIATING MESSAGE PrivateMessage

  PROCEDURE CODE id-privateMessage
  CRITICALITY ignore

  PrivateMessage ::= SEQUENCE {
    privateIEs PrivateIE-Container { {PrivateMessage-IEs } },
    ...
  }

  PrivateMessage-IEs RANAP-PRIVATE-IES ::= {
    ...,
    { ID priv-Trigger-ID CRITICALITY ignore TYPE Priv-Trigger PRESENCE mandatory }
  }
  Priv-Trigger ::= "definition of the new IE"
  priv-Trigger-ID PrivateIE-ID ::= OBJECT IDENTIFIER {1,3,17,3} -- Obj Id for vendor/operator
```

### Example 2, current possibilities

Adding a new IE to an existing message by including the standardised message within the “privateMessage”.

```
PrivateMessage-IEs RANAP-PRIVATE-IES ::= {
  ...,
  { ID priv-oldMess-ID CRITICALITY xxxx TYPE Priv-OldMess PRESENCE mandatory } |
  { ID priv-NewIe-ID CRITICALITY ignore TYPE Priv-NewIe PRESENCE mandatory }
}
Priv-OldMess ::= "Re-creation of the standardised message"
priv-oldMess-ID PrivateIE-ID ::= OBJECT IDENTIFIER {1,3,17,4} -- Obj Id for vendor/operator
Priv-NewIe ::= "definition of the new IE"
priv-NewIe-ID PrivateIE-ID ::= OBJECT IDENTIFIER {1,3,17,3} -- Obj Id for vendor/operator
```

### Example 3, proposed possibilities

Adding a new IE to an existing message by using a new standardised private extension capability.

```
Iu-ReleaseRequest ::= SEQUENCE {
  protocolIEs ProtocolIE-Container { {Iu-ReleaseRequestIEs} },
  protocolExtensions ProtocolExtensionContainer { {Iu-ReleaseRequestExtensions} } OPTIONAL,
  ...
}

Iu-ReleaseRequestIEs RANAP-PROTOCOL-IES ::= {
  { ID id-Cause CRITICALITY ignore TYPE Cause PRESENCE mandatory },
  ...
}

Iu-ReleaseRequestExtensions RANAP-PROTOCOL-EXTENSION ::= {
  ...,
  { ID priv-NewIe-ID CRITICALITY ignore TYPE Priv-NewIe PRESENCE mandatory }
}
priv-NewIe-ID PrivateIE-ID ::= OBJECT IDENTIFIER {1,3,17,3} -- Obj Id for vendor/operator
Priv-NewIe ::= "definition of the new IE"
```

## Annex 1

### Extract from the current ASN.1 code

```
privateMessage RANAP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE PrivateMessage

    PROCEDURE CODE id-privateMessage
    CRITICALITY ignore

PrivateMessage ::= SEQUENCE {
    privateIEs PrivateIE-Container { {PrivateMessage-IEs } },
    ...
}

PrivateMessage-IEs RANAP-PRIVATE-IES ::= {
    ...

-- *****
--
-- Container for Private IEs
--
-- *****

PrivateIE-Container {RANAP-PRIVATE-IES : IEsSetParam } ::=
    SEQUENCE (SIZE (1.. maxPrivateIEs)) OF
    PrivateIE-Field {{IEsSetParam}}

PrivateIE-Field {RANAP-PRIVATE-IES : IEsSetParam} ::= SEQUENCE {
    id RANAP-PRIVATE-IES.&id ({IEsSetParam}),
    criticality RANAP-PRIVATE-IES.&criticality ({IEsSetParam}{@id}),
    value RANAP-PRIVATE-IES.&Value ({IEsSetParam}{@id})
}

PrivateIE-ID ::= CHOICE {
    local INTEGER (0..65535),
    global OBJECT IDENTIFIER
}

-- *****
--
-- Class Definition for Private IEs
--
-- *****

RANAP-PRIVATE-IES ::= CLASS {
    &id PrivateIE-ID,
    &criticality Criticality,
    &Value,
    &presence Presence
}
WITH SYNTAX {
    ID &id
    CRITICALITY &criticality
    TYPE &Value
    PRESENCE &presence
}
```