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| Project | **IEEE 802.16 Broadband Wireless Access Working Group <http://ieee802.org/16>** |
| Title | **Universal Naming Schema for SAP Primitives** |
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| Re: | Contribution on comments to IEEE S802.16g-05/008r1 |
| Abstract | In this contribution, we describe the universal naming schema for both M-SAP and C-SAP service primitives. |
| Purpose | Adoption |
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# 1. Problem Statement

The purpose of this contribution is to describe a universal naming schema for M-SAP and C-SAP service primitives defined in 802.16g baseline documentation. This naming schema provides a unified and generic format for syntax and semantics of M-SAP and C-SAP primitives. This naming approach is not only aligned with IRP (Integration Reference Point) model adopted in 802.16g baseline document; but also provides an implementation-agnostic specification for M-SAP and C-SAP primitives. With this generic specification, it will be easier to map specified primitives to all possible implementation solutions of M-SAP and C-SAP.

# 2. Proposed Text

[Insert section 14.4.4, 14.4.4.1. and 14.4.4.2 as follows]

14.4.4 M-SAP and C-SAP service primitive template

14.4.4.1 Universal Naming Schema for SAP service primitives

Figure 1 shows an example of SAP interface between BS and NCMS.

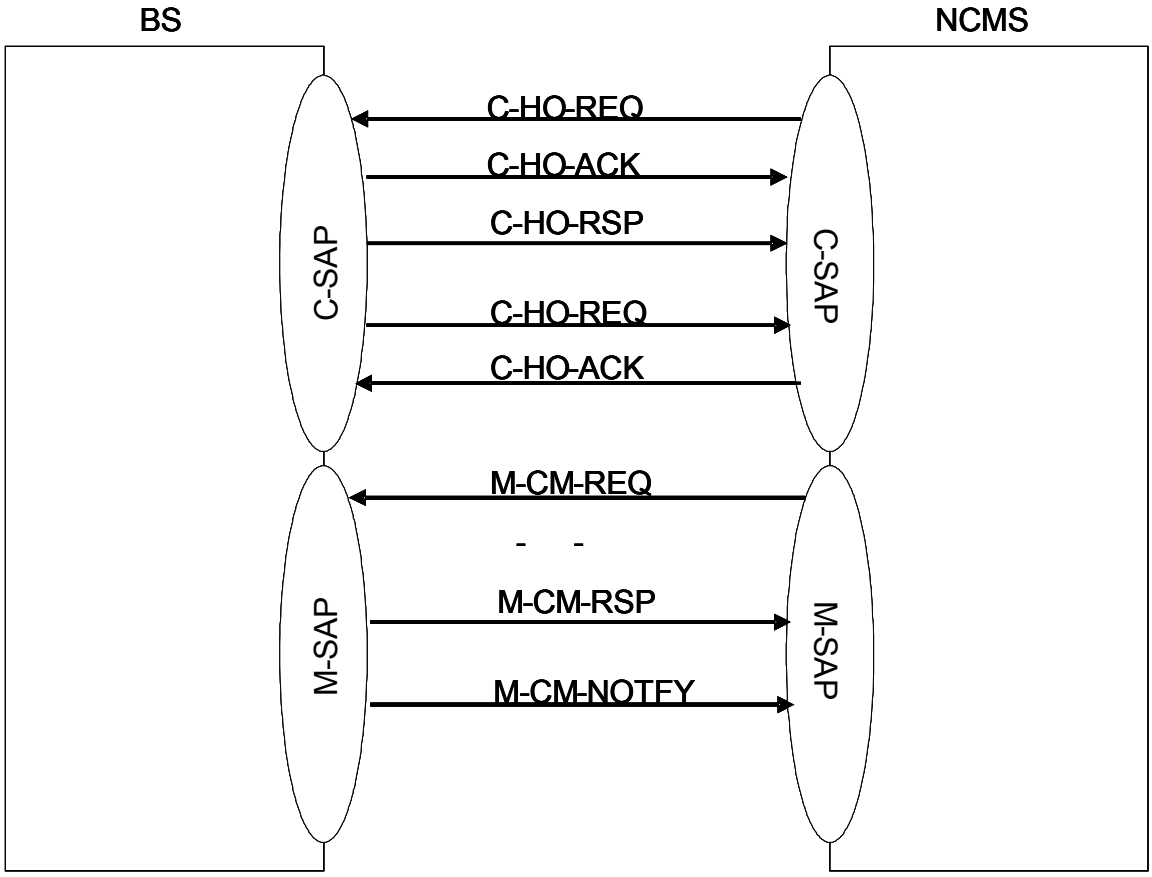

Figure 1 – Example of SAP Interface

The messages defined on the SAP consist of 3 fields – SAP, Function, and Operation.

SAP
- C – Control plane SAP
- M – Management plane SAP

Function
- CM – Configuration Management
- PM – Performance Management
- ALM – Alarm Management
- HO – Hand Off
- PG – Paging
- SFP – Service Flow Provisioning
- RRM – Radio Resource Management

Operation
- REQ – Request
- RSP – Response to the REQ message
- ACK – Acknowledgement to the reception of REQ or NOTFY message
- NOTFY – Event Notification

These messages are symmetrical between BS and NCMS. That is, both BS and NCMS can send these messages to the other depending on the functional behavior defined for M-SAP and C-SAP. ACK is only supported in C-SAP.

14.4.4.2 SAP Service Primitive Object Format

To be aligned with IRP model, this section defines an objected-oriented format for the syntaxes and semantics of SAP service primitives. There are two types of services: M-SAP/C-SAP operation service primitive and M-SAP/C-SAP notification service primitive.

- M-SAP/C-SAP operation service primitive:
  This primitive is defined as Primitive_name () with a parameter list. The format is like

```
primitive_name (    Message_id,
                    Operation_type,
                    Action_type,
                    Object_id,
                    Attribute_list,
                    Filter,
                    Scope,
                    Action_info,
                    Action_replay_info,
                    Time,
                    SAP_error_code )
```

The parameters are described briefly in the following table.

| Parameter name | Mandatory /Optional | Definition |
|---|---|---|

| | | |
|---|---|---|
| Msg_id | M | Integer uniquely identifies the primitive message |
| Operation_Type | M | Create, Delete, Get, Set, Action, Cancel |
| Action_type | O | When operation type is Action, it Specifies a particular action such as Start, End, Download, Reset, etc |
| Object_id | M | DN / RDN of managed objects which perform the operation |
| Attribute_list | M | Array of pair (Attribute_ID, Attribute_value). In Get request operation, Attribute_value is Null |
| Filter | O | Boolean expression involving attribute value to be evaluated for all selected objects. |
| Scope | O | Specify the sub-tree level of the naming tree for potentially objects to be selected. |
| Action_info | O | used in Action request about the action to perform |
| Action_replay_info | O | used in Action response about action replay |
| Time | O | Time info about an operation |
| SAP_error_code | O | used in error service to give the reason of the error |

- M-SAP/C-SAP notification service primitive example:
  This primitive is defined as Primitive_name () with a parameter list. The format is like
  primitive_name ( Message_id,
  Event_type,
  Event_info,
  Object_ID,
  Attribute_List,
  Time,
  SAP_Error_code)

The parameters are described briefly in the following table.

| Parameter name | Mandatory /Optional | Definition |
|---|---|---|
| Msg_id | M | Integer uniquely identifies the primitive message |
| Event_Type | M | Specify the type of occurring event |
| Event_info | O | used in event request. Pass reported event info |
| Object_id | M | DN / RDN of managed objects which perform the operation |
| Attribute_list | M | Array of pair (Attribute_ID, Attribute_value). |

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|---|---|---|
| Event_replay | O | used in event confirmation to pass event info |
| Time | O | Time info about an event |
| SAP_error_code | O | used in error service to give the reason of the error |

1. HO service primitive examples (Serving BS → ASN GW)

```
C-HO-REQ(    Operation_type: Action,
             Action_type: SHO/FBSS,
             Object_ID: NCMS
             Attribute_List: serving-BS, MS-ID, Mode, target-BS-list,
                             SF-info, CS-para-info)

C-HO-RSP(    Operation_type: Action,
             Action_type: SHO/FBSS,
             Object_ID: NCMS
             Attribute_List: serving-BS, MS-ID, Mode, target-BS-list)

C-HO-NOTFY( Event_type: SHO/FBSS,
             Object_ID: Serving-BS
             Attribute_List: serving-BS, MS-ID, Mode, SF-info,
                             CS-para-info )
```

2. HO service primitive examples (ASN GW → Target BS )

```
C-HO-REQ (   Operation_type: Action,
             Action_type: SHO/FBSS
             Object_ID: Target-BS
             Attribute_List: serving-BS, MS-ID, Mode, HO-Quality,
                             SF-info, CS-para-info )

C-HO-RSP(    Operation_type: Action,
             Action_type: SHO/FBSS
             Object_ID: Target-BS
             Attribute_List: serving-BS, MS-ID, Mode, MS-Access,
                             New-access, HO-quality )
```

References

[1] IEEE-Std 802.16-2004
[2] IEEE 802.16e/D11