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| Comment Resolution for CID#7 Regarding AN setup procedure |
| Date: 2016-06-17 |
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Abstract

This document provides the comment resolution for access network setup procedure in Recommended Practice specification of IEEE 802.1CF D0.0 to address the technical comment of #7 of omniRAN-16/0006.

**Comments on D0.0:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| CID | Category | Page | Sub-Cause | Line# | Comment | Proposed Change | Resolution |
| 7 | Technical | 25 | 7.1.4.5 | 665 | The discovery request should be sent by the AN (not the Service Provider) during the AN setup and initialization. After receiving the Discovery Request message, the Service Provider responds with the Discover response to include the information that AN needs to establish the network connection to the Service Provider network.  | Suggest to change to the original text. See a separate contribution for the change. | Revised.See detail below. |

**Discussion:**

The section 7.1.4 is to provide the setup procedure of access network (AN) over the unlicensed spectrum, including establishing the connection between the AN and Service Provider's Network, acquiring the configuration parameters of AN from the Service Provider network, and initializing the AN according to the received configuration parameters.

The comment #7 of omniRAN-16/0006 indicates that the Discovery Request message flow in 7.1.4.5.1 regarding the AN setup procedure is incorrect. We agree with this comment as for following reasons

* In the current D0.0 version, the Discovery Request message in FIG. 12 is sent by the Service Provider network to the AN Orchestrator. As the Discovery Request message is used for the AN to indicate its appearances and find the Service Provider network, it does not make sense for the Service Provider to send such message to the AN.
* The AN may be powered on at any time and the Service Provider may not know the status of AN before the basic connection is established. If the Service Provider blindly and constantly broadcasts the Discovery Request message, it would waste the network capacity and reduce the transmission efficiency. In the real deployment, it is not aware of a network implementing in such as way.
* The omniRAN as a Recommended Practice specification should reflect the real implementation and deployment scenario.

The correct message flow for Discovery Request and Response messages should be

1. The ANC is powered and sends a Discovery Request message on behalf of AN to the Service Provider network.
2. The Service Provider network sends a Discovery Response message with service network information and configuration parameters for the ANC to provision the access network.
3. After receiving the Discovery Response(s) with the configuration parameters, the ANC then can select a service provider's network and provision the network.

Based on above analysis, we agree the comments with revised resolution.

* In order to make consistent between the title of this chapter and content, the title of 7.1.4 is suggested to change to “Access network setup and release procedure”. Therefore, the access network setup procedure could be able to use the result from the radio channel allocation defined in 7.1.2 and 7.1.3.
* Add a new section 7.1.5 “Virtual access network instantiation and release procedure”. As the network virtualization and virtualized network functions are introduced in the recent proposals, it would be necessary to distinguish the basic access network setup and virtual access network instantiation, and reflect such new topic in the corresponding section. The virtual access network instantiation procedure could also be based on the result from the previous procedure of radio channel allocation defined in 7.1.2 and 7.1.3.
* The network manage system (NMS) is also discussed and added in the network reference model recently to support fault diagnosis, detection and report, and network configuration as well. As the AN setup is under control of NMS typically, it is necessary to refine the text to reflect such changes in the NRM.

**Proposed Text Changes:**

Instruction to Editor:

Please replace the text of sub-cause 7.1.4 of IEEE802.1CF D0.0 omniRAN specification with the following text.

------------- Begin Text Changes ---------------

### Access network setup and release procedure

#### Introduction

An IEEE 802 access network infrastructure can be operated by an access network operator over ASA spectrum or unlicensed spectrum. When the access network is powered up, it may need to search for a radio frequency channel with less congestion or interference over one or more channels in ASA or unlicensed bands using the procedures defined in 7.1.2 and 7.1.3 respectively. Once the operating channel is found, the access network shall be initialized with the configuration parameters retrieved through the NMS of access network operator.

#### Roles and Identifiers

##### Node of Attachment

NA is defined in the section 6.5. NAs may consist of one or more radio interfaces for an access network operator in the basic network service model. Each NA in the basic deployment model has its own air interface identifier (like BSSID) and the same network identifier in the AN.

##### Access Network

AN is defined in section 6.5. In the basic network deployment model, the AN consists of one or more NAs, one Access Network Controller (ANC) and Backhaul network (BH).

#### Use Cases

##### Access network infrastructure

In the basic network deployment model, an access network operator manages and operates the access network with the configuration parameters retrieved through the NMS of access network operator.

#### Functional Requirements

##### Basic access network setup

The access network needs to establish the connections with the subscription services and the access routers using the configuration parameters provided by the NMS for the configuration of access networks including NA backhaul network.

##### Access Network Configuration

AN configuration is the provisioning of the AN with:

* Air Interface Identifier
* Service Network Identifier
* Service Identity or Session Identifier
* Security information
* Radio parameters.
* Service parameters, such as QoS information

The AN configuration is under the control of ANC. After the AN is powered up, the ANC communicates with the NMS of the access network to get the configuration information, and then provisions the AN.

#### Detailed Procedure

##### Access Network Setup Procedure

The access network setup procedure includes

* Discovery of supported subscription services and access routers
* Establishing the connections with the subscription services and access routers

The discovery procedure for supported subscription services and access routers is used by the powered up AN to find the configuration parameters for the access network setup. Once the associated NMS is found and provides the configuration parameter, the ANC setup the access network with the configuration information retrieved from the NMS of the AN using either the unlicensed spectrum or ASA spectrum.

The Figure 12 shows an example of procedure of access network setup. When the access network is powered up, the ANC on behalf of NAs sends a Discovery Request message to the NMS which is a part of the access network. After receiving the Discovery Request message, the NMS sends the Discovery Response message with the access network information for the ANC to provision the access network.

NA

NMS

2. Discovery Request

ANC

3. Discovery Response

4. Join Request

5. Join Response

1. Access network power-up

 Figure 12 An example of access network setup procedure

The Discovery Request message may contain following information:

* ANC/NA Identifiers
* List of required configuration parameters
* Time stamp of this message
* Discovery type through which the AN retrieves the IP addresses of the connected subscription services and access routers, such as manual configuration, DNS server, etc.
* The capability information of physical NAs attached to the AN

The Discovery Response message should include the following information:

* Required configuration parameters
* ANC Identifier
* Time stamp
* Access Router Interface ID and IP addresses which help NAs to choose a proper port for the following communication
* Subscription Service Interface ID
* Radio configuration information for the required area
* Connection parameters to the subscription services and access router such as ports and addresses of the network and the load information of each port.
* Access network capabilities (max NA number, max user number…), security information, etc.

The Join Request message should include the following information:

* ANC or NA Identifier
* The Access Network Identifier
* Time stamp of this message
* ANC or NAs location information. This helps the NMS to determine whether to accept the join request
* Access network capabilities, encryption information, etc.

The Join Response message should include

* Access network Identifier
* ANC or NA Identifier
* Time stamp of this message
* Result code: indicating whether the Join Request is admitted or not. If not, it lists the reason of the rejection.

##### Access Network Release Procedure

There are two ways to release the access network: access network is released by itself, or released by the access network operator through the NMS.

NA

NMS

ANC

2. Release Confirm

1. Release Indication

(a)

NA

NMS

ANC

2. Release Response

1. Release Request

 (b)

Figure 13 an example of access network release procedure

Figure 13a and 13b shows an example of access network release procedure. The access network could be released by the ANC (Figure 13a), or by the Access Network through NMS (Figure 13b). In some particular cases like at certain abnormal condition, the access network may have to initiate access network release under the control of ANC (Figure 13a). In such case, the ANC will notify the Access network operator through the NMS that the access network will be shut down. Either the Access network operator responds the notification or not, the access network will release itself.

The Release Indication message may contain following information:

* ANC/NA Identifier
* Access Network identifier
* Time stamp of this message
* Reason code for release

The Release Confirm message should include

* Access Network Identifier
* ANC/NA Identifier
* Time stamp of this message
* Result code

In normal case, the access network release should be controlled by the Access network operator through the NMS. When the Access network operator needs to release the access network for maintenance, power saving, or major software/hardware upgrade, it may initiate the access network release through the NMS (Figure13b). When the ANC receives the Release Request message from the NMS, it will verify the command and start the access network release according to the requirements. The ANC will send the Release Response to the NMS about the result of access network release.

The Release Request message may contain following information:

* Access Network identifier
* ANC/NA Identifier
* Time stamp of this message

The Release Response message should include

* ANC/NA Identifier
* Access Network Identifier
* Time stamp of this message
* Result code

-------------- End Text Changes ----------------