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| Date: 2018-06-05 | | | |
| **Authors:** | | | |
| Name | Affiliation | Phone | Email |
| Max Riegel | Nokia Bell Labs |  | maximilian.riegel@nokia.com |
| Hao Wang | Fujitsu |  | wangh@cn.fujitsu.com |
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# Abstract

This document provides text amendment proposals to address CID77 of 802.1CF-D2.0

# Text amendments to address CID77:

**6.1.5 Access network setup-specific attributes**

AN setup covers essentially all base configuration parameters of the IEEE 802 technologies as well as the base attributes describing the network structure.

**6.1.5.1 Network Management Service (NMS)**

{1} NMS-ID: FQDN

Unique identifier of the default NMS

**6.1.5.2 Access Network Control (ANC)**

{1} OperationStatus: Indication of the status of the operation of AN.

**6.1.5.3 Backhaul (BH)**

{1} OperationStatus: Indication of the status of the operation of BH.

**6.1.5.4 Node of Attachment (NA)**

{1} OperationStatus: Indication of the status of the operation of NA.

**6.1.5.5 AN Configuration**

{1} ANCConfig: Configuration parameters of ANC  
e.g. to initialize the control functions and establish connection to the service entities such as CIS and SS.

{1+} NAConfig: Configuration parameters of NA to setup ports and initialize operational functions.

{1+} BHConfig: Configuration parameters of BH to initialize VLAN settings.

**6.1.5.5 Sensing statistics**

For the authorized spectrum access in TVWS, there are a few specific information elements:

{1} Geolocation

Describes the location of the AN requesting authorization make use of unused TV spectrum.

{1+} SS (spectrum sensing) statistics: Measurement results delivered by the NAs and eventually by the TEs to the ANC for selection of the operating channel. The CIS provides information about the spectrum database:

{0+} OfferedChannels: List of available channels with maximum-allowed EIRP Information provided by the spectrum database for authorized access to TVWS.

{0+} BackUpChannels: List of channels that can be used when the operating channel is heavily loaded or must be terminated.

**6.2.5 NDS-specific attributes**

**6.2.5.1 Service selection**

The access network discovery and selection process results in the selection of a particular NA to connect to, together with the chosen service provider and the related IP provider. The following tuple of identifiers are discovered and selected:

{1} ServiceProvider-ID: FQDN [RFC 7542]

Unique identifier of the selected service provider

{1} IPProvider-ID: FQDN

Unique identifier of the selected IP provider

{1} NA-ID: Node of attachment identifier

Unique identifier of the selected NA for the succeeding association

{1} AN-ID: Access network identifier

Unique identifier of the chosen access network for the succeeding connection setup

{1} SS-ID: Subscription service identifier

Unique identifier of the subscription service to be deployed for the succeeding authentication

{1} AR-ID: Access router identifier

Unique identifier of the access router to be deployed for the succeeding connection establishment

**6.2.5.2 Subscription**

A subscription denotes the unique relationship between a terminal and a subscription service. A common method to identify a subscription is the Network Access Identifier [RFC 7542]. In particular when multiple  subscriptions exist at a terminal, each subscription may be attributed by:

{1} Subscription-ID: NAI

Globally unique identifier of a subscription according to RFC 7542

{1} ServiceProvider-ID: FQDN

Globally unique identification of a service provider

{1+} IPProvider-ID:FQDN

Globally unique identification of an IP provider

{0+} AccessPolicy:

Access policies consist of a list of weighted NA-IDs and AN-IDs, which is evaluated for the detected AN-IDs and NA-IDs. The highest weighted NA-ID, or the best NA of the highest weighted AN-ID, is chosen for the connection establishment.

**6.2.5.3 TE**

{1+} TECapabilities: Terminal capabilities

Set of attributes to describe the capabilities of a terminal in relation to access network capabilities. The record may consist of parameters describing the support of features and options of a wired or wireless communication interface, authentication options, as well as network layer capabilities to reach particular information services.

**6.2.5.4 NA**

{1} AN-ID: Access network identifier

Defines access network to which NA belongs

{1} ANInfo: AN short information

Usually human readable text to describe a particular instance of an access network.  
{1} ANCapabilities: AN complete capabilities

An access network will have relation with at least one subscription service entity and may be able to handle multiple subscription services. For each supported subscription service there may be additional information such as:

* Cost information: Cost information describes the cost of using that subscription service. It may be a single value or a complex record of multiple cost issues.
* Supported roaming partners: A subscription service may act as agent for other subscription services. For appropriate routing of authentication messages, the access network requires information about roaming subscription services available through a directly connected subscription service.

An access network has at least one set of attributes describing its capabilities. Multiple set of attributes may exist when different portions of an access network are built differently.

* Link layer capabilities: Link layer capabilities are described by attributes such as MTU, encryption capabilities, and others.
* Link layer performance: Link layer performance can be described by attributes such throughput up/down, delay, jitter, residual error rates, either as list of parameters or by records representing different service classes.

An access network has connectivity to at least one access router for providing higher layer network functionality.

* Network layer capability of the access router. It has at least one set (but can have multiple sets) of network layer capabilities such as IP address, size of IP network, IP version, IP configuration support, and service discovery capabilities.
* Network interface performance of the access router connected with a single link to the access network. It has a single set of parameters describing the performance of the network interface, e.g., supported service classes (throughput up/down, delay, jitter).
* Offered application services
* The connected access router may provide additional information about the application services reachable by its interfaces.

{1} BeaconPeriod: Timer value

Value defines the period for triggering the broadcast of the AN short information

**6.3.5 Association-specific attributes**

**6.3.5.1 Access link**

An access link is established through the association process. It is defined through:

{1} Link-ID: Unique link identifier.

Identifier used to register the link in the local registry  
{1} LinkConfig: configuration values of the link.

Access technology dependent configuration parameters for configuration of link at both TE and NA. The parameters are negotiated during association between TE and NA.

**6.3.5.2 TE**

{1+} SupportedLinkCapabilities: possible link configuration.

List of access technology dependent configuration parameters which could be supported by TE

{1+} SupportedSecurityCapabilities: possible security modes.

List of access technology dependent authentication and encryption options supported by TE

{1+} SupportedQosCapabilities: possible QoS configuration.

List of access technology dependent QoS parameters which could be supported by TE

{1+} ResultCodes: Indication of the association results.

List of attributed acknowledgements of TE for indication of accepted link parameters

**6.3.5.3 NA**

{1+} AllowedLinkCapabilities: allowed link configuration

List of access technology dependent configuration parameters which could be accepted by NA

{1+} AllowedSecurityCapabilities: allowed security modes

List of access technology dependent authentication and encryption options accepted by NA

{1+} AllowedQosCapabilities: allowed QoS configurations

List of access technology dependent QoS parameters which could be acceoted by NA

{1} PreferredLinkProfile: desired link configuration attributes

Proposed list of access technology dependent configuration parameters of NA

{1} PreferredSecurityProfile: desired security mode

Proposed list of authentication and encryption options of NA

{1} PreferredQosProfile: desired QoS mode

Proposed list of access technology dependent QoS parameters on NA

**6.4.5 Authentication-specific attributes**

**6.4.5.1 Security association**

When the authentication process succeeds, a security association is established. It is defined through:

{1} SessionKey: Session credential

Unique credential established during authentication process. It is used as cryptographic session identifier for the whole duration of a session.  
{1} EncryptionMode: Encryption configuration

Set of parameters defining the encryption process of a session. It is established as part of the trust establishment process and maintained over the full duration of the session.

**6.4.5.2 Subscription**

{1} Subscription-ID: NAI

Globally unique identifier of a subscription to facilitate use of the same subscription for access to services provided through different access networks.  
{1} User-ID: Username

Unique identifier of a user within the scope of subscription service provider. It is usually the part of the Subscription-ID administered by the subscription service provider.  
{1} SubsCredential: Subscription credential

Cryptographic credential bound to a single subscription which allows the subscription server to verify the source of an access request.  
{1} ServiceProvider-ID: FQDN

Globally unique identifier to denote the service provider which issued a subscription  
{1} ServiceProfile: Definition of provided services

List of attributes describing the agreed set of communication services which a user can receive through the usage of a particular subscription.

**6.4.5.3 TE**

{1+} SupportedAuthMethods: possible authentication methods

List of the authentication methods, which the terminal requesting network access could support

{1+} SupportedEncryptionModes: possible encryption modes

List of the encryption methods, which the terminal requesting network access could support

{1} PreferredAuthMethod: preferred authentication method

Authentication method proposed by the terminal to be used for the requested session

{1} PreferredEncryptionMode: preferred encryption mode

Encryption method proposed by the terminal to be used for the requested session

**6.4.5.4 ANC**

{1} ANCredential: Authenticator credential

Cryptographic credential allowing the TE to verify the identity of the authenticator before handing over authentication credentials.  
{1+} SupportedEncryptionModes: possible encryption modes

List of the encryption methods which could be supported by an access network for a requested session

{1} PreferredEncryptionMode: preferred encryption mode

Proposed encryption method to be used for the requested session signaled to the TE for consideration

**6.4.5.5 SS**

{1} SSCredential: Subscription service credential

Cryptographic credential of the subscription service allowing the AN and TE to verify the identity before handing over sensitive information.

{1+} SupportedAuthMethods: possible authentication methods

List of the authentication methods which could be supported by a subscription service for a requested session

{1} PreferredAuthMethod: preferred authentication method

Proposed authentication method for the requested session signaled to the TE for consideration

**6.5.5 Datapath-specific attributes**

**6.5.5.1 Datapath**

Datapath establishment creates the datapath for the transport of the user information. A datapath is defined through:

{1} DP-ID: Unique datapath identifier

Unique identifier denoting a single datapath in an access network. It is used for the registration and maintenance of a datapath during its lifetime.  
{1} DPConfig: Configuration parameters of datapath

Complete configuration parameters and forwarding path of a datapath. It comprises all information necessary to configure the data relaying elements along the data forwarding path.

**6.5.5.2 NA**

{1} R1Config: R1 Session configuration parameters

Configuration parameters of the R1 interface of an NA for a particular datapath. They comprise PHY as well as DL attributes.

{1} R6Config: R6 Session configuration parameters

Configuration parameters of the R6 interface of an NA for a particular datapath. They comprise PHY as well as DL attributes.

{1} BRcfg: Bridging service definition

Configuration parameters of the bridging function between the R1 interface and the R6 interface of a particular datapath at an NA.

**6.5.5.3 BH**

{1+} R6Config: R6 Session configuration parameters

PHY and DL configuration parameters of the R6 interface of a BH for a particular datapath. The datapath of a BH may be connected to multiple NAs potentially requiring multiple instances of the R6Config element.

{1+} R3Config: R3 Session configuration parameters

PHY and DL configuration parameters of the R3 interface of a BH for a particular datapath. The datapath of a BH may be connected to multiple ARs potentially requiring multiple instances of the R3Config element.

{1+} BRCfg: Bridging service definition

Configuration parameters of the bridging functions between the R6 interfaces towards the NAs and the R3 interface towards the ARs of a particular datapath at an NA. Depending on configuration forwarding could happen between any of the interfaces of a datapath in a BH.

**6.5.5.4 AR**

{1} IPProvider-ID: FQDN

Globally unique identifier of an IP provider operating an AR.  
{1+} ARI-ID: Interface identifier

Globally unique identifier of an interface to an AR. An AR of a particular IP provider could expose multiple different AR interfaces each denoted through an unique identifier.  
{1+} R3Config: Interface configuration parameters

PHY and DL configuration parameters of the R3 interface of an AR for a particular datapath. If an AR is connected to a particular datapath through multiple R3 interfaces, multiple instances of the R3Config element are required.

**6.5.5.5 SS**

{1} ServiceProvider-ID: FQDN

Globally unique identifier of a service provider operating a subscription service

{1} DPSrvSpec: Datapath service definition

Set of parameters describing in an abstract way the behavior and the capabilities of a datapath. The information is used to derive concrete network element configuration parameters in AN and AR.

**6.6.5 QoS policy-specific attributes**

**6.6.5.1 Service flow**

QoS policy control defines and deals with service flows. A service flow is defined through:

{1} ServiceFlow-ID: Unique identifier

Identifier denoting a single instance of a service flow used for registration and maintenance. Therefore it has to be unique within the scope of an ANC, but may be attributed by the DP-ID to which the service flow belongs.

{1} SFConfig: Configuration parameters of service flow

Performance attributes of service flow, such as, e.g.:

* Datagram filter
* Priority
* Bandwidth
* Delay
* Jitter

The configuration parameters of forwarding network elements are derived from the performance attributes.

{1} SessionKey: Unique session credential

Unique credential of a session established during authentication process. It is attributed to a service flow to directly indicate the relation to a particular session and user.

{1} DP-ID: Related DataPath-ID

Related datapath identifier denoting the datapath instance to which the service flow belongs.

**6.6.5.2 NA**

{0+} SFParams: Service flow configuration parameters

Set of configuration parameters of NA for establishment of required forwarding behavior to fulfill the performance attributes of the service flow.

**6.6.5.3 BH**

{0+} SFParams: Service flow configuration parameters

Set of configuration parameters of BH for establishment of required forwarding behavior to fulfill the performance attributes of the service flow.

**6.6.5.4 SS**

{1} ServiceProvider-ID: FQDN

Globally unique identifier of the subscription service operator  
{1} SFSpec: Service flow parameters

Set of parameters for specification of end to end forwarding behavior of a flow of frames belonging to a particular service.  
{1} PolicyRules: Policing rules

The traffic policing rules describe attributes, such as, e.g.:

* Traffic specification
* Priority
* Usage limits (time, volume)

**6.7.5 Accounting and monitoring-specific attributes**

**6.7.5.1 Session statistics**

Accounting and monitoring creates records of session statistics. Session statistics are defined through:

{1} StatsRecord-ID: Unique identifier of the accounting record;  
{1} SessionKey: Unique credential of a session established during authentication process;  
{1} DP-ID: Related datapath identifier denoting the datapath instance to which the service flow belongs;

{1} AccountingStart: TimeStamp when starting the accounting process;  
{1} AccountingStop: TimeStamp when stopping the accounting process;  
{1+} StatsParams: Session statistics parameters and accounting results;

Usual session statistics parameters are, e.g.,

* Transmitted/received volume: Number of data bytes transmitted/received at a specific interface/observation point for a metered time period.
* QoS parameters: Quality of Service parameters that describe traffic service classes, priorities, etc.

**6.7.5.2 NA**

{1} R1 monitoring usage data,  
e.g., transmitted/received volume, throughput, QoS monitoring data

{1} R6 monitoring usage data,  
e.g., transmitted/received volume, throughput, QoS monitoring data

**6.7.5.3 BH**

{1} R3 monitoring usage data,  
e.g., transmitted/received volume, throughput, QoS monitoring data

{1} R6 monitoring usage data,  
e.g., transmitted/received volume, throughput, QoS monitoring data

**6.7.5.4 ANC**

{1} MonitorConfig: parameter set for monitoring tasks,   
e.g. trigger condition, monitoring type, scope, etc;

{1} CollectionConfig: parameter set for collection procedure,   
e.g. collection rules, collection model;

{1} MediationConfig: parameter set for mediation procedure,   
e.g. filtering, threshold, aggregation, etc;

**6.7.5.5 SS**

{1} ServiceProvider-ID: FQDN

Globally unique identifier to denote the service provider which issued a subscription

{1} AccountingConfig: Accounting configuration specification

Parameter set describe the rules for generation, transport and storage of accounting data, which are used for configuration of the accounting process.

**6.8.5 FDM-specific attributes**

**6.8.5.1 Alarm list**

Alarms describe the characteristics of faults in a predefined form, which will be used to notify the management entity. The set of generic attributes are defined through:

{1} Alarm-ID: Unique identifier of alarm.  
{1} AlarmParameter: Fault characteristics parameters,   
e.g. timestamp, units at fault, etc;.  
{1} ProbCause: Probable cause of the alarm,   
e.g. transmit failure, receive failure, threshold crossed;  
{1} Events: information about the event reported from the NEs,   
e.g., type, severity.

{1} State: state of the alarm,   
e.g. active or suppressed;

**6.8.5.2 Link-monitoring statistics**

The link-monitoring task is scheduled by the management entity and creates the statistics of the communication link.

{1} LM-ID: unique identifier of the link-monitoring task.

{1} NE-ID: identifier of the NE carrying the link-monitoring task.

{1} State: state of link-monitoring task indicating whether or not the task is handled properly on the NE;

{1} NBInfo: information about the reachable neighbor entities, such as identifiers, MAC addresses, and communication statistics, etc.

{1}EnInfo: information about the particular wireless environment, e.g., radio resource measure- ments, channel scan reports.

{1} Events: events created as well-defined threshold is crossed, status code defined by 802 specifica- tions, and notified exceptions and anomalies.

**6.8.5.3 Test statistics**

{1} Test-ID: unique identifier for the test task.  
{1} TestConfig: configuration parameters for the test,   
e.g. type, timestamps, targeted NE ID, etc .

{1} TestResult: results of the test,   
e.g. round trip time (RTT), jitter, etc.

**6.8.5.4 SelfCheck statistics**

{1} SC-ID: unique identifier for the self-check task.  
{1} NE-ID: identifier of the NE carrying the link-monitoring task.

{1} HWinfo: information about the hardware of the NE,   
e.g. model number, manufacture code, etc.  
{2} SWinfo: information about host software,   
e.g. released version, license, etc.  
{3} MIBinfo: 802 specific local MIB of the NE.  
{4} Loginfo: information from the system log of the NE captured by operation system or firmware.  
{5} Cominfo: information about recent communication activity,   
e.g. performance monitoring statistics.

**6.8.5.5 FDM Capabilities**

{1} BHCapability: FDM capabilities for BH.

Set of attributes to describe the capabilities of BH in support of FDM functions.

{1+} NACapability: FDM capabilities for NA.

Set of attributes to describe the capabilities of NA in support of FDM functions.

{1+} TECapability: FDM capabilities for TE.

Set of attributes to describe the capabilities of TE in support of FDM functions.

 {1} ARCapability: FDM capabilities for AR.

Set of attributes to describe the capabilities of AR in support of FDM functions.

**6.8.5.6 FDM Config**

{1} BHConfig: FDM configurations for BH.

Parameters set for configuration of supported BH’s FDM functions;

{1+} NAConfig: FDM configurations for NA.

Parameters set for configuration of supported NA’s FDM functions;

{1+} TEConfig: FDM configurations for TE.

Parameters set for configuration of supported TE’s FDM functions;

{1} ARConfig: FDM configurations for AR.

Parameters set for configuration of supported AR’s FDM functions;

**6.8.5.7 ANC**

{1} FDMCapability: FDM capabilities of the ANC.

Set of attributes to describe the capabilities of ANC in support of FDM functions;

{1} FDMConfig: parameter set for the FDM aggregation functions of the ANC.

Parameters set for configuration of supported ANC’s FDM functions;

**6.8.5.8 NMS**

{1} FDMRules: policy rules for fault management in the network.

Parameter set that describes the rules for fault detection, diagnosis, isolation and mitigation functions.

{1+} AggregationStats: aggregation statistics indicating the results when applied aggregation rules which will be provided to higher layer fault management functions.