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| Chapter 7.2.8 Mapping to IEEE 802 technologies |
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Abstract

This document proposes content for the chapter 7.2.8 Mapping to IEEE 802 technologies.

### Mapping to IEEE 802 technologies

IEEE 802 technologies provide the basic capabilities to perform the Network Discovery and Selection procedures described in this section.

Aside of the definition of the identifiers of the functional entities playing a role for network discovery and selection, the technology used for the realization of the R1 interface between the terminal and the access network must provide a number of functions to support the message exchanges for NDS:

* Broadcasting signals carrying information about the particular NA as well as about the AN, to which the NA belongs,
* Unicast or broadcast of query messages through terminals, to retrieve further information about the NAs, as well as the ANs, to which the NAs belong.
* Responding to query messages send out by terminals with information about the particular NA as well as about the AN, to which the NA belongs.

#### IEEE 802.3

The basic functions for NDS of IEEE 802.3 Ethernet are defined by IEEE 802.1X, which provides not only the methods for authentication and trust establishment but also the basic information exchanges for network discovery.

Section 10 of IEEE 802.1X (Network Announcements) details the messaging to provide announcements to newly connected terminals. Even the functions are mainly aimed for establishment of a trusted communication path between TE and NA, also information regarding the selection of the network access is conveyed. The information is carried through EAP-Announcement messages, which are further detailed in section 11 of IEEE 802.1X.

#### IEEE 802.11

IEEE 802.11 realizes the network discovery and selection procedures mainly through the definition of the MLME-SCAN procedure and the related definition of the Beacon, Probe Request, and Probe Response management frames. MLME-SCAN is part of the MAC Layer management primitives defined in section 6.3 of IEEE 802.11, while the information elements carried through Beacon frame, Probe Request frame, and Probe Response frame are detailed in section 9.3.3. A more comprehensive description of the NDS procedures in IEEE 802.11 is provided in the beginning of section 11.1.4 (Acquiring synchronization, scanning) with introduction of both, passive scanning as well as active scanning to retrieve the required information for initialization of a connection.

IEEE 802.11 provides a number of functional enhancements to support more complex deployments:

* Access Network Query Protocol
* Pre-Association Discovery Protocol
* Network triggered NDS (e.g., directed NA transition)
* Online subscription establishment (e.g., Hotspot 2.0 “Online Sign Up”)

#### IEEE 802.16

IEEE 802.16 specifies its functions and procedures for NDS in the section 6.3.9 Network Entry and Initialization and within the section on Network Topology Acquisition of 6.3.20 (MAC HO Procedures). Due to its prevalent deployment in licensed spectrum, IEEE 802.16 relies on passive scanning procedures, which does not cause any radio radiation through the terminal for detecting potential NAs, until the TE is tuned in the radio channel of the NA offering access to the AN.

#### IEEE 802.22

Due to the special procedures required for operation in TV Whitespace and licensed shared access, the IEEE 802.22 specification contains additional functions for network discovery and selection. Section 7.14 (Initialization and Network Association) describes the procedures for both the NA (BS), as well as the TE (CPE) to initiate operation and determine connectivity between TE and AN. Further details with references to the retrieved and processed information is given in the subsections addressing ‘CPE senses for and identifies WRAN services and incumbents’ to ‘CPE chooses WRAN service’. As IEEE 802.22 is aimed for fixed wireless access, no provisions exist to hand over a connection from one NA to another NA of the same WRAN service.