

# Brief Introduction to IEEE P802.1CF

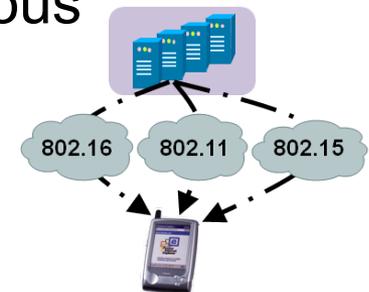
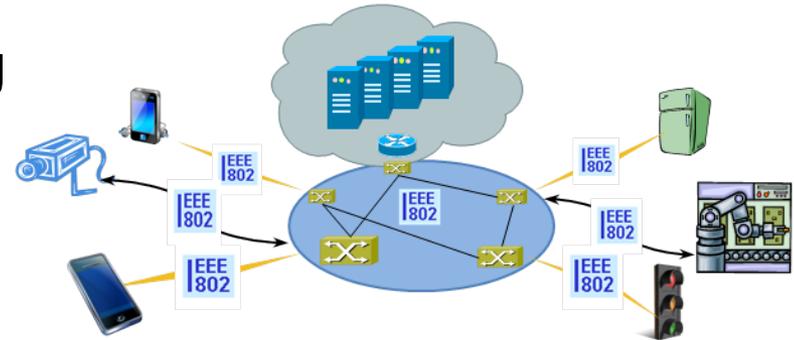
IEEE 802.1 OmniRAN TG

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2016-11-10

# There is Evidence to consider Commonalities of IEEE 802 Access Networks

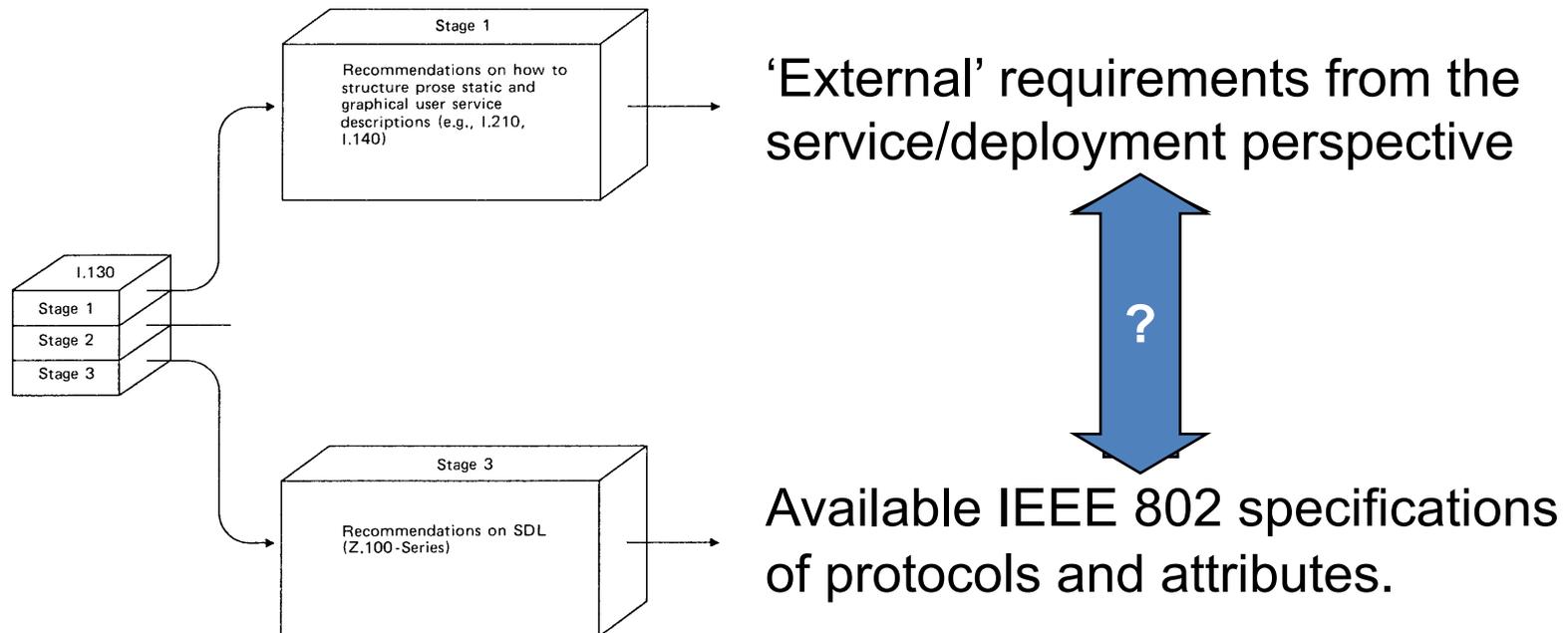
- More (huge) networks are coming up by everything gets connected
  - e.g. SmartGrid, ITS, IoT, ...
- New markets for IEEE 802 access technologies
  - e.g. factory automation, in-car communication, home automation, ...
- IEEE 802 access is becoming more heterogeneous
  - multiple network interfaces
    - e.g. IEEE 802.3, IEEE 802.11, IEEE 802.15...
  - multiple access network topologies
    - e.g. IEEE802.11 in residential, corporate and public
- multiple network subscriptions
  - e.g. multiple subscriptions for same interface
- New emerging techniques, like SDN and virtualization



# IEEE 802 demands a kind of 'Stage 2'

## *Network Specification in 3 Stages*

- For the specification of the Integrated Services Digital Network the ITU-T defined in its Rec. I.130 a sequential 3 stage process,.
- This process is nowadays commonly used in most telecommunication network standardization activities.



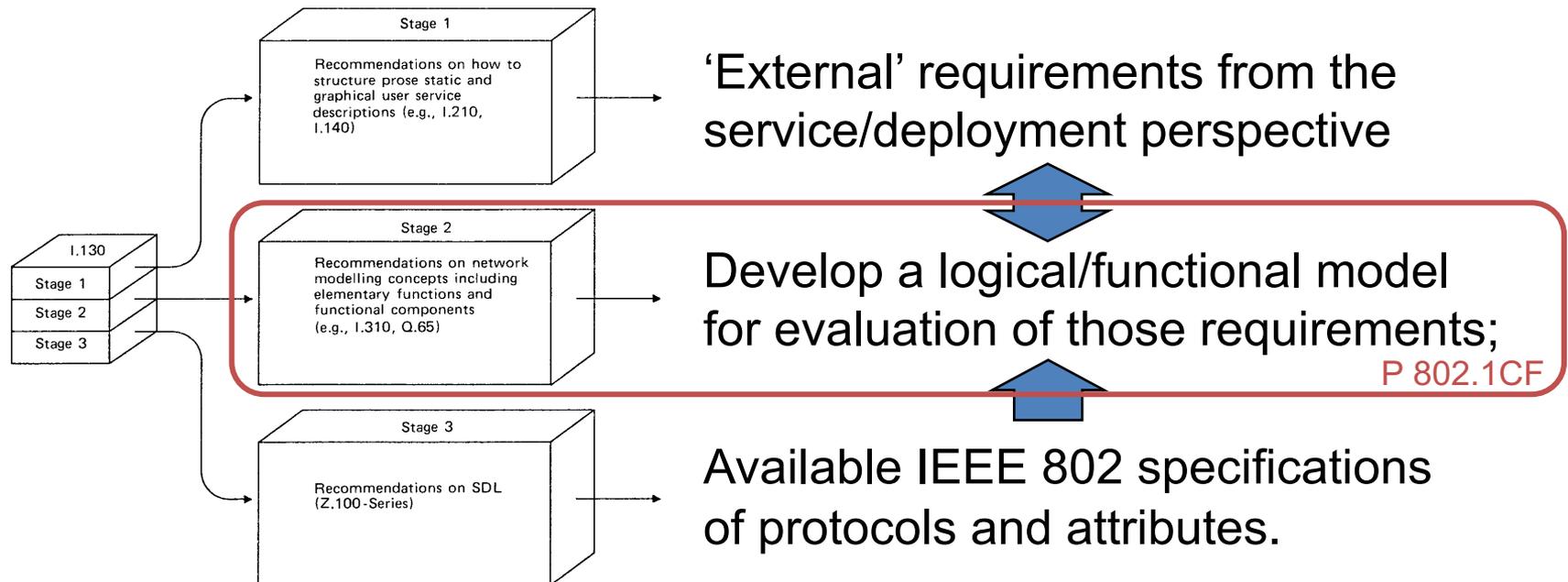
More Information: ETSI: *Making Better Standards*

<http://docbox.etsi.org/MTS/MTS/10-PromotionalMaterial/MBS-20111118/protocolStandards/stagedApproach.htm>

# IEEE 802 demands a kind of 'Stage 2'

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- A 'Stage 2' specification would provide a mapping of the existing IEEE 802 protocols to a functional network model, which facilitates easier evaluation and better understanding of end-to-end behavior.

# P802.1CF PAR

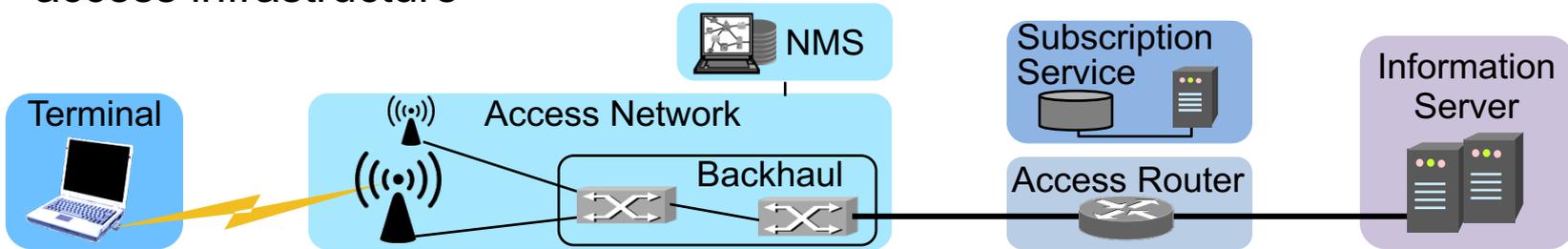
- **Project Title:**  
Network Reference Model and Functional Description of IEEE 802 Access Network
- **Scope:**  
This Recommended Practice specifies an access network, which connects terminals to their access routers, utilizing technologies based on the family of IEEE 802 Standards by providing an access network reference model, including entities and reference points along with behavioral and functional descriptions of communications among those entities.
- **Purpose:**  
Heterogeneous networks may include multiple network interfaces, multiple network access technologies, and multiple network subscriptions. In some cases such heterogeneous functionality must be supported in a single user terminal.  
  
This Recommended Practice supports the design and deployment of access networks based on IEEE 802 technologies, guides the developers of extensions to the existing standards in support of a heterogeneous access network, and enables the use of IEEE 802 standards in new network deployments by specifying the functions of the IEEE 802 technologies when deployed in access networks.

# P802.1CF D0.3 ToC

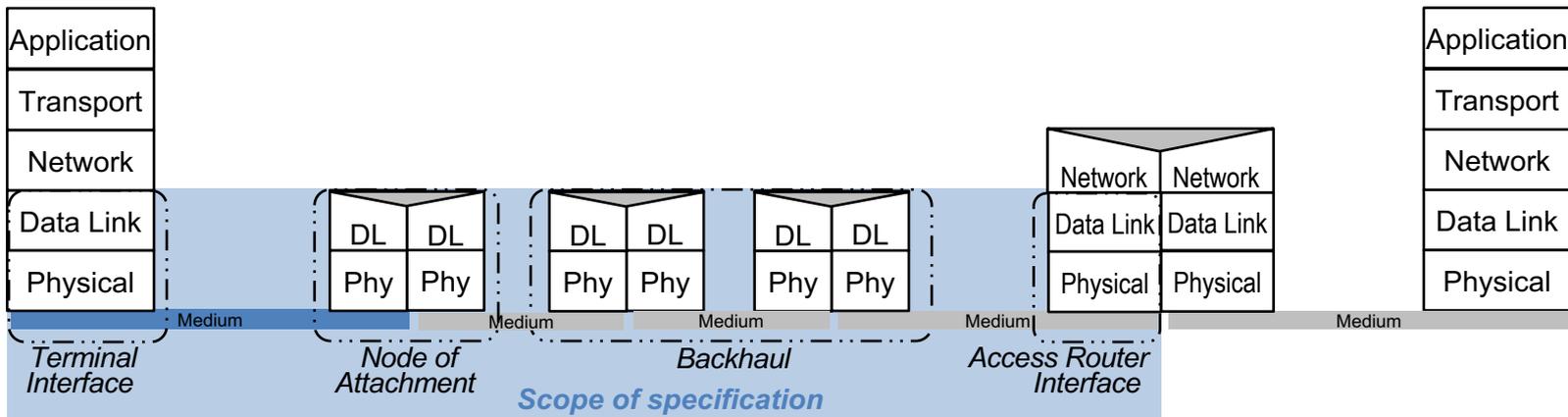
1. Overview
2. Normative references
3. Definitions
4. Acronyms, abbreviations, and conventions
5. Conformance
6. Network Reference Model
  1. Basic architectural concepts and terms
  2. Overview of IEEE 802 Network Reference Model
  3. Basic Network Reference Model
  4. NRM with Coordination and Information Service
  5. Comprehensive Network Reference Model
  6. Operational roles
  7. Network Virtualization
  8. Identifiers of functional entities
  9. Deployment scenarios
7. Functional Decomposition and Design
  1. Access network setup
  2. Access network discovery and selection
  3. Association and disassociation
  4. Authentication and trust establishment
  5. Data path establishment, relocation and teardown
  6. Authorization, QoS and policy control
  7. Accounting and monitoring
  8. Fault diagnostics and maintenance
8. Network virtualization functions
  1. SDN functional decomposition
  2. Network Function Virtualization
  3. Virtual Network Instantiation

# Network Reference Model design

- Core functional entities were identified from a common topology figure of an access infrastructure



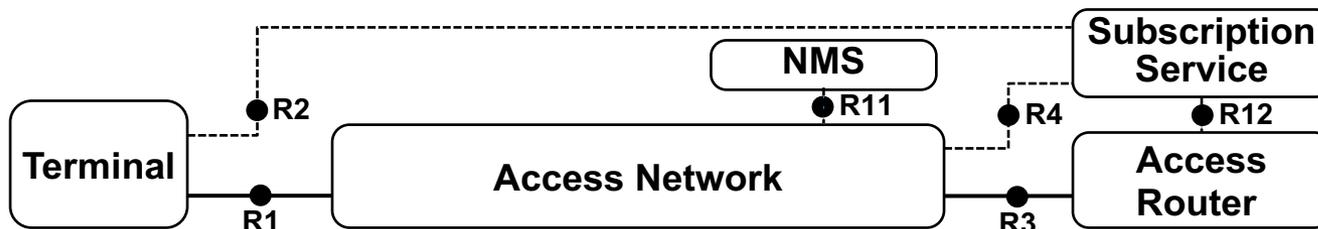
- The portion of the access infrastructure in scope of IEEE 802 was defined according to the protocol layer architecture of the data path



- IEEE 802 access network describes the layer 2 network between terminal and access router implemented through IEEE 802 technologies.

# Network Reference Model basics

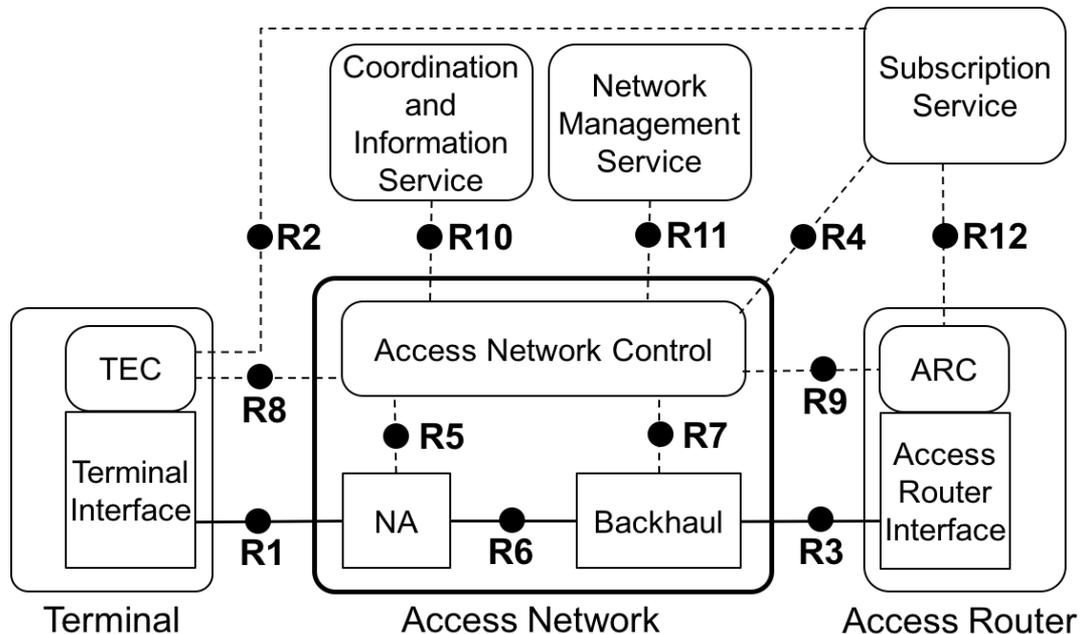
- The NRM denotes the functional entities and their relation to each others



- Functional entities represented by rounded rectangles
- Relations are shown by reference points indicating interfaces
  - Reference points are denoted through R...
    - Total of 12 reference points in the model
  - Two different kind of reference points
    - Forwarding path of Ethernet frames
      - Represented by solid lines
    - Control interfaces
      - Represented by dotted lines

# Comprehensive Network Reference Model

- Comprehensive NRM shows highest level of details

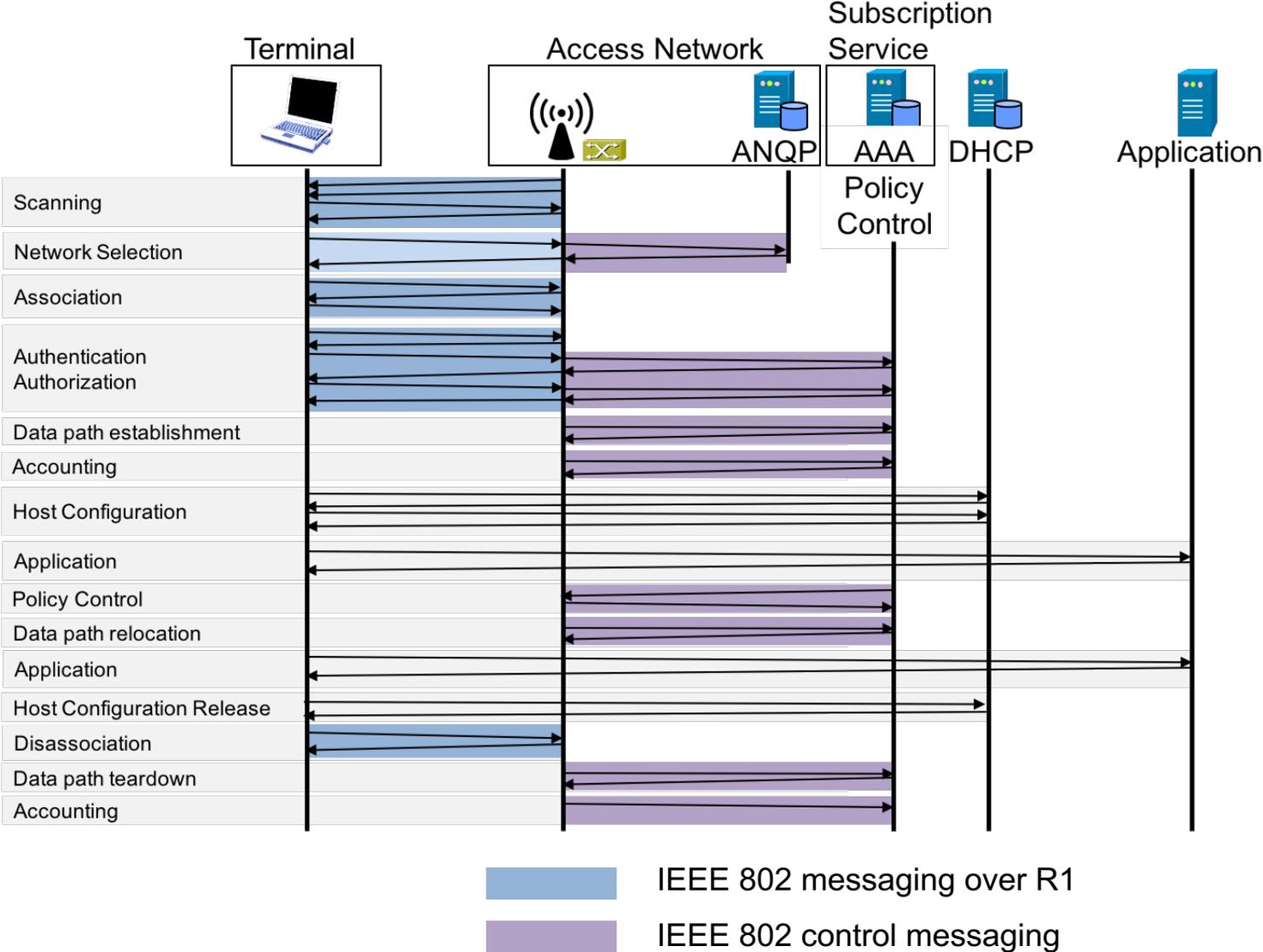


- NRM represents a logical view on an access network
  - For the purpose to define interfaces
- Control interfaces cover only attributes related to IEEE 802
  - Protocol details on control interfaces are out of scope

# Functional Decomposition and Design

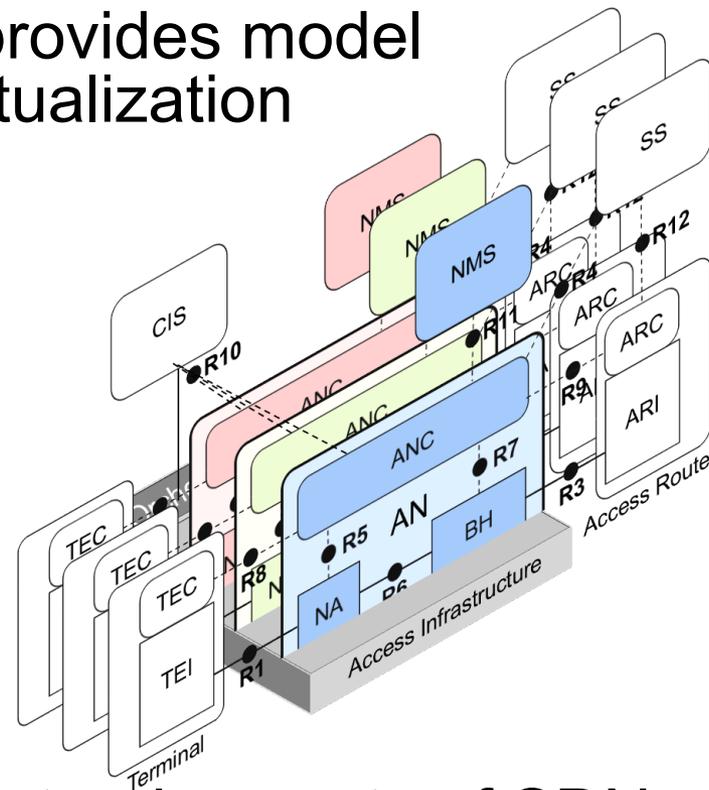
- Describes initialization of the network and the life cycle of user sessions
  - Initialization
    - Access network setup
  - Life cycle of an user session
    - Access network discovery and selection
    - Association and disassociation
    - Authentication and trust establishment
    - Data path establishment, relocation and teardown
    - Authorization, QoS and policy control
    - Accounting and monitoring
    - Fault diagnostics and maintenance
- Provides the insights into the required IEEE 802 functions and control information for network operation.

# Session life cycle of IEEE 802 access



# Advanced topic: Network virtualization

- Specification provides model for network virtualization

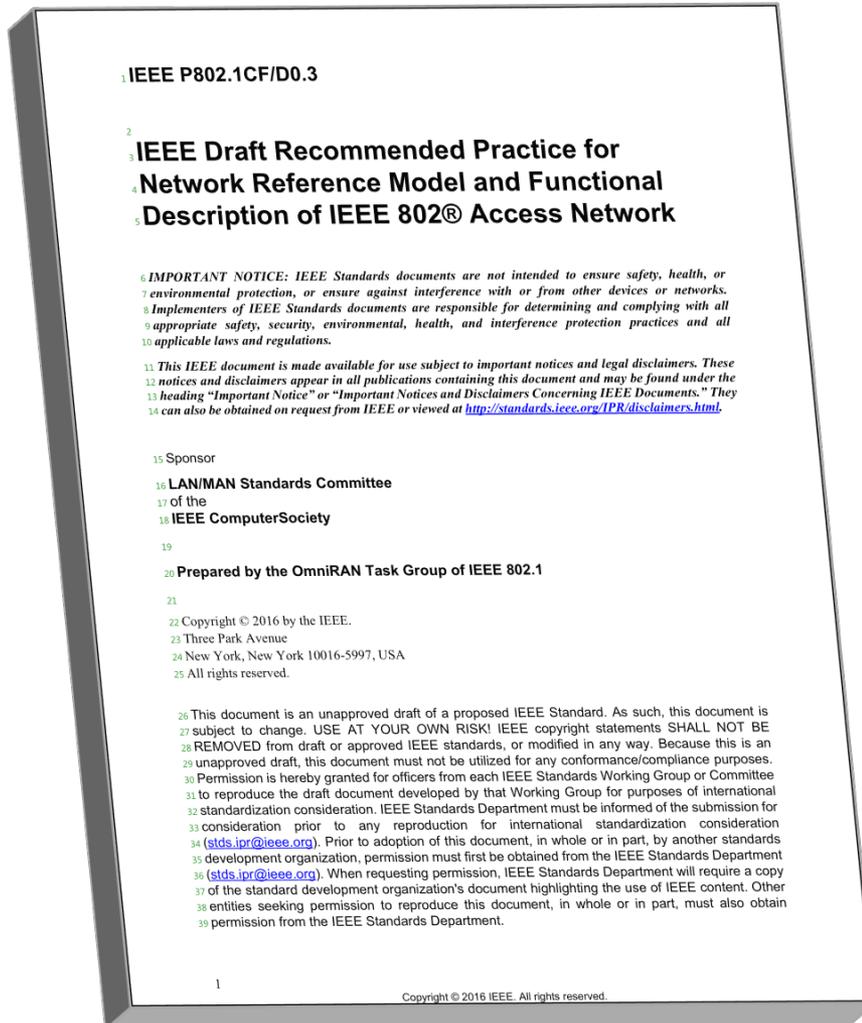


- Covers architectural aspects of SDN and NFV for IEEE 802 access network

## Status of the work

- Current draft P802.1CF-D0.3 provides initial text for all sections
- Not all details are sufficiently described yet
- Specification of network virtualization concepts is still evolving.
  
- Review and input from networking experts wanted to detect flaws and to enhance the document.

# How to get access to the specification



- IEEE 802 draft specifications are not publicly available.
- RFC 7241 describes various ways for IETF participants to get access to the draft specification.
- Please contact IEEE 802.1 chair Glenn Parsons <[glenn.parsons@ericsson.com](mailto:glenn.parsons@ericsson.com)>