Broadband Architecture Moving to FMC

MR-310

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2. Introduction to Broadband Forum

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    1. User Convenience
    2. Business Opportunities
    3. Interworking between Fixed Networks and Mobile Networks
        1. Connectivity
        2. Multi-Access Flexibility
        3. Policy Control and Resource Functionality
        4. User Subscription Management

5. BBF FMC Evolution
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1   Executive Summary

- This tutorial explains current state of interworking and convergence of BBF and 3GPP networks.

- It introduces existing architectures and frameworks of BBF and 3GPP networks, referring (when necessary for technical details) to the published specifications as well as work in progress.

- It highlights opportunities, use cases, challenges, and considerations for interworking and convergence between BBF and 3GPP networks.

- It is aimed to assist those who are interested in or involved in progressing the standardization work.

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2   Introduction to Broadband Forum

BBF Tutorial intro from Ambassador kit
(~10 slides)

[bbf-p0018.103.02.ppt](bbf-p0018.103.02.ppt)

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3   References
BBF

[1] TR-146 Subscriber Sessions, 2013
– Describing subscriber sessions and their management in BBF networks from PPP-based to Ethernet and IPoE-based networks. It includes subscriber session authentication and IP address/prefix allocation enabling the creation of subscriber sessions and providing profile management for them.

[2] MR-235 Considerations in Broadband Architecture Moving to FMC, 2011
– Describing BBF vision towards aligning the telecom industry in the industry trend called Fixed/Mobile Convergence.

[3] TR-203 Interworking between Next Generation Fixed and 3GPP Wireless Networks, 2012
– Business requirements and reference architectures for interworking use cases based on 3GPP UE devices moving between 3GPP mobile and BBF Fixed networks.

[4] WT-291 Nodal Requirements for Interworking between Next Generation Fixed and 3GPP Wireless Access, in straw ballot
– Builds on the work done in TR-203 and provides the nodal requirements for solutions associated with the TR-203 architecture and use cases.

[5] TR-134 Broadband Policy Control Framework (BPCF), 2012
– Defines an architectural framework to provide policy control in BBF networks. It specifies business requirements, use cases, and a minimum set of Information Flows that facilitate the management and execution of policies.

[6] WT-300 Policy Convergence, work in progress
– Business requirements and converged policy control reference architecture on enhancements of 3GPP PCC and BBF architectures to achieve network infrastructure optimization for operators that have both Fixed and wireless access networks.

[7] WT-178 Multi-service Broadband Network Architecture and Nodal Requirements
– Documents a set of architectures for broadband multi-service network, addressing typical infrastructures, topologies and deployment scenarios, and specifies associated nodal requirements.

3   References
3GPP

[8] TR 23.839 Study on support of Broadband Forum (BBF) access Interworking, Rel-12, 2013
– Architecture aspects for 3GPP-BBF access interworking. This work includes: aspects for mobility host-based (S2c) and network-based mobility for untrusted accesses (S2b) as part of the **BB1**; interworking functionality of BB1 when WLAN is being used and traffic is offloaded in the local wireline network as part of the **BB2**; and converged policy management and charging for the scenarios with traffic routed to EPC and offloaded at the BBF access network for operators providing both 3GPP and BBF accesses as part of the **BB3**.

[9] TR 23.852 Study on S2a Mobility based on GTP & WLAN access to EPC, Rel-11, 2013
– Addition of a S2a based on GTP option, supporting WLAN access to EPC through S2a via mechanisms, with no impact to legacy UE, and with impact to the new UE to come. The results may be used by 3GPP-BBF interworking activities (BBAI).

[10] TR 23.896 Support for Fixed broadband access network convergence, Rel-12, 2013
– Facilitates policy and charging control in the BBF network in the convergent scenario where a single operator is deploying both the BBF network and the Evolved Packet Core (EPC).

[11] TS 23.139 3GPP system - Fixed broadband access network interworking; Stage 2, Rel-12, 2013
– Describing interworking between 3GPP system and BBF networks to provide the IP connectivity to a 3GPP UE using WLAN and H(e)NB connected to BBF networks. It covers mobility, policy, QoS aspects and the interactions between BBF and the PCC frameworks and specifies the detailed extension to EPC as defined in TS 23.401, TS 23.402 and 23.203 for supporting BBF networks.

[12] TR 23.402 Architecture enhancements for non-3GPP accesses, Rel-12, 2013
– This document specifies the stage 2 service description for providing IP connectivity using non-3GPP accesses to the Evolved 3GPP Packet Switched domain. It covers both roaming and non-roaming mobility scenarios between 3GPP and non-3GPP accesses, policy control and charging, and authentication related to the usage of non-3GPP accesses.

[13] TS 23.203 Policy and Charging Control (PCC) architecture, Rel-12, 2013
– Specifies generic PCC aspects, and specific aspects for each type of IP Connectivity Access Network (e.g. GPRS, WLAN, Fixed Broadband, etc.), flow based charging for network usage, charging control and online credit control for service data flows, and policy control (e.g. gating control, QoS control, QoS signaling, etc.).

[14] TS 29.215 Policy and Charging Control (PCC) over S9 reference point; Stage 3, Rel-12, 2013
– Protocol specification of the S9 reference point responding to the functional requirements of the S9 reference point specification contained in 3GPP TS 23.203.

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4.1   User Convenience
Consumers want a life without barriers!

MR-235

Feeling Close

Living in Real-Time

Convenience and Control

flickr

WIKIPEDIA

- User convenience has to do with **security**, **simplicity**, **personalization** and **look-and-feel**.
- No matter how the user is accessing a service.

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4.2 Business Opportunities
FMC has many dimensions

MR-235

Fixed Mobile Convergence Overview

Converged services

Converged network and infrastructure

Converged user management and terminals

Converged business models

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4.2   Business Opportunities
Main Building Blocks

An IP-based infrastructure is needed for a multi-service packet network

Multiple Legacy Networks

Fixed voice

Cable

Mobile

Enterprise

Internet
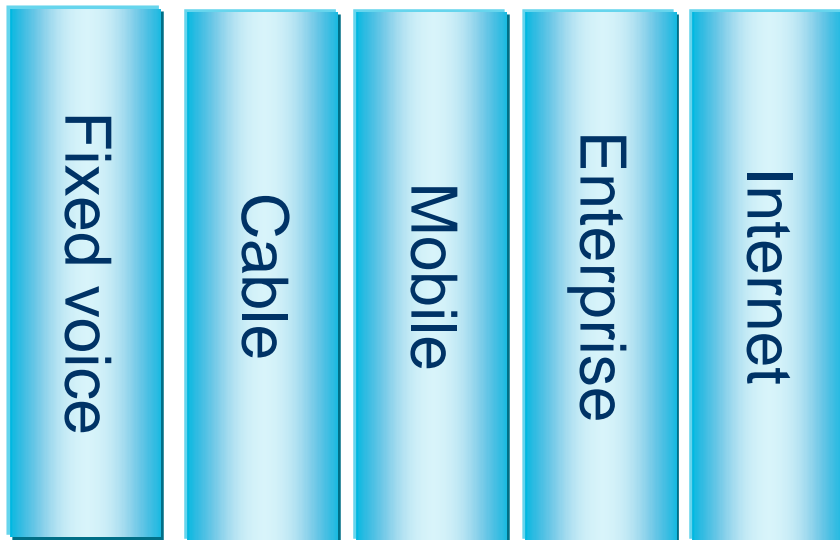
- Many vertical infrastructures
- Multiple single services

Converged Network

TR-146

IP

TR-145/TR-178
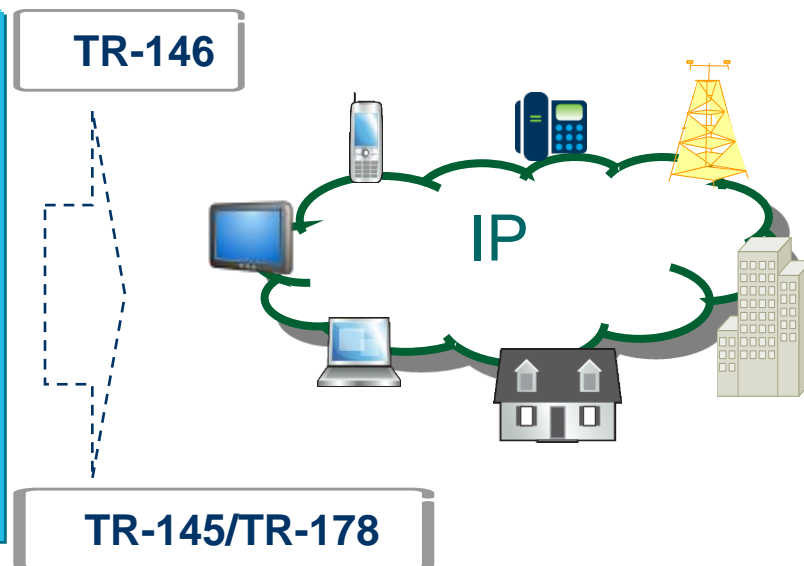
- Single horizontal IP-based infrastructure
- Enables service and network transformation
- Multi-service, QoS-enabled

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4.3   Interworking between Fixed Networks and Mobile Networks

4.3.1 Connectivity
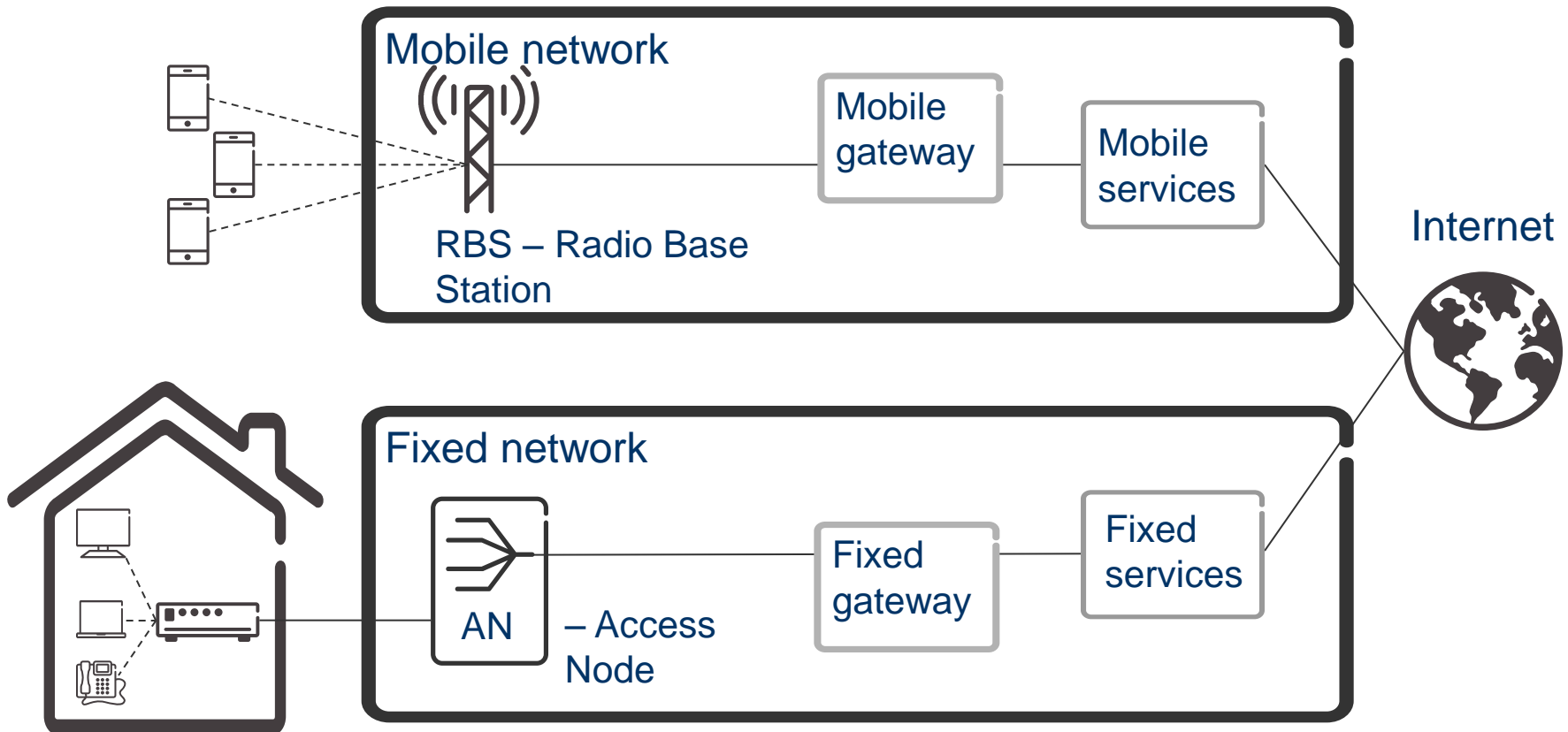
4.3   Interworking between Fixed Networks and Mobile Networks
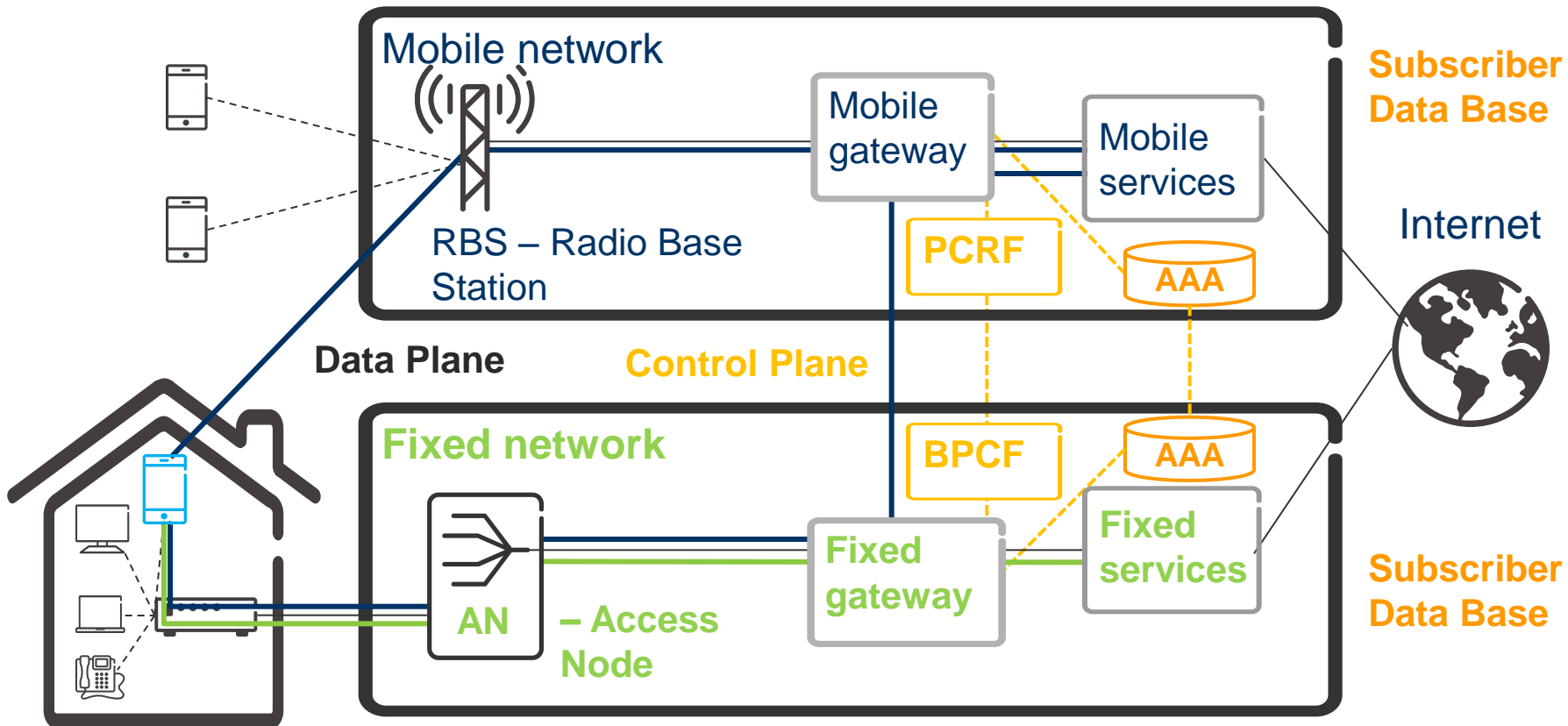
4.3.2 Multi-Access Flexibility
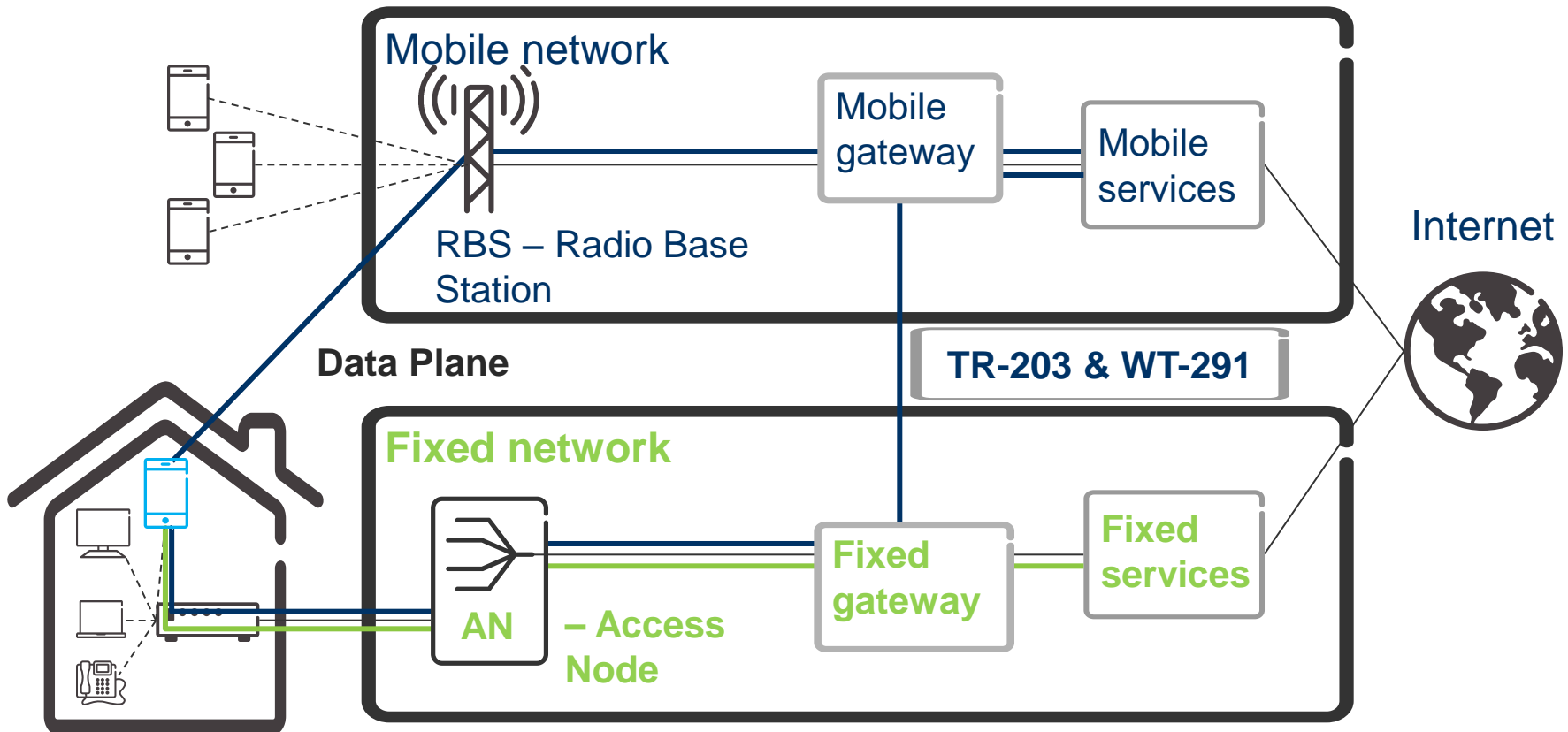
4.3 Interworking between Fixed Networks and Mobile Networks

4.3.3 Policy Control and Resource Functionality

4.3 Interworking between Fixed Networks and Mobile Networks
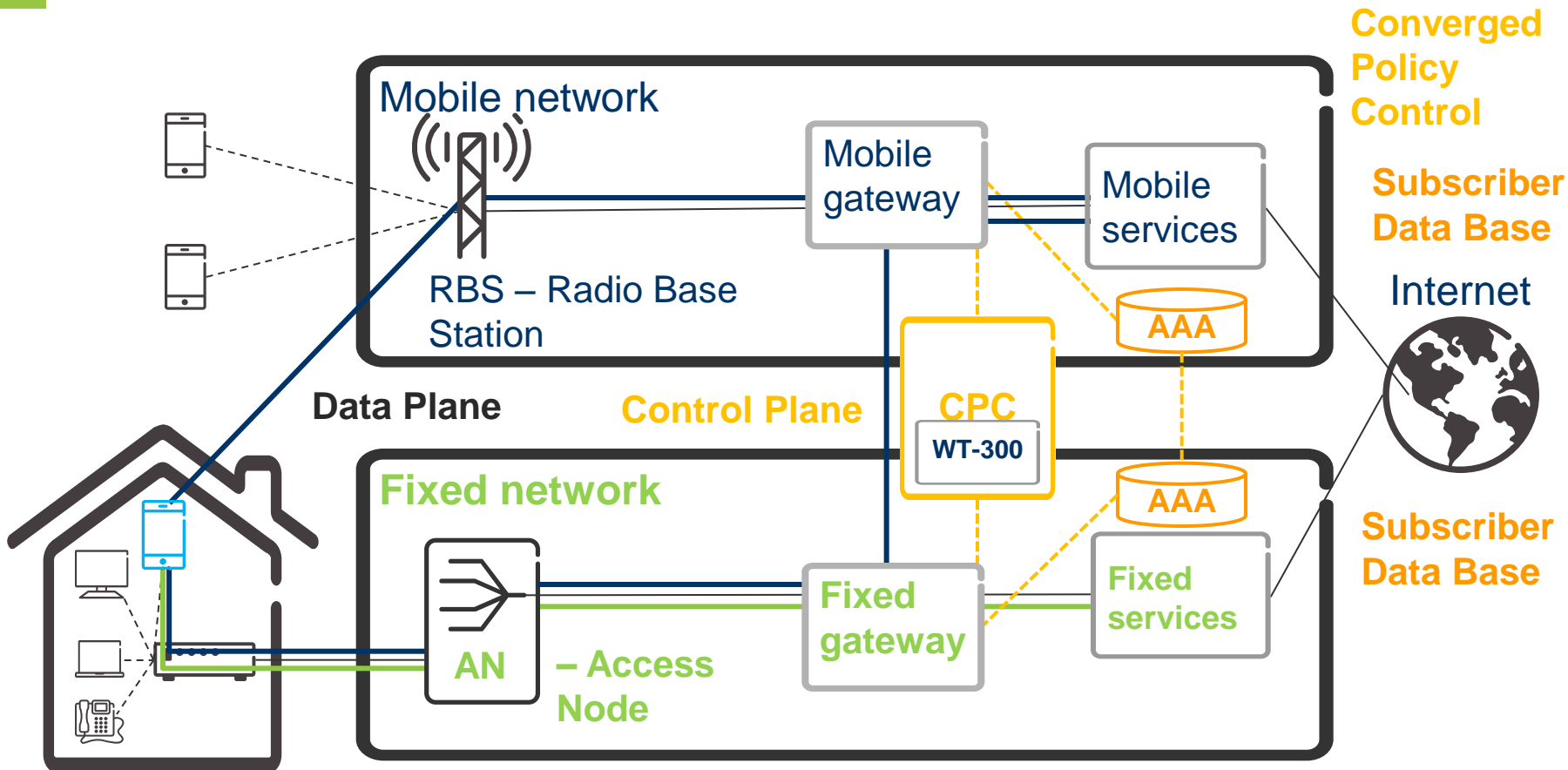
4.3.3 Policy Control and Resource Functionality

4.3 Interworking between Fixed Networks and Mobile Networks
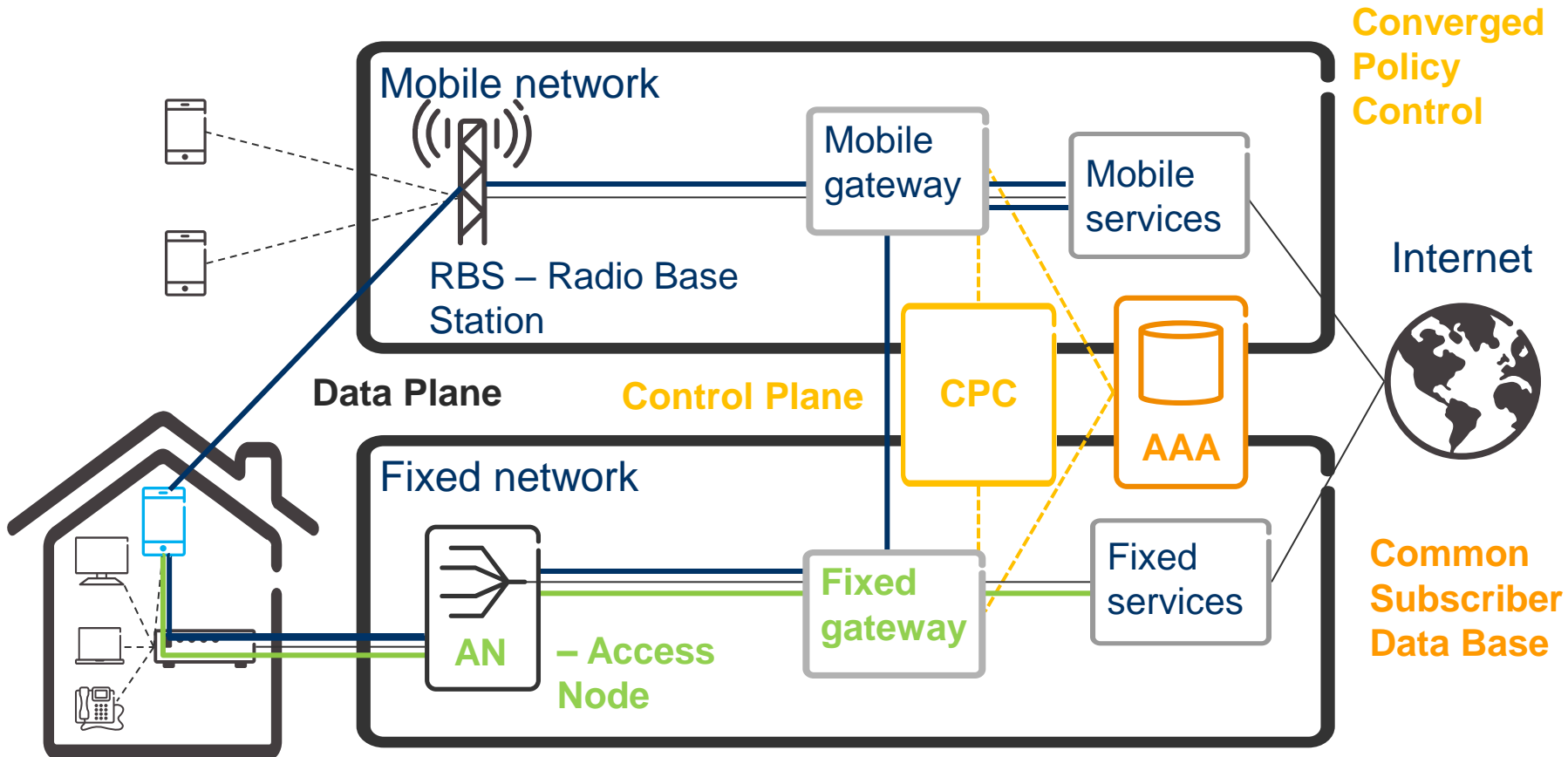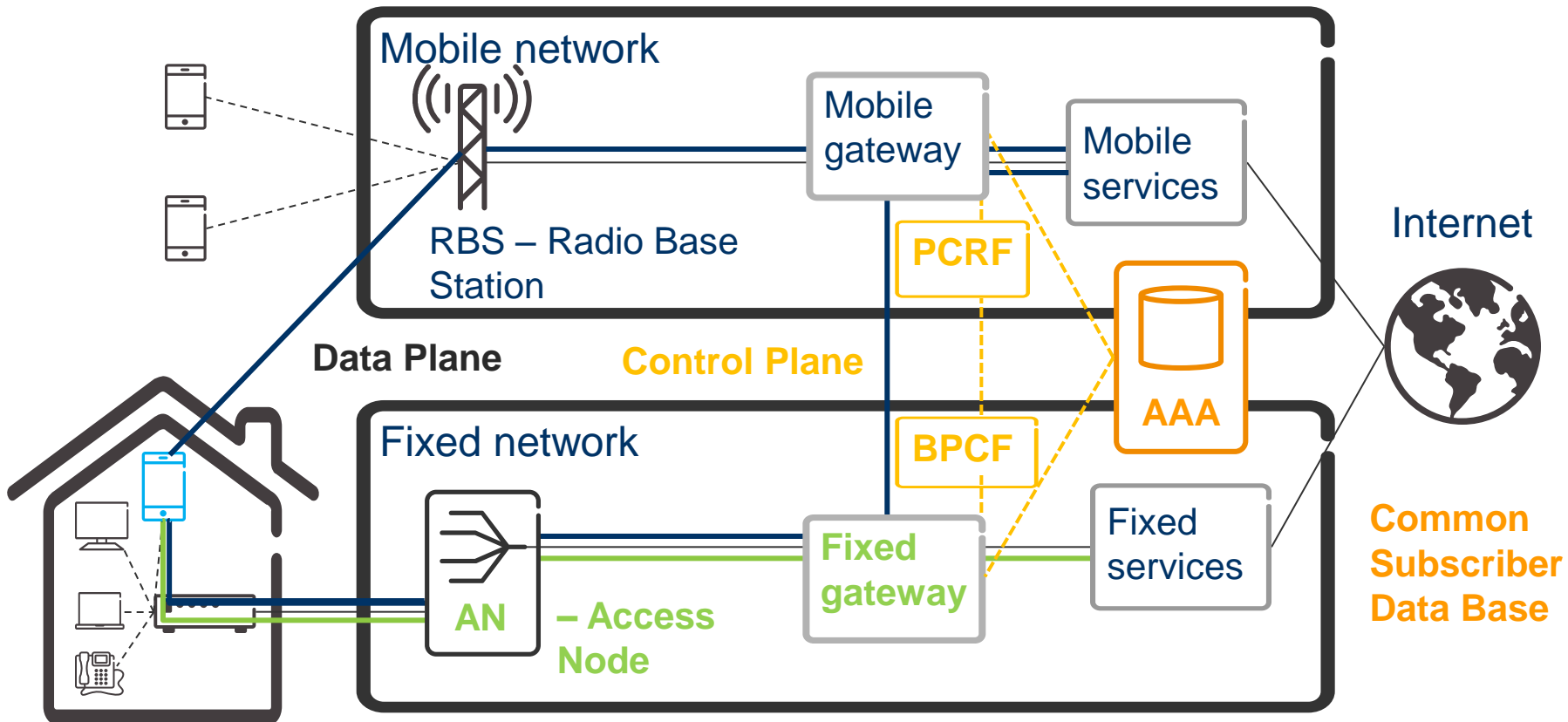
4.3.4 User Subscription Management

Mobile network

Subscriber Data Base

Mobile gateway

Mobile services

RBS – Radio Base Station

Internet

PCRF

AAA

Data Plane

Control Plane

Fixed network

BPCF

AAA

AN – Access Node

Fixed gateway

Fixed services

Subscriber Data Base

4.3 Interworking between Fixed Networks and Mobile Networks

4.3.4 User Subscription Management

4.3   Interworking between Fixed Networks and Mobile Networks

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5.1 Interworking Evolution

Interworking reference architecture, TR-203 (Fig. 12)
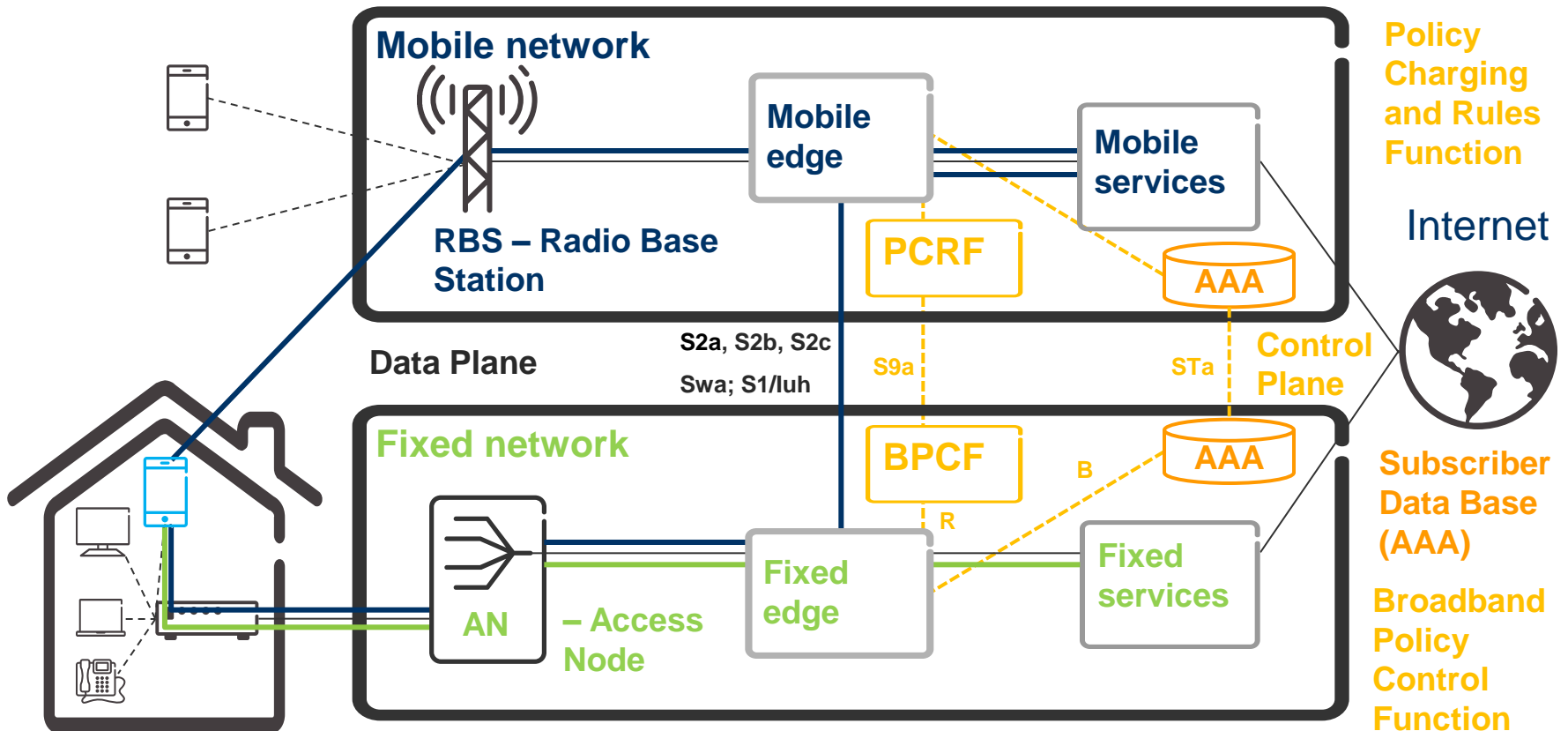
5.1 Interworking Evolution

- **Trusted WLAN Interworking Reference Architecture**
  - Interworking reference architecture for trusted WLAN **S2a-based** connectivity
    - Based on **TR-203** BBF-3GPP interworking framework;
    - Further specified in the nodal requirements described in BBF **WT-291**;
    - Tight bonds with **3GPP** TR 23.852: *Study on S2a Mobility based on GTP and WLAN access to EPC* (SaMOG);
      - Recommended solution by *GSMA – WBA Wi-Fi roaming Task Force* for scenarios requiring **IP Address Preservation** -- *White Paper on Session Continu*ity (July 2013).

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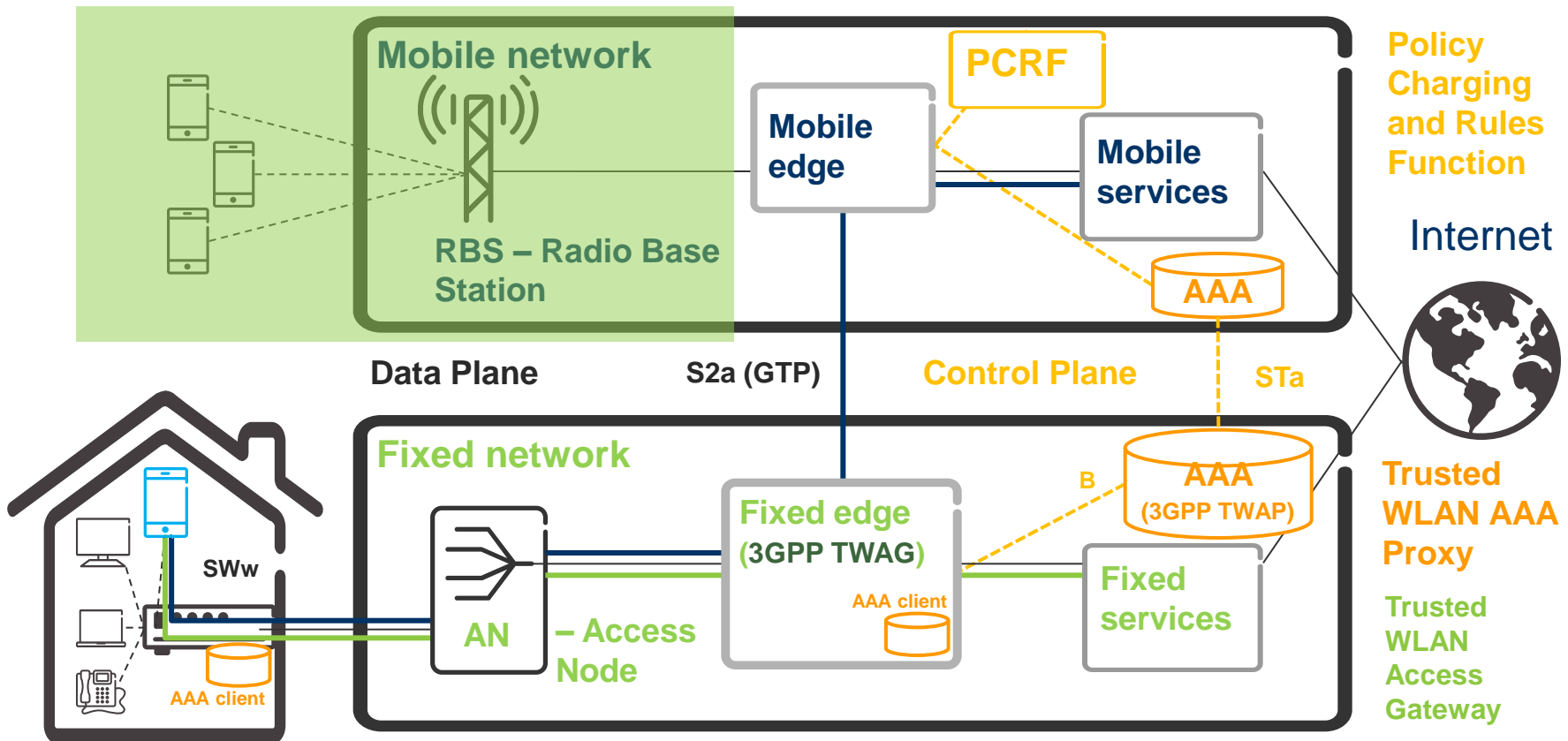# 5.1   Interworking Evolution
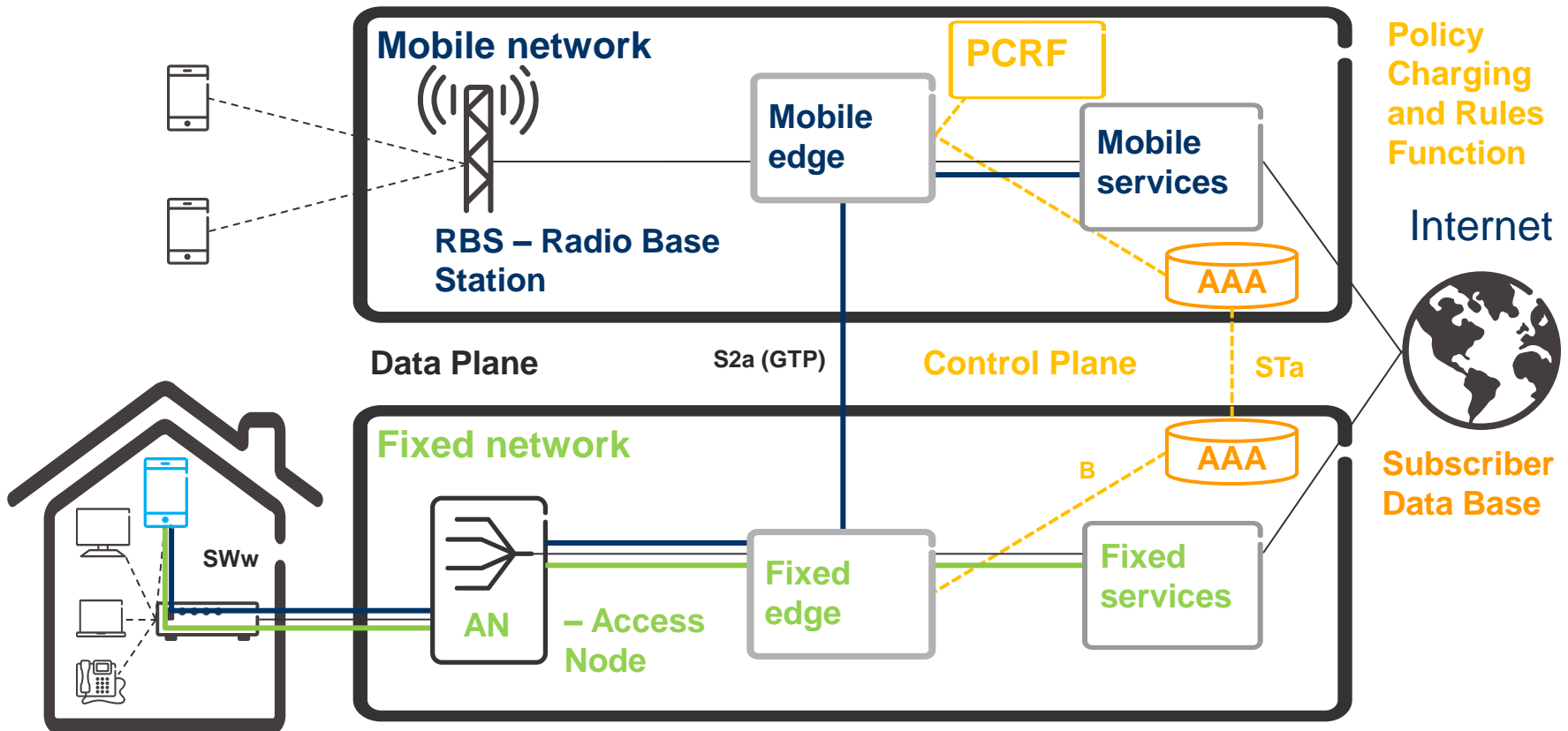
- S2a interworking

5.1   Interworking Evolution

- BBF S2a architectural variations:

    - Scenario with the **Trusted WLAN Access Gateway** (TWAG) on the Multi-service BNG;

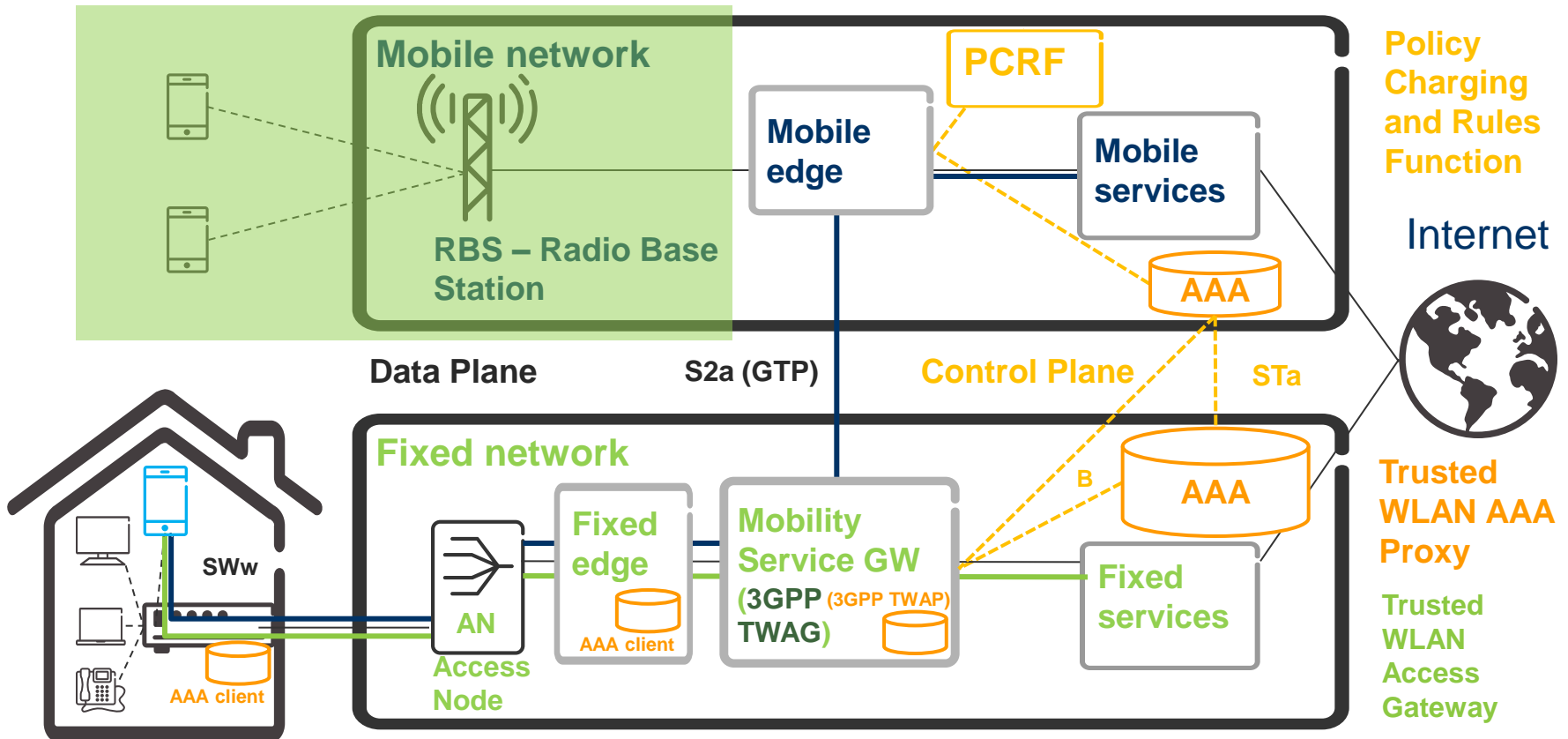   - Scenario with TWAG on a dedicated router.

5.1   Interworking Evolution

- S2a interworking: **Scenario with TWAG on IP Edge**

5.1   Interworking Evolution

- S2a interworking: **Scenario with TWAG on dedicated service edge**

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Summary slides

*This slide should be tailored by the presenter according to the **presentation event** and according to the **audience***

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