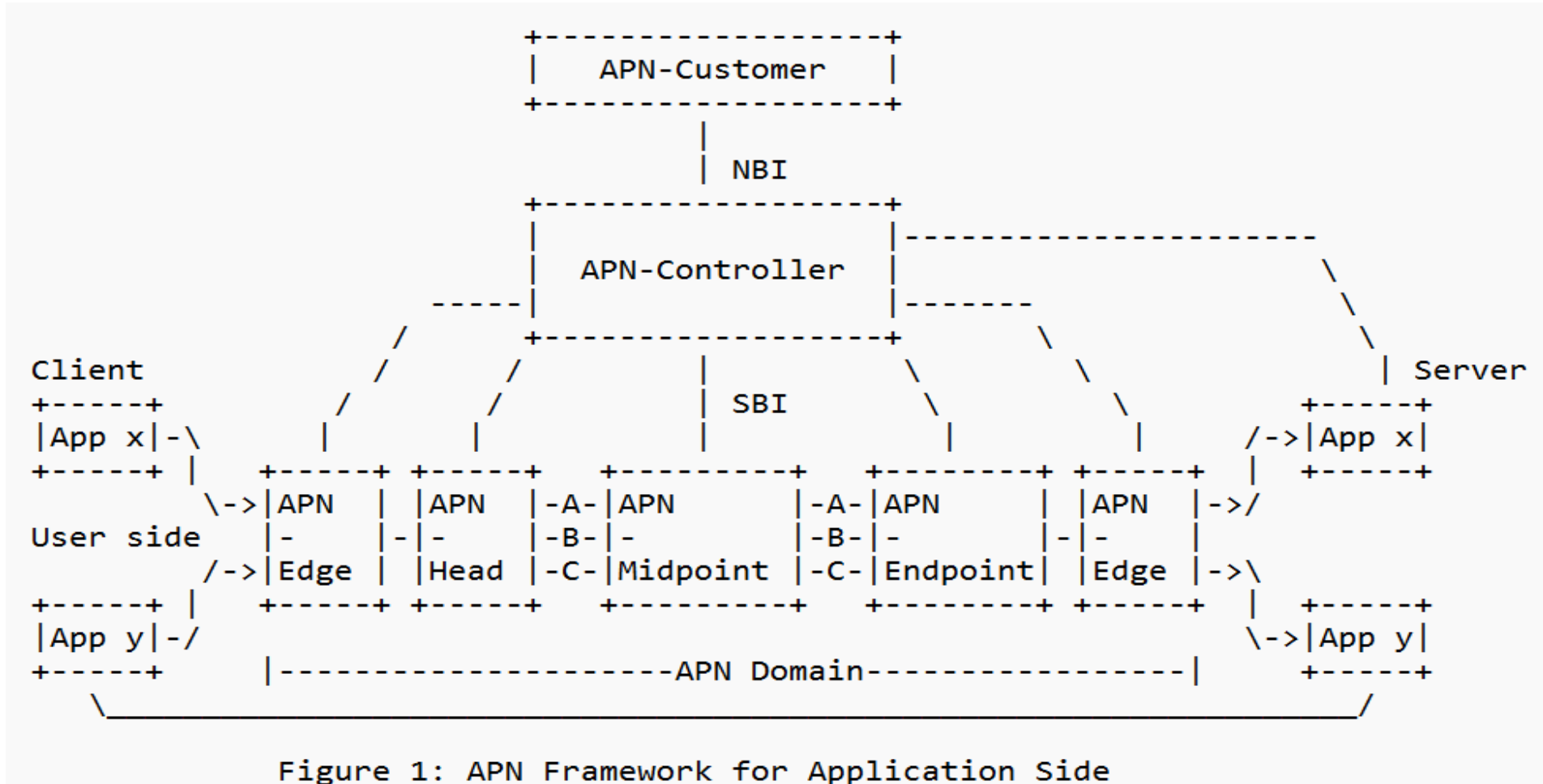


Extension of Application-aware Networking (APN) Framework for Application Side

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Extension of APN Framework for Application Side (1)



Extension of APN Framework for Application Side (2)

In the extension of the APN framework for application side, the new key components, APN-capable Application Server (AAS) and APN-capable Application Client (AAC), are introduced as follows:

- APN-capable Application Server (AAS): The AAS requests the APN-Controller to allocate the APN resources of a controlled APN domain. And the AAS allocates the APN resources received from the APN-Controller to the AAC to compose APN attribute according to the requirement from the AAC. When the AAS sends packets to the AAC, it adds APN attribute in these packets. The request sent by the AAS to the APN-Controller includes the application information, network service requirement, etc. The APN resources allocated by the APN-controller to the AAS includes sets of APN IDs and corresponding network service attributes.
- APN-capable Application Client (AAC): The AAC requests the AAS to allocate the APN resources. The AAC composes the APN attribute according to the allocated APN resources from the AAS. When the AAC sends packets to the AAS, it adds the APN attribute in these packets. The APN resources allocated by the AAS to the AAC includes the unique APN ID and the corresponding network service attributes.

Extension of APN Framework for Application Side (3)

In the extension of the APN framework for the application side, the functionalities of the following key components are extended or changed:

- APN-Edge: In the extension of APN framework for the application side, since the APN attribute is added by the application, the functionalities of the APN-Edge needs to be changed. The APN-Edge can directly transmit the packets without encapsulating tunnels for the purpose of carrying APN attribute. If the APN-Edge needs to encapsulate a tunnel for packets, it can directly obtain the APN attribute from these packets sent by the AAS/AAC and the APN attribute can be copied or be mapped into the outer tunnel header.
- APN-Head: The APN-Head can directly obtain the APN attribute from packets sent by the AAS/AAC to apply corresponding policies.
- APN-Midpoint: If policies need to be adjusted on the APN-Midpoint, the APN-Midpoint can also directly obtain the APN attribute from packets sent by the AAS/AAC.
- APN-Endpoint: The APN-Endpoint MUST keep the APN attribute in packets sent by the AAS/AAC without any change.
- APN-Controller: In the extension of APN framework for the application side, the APN-Controller is responsible for processing the request from the AAS and allocating the APN resources of the controlled APN domain to the AAS.

Security Consideration □ The APN attribute need to be transmitted among the AAS, AAC and APN domain.

The security mechanism MUST be introduced to guarantee the security of the transmission. The details of the security mechanism will be proposed in future versions of the draft.

Requirements

According to the extension of APN framework for the application side, there are following basic protocol extension requirements:

- [REQ01] Protocol extensions MUST be defined for the AAS to request the APN-Controller to allocated the APN resources of the APN domain.
- [REQ02] Protocol extensions MUST be defined for the APN-Controller to notify the allocated APN resources to the AAS.
- [REQ03] Protocol extensions MUST be defined for the AAC to request the AAS to allocate the APN resources.
- [REQ04] Protocol extensions MUST be defined for the AAS to notify the allocated APN resources to the AAC.
- [REQ05] Security mechanism MUST be defined to guarantee for that the APN attribute being securely transmitted among the AAS, AAC and the APN domain.

Usecases and Requirements of APN Framework for Application Side

- Application-aware Networking (APN) for Performance Enhancement of Media Service
 - <https://datatracker.ietf.org/doc/draft-peng-rtgwg-apn-for-media-service/>
- Application-aware Date Center Network (APDN) Use Cases and Requirements
 - <https://datatracker.ietf.org/doc/draft-wh-rtgwg-application-aware-dc-network/>
- Application Aware Computing Network
 - <https://datatracker.ietf.org/doc/html/draft-li-cats-application-aware-computing-network>
- APN Framework and Basic Usecases of Traffic Steering: Make life easy
- APN Framework for Application Side and New Usecases: Make life possible with more value.

Thank you!