

Leveraging the user plane function for network-side advisory signal

SCONE Working Group Interim

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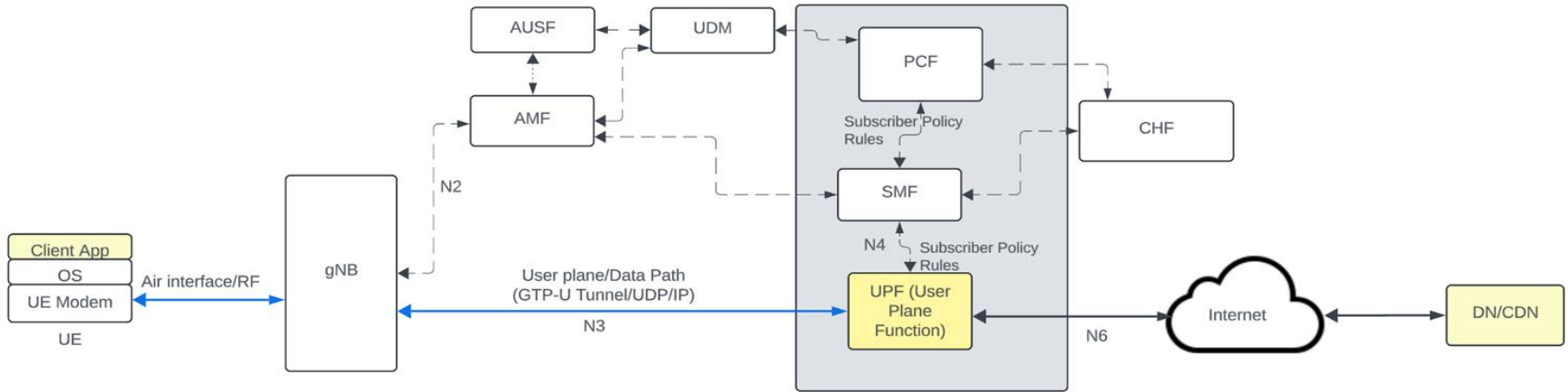
Verizon

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Introduction/Topics

- Overview of the 3GPP 5GC mobile network architecture
- UE to network element for SCONE signaling
- Equivalent architecture for a 4G network
- Summary/recap
- Extensible to other networks?
- Thoughts/Questions

3GPP mobile 5G packet core architecture



PDU Session = Air interface between UE & gNB then GTP-U Tunnel between gNB & UPF (N3)

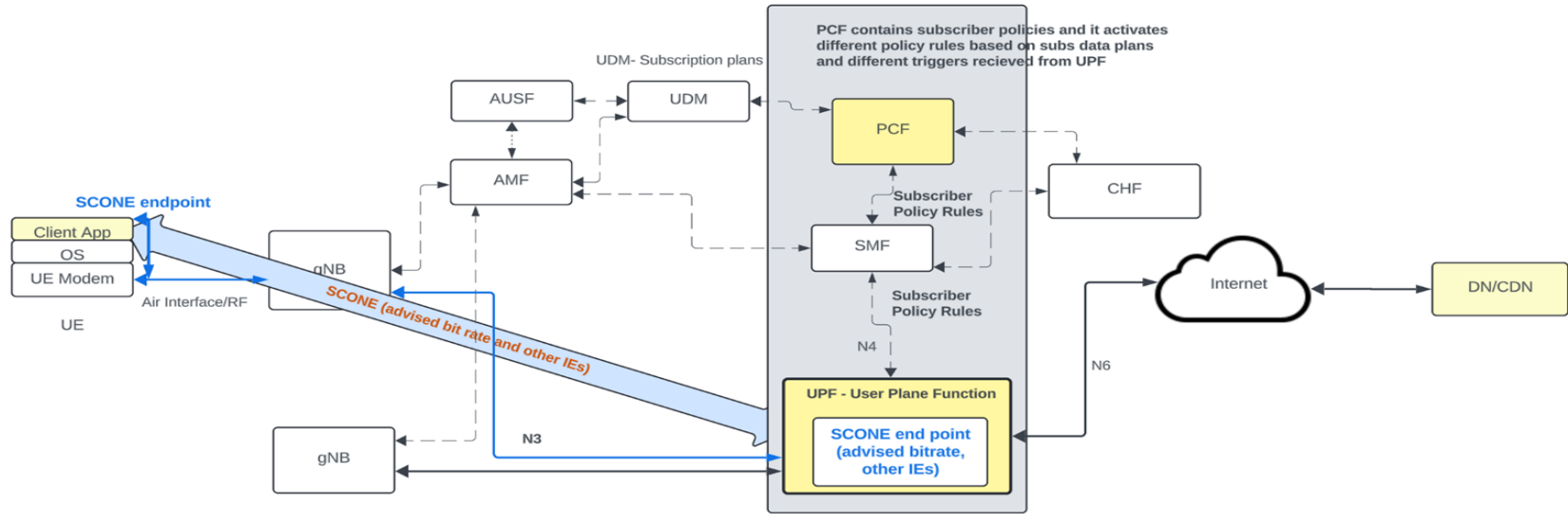
PDU Session is a logical path between UE (Mobile Device) and UPF (User Plane Function) to carry packets belonging to one or more IP flows

IP flows (aka service data flows, SDFs) may belong to one or more services. All the service data flows with same QoS maps on to one PDU session

UPF

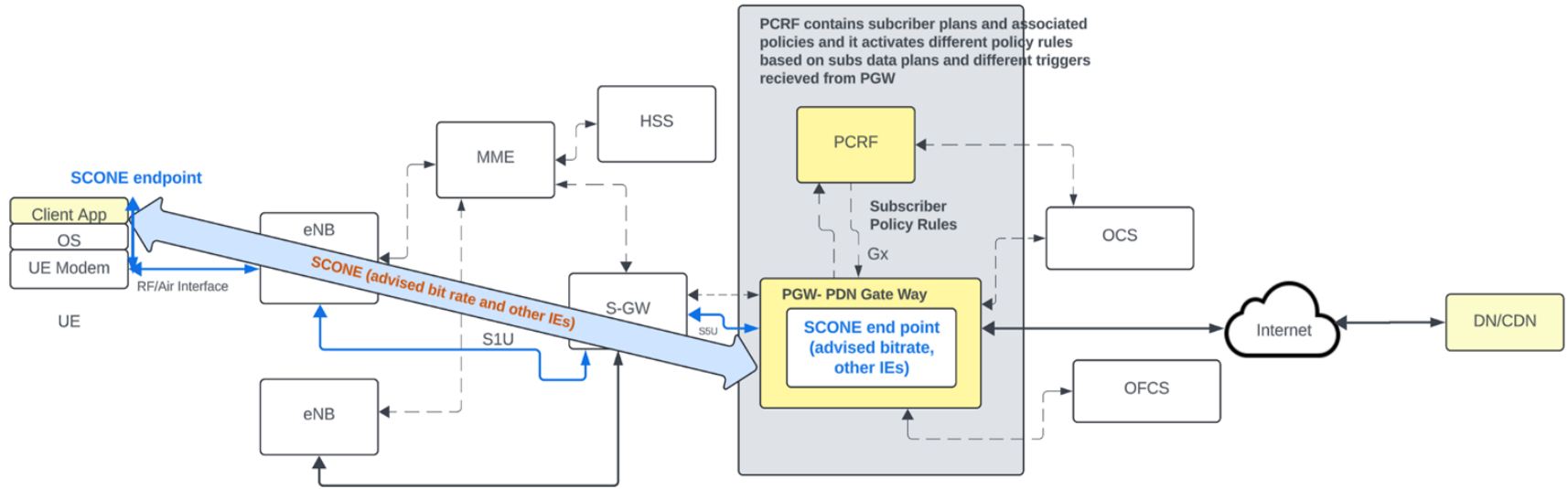
- Routes and forwards packets between the RAN and the DN/CDN
- Packet inspection
- Policy and Charging rule enforcement
- QoS handling for user plane, e.g. rate enforcement, Traffic usage reporting
- Allocation of UE IP address/prefix

UE to the network element for SCONE signal over 5G core



- UPF is the 3GPP on-path “network element” for routing & forwarding application packets between the UE, the RAN and the internet (**N3 + N6 interfaces**)
- UPF has access to subscriber policy via standard 3GPP **N4** interface
- SCONE signaling would use IP tuples of the flow for which advisory bit-rate is sent
- SCONE signal to be sent over the PDU session (**N3** interface + Radio network) that is carrying that IP flow

UE to the network element for SCONE signal over 4G



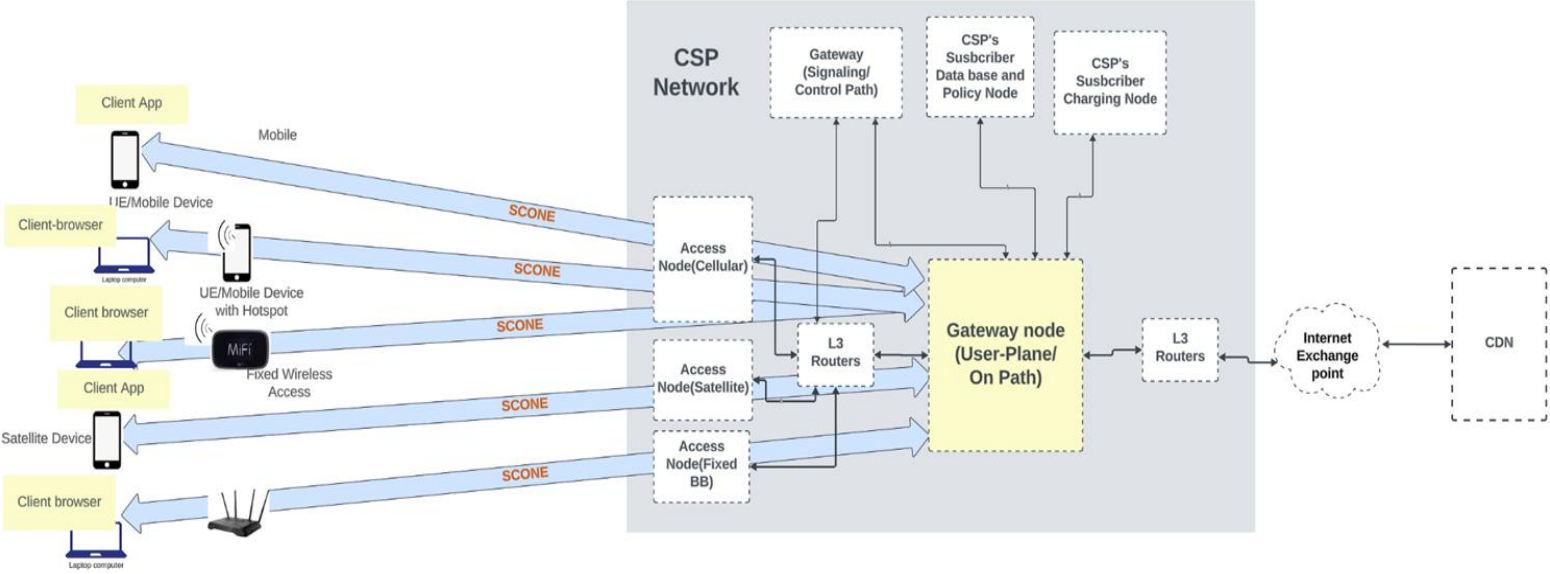
SCONE WG signaling would use IP tuples of the flow for which advised bit-rate is sent and it will be sent over the **EPS Bearer (S5U+S1U Interface + Air interface)** that is carrying that IP flow

Summary

- Client-app endpoint initiated “SCONE WG” signaling to the network element (UPF/5G) or PGW/4G) with the implicit flow detection
- UPF/PGW to send “advisory bit-rate” and other metadata using on-path SCONE WG signaling to the client-app endpoint based on subscriber data-plans
- Scone signaling does not require changes to how a CSP determines its video policy for a given flow (*No dependency between CSP’s video policy and SCONE WG protocol*)
- Application to self-adapt the video flow max bit-rate to “advised bit rate” value
- Dynamic updates*?

*Experimentation and experience needed to determine frequency of updates such as when changing networks (Radio Access Technology)

SCONE Generic Architecture (Access Agnostic)



Yes, can be extended beyond mobile networks

Thoughts? and Questions?