Non-3GPP Interworking Function

Network Security

Function of the 5G Core Network (5GCN) which provides a secure connection to devices on untrusted non-3GPP networks

Why is this technology useful?

- **Security:** information sent between the User Equipment and Data Network is protected, regardless of the communication medium
- **Efficiency:** Alleviates network congestion by allowing devices to access the 5G core without putting stress on the Radio Access Network
- **Flexibility:** Offers seamless and secure handover between 5G and Wi-Fi

How a connection is established

- Our connection to the 5G network goes in two directions: the Control Plane and the User Plane.
- The control plane is responsible for initial registration and authentication, Non-Access Stratum message transmission and the establishment of the User Plane, in which packet transmission will take place.

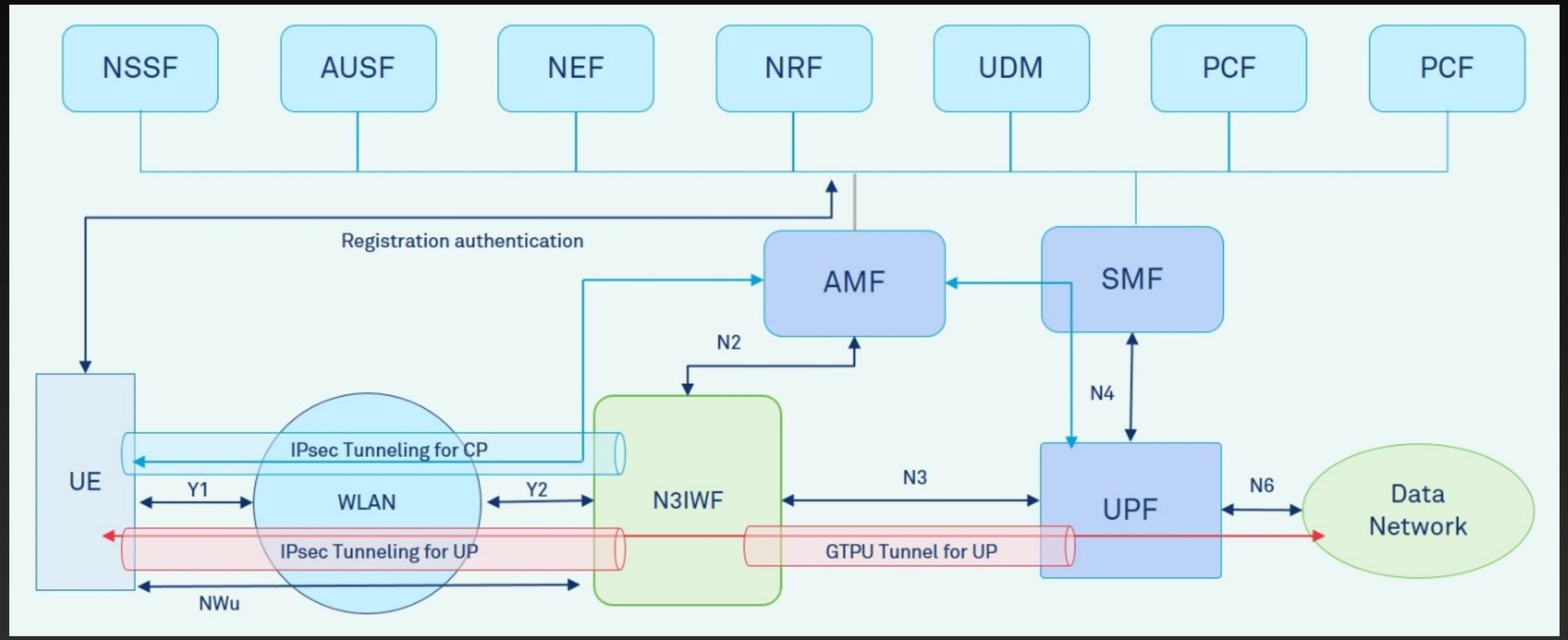

Figure 1: Architecture for untrusted Wi-Fi interworking

Source: wipro.com/Untrusted Non-3GPP Access Network Interworking with 5G Core

Control Plane

- Once the UE is assigned a local IP address on the Wi-Fi network, it establishes an IPSec tunnel to the N3IWF using the IKEv2 protocol. Through this connection, the registration and authentication with the AMF takes place, using NAS messages.
- After registration, another IPsec Security Association (SA) is established for NAS signalling (mobility and session management messages) over TCP, in order to protect the original IP signalling packets and the port numbers used for communication.

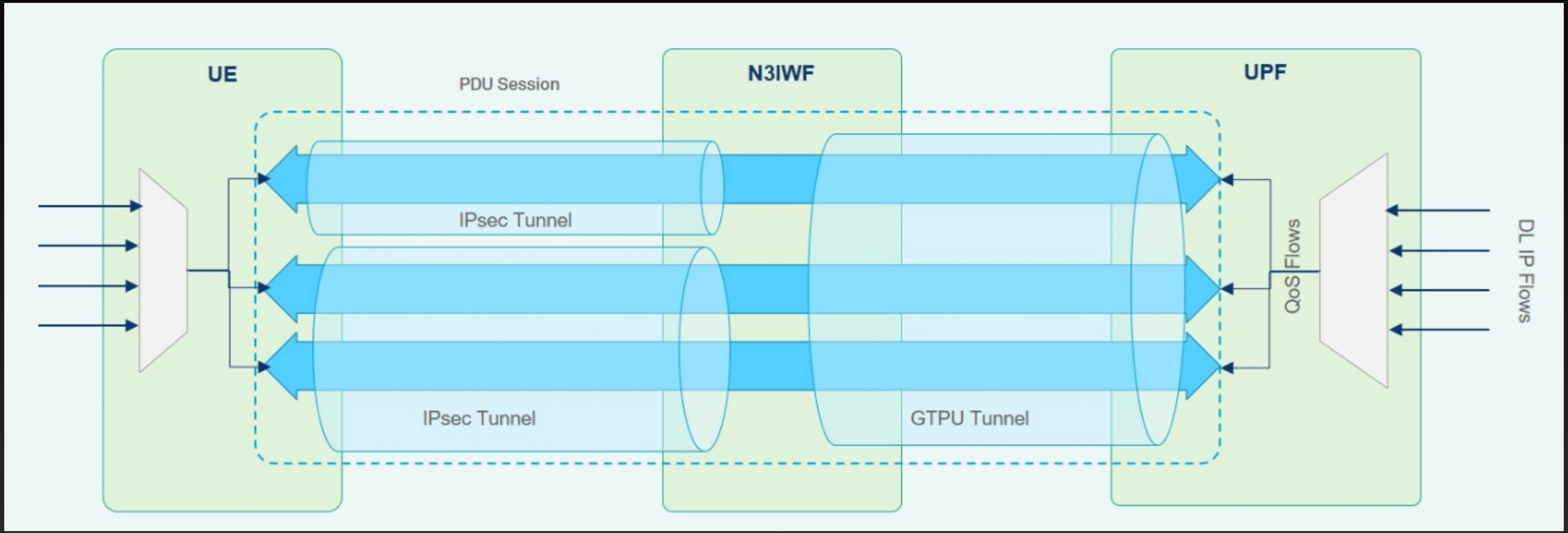

Figure 2: Diagram of a PDU session

Source: wipro.com/Untrusted Non-3GPP Access Network Interworking with 5G Core

User Plane

- The User Plane is established after registration through the creation of multiple IPsec Child SAs, using the same IKEv2 protocol, between the UE and N3IWF.
- The transfer of information from the User Equipment to the Data Network via the User Plane Function (UPF) is called a PDU session, and it is composed of the user plane mentioned above, as well as a GTP-U tunnel between the N3IWF and UPF.
- Once the PDU session is established, uplink and downlink traffic can commence, through various QoS flows over the untrusted WLAN.

Thank you for your time!

Source: wipro.com/Untrusted Non-3GPP Access Network Interworking with 5G Core