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(54) **Title:** USER PLANE MODEL FOR NON-3GPP ACCESS TO FIFTH GENERATION CORE NETWORK

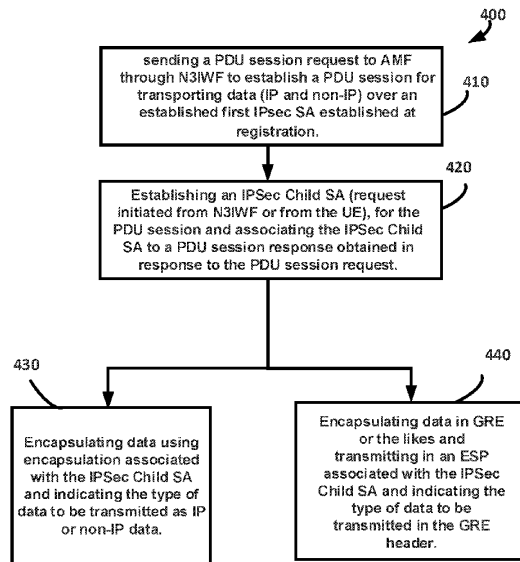


Figure 4a

(57) **Abstract:** Systems and methods relating to establishment of a Packet Data Unit, PDU, session over a Non 3GPP Access to a 3GPP network and transmitting IP data and non-IP data are provided. A method of operation of a wireless device is provided and comprises sending to an AMF over an N3IWF a PDU session request to establish a PDU session to transport one of IP data or non-IP data over an established first IPsec, Security Association, SA, establishing an IPsec Child SA, for the PDU session and associating the IPsec Child SA to a PDU session then encapsulating the data using ESP encapsulation or GRE encapsulation associated with the IPsec Child SA and indicating the type of data that is being transmitted (e.g., non-IP data that comprises raw application data). In this manner, an IoT device is able to securely transmit to the 3GPP network IP data/non-IP data/raw application data over an unsecure non 3GPP access network such as Wireless Local Area Network. Methods and apparatus describing the NAS signalling and the PDU session as each using their respective IPsec SA are provided. Similarly, methods and apparatus describing the NAS signalling and the PDU sessions sharing a common IPsec SA are provided. GRE encapsulation of the data within the ESP frame is described for both NAS signalling and PDU session in the case of multiple IPsec/Child SAs or common IPsec SA. Similarly, methods and apparatus are provided for the N3IWF which provides for the UE secure access to the network.

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