SESSION CONTEXT CONVERSION

Field

[1] The subject matter described herein relates to interworking between 5G and 4G.

Background

[2] As the cellular system including the 5G network supports an increasing number of devices and services including applications with a wide range of use cases and diverse needs with respect to bandwidth, latency, and reliability requirements, the cellular system may need to prioritize resources across the wireless access network and the core network (and/or for example, prioritizing across the control plane and the user plane) to support differentiation among different service data flows (SDFs). Moreover, the associated quality of service (QoS) requirements may need to be dynamic. The 3GPP document S2-182674 by Ericsson titled "Handling of mapped EPS QoS parameters in IWK with EPC" and the 3GPP document S2-174554 by Intel titled "QoS mapping for 5GC-EPC interworking" both disclose that the network maps a Session AMBR for 5G to an APN-AMBR for EPS.

Summary

[2a] In an aspect, the present disclosure refers to a method comprising:

receiving, at a user equipment (10),) while being served by a first system and during protocol data unit, PDU, session modification procedure, a PDU SESSION MODIFICATION COMMAND message including an access point name aggregate maximum bit rate value of a second system; and

setting, at the user equipment (10), an access point name aggregate maximum bit rate value of a session management context for the second system to the access point name aggregate maximum bit rate value of the second system that was received in the PDU SESSION MODIFICATION COMMAND message while being served by the first system, when there is an inter-system change from the first system to the second system, wherein the session management context for the second system is a default Evolved Packet System, EPS, bearer context.

[2b] In an aspect, the present disclosure refers to a user equipment (10) comprising:

means for receiving, at the user equipment (10), while being served by a first system and during protocol data unit, PDU, session modification procedure, a PDU SESSION MODIFICATION COMMAND message including an access point name aggregate maximum bit rate value of a second system; and

means for setting, at the user equipment (10), an access point name aggregate maximum bit rate value of a session management context for the second system to the access point name aggregate maximum bit rate value that was received in the PDU SESSION MODIFICATION COMMAND message while being served by the first system, when there is an inter-system change from the first system to the second system, wherein the session management context for the second system is a default Evolved Packet System, EPS, bearer context.

[2c] In an aspect, the present disclosure refers to a non-transitory computer-readable storage medium comprising program code which when executed by at least one processor causes operations comprising:

receiving, at a user equipment (10), while being served by a first system and during protocol data unit, PDU, session modification procedure, a PDU SESSION

MODIFICATION COMMAND message including an access point name aggregate maximum bit rate value of a second system; and

setting, at the user equipment (10), an access point name aggregate maximum bit rate value of a session management context for the second system to the access point name aggregate maximum bit rate value of the second system that was received in the PDU SESSION MODIFICATION COMMAND message while being served by the first system, when there is an inter-system change from the first system to the second system, wherein the session management context for the second system is a default Evolved Packet System, EPS, bearer context.

[3] In some example embodiments, there may be provided a method that includes receiving, at a user equipment while being served by a first system and during protocol data unit session establishment or modification procedure, a message including a default quality of service rule, the default quality of service rule including an access point name aggregate maximum bit rate value; and when there is an inter-system change from the first system to the second system, setting, at the user equipment, the access point name aggregate maximum bit rate value of a session management context for the second system to the received access point name aggregate maximum bit rate value received while being served by the first system.

[4] In some variations, one or more of the features disclosed herein including the following features can optionally be included in any feasible combination. The first system may

WHAT IS CLAIMED

1. A method comprising:

receiving, at a user equipment (10) while being served by a first system and during protocol data unit, PDU, session modification procedure, a PDU SESSION MODIFICATION COMMAND message including an access point name aggregate maximum bit rate value of a second system, and

setting, at the user equipment (10), an access point name aggregate maximum bit rate value of a session management context for the second system to the access point name aggregate maximum bit rate value of the second system that was received in the PDU SESSION MODIFICATION COMMAND message while being served by the first system, when there is an inter-system change from the first system to the second system,

wherein the session management context for the second system is a default Evolved Packet System, EPS, bearer context.

2. The method of claim 1, wherein the first system comprises a fifth generation core network, wherein the second system comprises a fourth generation evolved packet system, wherein the inter-system change includes a change from an N1 interface to an S1 interface, and wherein the access point name aggregate maximum bit rate value of the second system maintains session continuity during the inter-system change.

3. The method of claim 1, wherein the PDU SESSION MODIFICATION COMMAND message including the access point name aggregate maximum bit rate value of the second system is received from a node (400) in the first system.

4. The method of claim 3, wherein the node (400) comprises a packet data network

gateway-control plane function, PGW-C, a session management function, SMF, and/or a packet data network gateway-control plane function co-located with the session management function (176).

5. The method of any of claims 1-4 further comprising:

storing, at the user equipment (10), the received access point name aggregate maximum bit rate value of the second system as part of a PDU session context.

6. The method of any of claims 1-5, wherein when there is the inter-system change from a fifth generation system, 5GS, to a fourth generation, 4G, EPS, the received access point name aggregate maximum bit rate is used to configure the access point name aggregate maximum bit rate of an PDN connection in the EPS.

7. The method of claim 6, further comprising

creating the default EPS bearer context from a Quality of Service, QoS, flow of a default QoS rule of a PDU session context for which interworking to EPS is supported.

8. The method of claim 7, further comprising

using the access point name aggregate maximum bit rate value of the PDU session context to set the access point name aggregate maximum bit rate value of the corresponding default EPS bearer context.

9. The method of any of claims 6-8, comprising

deleting, at the user equipment (10), while being served by the first system, when a quality of service, QoS, flow is deleted, evolved packet system, EPS, QoS parameters including an access point name aggregate maximum bit rate value associated with the deleted QoS flow.

10. The method of any of claims 6-8 wherein, if an evolved packet system, EPS, bearer identity, EBI, is to be revoked, a message informs the user equipment (10) to remove mapped EPS QoS parameters and access point name aggregate maximum bit rate corresponding to the EBI to be revoked.

11. A user equipment (10) comprising:

means for receiving, at the user equipment (10), while being served by a first system and during protocol data unit, PDU, session modification procedure, a PDU SESSION MODIFICATION COMMAND message including an access point name aggregate maximum bit rate value of a second system; and

means for setting, at the user equipment (10), an access point name aggregate maximum bit rate value of a session management context for the second system to the access point name aggregate maximum bit rate value of the second system that was received in the PDU SESSION MODIFICATION COMMAND message while being served by the first system, when there is an inter-system change from the first system to the second system,

wherein the session management context for the second system is a default Evolved Packet System, EPS, bearer context.

12. The user equipment (10) of claim 11, wherein the first system comprises a fifth generation core network, wherein the second system comprises a fourth generation evolved packet system, wherein the inter-system change includes a change from an N1 interface to an S1 interface, and wherein the access point name aggregate maximum bit rate value of the second system maintains session continuity during the inter-system change.

13. The user equipment (10) of claims 11 or 12, wherein the PDU SESSION

MODIFICATION COMMAND message including the access point name aggregate maximum bit rate value of the second system is received from a node (400) in the first system.

14. The user equipment (10) of claim 13, wherein the node (400) comprises a packet data network gateway-control plane function, PGW-C, a session management function, SMF, and/or a packet data network gateway-control plane function co-located with the session management function (176).

15. The user equipment (10) of any of claims 11-14, wherein the user equipment (10) further comprises at least:

means for storing the received access point name aggregate maximum bit rate value of the second system as part of a PDU session context.

16. The user equipment (10) of any of claims 11-15, wherein when there is the inter-system change from a fifth generation system, 5GS, to a fourth generation, 4G, EPS, the received access point name aggregate maximum bit rate is used to configure the access point name aggregate maximum bit rate of an PDN connection in the EPS. .

17. The user equipment (10) of claim 16, wherein the user equipment (10) further comprises at least

means for creating the default EPS bearer context from a Quality of Service, QoS, flow of a default QoS rule of a PDU session context for which interworking to EPS is supported.

18. The user equipment (10) of claim 16 or 17, wherein the user equipment (10) further comprises at least:

means for using the access point name aggregate maximum bit rate value of the PDU

session context to set the access point name aggregate maximum bit rate value of the corresponding default EPS bearer context.

19. The user equipment (10) of any of claims 16-18, wherein the user equipment (10) further comprises at least:

means for deleting, while being served by the first system, when a quality of service, QoS, flow is deleted, evolved packet system, EPS, QoS parameters including an access point name aggregate maximum bit rate value associated with the deleted QoS flow.

20. The user equipment (10) of any of claims 16-18, wherein, if an evolved packet system, EPS, bearer identity, EBI, is to be revoked, a message informs the user equipment (10) to remove mapped EPS QoS parameters and an access point name aggregate maximum bit rate corresponding to the EBI to be revoked.

21. A non-transitory computer-readable storage medium comprising program code which when executed by at least one processor causes operations comprising:

receiving, at a user equipment (10), while being served by a first system and during protocol data unit, PDU, session modification procedure, a PDU SESSION MODIFICATION COMMAND message including an access point name aggregate maximum bit rate value of a second system; and

setting, at the user equipment (10), an access point name aggregate maximum bit rate value of a session management context for the second system to the access point name aggregate maximum bit rate value of the second system that was received in the PDU SESSION MODIFICATION COMMAND message while being served by the first system, when there is an inter-system change from the first system to the second system

wherein the session management context for the second system is a default Evolved Packet

System, EPS, bearer context.