

Default and Dedicated Bearer Support for Pure-P and Collapsed Sessions

- Revision History, on page 1
- Feature Description, on page 1

Revision History

Note Revision history details are not provided for features introduced before release 21.24.

Revision Details	Release
First introduced	Pre 21.24

Feature Description

Provides a foundation for contributing towards improved Quality of User Experience (QoE) by enabling deterministic end to-end forwarding and scheduling treatments for different services or classes of applications pursuant to their requirements for committed bandwidth resources, jitter and delay. In this way, each application receives the service treatment that users expect.

The Cisco EPC core platforms support one or more EPS bearers (default plus dedicated). An EPS bearer is a logical aggregate of one or more Service Data Flows (SDFs), running between a UE and a P-GW in the case of a GTP-based S5/S8 interface, and between a UE and HSGW (HRPD Serving Gateway) in case of a PMIP-based S2a interface. In networks where GTP is used as the S5/S8 protocol, the EPS bearer constitutes a concatenation of a radio bearer, S1-U bearer and an S5/S8 bearer anchored on the P-GW. In cases where PMIPv6 is used the EPS bearer is concatenated between the UE and HSGW with IP connectivity between the HSGW and P-GW.

An EPS bearer uniquely identifies traffic flows that receive a common QoS treatment between a UE and P-GW in the GTP-based S5/S8 design, and between a UE and HSGW in the PMIPv6 S2a approach. If different QoS scheduling priorities are required between Service Data Flows, they should be assigned to separate EPS

bearers. Packet filters are signaled in the NAS procedures and associated with a unique packet filter identifier on a per-PDN connection basis.

One EPS bearer is established when the UE connects to a PDN, and that remains established throughout the lifetime of the PDN connection to provide the UE with always-on IP connectivity to that PDN. That bearer is referred to as the default bearer. A PDN connection represents a traffic flow aggregate between a mobile access terminal and an external Packet Data Network (PDN) such as an IMS network, a walled garden application cloud or a back-end enterprise network. Any additional EPS bearer that is established to the same PDN is referred to as a dedicated bearer. The EPS bearer Traffic Flow Template (TFT) is the set of all 5-tuple packet filters associated with a given EPS bearer. The EPC core elements assign a separate bearer ID for each established EPS bearer. At a given time a UE may have multiple PDN connections on one or more P-GWs.

With this feature, UDP, TCP, and HTTP data is offloaded to Fastpath for Default and Dedicated bearer.

Supported Functionality

For Pure-P and Collapsed session, the:

1. Default bearer establishment includes (CCA-I):
   - Default bearer establishment with and without rule.
   - Predefined Rules/Group-of-Ruledefs (GoRs).
2. Default bearer updation includes (CCA-U/RAR):
   - New Rule installation.
   - Modification of existing rules (TFT change, MBR/GBR change, Flow Status change).
   - Removal of existing rules.
   - Default Bearer QoS change.
   - APN-AMBR change.
   - Predefined Rules/GoRs.
3. Default bearer deletion includes (CCA-U/RAR):
   - Removal of existing rules.
4. Dedicated bearer establishment includes (CCA-I/CCA-U/RAR):
   - New dedicated bearer establishment.
   - Predefined Rules/GoRs.
5. Dedicated bearer updation includes (CCA-U/RAR):
   - Addition of new rule on already installed dedicated bearer.
   - Modification of existing rules (TFT change, MBR/GBR change).
   - Removal of existing rules.
   - Rule QCI change.

- Predefined Rules/GoRs
- Basic Support for ADC over dedicated bearers
- IDLE to ACTIVE mode transition (SAEGW, DDN) support for dedicated bearers.

6. Dedicated bearer deletion includes:
   - Deletion of dedicated bearer through MME/PCRF and **clear subscribers imsi** *imsi_id* **ebi** *ebi_id* CLI command.
7. During session recovery for Pure-P and Collapsed session at User Plane, charging data is recovered for User Plane.
8. MME and eNodeB Handovers (HO):
   - Pure-P Call Type:
     - MME and eNodeB HO with and without new policy (Create, Update, Delete, and any combination of Create, Update, and Delete) from Gx.
   - Collapsed Call Type:
     - MME and eNodeB HO with and without new policy (Create, Update, and Delete) from Gx.
9. S-GW Handovers (HO):
   - Pure-P to Pure-P HO:
     - Pure-P to Pure-P HO with and without dedicated bearer with new policy (Create, Update, Delete, and any combination of Create, Update, and Delete) from Gx.
     - Pure-P to Pure-P HO with bearer marked for deletion during HO.
   - Collapsed to Pure-P and Pure-P to Collapsed HO:
     - Collapsed to Pure-P and Pure-P to Collapsed HOs without dedicated bearer with new policy (Install new rule, modify default bearer QCI, update, or remove rule) from Gx.
     - Collapsed to Pure-P and Pure-P to Collapsed HOs with dedicated bearer with and without new policy from Gx.

Limitations

In this release, the following functionality are not supported:

- Updation of dynamic rule precedence installed on default bearer.
- Time-based activation and deactivation of rules on default and dedicated bearer.
- Collision Handling is not yet supported.

  Collisions can happen between Control messages from PCRF and from Access side. Multiple procedures in a single PCRF initiated message (CCA-U/RAR) leads to uncontrolled collisions. For example, Creation of a Bearer along with Deletion of another Bearer in same RAR.

- Mid-session update and/or modification of ADC rules—whether change in configuration or PDN update over RAR, is not supported.
- MME and eNodeB Handovers (HO):
  - Pure-P Call Type:
    - Any failure handling or Collisions occurring during HO.
  - Collapsed Call Type:
    - MME and eNodeB HO with new policy (any combination of create, update, and delete together) from Gx.
    - Any failure handling or Collisions occurring during HO.
- S-GW Handovers (HO):
  - Pure-P to Pure-P HO:
    - Any failure handling or Collisions occurring during HO.
    - Dynamic rule QCI change installed on dedicated bearer such that its bearer EBI is not changed.
  - Collapsed to Pure-P and Pure-P to Collapsed HO:
    - Any failure handling or Collisions occurring during HO.