

StarOS中IDFT特征的行为

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简介

本文档介绍控制和用户计划分离(CUPS)和传统/裸机设置中的间接转发隧道(IDFT)功能的行为。

先决条件

要求

Cisco 建议您了解以下主题：

- StarOS
- 与IDFT相关的服务网关(SGW)功能

使用的组件

本文档中的信息基于SGW - 21.25.9 (旧版和CUPS) 软件和硬件版本。

本文档中的信息都是基于特定实验室环境中的设备编写的。用于本文的所有设备始于初始 (默认) 配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

背景信息

SGW支持IDFT创建和删除过程，适用于具有多数据包数据网络(PDN)和多承载的Pure-S和折叠呼叫。此功能适用于具有或不具有SGW重新定位和冲突场景的IDFT支持。

IDFT功能支持以下功能：

- 为Collapsed、Pure-S、Collapsed和Pure-S多PDN呼叫与多个承载的组合创建IDFT请求。
- 下行链路和上行链路IDFT承载上的数据传输。

- 从移动管理引擎(MME)删除IDFT请求。此外，如果MME不发送删除的IDFT请求，在默认值100秒到期后基于计时器删除IDFT承载。
- 当正常PDN关闭时，删除IDFT PDN，包括从MME/P-GW清除/删除用户。
- 在IDFT主用/IDFT时处理纯S和折叠呼叫时进行Sx-Path故障处理，创建Sx-Pending状态。
- 在IDFT PDN建立或删除时与任何其他程序的消息交互和冲突。
- 当IDFT PDN处于活动状态时，现在支持在非IDFT PDN上进行S11/S5和Sx-Path故障处理。

配置IDFT

本节介绍支持IDFT功能的CLI命令。

在控制平面上，使用这些CLI命令启用或禁用IDFT功能。

```
configure
  context context_name
    sgw-service service_name
      [ default | no ] egtp idft-support
    end
```

问题

即使功能关闭，SGW也会处理创建IDFT请求。在传统/裸机节点中可看到此行为。

以下是节点中存在的IDFT配置：

```
sgw-service SGW-SVC
  accounting context EPC gtp group default
  accounting mode gtp
  associate ingress egtp-service S11-SGW
  associate egress-proto gtp egress-context EPC egtp-service S5-S8-SGW
  no egtp idft-support
```

分析

跟踪和调试日志通过本实验中的此场景模拟获得，并且可看到“创建IDFT请求”和“创建IDFT响应”的行为。

1)MME将创建IDFT请求发送到SGW。

The screenshot shows a Wireshark capture of a GTPv2 message. The message type is 'Create Indirect Data Forwarding Tunnel Request' (166). The tunnel endpoint identifier is 0x00000005 (2147516421) and the sequence number is 0x000002 (2). The cause is 'Request accepted (16)'. The fully qualified tunnel endpoint identifier (F-TEID) is eNodeB GTP-U interface for DL data forwarding, TEID/GRE Key: 0x200111a0, IPv4 192.168.1.106.

2)SGW处理请求并将响应Create IDFT Response发送回MME，原因为“Request accepted”。

The screenshot shows a Wireshark capture of a GTPv2 message. The message type is 'Modify Bearer Response'. The tunnel endpoint identifier is 0x10010001 (268500993) and the sequence number is 0x000002 (2). The cause is 'Request accepted (16)'. The fully qualified tunnel endpoint identifier (F-TEID) is SGW GTP-U interface for data forwarding, TEID/GRE Key: 0x00010005, IPv4 10.1.4.1.

在此创建IDFT响应中，预期SGW必须发送创建IDFT响应，原因为“不支持数据转发”，因为配置中已禁用此功能。

在CUPS设置中使用相同的配置：

1)MME将创建IDFT请求发送到SGW。

```

# 0.113_2022-07-15 08:05:09.154000 192.168.1.100 10.1.10.1 GTPv2 nooby bearer request
5 0.020_2022-07-15 08:05:09.174000 10.1.10.1 192.168.1.100 GTPv2 Request accepted,Request accepted Modify Bearer Response
6 0.345_2022-07-15 08:05:09.519000 192.168.1.108 10.1.20.3 GTP Echo request
7 0.000_2022-07-15 08:05:09.519000 10.1.20.3 192.168.1.108 GTP Echo response
8 26.20_2022-07-15 08:05:35.726000 192.168.1.100 10.1.10.1 GTPv2 Create Indirect Data Forwarding Tunnel...
9 0.000_2022-07-15 08:05:35.726000 10.1.10.1 192.168.1.100 GTPv2 Data forwarding not supported Create Indirect Data Forwarding Tunnel...
10 3.792_2022-07-15 08:05:39.518000 192.168.1.108 10.1.20.3 GTP Echo request
11 0.000_2022-07-15 08:05:39.518000 10.1.20.3 192.168.1.108 GTP Echo response
12 0.074_2022-07-15 08:05:39.592000 10.1.20.3 192.168.1.108 GTP Echo request
13 0.001_2022-07-15 08:05:39.593000 192.168.1.108 10.1.20.3 GTP Echo response
14 29.92_2022-07-15 08:06:09.517000 192.168.1.108 10.1.20.3 GTP Echo request
15 0.000_2022-07-15 08:06:09.517000 10.1.20.3 192.168.1.108 GTP Echo response
16 2.002_2022-07-15 08:06:11.519000 10.1.10.1 192.168.1.100 GTPv2 Echo Request
17 0.610_2022-07-15 08:06:12.129000 192.168.1.100 10.1.10.1 GTPv2 Modify Bearer Request
18 0.002_2022-07-15 08:06:12.131000 10.1.10.1 192.168.1.100 GTPv2 Request accepted,Request accepted Modify Bearer Response

```

```

> Frame 8: 76 bytes on wire (608 bits), 76 bytes captured (608 bits) on interface 0
> Ethernet II, Src: 00:00:00:00:00:00 (00:00:00:00:00:00), Dst: 00:00:00:00:00:00 (00:00:00:00:00:00)
> Internet Protocol Version 4, Src: 192.168.1.100, Dst: 10.1.10.1
> User Datagram Protocol, Src Port: 10000, Dst Port: 2123
  GPRS Tunneling Protocol V2
    Flags: 0x48
    Message Type: Create Indirect Data Forwarding Tunnel Request (166)
    Message Length: 30
    Tunnel Endpoint Identifier: 0x80000006 (2147483654)
    Sequence Number: 0x000002 (2)
    Spare: 0
    Bearer Context : [Grouped IE]
      IE Type: Bearer Context (93)
      IE Length: 18
      0000 .... = CR flag: 0
      .... 0000 = Instance: 0
    > EPS Bearer ID (EBI) : 5
    > Fully Qualified Tunnel Endpoint Identifier (F-TEID) : eNodeB GTP-U interface for DL data forwarding, TEID/GRE Key: 0x20010089, IPv4 192.168.1.106

```

2)SGW处理请求并将响应Create IDFT Response发送回MME，原因为“不支持数据转发”。

```

7 0.000_2022-07-15 08:05:09.519000 10.1.20.3 192.168.1.108 GTP Echo request
8 26.20_2022-07-15 08:05:35.726000 192.168.1.100 10.1.10.1 GTPv2 Create Indirect Data Forwarding Tunnel...
9 0.000_2022-07-15 08:05:35.726000 10.1.10.1 192.168.1.100 GTPv2 Data forwarding not supported Create Indirect Data Forwarding Tunnel...
10 3.792_2022-07-15 08:05:39.518000 192.168.1.108 10.1.20.3 GTP Echo request
11 0.000_2022-07-15 08:05:39.518000 10.1.20.3 192.168.1.108 GTP Echo response
12 0.074_2022-07-15 08:05:39.592000 10.1.20.3 192.168.1.108 GTP Echo request
13 0.001_2022-07-15 08:05:39.593000 192.168.1.108 10.1.20.3 GTP Echo response
14 29.92_2022-07-15 08:06:09.517000 192.168.1.108 10.1.20.3 GTP Echo request
15 0.000_2022-07-15 08:06:09.517000 10.1.20.3 192.168.1.108 GTP Echo response
16 2.002_2022-07-15 08:06:11.519000 10.1.10.1 192.168.1.100 GTPv2 Echo Request
17 0.610_2022-07-15 08:06:12.129000 192.168.1.100 10.1.10.1 GTPv2 Modify Bearer Request
18 0.002_2022-07-15 08:06:12.131000 10.1.10.1 192.168.1.100 GTPv2 Request accepted,Request accepted Modify Bearer Response

```

```

> Frame 9: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface 0
> Ethernet II, Src: 00:00:00:00:00:00 (00:00:00:00:00:00), Dst: 00:00:00:00:00:00 (00:00:00:00:00:00)
> Internet Protocol Version 4, Src: 10.1.10.1, Dst: 192.168.1.100
> User Datagram Protocol, Src Port: 2123, Dst Port: 10000
  GPRS Tunneling Protocol V2
    Flags: 0x48
    Message Type: Create Indirect Data Forwarding Tunnel Response (167)
    Message Length: 14
    Tunnel Endpoint Identifier: 0x10010001 (268500993)
    Sequence Number: 0x000002 (2)
    Spare: 0
    Cause : Data forwarding not supported (106)
      IE Type: Cause (2)
      IE Length: 2
      0000 .... = CR flag: 0
      .... 0000 = Instance: 0
      Cause: Data forwarding not supported (106)
      0000 0... = Spare bit(s): 0
      .... 0... = PCE (PCE Connection IE Error): False
      .... ..0. = BCE (Bearer Context IE Error): False
      .... ...0 = CS (Cause Source): Originated by node sending the message

```

在管理指南中，要启用此功能，您需要执行以下步骤：
在控制平面上，使用这些CLI命令启用或禁用IDFT功能。

configure

```

context context_name
  sgw-service service_name
    [ default | no ] egtp idft-support
end

```

如果您按照旧版中的这些步骤启用/禁用该服务，则看不到任何切换该服务的选项。

```
[sgw]TITAN-ULTRA-001(config-sgw-service)# egtp
```

```
cause-code          - Configuration to related to handling failure response from peer  
change-notification-req - Configuration related to handling change notification request  
modify-bearer-req   - Configuration related to handling Modify Bearer Request
```

```
[sgw]TITAN-ULTRA-001(config-sgw-service)# no egtp
```

```
cause-code          - Configuration to related to handling failure response from peer  
change-notification-req - Configuration related to handling change notification request  
modify-bearer-req   - Configuration related to handling Modify Bearer Request
```

当您尝试在CUPS设置中启用/禁用它时，它会显示切换它的选项。

```
[SAEGW]saegw-cp1(config-sgw-service)# egtp
```

```
cause-code          - Configuration to related to handling failure response from peer  
change-notification-req - Configuration related to handling change notification request  
idft-support        - Enable/Disable the IDFT Feature for CUPS. By default, it is disabled  
modify-bearer-req   - Configuration related to handling Modify Bearer Request
```

```
[SAEGW]saegw-cp1(config-sgw-service)# egtp
```

```
cause-code          - Configuration to related to handling failure response from peer  
change-notification-req - Configuration related to handling change notification request  
idft-support        - Enable/Disable the IDFT Feature for CUPS. By default, it is disabled  
modify-bearer-req   - Configuration related to handling Modify Bearer Request
```

解决方案

此行为的原因如下：

传统行为：

- 旧版中没有CLI控制IDFT行为。
- 传统代码始终支持IDFT。

```
[local]ESC-CP# show license information
Tuesday July 12 02:30:39 UTC 2022
Session Limits:
      Sessions  Session Type
-----
      120000   HA
      100000   GGSN
      120000   ECS
      100000   Integrated Content Filtering Service
      100000   Application Detection and Control
      100000   PGW
      100000   SGW
      100000   SAE GW Bundle
[saegw]ESC-CP(config-sgw-service)# egtp
cause-code          - Configuration to related to handling failure response from peer
change-notification-req - Configuration related to handling change notification request
modify-bearer-req   - Configuration related to handling Modify Bearer Request
```

CUPS行为：

- CLI由许可证控制，也就是说，它仅随CUPS许可证提供。
- 可以在CUPS中启用/禁用它。

```
[local]ESC-CP# show license information
Tuesday July 12 02:36:59 UTC 2022
Session Limits:
      Sessions  Session Type
-----
      10000   HA
      100000   GGSN
      2000    ECS
      1000    Integrated Content Filtering Service
      1000    Application Detection and Control
      1000    PGW
      1000    SGW
      1000    SAE GW Bundle
      1000    CUPS SAEGW CP Bundle 1K/10k Sessions for ASR5k/QVPC
[saegw]ESC-CP(config-sgw-service)# egtp
cause-code          - Configuration to related to handling failure response from peer
change-notification-req - Configuration related to handling change notification request
idft-support        - Enable/Disable the IDFT Feature for CUPS. By default it is disabled
modify-bearer-req   - Configuration related to handling Modify Bearer Request
```

关于此翻译

思科采用人工翻译与机器翻译相结合的方式将此文档翻译成不同语言，希望全球的用户都能通过各自的语言得到支持性的内容。

请注意：即使是最好的机器翻译，其准确度也不及专业翻译人员的水平。

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