

# ASR 5000系列使用者級故障排除

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## 簡介

本文重點介紹適用於疑難排解特定使用者問題的CLI。無論只有一個已知的單訂閱伺服器或一組訂閱伺服器，還是一個未知的（初始）訂閱伺服器，都有許多CLI可幫助查明問題。在故障排除過程中，將它們與（非使用者特定的）統計資訊CLI結合使用。顯然，並非所有這些命令都適用於每種情況，因為其中一些命令是特定於協定的，而另一些命令是通用的，足以應用於所有訂戶。有些適用於使用者平面（在使用者和網路之間來回傳遞資料），而有些適用於呼叫控制平面（呼叫的建立），有些則同時適用於這兩種平面。

在很多地方提供了示例代碼片斷，以幫助明確要點。所有IP地址和標識資訊都已更改。

## 指令

## 監控訂戶 ( mon子 )

這可能是平台上最著名的命令之一，此處花費的大部分時間用於記錄和解釋其用法。根據選擇的設定，它有可能顯示特定使用者的所有介面、服務、協定等的所有控制/信令和負載資料。運行命令和解釋輸出時的一些注意事項包括：

- 根據截至某個時間點的調查，如果懷疑存在問題但某個特定使用者尚未知道有問題，則嘗試通過「下一呼叫」捕獲 ( 可能嘗試多次 ) 可能會在問題足夠頻繁時捕獲故障。如果問題很罕見，則此方法可能不可行。
- 對於已知呼叫型別(封閉式RP、開放式RP、演化資料最佳化(EVDO)、1X-EVDO、第2層隧道協定(L2TP)、本地代理(HA)、長期演化(LTE)等)，尤其是那些佔總音量百分比比較低的呼叫型別，或者那些對等分組控制功能(PCF)或對等體L2TP接入集中器(LAC)疑似問題的呼叫型別，則監控使用者選單選項允許通過此類標準限定下一次呼叫。這將顯著增加命中率。如果節點上的所有呼叫都是同一型別，則此方法不會增加任何值 ( 除了前面提到的對等體地址版本 )，因為這樣做不會縮小可能性。
- 詳細程度分為1到5個級別。如果不需要，請不要啟用更高級別的詳細程度，因為這會使讀取跟蹤軌跡 ( 快速 ) 更加困難。通常增大到詳細程度2 ( 預設值= 1 ) 就足夠了。
- 預設情況下，大多數但並非所有需要檢視的協定都處於開啟狀態
- 除了實際的資料包資料外，有時還會顯示一些特殊的CONTROL消息，這些消息可能說明了正在採取什麼隱蔽行動 — 這些資訊通常很有用。這包括呼叫結束時顯示的呼叫統計資訊。以下是控制訊息範例：

```
***CONTROL*** 00:25:27:054 Eventid:11813
```

```
No LMA address available for APN <apn2> in subscriber profile, PDN connection failed
```

- 如果在網關節點上配置了增強計費服務(ECS)，則開啟選項34 ( CSS資料 ) 允許檢視傳送至ECS模組的所有資料包，這有助於排除資料包丟棄和網路地址轉換(NAT)故障。例如，以下是一個使用者網際網路控制消息協定(ICMP)資料包，它是由ECS從專用IP 10.251.88.68到公共IP 209.165.201.1進行NAT處理的

```
<<<<OUTBOUND 23:57:08:943 Eventid:77000(9)
```

```
CSS Uplink Output PDU to ACS- slot:2 cpu:17 inst:4369
```

```
10.251.88.68 > 192.0.2.1: icmp: echo request (ttl 62, id 13840, len 84)
```

```
***CONTROL*** 23:57:08:943 Eventid:77202
```

```
Rule matched : icmp-pkts for uplink packet of subscriber MSID :
```

```
INBOUND>>>> 23:57:08:943 Eventid:77001(9)
```

```
CSS Uplink Input PDU from ACS- slot:3 cpu:34 inst:8738
```

```
209.165.201.1 > 192.0.2.1: icmp: echo request (ttl 62, id 13840, len 84)
```

- 如果從跟蹤中看不到ASR顯示特定行為的原因，則檢視使用者的內部處理可能具有值 ( 解釋此類輸出包括狀態機資訊等是困難的，但可通過工程完成 )，因此可以考慮 ( 稍後討論 ) logging monitor或logging trace命令。
- 所顯示的時間戳相當準確，但是，由於各種設施都在即時向螢幕寫入，因此不能權威地推斷所顯示的資料包的順序是正在處理資料包的實際順序，但將接近該順序。
- 在分組資料交換網路(PDSN)或高速分組資料服務網關(HSGW)節點的入口端，為了檢視所有A11消息傳送 ( 如果這在故障排除場景中很重要，可能不是 )，由移動站標識(MSID)而不是使用者名稱進行監控，因為在呼叫開始時使用者名稱尚未知 ( 尚未顯示 )，因此無法顯示。如果

MSID未知，則獲取初始跟蹤以揭示它，然後由該MSID重新開始監視。

以下範例顯示使用MSID進行監控時，比使用使用者名稱進行監控時更接近通話開始（A11回應）與使用行動IP(MIP)註冊請求甚至Radius驗證時的監控進行比較。在使用者名稱情況下，呼叫在FA服務點處捕獲，而在MSID監控中，呼叫在PDSN服務點處捕獲。

```
[local]PDSN> mon sub msid 111119782577072
```

```
-----  
(Switching Trace) - New Incoming Call:  
-----
```

```
MSID/IMSI      : 111119782577072          Callid         : 454a2432  
IMEI           : n/a                    MSISDN        : n/a  
Username       : n/a                    SessionType   : unknown(0x00000000)  
Status         : Dormant                Service Name  : ORP-1x  
Src Context    : source  
-----
```

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```
<<<<OUTBOUND 16:47:57:310 Eventid:29001(3)  
All Tx PDU, from 10.208.144.30:699 to 10.211.17.206:699 (75)  
    Message Type: 0x03 (Registration Reply)  
    Code: 0x00 (Accepted)  
    Lifetime: 0x0708
```

```
[local]PDSN> mon sub user 9782577072@cisco.com
```

```
-----  
Incoming Call:  
-----
```

```
MSID/IMSI      : 111119782577072          Callid         : 110b36ad  
IMEI           : n/a                    MSISDN        : n/a  
Username       : 9782577072@cisco.com    SessionType   : unknown(0x00000010)  
Status         : Dormant                Service Name  : FA_service-1  
Src Context    : destination  
-----
```

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```
<<<<OUTBOUND 17:11:53:987 Eventid:23901(6)  
RADIUS AUTHENTICATION Tx PDU, from 10.208.148.133:24912 to 198.51.100.1:1645 (401) PDU-  
dict=custom9  
Code: 1 (Access-Request)  
Id: 81  
Length: 401  
Authenticator: CB 94 F3 4B 04 77 9F 4A 7A 44 FA 13 C9 7A 60 3C  
    Calling-Station-Id = 111119782577072
```

- 在很多情況下啟用使用者L3(19)不會產生比否則捕獲的資訊更多的資訊，而是會造成多個資料包的重複。
- 開啟某些協定將導致重複的資料包，例如移動IP，MIP資料包顯示兩次，即點對點協定(PPP)和MIP。
- 使用非比例字型（如信使）時，輸出效果會好得多，因為列排得很準，使用這種字型進行分析時也會如此。
- 通過特定介面的輸出應與該界面上的資料包捕獲保持同步，不同之處在於，由於不會顯示IP資料包中的每個欄位，因此監控使用者輸出將成為子集，因為在進行有關協定的故障排除時，該欄位不一定相關。例如，不顯示IP報頭中的大多數欄位。如果需要這些欄位，請開啟HEX/ASCII選項。

- 許多輸出將根據標準進行解釋，因此系統不顯示實際的整數值，而是列印該值的文本表示。開啟verbosity 3和/或十六進位制/ascii轉儲以檢視原始資料。

以下是詳細程度3與2的示例輸出，後跟整個A11資料包的HEX/ASCII:

```

Application Sub Type: 0x01 (Radius)
  Radius Attr: Attribute Type: 26 (Vendor-Specific)
    Length: 12
    Vendor Id: 5535 (ThreeGPP2)
    Vendor Type: 40 (3GPP2-Airlink-Record-Type)
    Vendor Length: 6
    Value: 00 00 00 02      ....
          (Active-Start)

Application Sub Type: 0x01 (Radius)
  Radius Attr: 3GPP2-Airlink-Record-Type = Active-Start

0x0000  010a 0708 0000 0000 0ad0 901e 0ad0 9158      .....X
0x0010  d92c 509a 0265 af7e 2715 8881 ecba aed8      .,P..e.~'.....
0x0020  0000 0001 0006 0811 1111 4290 4988 6126      .....B.I.a&
0x0030  0000 d800 0015 9f01 011a 0c00 0015 9f28      .....(
0x0040  0600 0000 021a 0c00 0015 9f29 06ec baae      .....)....
0x0050  d81a 0c00 0015 9f2a 0600 0000 011a 1600      .....*.....
0x0060  0015 9f74 1041 3030 3030 3034 4444 3045      ...t.A000004DD0E
0x0070  4535 331a 1400 0015 9f0a 0e30 3031 3230      E53.....00120
0x0080  3030 3330 3131 341a 0c00 0015 9f0b 0600      0030114.....
0x0090  0000 001a 0c00 0015 9f0c 0600 0000 001a      .....
0x00a0  0c00 0015 9f0d 0600 0000 001a 0c00 0015      .....
0x00b0  9f10 0600 0000 211a 0c00 0015 9f11 0600      .....!.....
0x00c0  0000 001a 0c00 0015 9f12 0600 0000 001a      .....
0x00d0  0c00 0015 9f13 0600 0000 001a 0c00 0015      .....
0x00e0  9f14 0600 0000 001a 0c00 0015 9f15 0600      .....
0x00f0  0000 001a 0c00 0015 9f32 0600 0000 001a      .....2.....
0x0100  0c00 0015 9f27 0600 0000 0020 1400 0001      .....'.
0x0110  00b3 c5f0 257e 8e93 c719 1b79 3ef9 30be      ....%~.....y>.0.
0x0120  07

```

- 並非所有分段的資料包都顯示出來，因為網路處理器單元(NPU)在將來自線路的片段提供給處理呼叫的sessmgr進程之前合併這些片段，並且監控使用者會在何處輸出這些片段。與出站方向類似，不顯示NPU完成的分段。
- 在組合外部代理(FA)/HA機箱上，僅顯示其中一個使用者會話的輸出。例如，如果在FA上看到RADIUS身份驗證，則不會在呼叫的HA部分顯示該身份驗證。如果可能，在這些情況下使用監控協定捕獲要捕獲的特定協定。
- 對節點之間的問題 ( 如FA和HA ) 進行故障排除時，如果問題跨越兩個機箱，或者如果這樣可以幫助消除某些可能性，則對兩個機箱都進行跟蹤。

例如，這是從FA傳送到HA的相同資料包：

```

PDSN/FA:

<<<<OUTBOUND 23:57:08:941 Eventid:27001(0)
MIP-TUNNEL (IPv4-IPv4) Tx PDU
203.0.113.1 > 203.0.113.2: 10.251.88.68 > 192.0.2.1: icmp: echo request (ttl 62, id 13840, len 84) (ttl 255, id 0, len 104)

HA:

```

```
INBOUND>>>> 23:57:08:943 Eventid:27000(0)
MIP-TUNNEL (IPv4-IPv4) Rx PDU
203.0.113.1 > 203.0.113.2: 10.251.88.68 > 192.0.2.1: icmp: echo request (ttl 62, id 13840, len 84) (ttl 251, id 0, len 104)
```

- 從資料包資料網路(PDN)的出口介面傳送和接收的資料包 (由於出口是FA-HA IP隧道，因此不包括FA的出口)，按照NOT在未隧道介面上顯示資料包的系統體系結構不顯示。如果封包進入輸入中，然後向輸入中傳送回應，則表示封包到達目的地並返回 (包括目的地是機箱本身)。但是，如果沒有向入口傳送響應並且它應該傳送，則需要確定它是否從出口傳送以消除ASR的罪魁禍首，如果是，是否在出口上收到響應？這實際上適用於兩個方向。在傳輸網路中各個入口或出口介面和其他點上的資料包嗅探器，包括在傳輸中的各個點 (包括終端點) 進行記錄 (使用者裝置或網路/網際網路伺服器) 可能有助於確定不響應的原因。

以下是FA和HA上的ICMP請求和回應，其中封包僅顯示在HA的輸入 (FA-HA通道) 端，但顯示在FA的輸入和輸出端，因為兩個介面都已通道化。請注意，在FA和HA之間更改的唯一欄位是經過網路節點時的生存時間(TTL)值：

```
INBOUND>>>> 23:57:08:941 Eventid:25000(0)
PPP Rx PDU (85)
IP 85: 10.251.88.68 > 192.0.2.1: icmp: echo request (ttl 63, id 13840, len 84)
```

```
<<<<OUTBOUND 23:57:08:941 Eventid:27001(0)
MIP-TUNNEL (IPv4-IPv4) Tx PDU
203.0.113.1 > 203.0.113.2: 10.251.88.68 > 192.0.2.1: icmp: echo request (ttl 62, id 13840, len 84) (ttl 255, id 0, len 104)
```

```
INBOUND>>>> 23:57:08:943 Eventid:27000(0)
MIP-TUNNEL (IPv4-IPv4) Rx PDU
203.0.113.1 > 203.0.113.2: 10.251.88.68 > 192.0.2.1: icmp: echo request (ttl 62, id 13840, len 84) (ttl 251, id 0, len 104)
```

```
<<<<OUTBOUND 23:57:09:029 Eventid:27001(0)
MIP-TUNNEL (IPv4-IPv4) Tx PDU
203.0.113.2 > 203.0.113.1: 192.0.2.1 > 10.251.88.68: icmp: echo reply (ttl 42, id 27830, len 84) (ttl 255, id 0, len 104)
```

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```
INBOUND>>>> 23:57:09:030 Eventid:27000(0)
MIP-TUNNEL (IPv4-IPv4) Rx PDU
203.0.113.2 > 203.0.113.1: 192.0.2.1 > 10.251.88.68: icmp: echo reply (ttl 42, id 27830, len 84) (ttl 251, id 0, len 104)
```

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```
<<<<OUTBOUND 23:57:09:030 Eventid:25001(0)
PPP Tx PDU (88)
IP 88: 192.0.2.1 > 10.251.88.68: icmp: echo reply (ttl 41, id 27830, len 84)
```

\*客戶可訪問的ASR介面上沒有內建資料包嗅探器，但TAC在此區域具有某種功能，具體取決於協定 (無論什麼都不能捕獲使用者資料)

分析mon子輸出時，請考慮以下因素：

- 是否有預計可見的缺少資料包 (即來自機箱外部的響應、來自機箱的請求或來自機箱的轉發資

料包 )

- 是否可看到資料包的運行方向與故障排除的方向相反 ( 以確認至少有一個方向正常工作 )
- 資料包是否按照預期的時間間隔即時傳送或接收 , 和/或根據規範/配置的計時器值
- 按照協定的預期順序傳送/接收的資料包 ( 請參閱前面有關排序的警告 )
- 資料包中的各個欄位是否包含正確的/預期值 ( 埠號、ip地址等 ) ?
- 對於TCP/IP , 連線是否正確設定和斷開。Mon子使用的TCP標誌的標識包括S(SYN)、S(後跟Ack on line(Acknowledgement)、S(後跟Ack on line(SYN Ack)、P(Push)、R(Reset)、F(FIN)
- 問題是否持續發生或隨機發生
- 在使用者呼叫控制型別、使用者id ( 使用者名稱、msid、imsi等 )、專用或NAT IP池或地址範圍、UDP/TCP埠號、網路伺服器 ( 終端 ) 地址、使用者流量型別 ( HTTP、SMS、FTP、UDP等 )、對等呼叫控制節點地址(例如 : FA、HA、PCF、策略和計費規則功能(PCRF)、服務網關(SGW)、Diameter伺服器等等)。不要留下任何石頭。
- 熟悉服務提供商已經制定的可能發佈/洩露的規則和自定義協定行為 — 提問!!!

## 日誌監視器

這實際上是全域性配置命令 , 而不是用於監視特定使用者的運行時執行命令。使用此命令有兩個優點 :

- 不需要保持CLI會話處於開啟狀態 , 因為所有輸出都儲存到日誌中
- 它自動儲存使用者的所有設施的調試級別日誌 , 包括監控使用者通常出現的輸出。儘管調試遠遠超出所需的範圍 , 但不會遺漏任何資訊 , 並且不會對系統造成干擾 , 因為開啟日誌記錄或監控協定將適用於各種設施 ( 因為這樣做將拉取使用受監控設施的所有使用者的資訊 )。
- 輸出可能不像監控使用者生成的輸出那樣容易/快速讀取。 通常TAC和/或工程部門需要解釋輸出。
- 為了捕獲監控器使用者將捕獲的協定消息的詳細資訊 ( logging monitor僅儲存任何協定消息的前幾行 ) , 請同時運行監控器使用者會話 , 並在以後分析監控器輸出時根據需要引用輸出 , 或者 , 為日誌記錄啟用完整事件詳細程度 ( global config命令「logging display event-verbosity full」 )。 後一種方法不需要以後進行任何額外工作 , 因為所有輸出已經連續且完整。

## logging trace

與日誌記錄監控器相反 , 此方法使用exec模式級別訪問 , 但同時也要求裝置已連線。這可用於對使用者資料 ( 和/或在運行命令後進一步對呼叫控制事件進行故障排除 ) 進行故障排除 , 而不是對呼叫建立進行故障排除 , 因為需要已設定該呼叫才能使呼叫生效 ( 否則報告「沒有與指定條件匹配的呼叫且一無所獲」 )。 與日誌記錄監控器類似 , 「show logs」顯示所有捕獲的資料。

## 監控協定

此命令監控機箱上指定協定 ( 呼叫控制、資料平面 ) 的所有協定交換 , 輸出與監控使用者類似

- 由於可能施加的負載 , 這應該只是生產機箱上的最後選用方法 , 具體取決於協定的協定和資料包卷。
- 需要管理員CLI訪問許可權才能運行

- 要獲取特定使用者的輸出，需要通過標識資訊型別對其進行過濾，例如使用者名稱/MSID、日曆等。

## 活動或運行時記錄

這將捕獲指定級別指定合作室的輸出（範圍從錯誤到調試）

— 這與monitor協定在系統負載和過濾使用者輸出方面有著相同的問題

— 可能需要運行/配置系統日誌伺服器，具體取決於回程所需的設施、調試級別和時間範圍，否則資料可能會在嘗試在機箱上檢索時被覆蓋。

## Subscriber命令

對於以下所有使用者命令，不僅特定使用者的資訊可用，而且通過任意數量的標準，可將命中清單縮小到使用者組，例如使用者所連線的呼叫控制服務(PDSN、FA、HA、LAC、L2TP網路伺服器(LNS)、ECS、LTE等)或正在與(對等的)實體(PCF、FA、HA、LAC、LNS、SGW等)、連線到的、連線的或空閒時間較長的剩餘或會話時間/小於)、接收或傳送的資料量(大於/小於)、關聯的IP池名稱、休眠/活動狀態等，甚至這些引數以及許多其他引數的不同組合。使用聯機幫助列出各種可能性，然後進行實驗是一種很好的學習方法。

如前所述，並不要求總是知道要跟蹤的特定使用者。只需知道使用者所屬的類別，就可以獲得該類別中的使用者清單，從中可以進一步縮小/分析並選擇特定的使用者進行分析。請參閱「show subscribers」的CLI自動完成幫助。

當選擇特定使用者時，必須使用使用者名稱、國際移動使用者標識(IMSIS)、MSISDN、移動站ISDN(MSISDN)等關鍵字之一進行資格鑑定。

## show subscribers full

這可能是存在的第一使用者命令，應該針對每個使用者問題捕獲該命令。它包含指定使用者的大量資訊，對於排除使用者問題非常有用。雖然無法在此處討論每個欄位，但很明顯，某些欄位的檢查和引用數量比其他欄位多，不過根據進行故障排除的內容不同，每個場景也有所不同。需要注意的事項有：

- 某些欄位不相關，具體取決於呼叫技術。例如：- HA上的網域命名伺服器(DNS)位址不相關，因為DNS是從PDSN/FA發出的。
- 休眠只在接入節點上有意義，並且始終在網關上設定為活動狀態
- 某些欄位可能列出多次
- 某些欄位可能指示一個值，但實際上另一個值最終被使用。例如，如果與主伺服器存在連線問題，則使用的RADIUS伺服器可能會改變
- 對於LTE和其他裝置，每個使用者的每個連線承載顯示一個輸出。例如，如果一個使用者連線到三個應用點名稱(APN)，其中一個APN有兩個承載，那麼將會有四個依次獨立的輸出。
- 根據需要，各種欄位應該能夠與其他CLI的輸出相關聯，包括配置。

PDSN/FA ( 接入節點 ) 和HA ( HA是節點的網關型別 ) 節點型別的相關欄位，也主要適用於所有呼叫型別，包括：

- 狀態 — 休眠或活動。
- 接入型別/技術 — 呼叫入口端的技術
- 網路型別 — 呼叫出口端的技術
- 使用者名稱、MSID、IP地址、NAT IP地址 — 標識使用者的方法。  
附註：msid並不總是msid。例如，在PGW上，它是IMSI。
- Callid - 8個十六進位制數字ID，用於跟蹤每個會話的所有活動。封包資料網路閘道(PGW)或多媒體管理實體(MME)上的每個APN都有一個唯一的Callid
- Sessmgr例項 — 處理會話的sessmgr例項(show task resources will list the sessmgrs)
- 卡/Cpu - sessmgr所在的PSC或資料處理卡(DPC)
- PCF、HA、FA、DNS地址等 — 不言自明
- 連線時間 — 呼叫連線時
- 呼叫持續時間 — 呼叫已連線的時間。  
附註：如果使用者已漫遊，則在FA和HA之間可能會有所不同，因為新的FA節點不知道原始呼叫已啟動的總壽命
- 空閒時間 — 未交換使用者資料 ( 不計算控制資料包 ) 的時間
- 會話剩餘時間 — 會話在終止之前可以持續多長時間 ( 由硬編碼配置控制、在身份驗證中返回和/或在節點間協商 )
- MIP FA/MIP HA - MIP會話的各種值
- Input Pkts/Bytes — 從使用者通過入口端收到的使用者資料包/位元組數
- Output Pkts/Bytes — 通過入口端傳送到訂閱伺服器的使用者資料包/位元組數。  
附註：  
— 這些計數器適用於入口端。出口端沒有計數器!!  
— 這些計數和傳送到/來自ECS的資料包之間應該有密切的關聯，但可能沒有完全匹配
- input pkts dropped/output pkts dropped — 請注意，封包實際上可能會在ECS外遭捨棄，例如多點傳送封包，或是被環境中的存取控制清單(ACL)捨棄 ( 因此不要假設所有封包捨棄都在ECS中 )。

網關節點：

- ip池名稱 — 從中檢索IP地址的IP池。僅與呼叫端點 ( 網關 ) 相關，因為其他節點 ( 即PDSN ) 無法知道池名稱，只能知道地址。
- ECS Rulebase — 主動計費服務(ACS)中的rulebase，包含應用於使用者資料包的規則
- Nat ip address — 公開可路由IP地址，NAT將使用者私有分配的IP地址分配給使用者
- NAT領域 — 在ECS服務中使用的關聯NAT IP池的分組
- ( 按需 ) — NAT地址是永久還是臨時分配給使用者 ( 每個池配置 )
- ( NAT IP池名稱 ) — NAT池名稱
- Nexthop ip address - IP池的下一跳地址，資料包應轉發到哪個位置
- 分配的NAT埠塊 — 可用和使用的埠數以及這些埠的範圍，用於通過NAT IP進行NAT操作
- 下行鏈路CSS資訊/上行鏈路CSS資訊 — 由ECS服務處理的資料包的上行 ( 輸入 ) 和下行 ( 輸出 ) 方向的計數

以下是在PDSN和HA上為同一使用者同時執行的「show sub full」的簡短輸出 ( 刪除了某些「不太重要」的欄位 )，使兩者之間的輸出 ( 包括封包計數 ) 很容易相互關聯。



```
PDSN> show sub full username 9782577072@cisco.com
Monday May 18 23:56:20 UTC 2015
Username: 9782577072@cisco.com      Status: Dormant
  Access Type: pdsn-mobile-ip        Network Type: Mobile-IP
  Access Tech: CDMA 1xRTT            Access Network Peer ID: n/a
  callid: 3ee822d2                  msid: 111119782577072
  Card/Cpu: 15/0                    Sessmgr Instance: 212
  state: Connected                   PCF address: 10.211.17.207
connect time: Mon May 18 23:45:54 2015 call duration: 00h10m35s
idle time: 00h02m30s                idle time left: 02h02m30s
session time left: 23h44m25s        ip address: 10.251.88.68
Primary DNS Address: 209.165.200.225
Secondary DNS Address: 209.165.200.226
home-agent: 203.0.113.2
fa-service name: FA9 (context destination)
source context: source               destination context: destination
AAA context: source                 AAA domain: cisco.com
AAA start count: 1                 AAA stop count: 0
AAA interim count(RADIUS+GTPP): 0  Acct-session-id: 69A9CDEB
AAA RADIUS group: aaa-cisco.com
RADIUS Auth Server IP: 198.51.100.1
RADIUS Acct Server IP: 198.51.100.1
  NAS IP Address: 10.208.148.133
MIPFA Session:                      Care-of-Address: 203.0.113.1
  Home-Address: 10.251.88.68        HA-Address: 203.0.113.2
  Lifetime: 02h00m00s              Remaining Life: 01h49m25s
  Revocation Negotiated: yes        Revocation I Bit Negotiated: Yes
input pkts: 254                     output pkts: 229
input bytes: 24088                  output bytes: 129012
input pkts dropped: 0               output pkts dropped: 0
  dormancy total: 11                handoff total: 0
Num Auxiliary A10s:1
  PCF Address      SR_ID
10.211.17.207     1
```

```
[local]HA> show sub full username 9782577072@cisco.com
Monday May 18 23:56:14 UTC 2015
Username: 9782577072@cisco.com      Status: Online/Active
  Access Type: ha-mobile-ip         Network Type: IP
  Access Tech: Other                Access Network Peer ID: n/a
  callid: 4a6ae475                 msid: n/a
  Card/Cpu: 2/0                    Sessmgr Instance: 329
  state: Connected                  FA address: 66.174.112.72
connect time: Mon May 18 23:45:54 2015 call duration: 00h10m28s
idle time: 00h02m23s               idle time left: n/a
session time left: 23h49m32s
ip address: 10.251.88.68
ip pool name: MIP_Private
ha-service name: HA1
source context: HA                  destination context: XGWout
Acct-session-id: A414F3F6
RADIUS Auth Server IP: 198.51.100.1  RADIUS Acct Server IP: n/a
NAS IP Address: 10.208.148.135       Nexthop IP Address: 209.165.200.230
active input acl: ECS_ACL            active output acl: ECS_ACL
ECS Rulebase: 201                   Firewall-and-Nat Policy: MIP
  Nat Realm: MIP_NAT_Int             Nat ip address: 170.200.132.0 (on-demand) (MIP_NAT_Int04)
  Nexthop ip address: 209.165.200.230
Nat port chunks allocated[start - end]: (1 chunk) [6464 - 6495]
Max NAT port chunks used: 1
HA binding care-of-addr(s): 203.0.113.1
```

```

MIPHA binding 1: Care-of-Address: 203.0.113.1
                  FA Address/Port: 203.0.113.1/434
Home-Address: 10.251.88.68           HA-Address: 203.0.113.2
Lifetime: 02h00m00s                 Remaining Life: 01h49m32s
Revocation Negotiated: Yes           Revocation I Bit Negotiated: Yes
MN-HA-Key-Present: TRUE              MN-HA-SPI:300
FA-HA-Key-Present: TRUE              FA-HA-SPI:8832
Proxy DNS Intercept List: ROAMINGDNS
Downlink CSS Information
Service/ACL Names: /ECS_ACL
downlink pkts to svc: 229            downlink pkts from svc: 229
Uplink CSS Information
Service/ACL Names: /ECS_ACL
uplink pkts to svc: 254              uplink pkts from svc: 252
input pkts: 254                      output pkts: 229
input bytes: 24088                   output bytes: 129012

```

根據FA和HA節點之間的以下ICMP請求/響應資料包交換（實際有4個ICMP交換，此處只顯示一個），將顯示「show sub full」跟蹤的後續資料包/位元組計數：

```

[local]PDSN> show sub full username 9782577072@cisco.com
Monday May 18 23:56:20 UTC 2015

```

```

input pkts: 254                      output pkts: 229
input bytes: 24088                   output bytes: 129012
input pkts dropped: 0                output pkts dropped: 0

```

```

[local]PDSN> show sub full username 9782577072@cisco.com
Monday May 18 23:57:25 UTC 2015

```

```

input pkts: 258                      output pkts: 233
input bytes: 24424                   output bytes: 129348

```

```

INBOUND>>>> 23:57:08:943 Eventid:27000(0)
MIP-TUNNEL (IPv4-IPv4) Rx PDU
203.0.113.1 > 203.0.113.2: 10.251.88.68 > 192.0.2.1: icmp: echo request (ttl 62, id 13840, len
84) (ttl 251, id 0, len 104)

```

```

<<<<OUTBOUND 23:57:09:029 Eventid:27001(0)
MIP-TUNNEL (IPv4-IPv4) Tx PDU
203.0.113.2 > 203.0.113.1: 192.0.2.1 > 10.251.88.68: icmp: echo reply (ttl 42, id 27830, len 84)
(ttl 255, id 0, len 104)

```

```

[local]HA> show sub full username 9782577072@cisco.com
Monday May 18 23:56:14 UTC 2015

```

```

Downlink CSS Information
downlink pkts to svc: 229            downlink pkts from svc: 229
Uplink CSS Information
uplink pkts to svc: 254              uplink pkts from svc: 252
input pkts: 254                      output pkts: 229
input bytes: 24088                   output bytes: 129012

```

```

[local]HA> show sub full username 9782577072@cisco.com
Monday May 18 23:57:34 UTC 2015

```

```

Downlink CSS Information
downlink pkts to svc: 233            downlink pkts from svc: 233

```

```

Uplink CSS Information
  uplink pkts to svc: 258          uplink pkts from svc: 256

  input pkts: 258                 output pkts: 233
  input bytes: 24424              output bytes: 129348

```

以下示例片段用於LTE語音(VoLTE)呼叫。翻譯可能很棘手，因為上面列出的是兩個訂戶，而他們之間的差別並不明顯。

- 列出的第一個是預設IP多媒體系統(IMS)承載，第二個是專用(VoLTE)承載，兩者均屬於同一APN
- Acct-session-id:是獨特優勢。
- 兩個承載之間的輸入/輸出pkts/位元組不同，並且因為專用承載將傳送更多(語音)資料包，所以可以假設計數較高的使用者是專用承載，同時，ECS的/來自ECS的資料包計數對兩者都列出相同(預設承載使用的量)
- 即使專用連線稍後，兩端的連線時間顯示預設承載連線時間。
- 使用「show pgw-only full」(稍後討論)可以為PGW呼叫獲取更有用、更準確、更簡單的資訊

```

[local]PGW> show sub full imsi 300420060496012
Monday September 16 21:50:07 UTC 2013

Username: 0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org Status: Online/Active
  Access Type: gtp-pdn-type-ipv6          Network Type: IPv6
  Access Tech: eUTRAN                     Access Network Peer ID: n/a
  callid: 22075719                        msid: 300420060496012
  Card/Cpu: 7/1                           Sessmgr Instance: 115
  state: Connected                         SGW Address: 203.0.113.3
  connect time: Mon Sep 16 21:44:28 2013  call duration: 00h05m42s
  idle time: 00h00m00s                    idle time left: 02h05m00s
  session time left: 08759h54m
  long duration time left: n/a            long duration action: n/a
  always on: Disabled
  ip address: 2001:db8::1
  ip pool name: ims61-03
  source context: XGWin                   destination context: XGWout
...
  AAA context: XGWin                      AAA domain: XGWin
...
Acct-session-id: 42AE2B922619E10F
...
  active input acl: n/a                   active output acl: n/a
  active input ipv6 acl: ECS_ACL_V6       active output ipv6 acl: ECS_ACL_V6
  ECS Rulebase: PGW
...
P-CSCF address :
  Primary: 2001:db8::fd
  Secondary: 2001:db8::fe
  Tertiary: n/a
...
Downlink CSS Information
  Service/ACL Names: /ECS_ACL_V6
  (Active Charging Optimized Mode)
  downlink pkts to svc: 658              downlink pkts from svc: 658
Uplink CSS Information
  Service/ACL Names: /ECS_ACL_V6
  (Active Charging Optimized Mode)
  uplink pkts to svc: 675                uplink pkts from svc: 675
Collapsed cscf subscribers: none
input pkts: 29                           output pkts: 45

```

```

input bytes: 10578                                output bytes: 10763
input bytes dropped: 0                            output bytes dropped: 0
input pkts dropped: 0                            output pkts dropped: 0
...
pk rate from user(bps): 1375                    pk rate to user(bps): 1699
ave rate from user(bps): 458                    ave rate to user(bps): 566
sust rate from user(bps): 456                  sust rate to user(bps): 564
pk rate from user(pps): 0                      pk rate to user(pps): 1
...
CAE Server Address:
Username: 0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org Status: Online/Active
Access Type: gtp-pdn-type-ipv6                  Network Type: IPv6
Access Tech: eUTRAN                             Access Network Peer ID: n/a
callid: 22075719                                msid: 300420060496012
Card/Cpu: 7/1                                   Sessmgr Instance: 115
state: Connected                               SGW Address: 203.0.113.3
connect time: Mon Sep 16 21:44:28 2013        call duration: 00h05m42s
idle time: 00h00m00s                          idle time left: 02h05m00s
session time left: 08759h54m
long duration time left: n/a                  long duration action: n/a
always on: Disabled
ip address: 2001:db8::1
ip pool name: ims61-03
source context: XGWin                          destination context: XGWout
...
AAA context: XGWin                              AAA domain: XGWin
AAA start count: 0                             AAA stop count: 0
AAA interim count(RADIUS+GTPP): 0
Acct-session-id: 42AE2B922619E18D
...
active input ipv6 acl: ECS_ACL_V6              active output ipv6 acl: ECS_ACL_V6
ECS Rulebase: PGW
P-CSCF address : Primary: 2001:db8::fd Secondary: 2001:db8::fe Tertiary: n/a ... Downlink CSS
Information Service/ACL Names: /ECS_ACL_V6 (Active Charging Optimized Mode) downlink pkts to
svc: 658 downlink pkts from svc: 658 Uplink CSS Information Service/ACL Names: /ECS_ACL_V6
(Active Charging Optimized Mode) uplink pkts to svc: 675 uplink pkts from svc: 675 Collapsed
cscf subscribers: none input pkts: 643 output pkts: 617 input bytes: 58421 output bytes: 55925
... pk rate from user(bps): 1375 pk rate to user(bps): 1699 ave rate from user(bps): 458 ave
rate to user(bps): 566 sust rate from user(bps): 456 sust rate to user(bps): 564 pk rate from
user(pps): 0 pk rate to user(pps): 1

```

## show subscribers ( 僅限hsgw ) | pgw-only | ggsn-only | mme-only | sgw-only | sgsn-only)full

其中一些欄位具有非常有用的資訊，這些資訊專門針對呼叫型別而定製，而不只是普通的show subscriber full ( 這是更通用的，其中許多欄位適用於所有呼叫型別，儘管某些欄位仍特定於某些呼叫型別 )

- 對於hsgw-only和ggsn-only，輸出與普通「show sub full」沒有區別，只是限定符自動將命中清單限制為指定型別的呼叫。
- MSISDN有效地列出了裝置電話號碼
- 欄位名稱IMSI已明確且正確列出
- 請注意，來自同一APN的承載具有相同的Callid
- 持有者型別和持有者ID — 區分不同的持有者
- QCI — 服務品質識別符號 ( 範圍從1到9 )。在這種情況下，QCI 1用於語音，QCI 5用於IMS控制
- c-teid、u-teid — 控制平面和使用者平面的終端終端終結點識別符號對於標識將資料分組與哪個

## 承載關聯是必要的

- S5/S8/S2b-APN、SGi-APN — 持有者的APN
- input pkts/output pkts — 封包計數用於承載本身
- MBR/GBR上行鏈路/下行鏈路 — 兩個方向的最大和保證位元率。請注意38000 bits/sec for VoLTE，其與VoLTE編解碼器的位元率有關。

以下示例片段用於上面的「show sub full」所示的相同LTE語音(VoLTE)呼叫，大致在同一時間進行（參見時間戳），以便在感興趣時可以對輸出進行有用的比較。它還包括當時已連線的網際網路APN:

```
[local]PGW> show sub pgw-only full imsi 300420060496012
Monday September 16 21:50:25 UTC 2013
```

```
Username: 0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org
```

```
Subscriber Type : Home
Status          : Online/Active
State           : Connected
Connect Time    : Mon Sep 16 21:44:28 2013
Idle time       : 00h00m00s
MS TimeZone     : +5:00      Daylight Saving Time: +1 hour
```

```
Access Type: gtp-pdn-type-ipv6      Network Type: IPv6
Access Tech: eUTRAN                  pgw-service-name: PGW1
Callid: 22075719                     IMSI: 300420060496012
Protocol Username:                    MSISDN: 19126757869
Interface Type: S5S8GTP
Emergency Bearer Type: N/A
S6b Auth Status: Enabled
Acct-session-id (C1): 42AE2B922619E10F
ThreeGPP2-correlation-id (C2): 3939BA30 / h0WKcCZS
Card/Cpu: 7/1                        Sessmgr Instance: 115
```

```
Bearer Type: Default Bearer-Id: 5 Bearer State: Active IP allocation type: N/A IPv6 allocation
type: local pool IP address: 2001:db8::1 Framed Routes: N/A Framed Routes Source: N/A ULI: TAI-
ID: MCC: 300 MNC: 420 TAC: 0x8504 ECGI-ID: MCC: 300 MNC: 420 ECI: 0x207b201 Accounting mode:
None APN Selection Mode: Subscribed MEI: 9900015028325700 Serving Nw: MCC=300, MNC=420 Charging
id: 639230223 Charging chars: normal Source context: XGWin Destination context: XGWout
S5/S8/S2b-APN: IMSAPN SGi-APN: IMSAPN APN-OI: mnc420.mcc300.gprs IMS Auth Service : IMS-GX
active input ipv4 acl: active output ipv4 acl: active input ipv6 acl: ECS_ACL_V6 active output
ipv6 acl: ECS_ACL_V6 ECS Rulebase: PGW Bearer QoS: QCI: 5 ARP: 0x069 PCI: 1 (Disabled) PL : 10
PVI: 1 (Disabled) MBR Uplink(bps): 0 MBR Downlink(bps): 0 GBR Uplink(bps): 0 GBR Downlink(bps):
0 P-CSCF address : 1: 2001:db8::fd 2: 2001:db8::fe 3: NA Access Point MAC Address: N/A pgw c-
teid: [0x8d11c073] 2366750835 pgw u-teid: [0xc20d0073] 3255631987 sgw c-teid: [0x00160880]
1443968 sgw u-teid: [0x00160885] 1443973 ePDG c-teid: N/A ePDG u-teid: N/A pgw c-addr:
203.0.113.4 pgw u-addr: 203.0.113.4
2001:db8::1f sgw c-addr: 203.0.113.3 sgw u-addr: 203.0.113.3 ePDG c-addr: N/A ePDG u-addr: N/A
Downlink APN AMBR: 600 Kbps Uplink APN AMBR: 600 Kbps input pkts: 29 output pkts: 45 input
bytes: 10578 output bytes: 10763 input bytes dropped: 0 output bytes dropped: 0 input pkts
dropped: 0 output pkts dropped: 0 ... pk rate from user(bps): 27699 pk rate to user(bps): 24879
ave rate from user(bps): 9691 ave rate to user(bps): 8859 sust rate from user(bps): 9720 sust
rate to user(bps): 8885 pk rate from user(pps): 37 pk rate to user(pps): 34 ave rate from
user(pps): 12 ave rate to user(pps): 11 sust rate from user(pps): 12 sust rate to user(pps): 11
link online/active percent: 100 ... CAE Server Address: Username:
0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org Subscriber Type : Home Status :
Online/Active State : Connected Connect Time : Mon Sep 16 21:49:53 2013 Idle time : 00h00m00s MS
TimeZone : +5:00 Daylight Saving Time: +1 hour Access Type: gtp-pdn-type-ipv6 Network Type: IPv6
Access Tech: eUTRAN pgw-service-name: PGW1 Callid: 22075719 IMSI: 300420060496012 Protocol
Username: MSISDN: 19126757869 Interface Type: S5S8GTP Emergency Bearer Type: N/A S6b Auth
Status: Enabled Acct-session-id (C1): 42AE2B922619E18D ThreeGPP2-correlation-id (C2): 3939BA30 /
h0WKcCZS Card/Cpu: 7/1 Sessmgr Instance: 115 Bearer Type: Dedicated Bearer-Id: 7 Bearer State:
```

Active IP allocation type: N/A IPv6 allocation type: local pool IP address: 2001:db8::1 Framed Routes: N/A Framed Routes Source: N/A ULI: TAI-ID: MCC: 300 MNC: 420 TAC: 0x8504 ECGI-ID: MCC: 300 MNC: 420 ECI: 0x207b201 Accounting mode: None APN Selection Mode: Subscribed MEI: 9900015028325700 Serving Nw: MCC=300, MNC=420 Charging id: 639230349 Charging chars: normal Source context: XGWin Destination context: XGWout S5/S8/S2b-APN: IMSAPN SGi-APN: IMSAPN APN-OI: mnc420.mcc300.gprs IMS Auth Service : IMS-GX active input ipv4 acl: active output ipv4 acl: active input ipv6 acl: ECS\_ACL\_V6 active output ipv6 acl: ECS\_ACL\_V6 ECS Rulebase: PGW Bearer QoS: QCI: 1 ARP: 0x06d PCI: 1 (Disabled) PL : 11 PVI: 1 (Disabled) MBR Uplink(bps): 38000 MBR Downlink(bps): 38000 GBR Uplink(bps): 38000 GBR Downlink(bps): 38000 P-CSCF address : 1: 2001:db8::fd 2: 2001:db8::fe 3: NA Access Point MAC Address: N/A pgw c-teid: [0x8d11c073] 2366750835 pgw u-teid: [0xc1f20073] 3253862515 sgw c-teid: [0x00160880] 1443968 sgw u-teid: [0x00160887] 1443975 ePDG c-teid: N/A ePDG u-teid: N/A pgw c-addr: 203.0.113.4 pgw u-addr: 203.0.113.4 2001:db8::1f sgw c-addr: 203.0.113.3 sgw u-addr: 203.0.113.3 ePDG c-addr: N/A ePDG u-addr: N/A Downlink APN AMBR: 600 Kbps Uplink APN AMBR: 600 Kbps input pkts: 1640 output pkts: 1614 input bytes: 149478 output bytes: 146930 input bytes dropped: 0 output bytes dropped: 0 input pkts dropped: 0 output pkts dropped: 0 ... pk rate from user(bps): 27699 pk rate to user(bps): 24879 ave rate from user(bps): 9691 ave rate to user(bps): 8859 sust rate from user(bps): 9720 sust rate to user(bps): 8885 pk rate from user(pps): 37 pk rate to user(pps): 34 ave rate from user(pps): 12 ave rate to user(pps): 11 sust rate from user(pps): 12 sust rate to user(pps): 11

CAE Server Address:

Username: 0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org

Subscriber Type : Home  
Status : Online/Active  
State : Connected  
Connect Time : Mon Sep 16 21:44:33 2013  
Idle time : 00h02m04s  
MS TimeZone : +5:00 Daylight Saving Time: +1 hour

Access Type: gtp-pdn-type-ipv4-ipv6 Network Type: IPV4+IPv6  
Access Tech: eUTRAN pgw-service-name: PGW1  
Callid: 2207571f IMSI: 300420060496012  
Protocol Username: MSISDN: 19126757869  
Interface Type: S5S8GTP  
Emergency Bearer Type: N/A  
S6b Auth Status: Enabled  
Acct-session-id (C1): 42AE2B922619E115  
ThreeGPP2-correlation-id (C2): 3939BA36 / h0WKfBYt  
Card/Cpu: 7/1 Sessmgr Instance: 115

Bearer Type: Default Bearer-Id: 6

Bearer State: Active  
IP allocation type: local pool  
IPv6 allocation type: local pool  
IP address: 2001:db8::2, 10.174.230.156  
Framed Routes: N/A Framed Routes Source: N/A

ULI:

TAI-ID:  
MCC: 300 MNC: 420  
TAC: 0x8504  
ECGI-ID:  
MCC: 300 MNC: 420  
ECI: 0x207b201

Accounting mode: None APN Selection Mode: Subscribed  
MEI: 9900015028325700 Serving Nw: MCC=300, MNC=420  
Charging id: 639230229 Charging chars: normal  
Source context: XGWin Destination context: XGWout

S5/S8/S2b-APN: INTERNET

SGi-APN: INTERNET  
APN-OI: mnc420.mcc300.gprs

IMS Auth Service : IMS-GX  
active input ipv4 acl: ECS\_ACL\_V4 active output ipv4 acl: ECS\_ACL\_V4  
active input ipv6 acl: ECS\_ACL\_V6 active output ipv6 acl: ECS\_ACL\_V6

ECS Rulebase: OCS

Bearer QoS:

QCI: 9

ARP: 0x069

PCI: 1 (Disabled)

PL : 10

PVI: 1 (Disabled)

MBR Uplink(bps): 0

MBR Downlink(bps): 0

GBR Uplink(bps): 0

GBR Downlink(bps): 0

P-CSCF address :

1: NA

2: NA

3: NA

Access Point MAC Address: N/A

pgw c-teid: [0xc298073] 2351530099

pgw u-teid: [0xc20b8073] 3255533683

sgw c-teid: [0x31580880] 827852928

sgw u-teid: [0x31580886] 827852934

ePDG c-teid: N/A

ePDG u-teid: N/A

pgw c-addr: 203.0.113.4 pgw u-addr: 203.0.113.4

2001:db8::1f

sgw c-addr: 203.0.113.3

sgw u-addr: 203.0.113.3

ePDG c-addr: N/A

ePDG u-addr: N/A

Downlink APN AMBR:

75000 Kbps

Uplink APN AMBR:

75000 Kbps

input pkts: 21

output pkts: 23

input bytes: 2687

output bytes: 6457

input bytes dropped: 0

output bytes dropped: 0

input pkts dropped: 0

output pkts dropped: 0

...

CAE Server Address:

Total subscribers matching specified criteria: 3

## show active-charging sessions full

這可能是僅次於「show sub full」的第二重要的使用者命令，如果排除與ECS相關的問題(如資料包丟棄、線上計費、IMS(PCRF)授權)，在網關上就更為重要。

- 上行鏈路和下行鏈路資料包和位元組應當與報告在「show sub pgw-only」中傳送至/來自ECS的資料包相匹配
- 請注意跟蹤丟棄資料包的各種欄位
- Dynamic-Rule-Name條目是PCRF在初始互動和正在互動時通過Gx互動返回的規則。與規則匹配的資料包計數及其定義將列出
- 對於計費規則定義(在本示例中，它是專用VoLTE承載者)，也會列出配額、使用量和時間

為了保持一致，以下示例片段用於上面的「show sub full」和「show sub pgw-only full」所示的相同LTE語音(VoLTE)呼叫，大約在同一時間進行(參見時間戳)，以便在感興趣時可以對輸出進行有用的比較。

- 另外還顯示了捕獲線上計費資料的Internet APN
- 規則0\_0用於語音(即時傳輸協定(RTP))資料，規則0\_1用於即時控制協定(RCP) — 用於傳達鏈路的品質和該鏈路上的語音隨時間的變化。運行此CLI時，沒有資料包通過RCP承載器。

[local]PGW> show active-charging sessions full imsi 300420060496012  
Monday September 16 21:50:18 UTC 2013

Session-ID: 115:12023212 Username:  
0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org  
Callid: 22075719 IMSI/MSID: 300420060496012  
MSISDN: 19126757869  
ACSMgr Instance: 115 ACSMgr Card/Cpu: 7/1  
SessMgr Instance: 115  
Client-IP: 2001:db8::  
NAS-IP: 0.0.0.0  
Access-NAS-IP(FA):  
NAS-PORT: 0 NSAPI: 5  
Acct-Session-ID: 393A43B1  
NAS-ID: n/a  
Access-NAS-ID(FA): n/a  
3GPP2-BSID: n/a  
Access-Correlation-ID(FA): n/a  
3GPP2-Correlation-ID: n/a  
MEID: n/a  
Carrier-ID: n/a ESN: n/a  
Uplink Bytes: 10778 Downlink Bytes: 10411  
Uplink Packets: 32 Downlink Packets: 41  
Injected Uplink Bytes: 0 Injected Downlink Bytes: 0  
Injected Uplink Packets: 0 Injected Downlink Packets: 0  
Buffered Uplink Packets: 0 Buffered Downlink Packets: 0  
Buffered Uplink Bytes: 0 Buffered Downlink Bytes: 0  
Uplink Packets in Buffer: 0 Uplink Bytes in Buffer: 0  
Downlink Packets in Buffer: 0 Downlink Bytes in Buffer: 0  
Buff Over-limit Uplink Pkts: 0 Buff Over-limit Uplink Bytes: 0  
Buff Over-limit Downlink Pkts: 0 Buff Over-limit Downlink Bytes: 0  
Processed Uplink Packets: 0 Processed Downlink Packets: 0  
Dropped Uplink Packets: 0 Dropped Downlink Packets: 0  
Uplink Out of Order Packets: 0 Downlink Out of Order Packets: 0  
Dyn FUI Redirected Flows: 0 Dyn FUI Discarded Pkts: 0  
ITC Terminated Flows: 0 ITC Redirected Flows: 0  
ITC Dropped Packets: 0 ITC ToS Remarkd Packets: 0  
ITC Dropped Upl Pkts: 0 ITC Dropped Dnl Pkts: 0  
ITC Dropped Upl Bytes: 0 ITC Dropped Dnl Bytes: 0  
Flow action Terminated Flows: 0  
PP Flow action Terminated Flows: 0  
CC Dropped Uplink Packets: 0 CC Dropped Uplink Bytes: 0  
CC Dropped Downlink Packets: 0 CC Dropped Downlink Bytes: 0  
NRUPC Req Made: 1 NRUPC Req Success: 1  
NRUPC Req Failed: 0 NRUPC Req Time Out: 0  
Dynamic Rule Limiting: Enabled  
Bearer Bandwidth Limiting: Enabled  
Uplink MBR (bps): 0 Downlink MBR (bps): 0  
Uplink GBR (bps): 0 Downlink GBR (bps): 0  
Uplink Burst (bytes): 0 Downlink Burst (bytes): 0  
Dropped Uplink Pkts: 0 Dropped Downlink Pkts: 0  
Dropped Uplink Bytes: 0 Dropped Downlink Bytes: 0  
Current Readdressed Sessions: 0  
Total Readdressed Uplink Pkts: 0  
Total Readdressed Uplink Bytes: 0  
Total Readdressed Downlink Pkts: 0  
Total Readdressed Downlink Bytes: 0  
Total Readdressing Failure Packets: 0  
Non Syn Flow: 0 Duplicate Key: 0  
Dropped Pkts: 0

Creation Time: Monday September 16 21:44:28 GMT 2013



Last Pkt Time: Monday September 16 21:50:20 GMT 2013  
 Duration: 00h:05m:52s  
 Active Charging Service name: LTE  
 Rule Base name: PGW  
 URL-Redir First-Request-Only: n/a  
 Bandwidth Policy: n/a  
 FW-and-NAT Policy: n/a  
 NAT Policy NAT44: Not-required  
 NAT Policy NAT64: Not-required  
 TPO Policy: n/a  
 CF Policy ID: n/a  
 Old CF Policy ID: n/a  
 Dynamic Charging: Enabled  
 Dynamic Chrg Msg Received: 3 Rule Definitions Received: 3  
 Installs Received: 3 Removes Received: 0  
 Installs Succeeded: 3 Installs Failed: 0  
 Removes Succeeded: 0 Removes Failed: 0  
 Uplink Dynamic Rule Packets: 32 Uplink Dynamic Rule Bytes: 10778  
 Downlink Dynamic Rule Packets: 41 Downlink Dynamic Rule Bytes: 10411  
 Dynamic Charging Packet Drop statistics:  
 PCC Rule BW Limit Upl Pkts: 0 PCC Rule BW Limit Dnl Pkts: 0  
 PCC Rule BW Limit Upl Bytes: 0 PCC Rule BW Limit Dnl Bytes: 0  
 PCC Rule Gating Upl Pkts: 0 PCC Rule Gating Dnl Pkts: 0  
 PCC Rule Gating Upl Bytes: 0 PCC Rule Gating Dnl Bytes: 0  
 RuleMatch Fail Upl Pkts: 0 RuleMatch Fail Dnl Pkts: 0  
 RuleMatch Fail Upl Bytes: 0 RuleMatch Fail Dnl Bytes: 0  
 Credit-Control: Off  
 Event-Triggers:  
 QoS Renegotiate Up: 0 QoS Renegotiate Dn: 0  
 TCP Proxy Flows Requests: 0 TCP Proxy Flows Request Success: 0  
 Disable TCP Proxy Flows Requests: 0 Disable TCP Proxy Flows Success: 0  
 Current TCP Proxy Flows: 0 Total TCP Proxy Flows: 0  
 TCP-proxy reset for non-SYN flows: 0  
 Current IP Flows: 0 Current ICMP Flows: 0  
 Current IPv6 Flows: 2 Current ICMPv6 Flows: 0  
 Current TCP Flows: 1 Current UDP Flows: 1  
 Current HTTP Flows: 0 Current HTTPS Flows: 0  
 Current FTP Flows: 0 Current POP3 Flows: 0  
 Current SMTP Flows: 0 Current SIP Flows: 1  
 Current RTSP Flows: 0 Current RTP Flows: 0  
 Current RTCP Flows: 0 Current IMAP Flows: 0  
 Current WSP-CO Flows: 0 Current WSP-CL Flows: 0  
 Current MMS Flows: 0 Current DNS Flows: 0  
 Current PPTP-GRE Flows: 0 Current PPTP Flows: 0  
 Current P2P Flows: 0 Current H323 Flows: 0  
 Current TFTP Flows: 0  
 Current UNKNOWN Flows: 1  
 Max (L3) Flows: 6  
 Max Flows Timestamp: Monday September 16 21:44:39 GMT 2013

CAE-Readdressing:  
 GET Requests redirected: 0  
 POST Requests redirected: 0  
 Other Requests redirected: 0  
 HTTP Responses redirected: 0  
 Requests having xheader inserted: 0  
 Total Uplink Bytes: 0  
 Total Uplink Packets: 0  
 Total Downlink Bytes: 0  
 Total Downlink Packets: 0  
 Total request charging action hit: 0  
 Total response charging action hit: 0  
 Total Charging action hit - Req. Readdr.: 0

Total Charging action hit - Resp. Readdr.: 0  
 CAE Readdressing Err. Conditions:  
 Total connection failed to video server: 0  
 Skipped Req. Readdr. - pipelined req: 0  
 Skipped Req. Readdr. - persistent case: 0  
 Skipped Req. Readdr. - zero copied buf: 0  
 Skipped Req. Readdr. - buf limit exceed: 0  
 Req. Readdr. - Socket Mig. failed: 0  
 Skipped Flow. - pipelined req.: 0  
 Skipped Resp. Readdr. - pipelined req: 0  
 Skipped Resp. Readdr. - persistent case: 0  
 Skipped Resp. Readdr. - partial resp hdr: 0  
 Skipped Resp. Readdr. - zero copied buf: 0  
 Skipped Resp. Readdr. - buf limit exceed: 0  
 Resp. Readdr. - Socket Mig. failed: 0  
 Total load balancer failed: 0  
 Total MVG xheader insertion failed: 0  
 Rulebase configuration missing: 0

Transrating:

Total Transrated Video Connections: 0  
 Total GZIP'd Video Connections: 0  
 Total MP4 Video Connections: 0  
 Total FLV Video Connections: 0  
 Transrated Sorenson H263 Connections: 0  
 Transrated H264 Connections: 0  
 Failed Sorenson H263 Connections: 0  
 Failed H264 Connections: 0  
 Failed Video Codec not supported 0  
 Total Input Video Data Bytes: 0  
 SH263 Input Video Data Bytes: 0  
 H264 Input Video Data Bytes: 0  
 GZIP Input Video Data Bytes: 0  
 Total Output Video Data Bytes: 0  
 SH263 Output Video Data Bytes: 0  
 H264 Output Video Data Bytes: 0  
 GZIP Output Video Data Bytes: 0  
 Average Input Video Bit Rate: 0  
 SH263 Input Video Bit Rate: 0  
 H264 Input Video Bit Rate: 0  
 Average Output Video Bit Rate: 0  
 SH263 Output Video Bit Rate: 0  
 H264 Output Video Bit Rate: 0  
 Average Bit Rate Reduction: 0  
 SH263 Bit Rate Reduction: 0  
 H264 Bit Rate Reduction: 0  
 TCP-Proxy Session Stats: n/a  
 WiMAX Hotlining Status: n/a  
 Link Monitoring Average Throughput: 0 kbps  
 Link Monitoring Average RTT: 0 ms

Charging Updates: n/a

Dynamic Charging Rule Definition Statistics:

Dynamic-Rule-Name	Pkts-Down	Bytes-Down	Pkts-Up	Bytes-Up	Hits
IMSDefault	41	10411	32	10778	73
Total Dynamic Rules:	1				
Total Predefined Rules:	0				
Total Firewall Predefined Rules:	0				
Charging-Updates Statistics:					n/a

Dynamic Charging Rule Definition(s) Configured:

Name Prior Content-Id Chrg-Type Rule Parameters

```

-----
IMSDefault  950      100  Offline Gate Status:      Allow All
QoS Class Identifier:      5
ARP Priority Level:        10
Reporting Level: Rating Grp
Metering Method:      Duration
Uplink MBR:      75000000
Downlink MBR:      75000000
Filter 1:
Direction:      Uplink
Dst Addr  ::/0
Filter 2:
Direction:      Downlink
Src Addr  ::/0

```

Predefined Rules Enabled List: n/a  
Predefined Firewall Rules Enabled List: n/a

```

Session-ID:      115:12023218  Username:
0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org
Callid:      2207571f  IMSI/MSID:      300420060496012
MSISDN:      19126757869
ACSMgr Instance:      115  ACSMgr Card/Cpu:      7/1
SessMgr Instance:      115
Client-IP:      2001:db8::,10.174.230.156
NAS-IP:      0.0.0.0
Access-NAS-IP(FA):
NAS-PORT:      0  NSAPI:      6
Acct-Session-ID:      393A43B7
NAS-ID:      n/a
Access-NAS-ID(FA):      n/a
3GPP2-BSID:      n/a
Access-Correlation-ID(FA):      n/a
3GPP2-Correlation-ID:      n/a
MEID:      n/a
Carrier-ID:      n/a  ESN:      n/a
Uplink Bytes:      2887  Downlink Bytes:      6105
Uplink Packets:      24  Downlink Packets:      19
Injected Uplink Bytes:      0  Injected Downlink Bytes:      0
Injected Uplink Packets:      0  Injected Downlink Packets:      0
Buffered Uplink Packets:      0  Buffered Downlink Packets:      0
Buffered Uplink Bytes:      0  Buffered Downlink Bytes:      0
Uplink Packets in Buffer:      0  Uplink Bytes in Buffer:      0
Downlink Packets in Buffer:      0  Downlink Bytes in Buffer:      0
Buff Over-limit Uplink Pkts:      0  Buff Over-limit Uplink Bytes:      0
Buff Over-limit Downlink Pkts:      0  Buff Over-limit Downlink Bytes:      0
Processed Uplink Packets:      0  Processed Downlink Packets:      0
Dropped Uplink Packets:      0  Dropped Downlink Packets:      0
Uplink Out of Order Packets:      0  Downlink Out of Order Packets:      0
Dyn FUI Redirected Flows:      0  Dyn FUI Discarded Pkts:      0
ITC Terminated Flows:      0  ITC Redirected Flows:      0
ITC Dropped Packets:      0  ITC ToS Remarkd Packets:      0
ITC Dropped Upl Pkts:      0  ITC Dropped Dnl Pkts:      0
ITC Dropped Upl Bytes:      0  ITC Dropped Dnl Bytes:      0
Flow action Terminated Flows:      0
PP Flow action Terminated Flows:      0
CC Dropped Uplink Packets:      0  CC Dropped Uplink Bytes:      0
CC Dropped Downlink Packets:      0  CC Dropped Downlink Bytes:      0
NRUPC Req Made:      1  NRUPC Req Success:      1
NRUPC Req Failed:      0  NRUPC Req Time Out:      0
Dynamic Rule Limiting: Enabled
Bearer Bandwidth Limiting: Enabled
Uplink MBR (bps):      0  Downlink MBR (bps):      0
Uplink GBR (bps):      0  Downlink GBR (bps):      0

```

Uplink Burst (bytes):	0	Downlink Burst (bytes):	0
Dropped Uplink Pkts:	0	Dropped Downlink Pkts:	0
Dropped Uplink Bytes:	0	Dropped Downlink Bytes:	0
Current Readdressed Sessions:			0
Total Readdressed Uplink Pkts:			0
Total Readdressed Uplink Bytes:			0
Total Readdressed Downlink Pkts:			0
Total Readdressed Downlink Bytes:			0
Total Readdressing Failure Packets:			0
Non Syn Flow:	0	Duplicate Key:	0
Dropped Pkts:	0		
Creation Time:	Monday September 16 21:44:33 GMT 2013		
Last Pkt Time:	Monday September 16 21:48:33 GMT 2013		
Duration:	00h:05m:47s		
Active Charging Service name:	LTE		
Rule Base name:	OCS		
URL-Redir First-Request-Only:	n/a		
Bandwidth Policy:	n/a		
FW-and-NAT Policy:	NATPOLICY		
NAT Policy NAT44:	Required		
NAT Policy NAT64:	Not-required		
TPO Policy:	n/a		
CF Policy ID:	n/a		
Old CF Policy ID:	n/a		
Dynamic Charging:	Enabled		
Dynamic Chrg Msg Received:	1	Rule Definitions Received:	1
Installs Received:	3	Removes Received:	0
Installs Succeeded:	3	Installs Failed:	0
Removes Succeeded:	0	Removes Failed:	0
Uplink Dynamic Rule Packets:	22	Uplink Dynamic Rule Bytes:	2763
Downlink Dynamic Rule Packets:	17	Downlink Dynamic Rule Bytes:	5879
Dynamic Charging Packet Drop statistics:			
PCC Rule BW Limit Upl Pkts:	0	PCC Rule BW Limit Dnl Pkts:	0
PCC Rule BW Limit Upl Bytes:	0	PCC Rule BW Limit Dnl Bytes:	0
PCC Rule Gating Upl Pkts:	0	PCC Rule Gating Dnl Pkts:	0
PCC Rule Gating Upl Bytes:	0	PCC Rule Gating Dnl Bytes:	0
RuleMatch Fail Upl Pkts:	0	RuleMatch Fail Dnl Pkts:	0
RuleMatch Fail Upl Bytes:	0	RuleMatch Fail Dnl Bytes:	0
Credit-Control:	On		
CC Peer:	PHLARTRMAS03		
CC Group:	DCCA-GY		
CC Mode:	DIAMETER		
CC Failure Handling:	Retry & Terminate		
CC Session Failover:	Enabled		
CCR-I Server Unreachable Handling:	Continue		
CCR-U Server Unreachable Handling:	Continue		
Total CCR-U	0		
Current Server Unreachable State:	n/a		
Interim Volume in Bytes (used / allotted):	na/	na	
Interim Time in Seconds (used / allotted):	na/	na	
Server Retries (attempted / configured):	na/	na	
QoS Renegotiate Up:	0	QoS Renegotiate Dn:	0
TCP Proxy Flows Requests:	0	TCP Proxy Flows Request Success:	0
Disable TCP Proxy Flows Requests:	0	Disable TCP Proxy Flows Success:	0
Current TCP Proxy Flows:	0	Total TCP Proxy Flows:	0
TCP-proxy reset for non-SYN flows:	0		
Current IP Flows:	0	Current ICMP Flows:	0
Current IPv6 Flows:	1	Current ICMPv6 Flows:	0
Current TCP Flows:	1	Current UDP Flows:	0
Current HTTP Flows:	0	Current HTTPS Flows:	0
Current FTP Flows:	0	Current POP3 Flows:	0
Current SMTP Flows:	0	Current SIP Flows:	0
Current RTSP Flows:	0	Current RTP Flows:	0

```

Current RTCP Flows:          0  Current IMAP Flows:          0
Current WSP-CO Flows:       0  Current WSP-CL Flows:       0
Current MMS Flows:         0  Current DNS Flows:         0
Current PPTP-GRE Flows:    0  Current PPTP Flows:        0
Current P2P Flows:         0  Current H323 Flows:        0
Current TFTP Flows:        0
Current UNKNOWN Flows:     1
Max (L3) Flows:            6
Max Flows Timestamp:      Monday September 16 21:44:40 GMT 2013

```

```

...
Charging Updates:          n/a

```

```

Rating-Group:              3300
Service-Identifier:        0
State:                     Charging
Checkpoint State:         Current
Pending Update:           No
Last Answer:              0h05m47s
Validity-Time:            42853
Volume Threshold:        255852544

```

	Quota	Usage	Total Usage
CC-Time:	-	347	347
CC-Total-Octets:	524288000	8992	8992
CC-Input-Octets:	-	2887	2887
CC-Output-Octets:	-	6105	6105
CC-Service-Specific-Units:	-	36	36
Quota-Consumption-Time:	-	-	-
Quota-Hold-Time:	-	-	-
Quota-Validity-Time:	43200	347	

Ruledef Name	Pkts-Down	Bytes-Down	Pkts-Up	Bytes-Up	Hits
HandleDNS3300	2	226	2	124	4

Firewall-Ruledef Name	Pkts-Down	Bytes-Down	Pkts-Up	Bytes-Up	Hits
int_apn_src	2	226	2	124	4

Dynamic Charging Rule Definition Statistics:

Dynamic-Rule-Name	Pkts-Down	Bytes-Down	Pkts-Up	Bytes-Up	Hits
RTRRule3300	17	5879	22	2763	36

```

Total Dynamic Rules:      1
Total Predefined Rules:   2
Total Firewall Predefined Rules: 0

```

Charging-Updates Statistics: n/a

Dynamic Charging Rule Definition(s) Configured:

Name	Prior Content-Id	Chrg-Type	Rule Parameters
RTRRule3300	950	3300	Both Gate Status: Allow All QoS Class Identifier: 9 ARP Priority Level: 10 Reporting Level: Rating Grp Metering Method: Durn + Vol Uplink MBR: 75000000 Downlink MBR: 75000000 Filter 1: Direction: Uplink Dst Addr 0.0.0.0/0 Filter 2: Direction: Downlink

Src Addr 0.0.0.0/0  
Filter 3:  
Direction: Uplink  
Dst Addr ::/0  
Filter 4:  
Direction: Downlink  
Src Addr ::/0

Predefined Rules Enabled List:

HandleTCP3300  
HandledDNS3300

Predefined Firewall Rules Enabled List: n/a

Session-ID: 115:12023409 Username:  
0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org  
Callid: 22075719 IMSI/MSID: 300420060496012  
MSISDN: 19126757869  
ACSMgr Instance: 115 ACSMgr Card/Cpu: 7/1  
SessMgr Instance: 115  
Client-IP: 2001:db8::  
NAS-IP: 0.0.0.0  
Access-NAS-IP(FA):  
NAS-PORT: 0 NSAPI: 7  
Acct-Session-ID: 393A43B1  
NAS-ID: n/a  
Access-NAS-ID(FA): n/a  
3GPP2-BSID: n/a  
Access-Correlation-ID(FA): n/a  
3GPP2-Correlation-ID: n/a  
MEID: n/a  
Carrier-ID: n/a ESN: n/a  
Uplink Bytes: 94041 Downlink Bytes: 83406  
Uplink Packets: 1033 Downlink Packets: 922

...

Dynamic Rule Limiting: Enabled

Bearer Bandwidth Limiting: Enabled

Uplink MBR (bps):	38000	Downlink MBR (bps):	38000
Uplink GBR (bps):	38000	Downlink GBR (bps):	38000
Uplink Burst (bytes):	9500	Downlink Burst (bytes):	9500
Dropped Uplink Pkts:	0	Dropped Downlink Pkts:	0
Dropped Uplink Bytes:	0	Dropped Downlink Bytes:	0
Current Readdressed Sessions:			0
Total Readdressed Uplink Pkts:			0
Total Readdressed Uplink Bytes:			0
Total Readdressed Downlink Pkts:			0
Total Readdressed Downlink Bytes:			0
Total Readdressing Failure Packets:			0
Non Syn Flow:	0	Duplicate Key:	0
Dropped Pkts:	0		

Creation Time: Monday September 16 21:44:28 GMT 2013  
Last Pkt Time: Monday September 16 21:50:20 GMT 2013  
Duration: 00h:05m:52s  
Active Charging Service name: LTE  
Rule Base name: PGW  
URL-Redir First-Request-Only: n/a  
Bandwidth Policy: n/a  
FW-and-NAT Policy: n/a  
NAT Policy NAT44: Not-required  
NAT Policy NAT64: Not-required  
TPO Policy: n/a  
CF Policy ID: n/a  
Old CF Policy ID: n/a  
Dynamic Charging: Enabled

```

Dynamic Chrg Msg Received:      0 Rule Definitions Received:      0
Installs Received:             0 Removes Received:                 0
Installs Succeeded:           0 Installs Failed:                 0
Removes Succeeded:            0 Removes Failed:                 0
Uplink Dynamic Rule Packets:   1033 Uplink Dynamic Rule Bytes:      94041
Downlink Dynamic Rule Packets: 922 Downlink Dynamic Rule Bytes:    83406
Dynamic Charging Packet Drop statistics:
PCC Rule BW Limit Up1 Pkts:    0 PCC Rule BW Limit Dnl Pkts:     0
PCC Rule BW Limit Up1 Bytes:   0 PCC Rule BW Limit Dnl Bytes:    0
PCC Rule Gating Up1 Pkts:     0 PCC Rule Gating Dnl Pkts:      0
PCC Rule Gating Up1 Bytes:     0 PCC Rule Gating Dnl Bytes:     0
RuleMatch Fail Up1 Pkts:      0 RuleMatch Fail Dnl Pkts:       0
RuleMatch Fail Up1 Bytes:     0 RuleMatch Fail Dnl Bytes:     0
Credit-Control:                                     Off
Event-Triggers:
QoS Renegotiate Up:           0 QoS Renegotiate Dn:             0
TCP Proxy Flows Requests:     0 TCP Proxy Flows Request Success: 0
Disable TCP Proxy Flows Requests: 0 Disable TCP Proxy Flows Success: 0
Current TCP Proxy Flows:      0 Total TCP Proxy Flows:         0
TCP-proxy reset for non-SYN flows: 0
Current IP Flows:             0 Current ICMP Flows:            0
Current IPv6 Flows:           1 Current ICMPv6 Flows:          0
Current TCP Flows:            0 Current UDP Flows:             1
Current HTTP Flows:           0 Current HTTPS Flows:          0
Current FTP Flows:            0 Current POP3 Flows:           0
Current SMTP Flows:           0 Current SIP Flows:             0
Current RTSP Flows:           0 Current RTP Flows:            0
Current RTCP Flows:           0 Current IMAP Flows:           0
Current WSP-CO Flows:         0 Current WSP-CL Flows:         0
Current MMS Flows:            0 Current DNS Flows:            0
Current PPTP-GRE Flows:       0 Current PPTP Flows:           0
Current P2P Flows:            0 Current H323 Flows:           0
Current TFTP Flows:           0
Current UNKNOWN Flows:        1
Max (L3) Flows:               0
Max Flows Timestamp:                                     n/a

```

...

```

Charging Updates: n/a
No Charging ruledef(s) match the specified criteria
No Firewall ruledef(s) match the specified criteria

```

Dynamic Charging Rule Definition Statistics:

Dynamic-Rule-Name	Pkts-Down	Bytes-Down	Pkts-Up	Bytes-Up	Hits
0_0	922	83406	1033	94041	1955
Total Dynamic Rules:	2				
Total Predefined Rules:	0				
Total Firewall Predefined Rules:	0				
Charging-Updates Statistics:	n/a				

Dynamic Charging Rule Definition(s) Configured:

Name	Prior Content-Id	Chrg-Type	Rule Parameters
0_0	400	102	Offline Gate Status: Allow All QoS Class Identifier: 1 ARP Priority Level: 11 Reporting Level: Rating Grp Metering Method: Duration Uplink MBR: 38000 Downlink MBR: 38000 Uplink GBR: 38000 Downlink GBR: 38000

```

Filter 1:
Direction:          Uplink
Protocol:           UDP
Src Addr  2001:db8::12/128
Dst Addr  2001:db8::13/128
Dst Port  59536
Filter 2:
Direction:          Downlink
Protocol:           UDP
Src Addr  2001:db8::13/128
Dst Addr  2001:db8::12/128
Dst Port  53626
0_1  401  102  Offline Gate Status:      Allow All
QoS Class Identifier:  1
ARP Priority Level:    11
Reporting Level:      Rating Grp
Metering Method:      Duration
Uplink MBR:           0
Downlink MBR:         0
Uplink GBR:           0
Downlink GBR:         0
Filter 1:
Direction:          Uplink
Protocol:           UDP
Src Addr  2001:db8::12/128
Dst Addr  2001:db8::13/128
Dst Port  59537
Filter 2:
Direction:          Downlink
Protocol:           UDP
Src Addr  2001:db8::13/128
Dst Addr  2001:db8::12/128
Dst Port  53627

```

Predefined Rules Enabled List: n/a

Predefined Firewall Rules Enabled List: n/a

Total acs sessions matching specified criteria: 3

## show active-charging firewall statistics

這是「show active-charging sessions full」的妹妹，可以提供有關封包捨棄原因的更多資訊。

```

[XGWout]PGW> show active-charging firewall statistics callid 0000513a
Thursday June 18 17:01:20 UTC 2015
Firewall Statistics for Callid 0000513a in Context: XGWout.
Data Stats:
Total Packets Received:          8745
Total Bytes Received:            5296353
Total Packets Sent:              8704
Total Bytes Sent:                5291193
Total Packets (NAT64 Translation): 0
Total Bytes Reduced (NAT64 Translation): 0
Total Packets Injected:          0
Total Bytes Injected:            0
Uplink Packets Dropped:          37
Uplink Bytes Dropped:            5000
Downlink Packets Dropped:        4
Downlink Bytes Dropped:         160
Total Malformed Packets:        0

```



```

Total DOS Attacks: 0
Total Flows Processed by Firewall: 0
Total NAT Flows Processed by Firewall: 171
Total NAT44 Flows Processed by Firewall: 171
Total NAT64 Flows Processed by Firewall: 0
Total Bypass-NAT Flows Processed by Firewall: 0
Total Bypass-NAT44 Flows Processed by Firewall: 0
Total Bypass-NAT64 Flows Processed by Firewall: 0
Current Flows Processed by Firewall: 0
Current NAT Flows Processed by Firewall: 1
Current NAT44 Flows Processed by Firewall: 1
Current NAT64 Flows Processed by Firewall: 0
Current Bypass-NAT Flows Processed by Firewall: 0
Current Bypass-NAT44 Flows Processed by Firewall: 0
Current Bypass-NAT64 Flows Processed by Firewall: 0

```

## show subscribers data-rate [high/low]

捕獲使用者或使用者組的資料速率/吞吐量

- 與正常組或其他組 ( 即有問題的特定IP池中的使用者 ) 相比，這對應用於懷疑有任一/兩個方向的資料問題的使用者組最有用

以下輸出適用於與前面命令同時使用的VoLTE使用者。

```
[local]PGW> show sub data-rate high callid 22075719
Monday September 16 21:51:07 UTC 2013
```

```

Total Subscribers      : 1
Active                 : 1           Dormant                 : 0
peak rate from user(bps): 27699     peak rate to user(bps) : 24879
ave rate from user(bps) : 16663     ave rate to user(bps)  : 16433
sust rate from user(bps): 16692     sust rate to user(bps) : 16459
peak rate from user(pps): 37        peak rate to user(pps) : 34
ave rate from user(pps) : 22        ave rate to user(pps)  : 22
sust rate from user(pps): 22        sust rate to user(pps) : 22

```

## show subscribers debug-info

此命令包含的資訊大多可能有助於TAC或工程部門支援客戶，不過此處有些資訊可能會引起好奇客戶的興趣。

此處使用的是相同的VoLTE示例：

```
[local]PGW> show sub debug-info msid 300420060496012
Monday September 16 21:50:51 UTC 2013
```

```

username: 0300420060496012@nai.epc.mnc420.mcc300.3gppnetwork.org
callid: 22075719 msid: 300420060496012 Card/Cpu: 7/1 Sessmgr Instance: 115 Primary callline:
Redundancy Status: Original Session Checkpoints Attempts Success Last-Attempt Last-Success Full:
8 6 63300ms 63300ms Micro: 661 661 0ms 0ms GR Checkpoints Sent 2 Full Checkpoints, last 63

```

```

seconds before 56 Micro Checkpoints, last 3 seconds before Invalidate-CRRs: 0 Call Statistics: 1
Current number of NAT flows checkpointed: 0 Current state: SMGR_STATE_CONNECTED FSM Event trace:
State Event Num Occurances Time SMGR_STATE_OPEN SMGR_EVT_NEWCALL (1) 2013-09-16:21:44:28
SMGR_STATE_NEWCALL_ARRIVED SMGR_EVT_IPV6ADDR_ALLOC_SUCCESS (1) 2013-09-16:21:44:29
SMGR_STATE_NEWCALL_ARRIVED SMGR_EVT_ANSWER_CALL (1) 2013-09-16:21:44:29
SMGR_STATE_NEWCALL_ANSWERED SMGR_EVT_LINE_CONNECTED (1) 2013-09-16:21:44:29
SMGR_STATE_LINE_CONNECTED SMGR_EVT_LOWER_LAYER_UP (1) 2013-09-16:21:44:29 CLP State Trace: State
EBI's Associated Time CLI_MAPPED_SGX_EVT_POLICY_STATUS_IND - - - - - 2013-09-
16:21:49:53 CLI_MAPPED_SGX_EVT_POLICY_CHANGE_REQ - - - - - 2013-09-16:21:49:53
CLI_MAPPED_SEF_EVT_POLICY_CHANGE_REQ - - - - - 2013-09-16:21:49:53
CLI_MAPPED_SEF_EVT_POLICY_CHANGE_RSP - - - - - 2013-09-16:21:49:53
CLI_MAPPED_SGX_EVT_POLICY_CHANGE_REQ - - - - - 2013-09-16:21:49:53
CLI_MAPPED_SGX_EVT_POLICY_STATUS_IND - - - - - 2013-09-16:21:49:53
CLI_MAPPED_SEF_EVT_SESS_SETUP_RSP - - - - - 2013-09-16:21:44:29
CLI_MAPPED_SGX_EVT_POLICY_STATUS_IND - - - - - 2013-09-16:21:44:29
SMGR_CLP_EVT_PGW_UPDATE_BEARER_REQ - - - - - 2013-09-16:21:44:29
CLI_MAPPED_SEF_EVT_BEARER_BINDING_RSP - - - - - 2013-09-16:21:44:29
SMGR_CLP_EVT_PGW_CREATE_SESSION_RSP 5 - - - - - 2013-09-16:21:44:29
CLI_MAPPED_SGX_EVT_POLICY_CHANGE_REQ - - - - - 2013-09-16:21:49:52
CLI_MAPPED_SEF_EVT_POLICY_CHANGE_REQ - - - - - 2013-09-16:21:49:52
CLI_MAPPED_SEF_EVT_POLICY_CHANGE_RSP - - - - - 2013-09-16:21:49:52
CLI_MAPPED_SGX_EVT_POLICY_CHANGE_REQ - - - - - 2013-09-16:21:49:52
CLI_MAPPED_SGX_EVT_POLICY_STATUS_IND - - - - - 2013-09-16:21:49:52
SMGR_CLP_EVT_PGW_CREATE_BEARER_REQ - - - - - 2013-09-16:21:49:52
CLI_MAPPED_SEF_EVT_BEARER_BINDING_RSP - - - - - 2013-09-16:21:49:53
SMGR_CLP_EVT_PGW_CREATE_BEARER_RSP - - 7 - - - - - 2013-09-16:21:49:53
CLI_MAPPED_SEF_EVT_POLICY_STATUS_IND - - - - - 2013-09-16:21:49:53 Sub Session State
Trace: EBI ID State TimeStamp 5 SMGR_STATE_NEWCALL_ARRIVED 2013-09-16:21:44:28 5
SMGR_STATE_CONNECTED 2013-09-16:21:44:29 7 SMGR_STATE_CONNECTED 2013-09-16:21:49:53 NAT Policy
NAT44: Not-required NAT Policy NAT64: Not-required Data Reorder statistics Total timer expiry: 0
Total flush (tmr expiry): 0 Total no buffers: 0 Total flush (no buffers): 0 Total flush (queue
full): 0 Total flush (out of range):0 Total flush (svc change): 0 Total out-of-seq pkt drop: 0
Total out-of-seq arrived: 0 IPv4 Reassembly Statistics: Success: 0 In Progress: 0 Failure
(timeout): 0 Failure (no buffers): 0 Failure (other reasons): 0 Re-addressed Session Entries:
Allowed: 2000 Current: 0 Added: 0 Deleted: 0 Revoked for use by different subscriber: 0 TCP
Proxy DNS Info entries 0 IPv4 ACL applied: active input acl: number of rules: 0 active output
acl: number of rules: 0 ACL caching statistics: input packets: 2206 input cache hits: 0 output
packets: 2183 output cache hits: 0 IPv6 ACL applied: active input ipv6 acl: ECS_ACL_V6 number of
rules: 8 active output ipv6 acl: ECS_ACL_V6 number of rules: 8 IPv6 ACL caching statistics:
input cache hits: 1787 output cache hits: 739 Total number of ACL reload: 0 Total number of ACS
session deleted on ACL reload: 0 NEMO Mode: N/A ; Peer bond: NO ; Peer Callid: 00000000 sessmgr
NPU Flow Details: Flow Id Flow Type Nat Realm VPN Id 8079786 IPV6_FLOW n/a 5 Private IP NPU flow
timeout (Seconds) : n/a ACS PCP Service: n/a

```

## show subscribers aaa-configuration

這是一個龐大的使用者所有AAA和配置（甚至與非AAA相關）相關資訊的清單，無論是否使用AAA，或者是否曾經訪問AAA。檢視機箱分配給使用者的情況很有用，而不必分析AAA身份驗證資料包交換、使用者配置檔案或對預設機箱設定做出假設。

## 顯示訂閱者活動

此圖示訂戶的活動級別

## show active-charging flows ip-address

以下是連線到給定輸出IP位址的所有作業階段 ( 按流ID ) 以及兩個方向傳送的位元組數的所有串流清單。必須首先使用監控訂戶來檢視訂戶嘗試訪問的地址，然後確認是否從該地址收到任何資料包。

- 有關關注流id的詳細資訊，可使用show active-charging flows full flow-id檢索，並由MS IP欄位標識正確的流 ( 此時從mon子輸出中已知的使用者的IP地址 )。

## show subscribers policy

這將列出分配的訂戶的當前策略

## show [mipfa | mipha]全功能

該清單列出了有關訂戶的詳細MIP相關資訊

```
[local]PDSN-FA> show mipfa full username 9786045176@cisco.com
Tuesday May 12 16:08:05 UTC 2015
Username: 9786045176@cisco.com          Callid: 1120ff97
MSID: 311289786045176
Num Agent Advt Sent: 1      Num Agent Solicit Rcvd: 0

Home Address #1: 10.235.121.62          NAI: 9786045176@cisco.com
FA Address: 203.0.113.1                HA Address: 203.0.113.2
Lifetime: 02h00m00s                   Remaining Lifetime: 01h56m04s
Reverse Tunneling: On                  Encapsulation Type: IP-IP
GRE Key: n/a                           IPsec Required: No
IPsec Ctrl Tunnel Estab.: No           IPsec Data Tunnel Estab.: No
MN-AAA Removal: No                    Proxy MIP: Disabled
DMU Auth Failures: 0                   Send Terminal Verification: Disabled
Revocation Negotiated: YES             Revocation I Bit Negotiated: YES
MN-HA-Key-Present: FALSE               MN-HA-SPI: n/a
FA-HA-Key-Present: TRUE                FA-HA-SPI: 8832
MN-FA-Key-Present: FALSE               MN-FA-SPI: n/a
HA-RK-KEY-Present: FALSE              HA-RK-SPI: n/a
HA-RK-Lifetime: n/a                    HA-RK-Remaining-Lifetime: n/a
Send Host Config: Disabled
```

## show [mipfa | mipha]計數器

此報告訂閱伺服器的各種MIP相關計數器：

[local]PFDN> show mipfa counters username 9786045176@cisco.com

Tuesday May 12 16:08:12 UTC 2015

MSID: 311289786045176

Username: 9786045176@cisco.com

Callid: 1120ff97

Num Agent Advt Sent: 1 Num Agent Solicit Rcvd: 0

Home Address: 10.235.121.62

NAI: 9786045176@cisco.com

FA Address: 203.0.113.1

HA Address: 203.0.113.2

Registration Request Received:

Total Received Reg:	1	Accepted Reg:	1
Rejected Reg:	0		
Denied Reg:	0	Discarded Reg:	0
Relayed Reg:	1	Auth Failed Reg:	0
FA Denied Reg:	0	HA Denied Reg:	0
Rcvd with MIP Key Data:	0		

Init RRQ Received:	1	Init RRQ Accepted:	1
Init RRQ Rejected:	0		
Init RRQ Denied:	0	Init RRQ Discarded:	0
Init RRQ Relayed:	1	Init RRQ Auth Failed:	0
Init PMIP RRQ Xmit:	0	Init PMIP RRQ Re-Xmit:	0
Init RRQ Denied by FA:	0	Init RRQ Denied by HA:	0

Renew RRQ Received:	0	Renew RRQ Accepted:	0
Renew RRQ Rejected:	0		
Renew RRQ Denied:	0	Renew RRQ Discarded:	0
Renew RRQ Relayed:	0	Renew RRQ Auth Failed:	0
Renew PMIP RRQ Xmit:	0	Renew PMIP RRQ Re-Xmit:	0
Renew RRQ Denied by FA:	0	Renew RRQ Denied by HA:	0

Dereg RRQ Received:	0	Dereg RRQ Accepted:	0
Dereg RRQ Rejected:	0		
Dereg RRQ Denied:	0	Dereg RRQ Discarded:	0
Dereg RRQ Relayed:	0	Dereg RRQ Auth Failed:	0
Dereg PMIP RRQ Xmit:	0	Dereg PMIP RRQ Re-Xmit:	0
Dereg RRQ Denied by FA:	0	Dereg RRQ Denied by HA:	0

Denied by FA:

Unspecified error:	0	Reg Timeout:	0
Admin Prohibited:	0	No Resources:	0
MN Auth Failure:	0	HA Auth Failure:	0
Lifetime too long:	0	Poorly formed Request:	0
Poorly formed Reply:	0	MN Too Distant:	0
Invalid COA:	0	Missing NAI:	0
Missing Home Agent:	0	Missing Home Addr:	0
Unknown Challenge:	0	Missing Challenge:	0
Stale Challenge:	0		
Encap Unavailable:	0	Rev Tunnel Unavailable:	0
Rev Tunnel Mandatory:	0	HA Network Unreachable:	0
Delivery Style Unavailable:	0	HA Host Unreachable:	0
HA Port Unreachable:	0	HA Unreachable:	0
Unknown CVSE Rcvd:	0	MIP Key Request:	0
AAA Authenticator:	0	Public Key Invalid:	0

Discarded by FA:

Invalid Extn:	0	Invalid UDP Checksum:	0
---------------	---	-----------------------	---

Denied by HA:

FA Auth Failure:	0	Poorly formed Request:	0
Mismatched ID:	0	Simul Bindings Exceeded:	0
Unknown HA:	0	Rev Tunnel Unavailable:	0
MN Auth Failure:	0	No Resources:	0
Admin Prohibited:	0	Rev Tunnel Mandatory:	0
Encap Unavailable:	0	Unspecified Reason:	0

```

Unknown CVSE Rcvd:          0

Registration Reply Rcvd:
  Total:                    1          Relayed:          1
  Errors:                   0

  Init RRP Rcvd:           1          Init RRP Relayed:  1
  Renew RRP Rcvd:         0          Renew RRP Relayed: 0
  Dereg RRP Rcvd:         0          Dereg RRP Relayed: 0
  RRP with Dyn HA Rcvd:   0          RRP with Dyn HA Denied: 0

Registration Reply Sent:
  Total:                    1          Accepted Reg:     1
  Accepted DeReg:         0          Denied:           0
  Send Error:             0

Tunnel Data Received:
  Total Packets :          3383
    IPIP:                 3383          GRE:              0
  Total Bytes :           3850296
    IPIP:                 3850296      GRE:              0
  Errors:
    Protocol Type Error:   0          GRE Key Absent:   0
    GRE Checksum Error :   0          Invalid Pkt Length: 0
    No Session Found :    0

Tunnel Data Sent:
  Total Packets :          2905
    IPIP:                 2905          GRE:              0
  Total Bytes :           346228
    IPIP:                 346228      GRE:              0

```

## show ppp [full]

報告有關訂戶的詳細PPP相關資訊。  
 — 完整版本不是普通版本的超集。

```

[local]PDSN-HSGW> show ppp username 9786045176@cisco.com
Tuesday May 12 16:08:18 UTC 2015
PPP Summary:
  1 PPP Sessions In Progress

Layer Info:
  1 LCP Up          1 IPCP Up          0 IPv6CP Up      0 CCP Up

Compression:
  0 VJ Compressed Sessions (loc to rem)
  0 VJ Compressed Sessions (rem to loc)
  0 ROHC Compressed Sessions (loc to rem)
  0 ROHC Compressed Sessions (rem to loc)
  0 Normal PPP Compressed Sessions
  0 Stateless PPP Compressed Sessions
  1 NONE          0 STAC          0 MPPC          0 DEFLATE (loc to rem)
  1 NONE          0 STAC          0 MPPC          0 DEFLATE (rem to loc)

Errors:
  0 In errors          0 In discards          0 In unknown proto
  0 Out errors         0 Out discards         0 Pkt too long

```

```
0 Bad address          0 Bad control          0 Bad FCS
0 Bad Length
0 Echo req rcvd        0 Echo rsp rcvd        0 Echo Req sent
0 Echo rsp sent        0 Invalid magic-number rcvd
0 LCP Vend Ext req sent      0 LCP Vend Ext req resent
0 LCP Vend Ext rsp rcvd      0 LCP Vend Ext protocol rejected
0 LCP Vend Ext req max-retried
0 Decomp errors         0 Comp Reset sent
0 Comp errors          0 Comp expansion       0 Comp Reset rcvd
```

Data Stats:

```
294366 In octs(unframed)      2059 In pkts
  307 In ctrl octs            8 In ctrl pkts
    0 In comp octs           0 In comp pkts
    0 In uncomp octs
307522 In framed octs
3798297 Out octs(unframed)    3400 Out pkts
  139 Out ctrl octs          6 Out ctrl pkts
    0 Out comp octs          0 Out comp pkts
    0 Out uncomp octs
3840820 Out framed octs
```

```
[local]PDSN-HSGW> show ppp full username 9786045176@cisco.com
Tuesday May 12 16:08:23 UTC 2015
Username: 9786045176@cisco.com Callid:1120ff97 Msid: 311289786045176
```

LCP State: Opened

```
mtu (Negotiated/Enforced): 1500/1500 mru: 1500
auth algorithm (loc to rem): none (rem to loc): none
PFC (loc to rem): enabled [ignore] (rem to loc): enabled
ACFC (loc to rem): enabled [ignore] (rem to loc): enabled
async map (loc to rem): 0x00000000 (rem to loc): 0x00000000
```

IPCP State: Opened

```
IP Header comp. (loc to rem): none
                  (rem to loc): none
Local Address:   203.0.113.1      Remote Address:   0.0.0.0
Primary DNS:    209.165.200.225  Secondary DNS:   209.165.200.226
Primary NBNS:   0.0.0.0          Secondary NBNS:   0.0.0.0
```

IPV6CP State: Not Opened

CCP State: Not Opened

```
294701 In octs(unframed)      2063 In pkts
3798574 Out octs(unframed)    3404 Out pkts
  307 In ctrl octs            8 In ctrl pkts
  139 Out ctrl octs          6 Out ctrl pkts
307883 In framed octs        3841113 Out framed octs
291333 In data (unfr/data-cmp) octs 3784675 Out data (unfr/data-cmp) octs
291471 In data (iphdr-cmp) octs 3784843 Out data (iphdr-cmp) octs
  0 In data (iphdr-cmp-fail) octs 0 In data (iphdr-cmp-fail) pkts
  0 In data (iphdr-rohc) octs 0 Out data (iphdr-rohc) octs
  0 In data (iphdr-rohc-fail) octs 0 In data(iphdr-rohc-fail) pkts
  0 In discards              0 In errors
  0 Out discards             0 Out errors
  0 Bad address              0 Bad control
  0 Pkt too long            0 Bad FCS
  0 Bad pkt length
  0 Echo req rcvd           0 Echo rsp rcvd
  0 Echo req sent           0 Echo rsp sent
  0 LCP Vend Ext req sent    0 LCP Vend Ext req resent
  0 LCP Vend Ext rsp rcvd    0 LCP Vend Ext protocol rejected
  0 LCP Vend Ext req max-retried
```

0 Invalid magic-number rcvd

Total PPP sessions matching specified criteria: 1

show ppp counters

[local]PDSN-HSGW> show ppp counters username 9786045176@cisco.com

Tuesday May 12 16:08:52 UTC 2015

Username: 9786045176@cisco.com Callid:1120ff97 Msid: 311289786045176

296894 In octs(unframed)	2083 In pkts
3800156 Out octs(unframed)	3412 Out pkts
307 In ctrl octs	8 In ctrl pkts
139 Out ctrl octs	6 Out ctrl pkts
310124 In framed octs	3842736 Out framed octs
293517 In data (unfr/data-cmp) octs	3786225 Out data (unfr/data-cmp) octs
293655 In data (iphdr-cmp) octs	3786393 Out data (iphdr-cmp) octs
0 In data (iphdr-cmp-fail) octs	0 In data (iphdr-cmp-fail) pkts
0 In data (iphdr-rohc) octs	0 Out data (iphdr-rohc) octs
0 In data (iphdr-rohc-fail) octs	0 In data(iphdr-rohc-fail) pkts
0 In discards	0 In errors
0 Out discards	0 Out errors
0 Bad address	0 Bad control
0 Pkt too long	0 Bad FCS
0 Bad pkt length	
0 Echo req rcvd	0 Echo rsp rcvd
0 Echo req sent	0 Echo rsp sent
0 LCP Vend Ext req sent	0 LCP Vend Ext req resent
0 LCP Vend Ext rsp rcvd	0 LCP Vend Ext protocol rejected
0 LCP Vend Ext req max-retried	
0 Invalid magic-number rcvd	

Total PPP sessions matching specified criteria: 1

## show rp full

此報告有關訂戶的詳細A11 ( RP介面 ) 相關資訊

- 「show rp counters」 是此命令的子集

[local]PDSN-HSGW> show rp full username 9786045176@cisco.com

Tuesday May 12 16:07:52 UTC 2015

Username: 9786045176@cisco.com Callid: 1120ff97 Msid: 311289786045176

A10 Connection #1:(Main)

PCF Address: 10.207.6.67

PDSN Address: 10.211.28.132

MN Sess Ref ID: 1

GRE Key: 1864769

Service Option: 59

Flow Control State : XON

Lifetime: 00h30m00s

Remaining Lifetime: 00h28m59s

GRE Receive:

Total Packets Rcvd: 2017

Total Bytes Rcvd: 367426

GRE Send:

Total Packets Sent: 4722

Total Bytes Sent: 3988706

Data Over Signaling Packets: 0

Data Over Signaling Bytes: 0

IP Header compression:

Forward: ROHC not negotiated

Reverse: ROHC not negotiated

GRE Flow Control:

Total Packets Received with XOFF: 0  
Total Packets Received with XON: 0  
Total XON->XOFF Transitions: 0  
Total Output Packets Dropped on XOFF: 0  
Total Output Bytes Dropped on XOFF: 0

SPI: 257

Prev System Id: 0 Current System Id: 0  
Prev Network Id: 0 Current Network Id: 0  
Prev Packet Zone Id: 0 Current Packet Zone Id: 0  
BSID: 001C00030015 GRE Segmentation : Disabled

Registration Request/Reply:

Renew RRQ Accepted: 0 Discarded: 0  
Intra PDSN Active H/O RRQ Accept: 0 Intra PDSN Dormant H/O RRQ Accept: 0  
Inter PDSN Handoff RRQ Accepted: 1  
Reply Send Error: 0

Registration Update/Ack:

Initial Update Transmitted: 0 Update Retransmitted: 0  
Denied: 0 Not Acknowledged: 0  
Reg Ack Received: 0 Reg Ack Discarded: 0  
Update Send Error: 0

Registration Update Send Reason:

Lifetime Expiry: 0 Upper Layer Initiated: 0  
Other Reasons: 0 Handoff Release: 0  
Session Manager Exited: 0

Registration Update Denied:

Reason Unspecified: 0 Admin Prohibited: 0  
PDSN Failed Authentication: 0 Identification Mismatch: 0  
Poorly Formed Update: 0

Session Update/Ack:

Initial Update Transmitted: 1 Update Retransmitted: 0  
Denied: 0 Not Acknowledged: 0  
Sess Update Ack Received: 1 Sess Update Ack Discarded: 0  
Update Send Error: 0

Session Update Send Reason:

Always On: 0 QoS Info: 1  
TFT violation: 0 Traffic Violation: 0  
Traffic Policing: 0 Operator Triggered: 0

Session Update Denied:

Reason Unspecified: 0 Insufficient Resources: 0  
Admin Prohibited: 0 Parameter not updated: 0  
PDSN Failed Authentication: 0  
Identification Mismatch: 0  
Poorly Formed Update: 0  
Profile Id Not Supported: 0 Handoff In Progress : 0

GRE Receive:

Total Packets Received: 2017 Protocol Type Error: 0  
Total Bytes Received: 367426 GRE Key Absent: 0  
GRE Checksum Error: 0  
Invalid Packet Length: 0

GRE Send:

Total Packets Sent: 4722



```
Total Bytes Sent:          3988706
Total Packets Sent in SDB:0
Total Bytes Sent in SDB:  0
```

GRE Segmentation:

```
Total Packets Received with Segmentation Indication:  0
Total Packets Sent with Segmentation Indication:      0
Total Successful Reassembly:                          0
Total packets processed without proper reassembly:    0
```

GRE Flow Control:

```
Total Packets Received with XOFF:      0
Total Packets Received with XON:       0
Total XON->XOFF Transitions:           0
Total Output Packets Dropped on XOFF:   0
Total Output Bytes Dropped on XOFF:    0
```

Total RP sessions matching specified criteria: 1

## show l2tp sessions full

此報告有關訂戶的詳細l2tp相關資訊

— 請注意，與呼叫的LNS端相比，呼叫LAC端(0s)的Rx和Tx資料資料包計數似乎不正確

```
[local]PDSN-LAC> show l2tp sessions full user 0020000648@cisco.com
Wednesday June 17 23:34:13 UTC 2015
```

```
Username: 0020000648@cisco.com   Callid: 161df87f   Msid: 311280020000648
Peer IP Address: 203.0.113.11    Service Name:    LAC-Service1
Context Name: destination        Service Type:    LAC
```

Session State: LAC\_ESTABLISHED

```
Local Tunnel ID: 7                Local Session ID: 2471
Peer Tunnel ID: 88                Peer Session ID: 2471
Call Type: LAC-INCOMING          Call Serial Num: 371062911
Rx Connect Speed: 57600          Tx Connect Speed: 64000
PPP Proxy-Auth: CHAP_MD5         Tunnel Key: n/a
Bearer Type: DIGITAL             Framing Type: ASYNC
System ID: 0                     Network ID: 0
Cell Number: 0                   Service Option: 0
```

```
Data Rx Sequence Num Enabled: DISABLED
Data Tx Sequence Num Enabled: DISABLED
Data Rx Sequence Num: 0
Data Tx Sequence Num: 0
```

```
Rx Data Pkts: 0                   Tx Data Pkts: 0
Rx Data Octs: 0                   Tx Data Octs: 0
Rx Discard Data Pkts: 0
```

Handoffs: 0

```
[local]HA-LNS> show l2tp sessions full username 0020009112@cisco.com
Wednesday June 17 23:33:01 UTC 2015
```

```
Username: 0020000648@cisco.com   Callid: 0a30f2ac   Msid: 311280020000648
```

Peer IP Address: 203.0.113.10      Service Name: SIP-LNS  
Context Name: LNSINGRESS      Service Type: LNS

Session State: LNS\_ESTABLISHED

Local Tunnel ID:	88	Local Session ID:	2471
Peer Tunnel ID:	7	Peer Session ID:	2471
Call Type:	LNS-INCOMING	Call Serial Num:	371062911
Rx Connect Speed:	57600	Tx Connect Speed:	64000
PPP Proxy-Auth:	CHAP_MD5	Tunnel Key:	n/a
Bearer Type:	DIGITAL	Framing Type:	ASYNC

Data Rx Sequence Num Enabled:	ENABLED
Data Tx Sequence Num Enabled:	DISABLED
Data Rx Sequence Num:	15
Data Tx Sequence Num:	6

Rx Data Pkts:	15	Tx Data Pkts:	6
Rx Data Octs:	953	Tx Data Octs:	424
Rx Discard Data Pkts:	0		

## show rsvp counters

其中列出訂閱伺服器的詳細rsvp計數器

## show ims-authorization sessions full

該清單列出有關PCRF會話的詳細資訊

此示例顯示兩個APN ( APN1和APN2 ) 的PCRF資訊

- 請注意 , SGSN IP地址實際上是SGW地址

```
[local]PGW> show ims-authorization sessions full imsi 300420160377232  
Wednesday June 17 23:47:00 UTC 2015
```

```
CallId: 4d9f33cb      Service Name: IMS-GX  
IMSI: 300420160377232  
Session ID: 0007-diamprox.y.PHLA.Gx.ims.com;1302279115;926061183;55810c5d-17f02  
Bearer Type: GTP  
SGSN IP-Addr: 203.0.113.3  
APN: APN1  
Bearer Control Mode: UE/NW  
State: Connected
```

```
Negotiated Supported Features:  
3gpp-r10  
Bound PCRF Server: ohcis04mra01.cisco.com  
Primary PCRF Server: ohcis04mra01.cisco.com  
Secondary PCRF Server: njbbs04mra01.cisco.com  
Primary P-CSCF: NA  
Secondary P-CSCF: NA
```

Outstanding CCR-U: 0

UE IP Address:

UE IP Session Type: IPv6

IPv4 Address: NA

IPv6 Prefix: 5555:1000:8010:a9a4::

Auth Decision:

Event Triggers:

QoS-Change

PLMN-Change

RAT-Change

IP\_CAN-Change

Usage-Report

Successful-Resource-Alloc

UE-Timezone-Change

Resource-Modification-Request

UE-IP-Address-Allocate

UE-IP-Address-Release

Default-EPS-Bearer-QoS-Change

APN-AMBR-Modification-Failure

Default-EPS-Bearer-QoS-Modification-Failure

Event Report Indication: None

Negotiated QoS:

Default-Bearer-QoS:

QCI: 5

ARP:

PL: 10 PCI: 1

PVI: 1

APN AMBR Uplink(in bps): 600000

APN AMBR Downlink(in bps): 600000

CallId: 4d9f5163

Service Name: IMS-GX

IMSI: 300420160377232

Session ID: 0007-diamproxy.PHLA.Gx.ims.com;1302286691;929479551;55814953-17f02

Bearer Type: GTP

SGSN IP-Addr: 203.0.113.3

APN: APN2

Bearer Control Mode: UE/NW

State: Connected

Negotiated Supported Features:

3gpp-r10

Bound PCRF Server: ohcis04mra01.cisco.com

Primary PCRF Server: ohcis04mra01.cisco.com

Secondary PCRF Server: njbbs04mra01.cisco.com

Primary P-CSCF: NA

Secondary P-CSCF: NA

Outstanding CCR-U: 0

UE IP Address:

UE IP Session Type: IPv4\_IPv6

IPv4 Address: 100.107.226.26

IPv6 Prefix: 5555:1000:b029:a82d::

Auth Decision:

Event Triggers:

QoS-Change

PLMN-Change

RAT-Change

IP\_CAN-Change

Out-Of-Credit

Reallocation-Of-Credit

Usage-Report

Resource-Modification-Request

UE-IP-Address-Allocate

UE-IP-Address-Release

```
Default-EPS-Bearer-QoS-Change
APN-AMBR-Modification-Failure
Default-EPS-Bearer-QoS-Modification-Failure
Event Report Indication: None
```

Negotiated QoS:

```
Default-Bearer-QoS:
QCI: 8
ARP:
  PL: 10          PCI: 1
  PVI: 1
APN AMBR Uplink(in bps): 150000000    APN AMBR Downlink(in bps): 150000000
```

## 非使用者特定命令

雖然命令「show port npu counters」和「show port datalink counters」適用於整個介面，但如果要檢視系統是否在輸出介面處理特定使用者的資料（請參閱上文關於監控使用者限制的論述），並且使用者可以受到控制，則要嘗試通過網路傳送非常大的資料包，並且檢視介面計數器是否隨著在短視窗中傳送的資料包的數量而增加已傳送。要確信檢查結果，需要確保在運行測試之前，針對所選資料包大小的計數器不經常增加。