

Cisco 7500系列上使用分散式QoS的訊框中繼流量調節

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簡介

本文檔說明了將流量整形應用到具有多功能介面處理器(VIP)的Cisco 7500系列路由器和其他平台上的幀中繼介面之間的區別。其他平台包括Cisco 7200、3600和2600系列路由器。

必要條件

需求

本文件沒有特定需求。

採用元件

本文件所述內容不限於特定軟體和硬體版本。

慣例

如需文件慣例的詳細資訊，請參閱[思科技術提示慣例](#)。

背景資訊

自Cisco IOS®軟體版本12.1(5)T起，服務品質(QoS)原則必須在VIP上以分散模式執行；不再支援基於路由交換處理器(RSP)的QoS。因此，您必須使用shape命令和模組化QoS命令列介面(MQC)的其他命令，才能為Cisco 7500系列上的VIP上的訊框中繼介面實作分散式流量調節(DTS)。DTS結合了通用流量調節(GTS)和訊框中繼流量調節(訊框中繼TS)。如需範例設定，請參閱[設定分散式流量](#)

調節。

下表說明了如何配置幀中繼TS，這取決於平台：

	7500系列	7200、3600、2600和其他非VIP平台
支援的整形機制	DTS	訊框中繼TS
組態指令	策略對映中的shape命令	主介面上的訊框中繼流量調節；對映類配置命令以指定整形引數
需要dCEF ¹	是(使用show cef linecard命令進行驗證。)	否

¹ dCEF =分散式Cisco Express Forwarding

注意：在Cisco 7500系列上，由於幀中繼TS僅在非分散式模式下執行RSP，因此現在阻止了通過frame-relay traffic-shaping命令配置幀中繼TS的功能。使用dCEF和幀中繼TS時，CEF「punt」鄰接會導致RSP快速交換所有資料包，這對於最大轉發效能而言不是最理想的。

配置步驟

使用以下步驟在基於VIP的幀中繼介面上配置DTS：

1. 使用以下命令啟用dCEF：

```
router(config)# ip cef distributed
```

2. 確保幀中繼介面已啟用分散式交換。

```
router(config-if)# interface serial 8/0/0  
router(config-if)# ip route-cache distributed
```

```
router# show ip interface serial 8/0/0  
Serial8/0/0 is up, line protocol is up  
Internet address is 24.0.0.2/24  
Broadcast address is 255.255.255.255  
!--- Output suppressed. ICMP redirects are always sent ICMP unreachable are always sent  
ICMP mask replies are never sent IP fast switching is enabled IP fast switching on the same  
interface is disabled IP Flow switching is disabled IP CEF switching is enabled IP  
Distributed switching is enabled  
IP Fast switching turbo vector  
IP CEF switching with tag imposition turbo vector  
IP multicast fast switching is enabled  
IP multicast distributed fast switching is disabled  
IP route-cache flags are Fast, Distributed, CEF  
Router Discovery is disabled  
IP output packet accounting is disabled
```

3. 建立服務策略並將其應用於對映類。您可以實施以下策略之一：**單級策略** — 將整形引數應用於虛電路(VC)流量**分層策略** — 應用兩級策略，在「父」級別進行整形並在「子」級別進行排隊有關詳細資訊，請參閱[作為QoS策略的流量策略 \(分層流量策略\) 示例](#)。註：Cisco IOS軟體版本12.1(2)T在Cisco 7500系列以外的平台上引入了對低延遲佇列(LLQ)的支援，而分散式LLQ(dLLQ)在VIP的Cisco IOS軟體版本12.1(5)T中引入。分散式版本增強了此功能的效能。您可以為每個資料鏈路連線識別符號(DLCI)配置唯一服務策略。您無需使用對映類。您可以將

service-policy命令直接應用於子介面或DLCI。但是，請在對映類內配置dLLQ。

4. 使用以下命令驗證服務策略的正確操作：**show policy-map interface**顯示介面形狀**show vip full-qos**

FRF.12和DTS

Cisco IOS軟體版本12.1(5)T引入了訊框中繼分段FRF.12的分散式版本。將分散式FRF.12套用到訊框中繼介面時，您必須定義對映類並在對映類下套用服務原則。如果嘗試使用直接應用到介面的服務策略來配置對映類，則路由器會在啟用日誌記錄控制檯的情況下報告此錯誤消息：

Frame Relay fragmentation works with dTS only.

Please remove traffic-shaping from the interface serial 1/0/0

本節中的配置和配置驗證命令已在Cisco 7500系列路由器上測試，該路由器在RSP 8上運行Cisco IOS軟體版本12.2(5)T。

註：有關選擇分段值的詳細資訊，請參閱[具有服務品質\(分段、流量調節、LLQ/IP RTP優先\)](#)的幀中繼上的VoIP。

DTS和FRF.12的示例配置

```
interface Ethernet4/1/3
 ip address 10.122.3.206 255.255.255.0
!
interface Serial5/0/0:0
 no ip address
 encapsulation frame-relay
 load-interval 30
 no fair-queue
 !--- Do not configure frame-relay traffic-shaping.
!
interface Serial5/0/0:0.1 point-to-point
 ip address 10.1.1.2 255.255.255.0
 frame-relay interface-dlci 16
 class test
 frame-relay ip rtp header-compression
!
map-class frame-relay test
 no frame-relay adaptive-shaping
 service-policy output llq-shape
 frame-relay fragment 120
 !--- Apply the frame-relay fragment command to the !---
Frame Relay map class.

 access-list 101 permit udp any range 16384 32767 any
 range 16384 32767
```

MS-7507-8A# **show ip rtp head**

RTP/UDP/IP header compression statistics:

DLCI 16 Link/Destination info: point-to-point dlci

Interface Serial5/0/0:0:

Distributed fast switched:

4 seconds since line card sent last stats update

Rcvd: 105475 total, 105472 compressed, 0 errors

0 dropped, 0 buffer copies, 0 buffer failures

Sent: 99451 total, 99447 compressed,

3776208 bytes saved, 2187963 bytes sent

2.72 efficiency improvement factor
Connect: 256 rx slots, 256 tx slots,
0 long searches, 3 misses 0 collisions, 0 negative cache hits
99% hit ratio, five minute miss rate 0 misses/sec, 0 max

MS-7507-8A# **show policy-map**

Policy Map llq-shape
Class class-default
 shape peak 256000 1024 1024
 service-policy llq
Policy Map llq
Class voip
 priority percent 50

MS-7507-8A# **show policy-map interface s 5/0/0:0.1**

Serial5/0/0:0.1: DLCI 16 -
Service-policy output: llq-shape
 queue stats for all priority classes:
 queue size 0, queue limit 32
 packets output 147008, packet drops 0
 tail/random drops 0, no buffer drops 0, other drops 0
Class-map: class-default (match-any)
 148237 packets, 10393582 bytes
 30 second offered rate 24000 bps, drop rate 0 bps
Match: any
 queue size 0, queue limit 64
 packets output 149563, packet drops 0
 tail/random drops 0, no buffer drops 0, other drops 0
Shape: cir 256000, Bc 1024, Be 1024
 lower bound cir 0, adapt to fecn 0
 output bytes 6972057, shape rate 10000 bps
Service-policy : llq
 Class-map: voip (match-all)
 146701 packets, 10325334 bytes
 30 second offered rate 24000 bps, drop rate 0 bps
 Match: access-group 101
 Priority: 50% (128 kbps), burst bytes 3200, b/w
 exceed drops: 0
 Class-map: class-default (match-any)
 1536 packets, 68248 bytes
 30 second offered rate 0 bps, drop rate 0 bps
 Match: any
 queue size 0, queue limit 32
 packets output 2555, packet drops 0
 tail/random drops 0, no buffer drops 0, other drops 0

MS-7507-8A# **show frame pvc 16**

PVC Statistics for interface Serial5/0/0:0 (Frame Relay DTE)
DLCI = 16, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial5/0/0:0.1
input pkts 3036327 output pkts 199453
in bytes 198958363
out bytes 17271661 dropped pkts 0 in FECN pkts 0
in BECN pkts 0 out FECN pkts 0 out BECN pkts 0
in DE pkts 0 out DE pkts 0
out bcast pkts 1071 out bcast bytes 371448
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 35000 bits/sec, 50 packets/sec
pvc create time 17:51:42, last time pvc status changed 17:50:53
fragment type end-to-end fragment size 120

MS-7507-8A# **show interface shape**

Serial5/0/0:0 nobuffer drop 0
Serial5/0/0:0.1(class 0):
cir 256000, Bc 1024, Be 1024

lower bound cir 0, adapt to fecn 0
packets output 152104, bytes output 6985505
queue limit 64, queue size 0, drops 0
last clear = 16:58:59 ago, shape rate = 10000 bps

MS-7507-8A# show ip rtp head

RTP/UDP/IP header compression statistics:
DLCI 16 Link/Destination info: point-to-point dlci
Interface Serial5/0/0:0:
Distributed fast switched:
4 seconds since line card sent last stats update
Rcvd: 105475 total, 105472 compressed, 0 errors
0 dropped, 0 buffer copies, 0 buffer failures
Sent: 99451 total, 99447 compressed,
3776208 bytes saved, 2187963 bytes sent
2.72 efficiency improvement factor
Connect: 256 rx slots, 256 tx slots,
0 long searches, 3 misses 0 collisions, 0 negative cache hits
99% hit ratio, five minute miss rate 0 misses/sec, 0 max

MS-7507-8A# show policy-map

Policy Map llq-shape
Class class-default
shape peak 256000 1024 1024
service-policy llq
Policy Map llq
Class voip
priority percent 50

MS-7507-8A# show policy-map interface s 5/0/0:0.1

Serial5/0/0:0.1: DLCI 16 -
Service-policy output: llq-shape
queue stats for all priority classes:
queue size 0, queue limit 32
packets output 147008, packet drops 0
tail/random drops 0, no buffer drops 0, other drops 0
Class-map: class-default (match-any)
148237 packets, 10393582 bytes
30 second offered rate 24000 bps, drop rate 0 bps
Match: any
queue size 0, queue limit 64
packets output 149563, packet drops 0
tail/random drops 0, no buffer drops 0, other drops 0
Shape: cir 256000, Bc 1024, Be 1024
lower bound cir 0, adapt to fecn 0
output bytes 6972057, shape rate 10000 bps
Service-policy : llq
Class-map: voip (match-all)
146701 packets, 10325334 bytes
30 second offered rate 24000 bps, drop rate 0 bps
Match: access-group 101
Priority: 50% (128 kbps), burst bytes 3200, b/w
exceed drops: 0
Class-map: class-default (match-any)
1536 packets, 68248 bytes
30 second offered rate 0 bps, drop rate 0 bps
Match: any
queue size 0, queue limit 32

packets output 2555, packet drops 0
tail/random drops 0, no buffer drops 0, other drops 0

MS-7507-8A# show frame pvc 16

PVC Statistics for interface Serial5/0/0:0 (Frame Relay DTE)

```
DLCI = 16, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial5/0/0:0.1
input pkts 3036327    output pkts 199453
in bytes 198958363
out bytes 17271661    dropped pkts 0    in FECN pkts 0
in BECN pkts 0        out FECN pkts 0    out BECN pkts 0
in DE pkts 0          out DE pkts 0
out bcast pkts 1071  out bcast bytes 371448
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 35000 bits/sec, 50 packets/sec
pvc create time 17:51:42, last time pvc status changed 17:50:53
fragment type end-to-end fragment size 120
```

```
MS-7507-8A# show interface shape
Serial5/0/0:0 nobuffer drop 0
Serial5/0/0:0.1(class 0):
cir 256000, Bc 1024, Be 1024
lower bound cir 0, adapt to fecn 0
packets output 152104, bytes output 6985505
queue limit 64, queue size 0, drops 0
last clear = 16:58:59 ago, shape rate = 10000 bps
```

已知問題

如果仍然使用Cisco IOS軟體版本12.1E，則配置有幀中繼封裝的VIP介面可能會因匯流排錯誤而崩潰。如果在介面傳遞流量時應用服務策略，就會發生此崩潰。解決方法是在更新服務策略之前停止所有後台流量。或者，您可以升級到Cisco IOS軟體版本12.2或更高版本。

如需詳細資訊，請參閱[思科工具與資源](#)頁面。

相關資訊

- [QoS技術支援](#)
- [技術支援與文件 - Cisco Systems](#)